Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

May 12, 2016

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

RE: **Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 806382**
T-Mobile Site ID: CT11252A
74 Goodrich Lane, Portland, CT 06480
Latitude: 41° 36' 29.9" / Longitude: -72° 35' 29.56"
Parcel No: 000084-000000-000009

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 137 foot level of the existing 160 foot monopole at 74 Goodrich Lane, Portland, CT. The tower is owned by Crown Castle and the property is owned by Wayne Rivera and Joan J. Hale. T-Mobile now intends to remove and replace the existing antenna mount with a new antenna mount. Remove and replace three (3) existing antennas with six (6) new antennas. Remove six (6) existing TMAs and install six (6) new RRUs. Remove and replace six (6) existing coax lines with one (1) hybrid cable. Remove and replace existing cabinet with one (1) new cabinet. These antennas would be installed at the 137 foot level of the tower.

This facility was approved by the Connecticut Siting Council in Docket No. 58 on July 11, 1986. This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Susan Bransfield, First Selectwoman, Town of Portland and Wayne Rivera and Joan J. Hale as the property owners.

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

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

3. The proposed modification 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 Communication Commission safety standard.

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Kimberly Myl.

Sincerely,

Kimberly Myl

Kimberly Myl
Real Estate Specialist
Crown Castle
1200 MacArthur Boulevard, Suite 200
Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Susan Bransfield, First Selectwoman
Town of Portland
33 East Main Street - 2nd Floor,
Portland, Connecticut 06480-0071

Wayne Rivera
58 Goodrich Lane
Portland, CT 06480

Joan J. Hale
3060 North Atlantic Avenue, Apt. 301
Cocoa Beach, FL 32931-5046

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN HARTFORD, TOLLAND AND MIDDLESEX COUNTIES.

CONNECTICUT SITING COUNCIL

July 11, 1986

O P I N I O N

Hartford Cellular Company applied to the Connecticut Siting Council (Council) for a certificate of environmental compatibility and public need for the construction, maintenance, and operation of telecommunication towers and associated equipment in the towns of: Bloomfield; Glastonbury; Haddam; Hartford; Middlefield; Portland; Rocky Hill; Somers; and Willington. The application was subsequently amended to include proposed sites in the towns of Vernon and Windsor.

This application, which includes that portion of the state designated by the Federal Communications Commission (FCC) as the Hartford NECMA, is the second NECMA in the non-wireline competitor's plan to provide cellular telephone coverage to Connecticut. The Hartford NECMA coverages are planned to overlap with coverages from those sites already certificated by the Council in the New Haven NECMA to provide continuous mobile telephone coverage along the major highways of Connecticut.

The geologic characteristics of Connecticut include a Central Lowlands, a Coastal Plain and Western and Eastern Highlands. Most of the major thoroughfares of Connecticut follow paths of least resistance through the Central Valley and

along the coastal plain. Running north and south parallel to the Central Valley are Connecticut's ridgelines, which are both impediments to cellular telephone service and leading candidates for tower sites providing extensive coverage.

Just as the development of Connecticut has been closely tied to its geological formations, so apparently are its cellular telephone sites and coverages. Conflicts between those who wish to see natural ridgelines and broadcasters seeking broad coverage therefore become inevitable. The FCC having declared a need for cellular service, the Council is faced with the difficult choice between sacrificing ridgelines to a few conspicuous towers or placing more towers in less visible areas of lower elevation, where most of the state's population resides. Exposure to electromagnetic radiation at the levels described in this application is not now considered a threat to human health by most United States scientists at the present time.

Since the radiation standards are currently under federal review the Council will order that the certificate holder shall comply with any new EPA RF standard, even if existing facilities are not subject to any such standard when and if it is promulgated.

Tower visibility is the other environmental issue of major concern here. The placement of towers on exposed ridgelines renders such towers more visible to the valleys below the

ridgelines. The Council is concerned about the incremental effects of placing more and more towers on ridgelines, which as a group represent one of the last undeveloped portions of Connecticut and which serve as important migration corridors and habitat for a variety of wildlife. Historically, the Council has encouraged the siting of towers which it found to be of public need within already developed areas, such as commercial and industrial zones where people work, rather than recreational or residential areas where people tend to spend their leisure time.

Sharing existing towers is an option highly encouraged by the Council. Another favorable solution is the siting of towers on the rooftops of tall urban buildings. Such sites tend to provide high elevation, low visibility, and distance from residences.

Given the prominence of ridgelines and the clear intent of both local and state government to protect Connecticut ridgelines, the Council assessed very carefully the need for the proposed Bloomfield and Middlefield tower sites to determine if such need outweighs the environmental effects of the towers. The proposed Bloomfield site is near a state park, an educational facility, and residences. As originally proposed, a 180' lattice tower would be clearly visible over a wide area from all points of the compass. A 100' tower, as the revised application proposes, would still be visible from the

surrounding area. It would be added to thirteen towers and an earth station facility within three miles of the proposed site. This, however, is not sufficient evidence in favor of this proposed site. The Council would prefer the further exploration of the option of siting towers on either side of Talcott Mountain ridge and of the potential for sharing one or more existing towers or tower sites on Talcott and Rattlesnake Mountains. The proposed Bloomfield site is therefore rejected without prejudice.

The proposed Middlefield site on Beseck Mountain offers a somewhat different set of circumstances to those found in Bloomfield. Although it is on a prominent ridgeline, this proposed site is not near a state park or an educational facility. However, it would be clearly visible from a wide area encompassing several towns, major highways, and several homes nearby.

The proposed site is near a Southern New England Telephone (SNET) monopole. Although the applicant reported that SNET refused permission to share their tower at this site it does believe some sharing as with the State Police, will be possible at this site to eliminate the need for some additional towers. The Council urges the applicant to continue negotiating with the State Police regarding a shared tower in the Middlefield area and to reopen negotiation with SNET to seek a means of consolidating facilities at this location, as

is apparently contemplated for a cell site in Southbury.

The Council at this time has no information from the State Police regarding their requirements as to tower height, type, alignment, or antennas. To certificate the applicant's proposed tower at this time could lead to the construction of two new substantial towers atop Beseck Mountain, instead of the consolidation of one shared facility. The Council will therefore reject the proposed Middlefield tower without prejudice, pending further development of a tower sharing and consolidation plan.

The proposed Glastonbury site is on an existing tower, a consolidation strategy the Council strongly encourages. The proposed Haddam tower site raised some visibility questions, but it is not on a prominent ridgeline, nor is it near many residences or any recreational areas. The site will also provide needed coverage along Route 9.

The proposed Hartford site is on the rooftop of an existing building; only two antennas might be visible from the streets below.

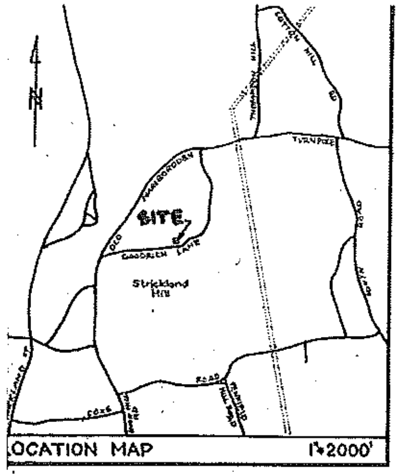
The proposed Portland site is not in the immediate vicinity of any homes, but would be visible from Old Marlborough Turnpike. The visibility of a tower at this site would be lessened if a monopole structure were used and the Council will approve the site for a monopole structure only.

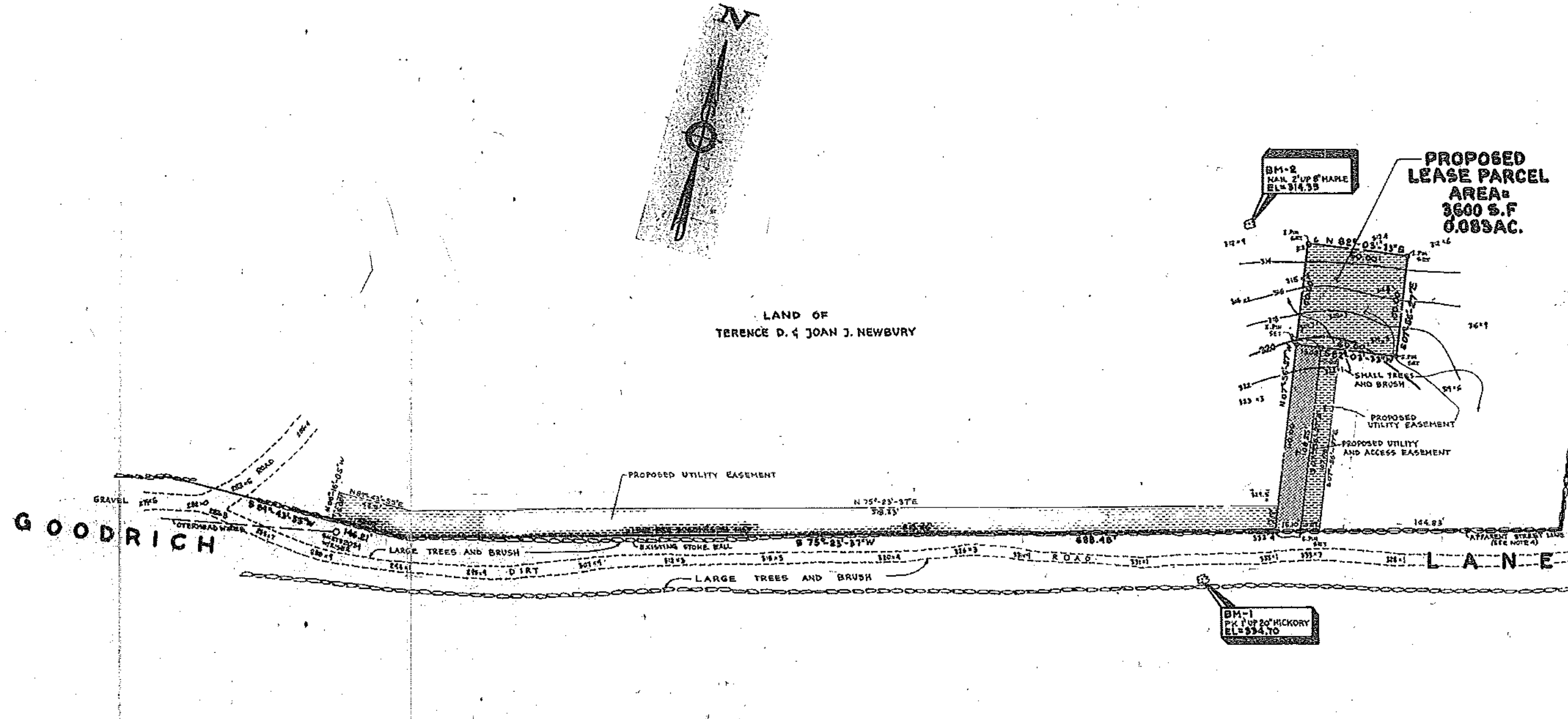
In Rocky Hill, the applicant proposed a monopole, which will resemble the pole structures on a nearby electric transmission line. There are no residences in the vicinity of the Rocky Hill site which is within a relatively isolated area. The proposed Somers site is in a level agricultural area and well removed from most homes and roads.

The proposed Vernon tower would be constructed near an existing well-screened water tank which will aid in shielding the lower portion of this tower. Although there are many residences in the area, few would have a direct view of the tower due to the topography of the area. The proposed Willington tower is well removed from any nearby homes and roads, and the substantial number of trees in the area would add further screening.

The proposed Windsor tower would be placed within an industrial area of that town, which has few homes in the immediate vicinity. The tower might also be shared with the Town of Windsor, a relationship the Council encourages.

One salient point noted by the Council in these proceedings was that those tower sites which were proposed for developed areas such as an existing tower, a rooftop, and an industrial zone, received virtually no opposition. Those which were proposed in exposed areas such as residential neighborhoods and ridgelines provoked a substantial negative response from nearby residents and town officials. The Council assumes that the applicant has also noted such responses.





NOTES:

1) BEARINGS REFER TO APPROXIMATE TRUE NORTH.

2) ELEVATIONS REFER TO APPROXIMATE GEODETIC VERTICAL DATUM OF 1929 BASED ON U.S. GEOLOGICAL SURVEY MAPPING.

3) REFERENCE IS MADE TO A MAP ENTITLED, "SCENIC FARMS, A SUBDIVISION OF RICHARD D. MCGINLEY, OLD MARBOROUGH TURNPIKE, PORTLAND, CONN." BY DAVID B. NYLCHREEST, SCALE 1"=100', DATED 12/30/75 REVISED TO 11/13/79.

4) GOODRICH LANE IS APPARENTLY AN OLD 2 ROD HIGHWAY FOR WHICH NO RECORDS CAN BE FOUND AT THE PORTLAND TOWN HALL. THE PROPERTY IS TOGETHER WITH SUCH RIGHTS AS MAY EXIST IN AND TO GOODRICH LANE.

5) THE PROPERTY IS ZONED RR-RURAL RESIDENTIAL.

Rec'd for Record Nov 25, 1987 at 10:55 A M
Recorded by [signature] Town Clerk

#1441

PARCEL TO BE LEASED BY
METRO MOBILE CTS OF HARTFORD, INC.
FROM
TERENCE D. & JOAN J. NEWBURY
GOODRICH LANE
PORTLAND, CONNECTICUT

I HEREBY CERTIFY THAT THIS MAP AND SURVEY ARE SUBSTANTIALLY CORRECT AND WERE PREPARED IN ACCORDANCE WITH THE STANDARDS OF A CLASS A-2 SURVEY AS DEFINED IN THE CODE OF PRACTICE FOR THE STANDARDS OF ACCURACY OF SURVEYS AND MAPS ADOPTED DECEMBER 10, 1975 AS AMENDED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC.

[signature]
MICHAEL G. WILMES L.S. NO. 14205

CL&P Co GRID No. E-E-K08D3-1428

NO.	DATE	REVISION DESCRIPTION
2	5-21-1987	UTILITY EASEMENT REVISED
1	3-5-1987	UTILITY EASEMENT REVISED

Greiner — SURVEYING & MAPPING
WALLINGFORD, CONNECTICUT
SCALE 1"=40' DATE AUG. 1986 JOB NO F01401I REF SEARCH #3052
FB 928-53, 928-7

DRAWN BY	OFFICE	COMPUTED	MAP CHECK	CREW CHIEF
S. KALINKA	M. WILMES	M. WILMES	S. KALINKA	J. LECHOWICZ

REAL ESTATE RECORD
TOWN OF PORTLAND

ILLEGAL LOT SPLIT

ASSESSMENT YEAR: 2012

GENERAL DATA:

DATE: 07/05/2012

Unique ID: 00354100 GIS: Sequence#: 00 List No.: 1604

OWNER'S ADDRESS
Name 1: HALE JOAN J
Name 2:
Care of: CROWN ATLANTIC LLC
Street 1: PMB 353
Street 2: 4017 WASHINGTON RD
City: MCMURRAY
State: PA Zip: 15317

Street Codes:
Property Loc: 74 GOODRICH LANE

Legal Prop Loc: 74 GOODRICH LANE
Vol/Page: 284/47

Map/Block/Lot: 084/0009
District:

Record Status: ACTIVE
Billing Status: B-Billable Acco
Total Acreage: 0.08
Record Date: 12/24/1992
Sale Price: $0.00

Census Tract: 5601/00/5601/00
Prop Exempt: No

Last Audited: __/__/____

By whom:

Last Visited: __/__/____
By whom:

VALUES AND EXEMPTIONS:

ASSESSMENT

OLD CODES	NEW CODES	QUANTITY	AMOUNT	DESCRIPTION
41	400	0.08	161180	PUBLIC UTILITY

EXEMPTIONS

EX. CODE	APP. DATE	EX. AMT.
	__/__/____	

Assessed Value: 161180 Total Exemptions: Net Value: 161180

BENEFITS AND SERVICES:

STATE ELDERLY REIMBURSEMENT PROGRAMS

LOCAL BENEFITS

	Type	Year	% OR $	Ben/Frz AMT	OWNER %	CB Gross	
TOWN		0000		0.00	0.00	0	0.00
DISTRICT		0000	DOLLAR	0.00	0.00	0	0.00
							0.00

7-5-12

SERVICES:
NONE

1st instance of lease @ 188/1 (V/B) which delineates a 60x60' parcel & has a map included with lease (dated 9-22-86).

Salafia purchased the house & remaining land @ 292/231 (V/B), my database goes back to 2004 and both accounts have stayed the same since then as far as assessor records.

R

02491

VOL 284 PAGE 47

QUITCLAIM DEED - STATUTORY FORM

I, TERENCE D. NEWBURY of the Town of Lawrenceville, County of Gwinnett and State of Georgia, for consideration paid, grant to JOAN CAROL JACKSON of the Town of Portland, County of Middlesex and State of Connecticut, with QUITCLAIM COVENANTS, the premises more particularly described in Schedule A which is attached hereto and made a part hereof but subject, however, to the Subordinated Right of First Refusal more particularly set forth in said Schedule A.

IN WITNESS WHEREOF I have hereunto set my hand and seal this 17th day of December, 1992.

Signed, sealed and delivered
in the presence of:

Evelyn A. Blackstock
Evelyn A. Blackstock

Terence D. Newbury
Terence D. Newbury

Ron Halverson
Ron Halverson

STATE OF GEORGIA)
) ss. LAWRENCEVILLE
COUNTY OF GWINNETT)

On this the 17th day of December, 1992, before me, Evelyn A. Blackstock, the undersigned officer, personally appeared, TERENCE D. NEWBURY, known to me (or satisfactorily proven) to be the person described in the foregoing instrument, and acknowledged that he executed the same for the purposes therein contained.

IN WITNESS WHEREOF I hereunto set my hand and official seal.

TOWN OF PORTLAND
CONVEYANCE TAX RECEIVED
STATE $ -0- LOCAL $ -0- NO -0-
Bernadette M. Wilson
TOWN CLERK

Evelyn A. Blackstock
Commissioner of the Superior Court
Notary Public
My Commission Expires: 4/2CK

Notary Public, Gwinnett County, Georgia
My Commission Expires June 29, 1996

SCHEDULE A
DESCRIPTION OF PREMISES AND
RIGHT OF FIRST REFUSAL IN THE RELEASOR

DESCRIPTION OF PREMISES:

All that certain piece or parcel of land presently dedicated to use as leased premises for a microwave communications relay tower, which premises were leased from Terence D. Newbury and Joan J. Newbury, as Lessors, to Metro Mobile Cellular Telephone Company, as Lessee, by a certain Cellular Property Lease And Right Of First Refusal document dated July 31, 1985. Said document was subsequently modified by a document entitled, "Modification of Cellular Property Lease and Right of First Refusal", which modification was dated July 26, 1986. The name of the Lessee under the modification was amended to Metro Mobile CTS of Hartford, Inc., a Connecticut corporation. Notice of said Lease was recorded in a document entitled, "Notice of Lease and Commencement Date Agreement" dated September 18, 1986 and recorded in Volume 188 Pages 1-9 of the Portland Land Records.

It is the intention of the Releasor herein to quitclaim to the Releasee his entire interest in those premises which are subject to the aforesaid Lease and, further, to create a Subordinated Right of First Refusal running in favor of the Releasor, his heirs, executors, administrators and assigns.

Reference is hereby made to the following two maps:

1) "'SCENIC FARMS' A SUBDIVISION OF RICHARD D. McGINLEY, OLD MARLBOROUGH TURNPIKE, PORTLAND, CONN., PLAN OF SUBDIVISION, DAVID B. MYLCHREEST, Consulting Engineer, Civil - Structural - Survey, Laurel Grove Rd., Middletown, Conn., DATE 12-30-75, SCALE 1" = 100', DRAWING No. 4 OF 4, FILE No. 7539, REVISED: 2-18-76 TO SHOW 12 LOTS, REVISED: 4-21-76 DRAINAGE EASEMENTS & MINOR CORRECTIONS, REVISED: 5-18-76: TO SHOW LOT 13, REVISED: 7-26-77 - INSET LOWER LEFT, REVISED: 11-13-79 ELIM. LOT 11, CHANGE LOTS 6, 7, 12", which map is on file in the office of the Portland Town Clerk as Map #1096.

2) "PARCEL TO BE LEASED BY METRO MOBILE CTS OF HARTFORD, INC. FROM TERENCE D. & JOAN J. NEWBURY, GOODRICH LANE, PORTLAND, CONNECTICUT, Greiner SURVEYING & MAPPING, WALLINGFORD, CONNECTICUT, SCALE 1" = 40', DATE AUG. 1986, JOB NO. F014011 F016011, REF SEARCH #3052, DRAWN BY S. KALINKA, OFFICE M. WILMES, COMPUTED M. WILMES, MAP CHECK S. KALINKA, CREW CHIEF J. LECHOWICZ, REVISION 1 3-5-1987 UTILITY EASEMENT REVISED, REVISION 2 5-27-1987 UTILITY EASEMENT REVISED", which map is on file in the office of the Town Clerk as Map #1441.

Reference is also hereby made to a portion of a map shown in Volume 188 at Page 5 of the Portland Land Records.

The following described parcels are those parcels shown on a map entitled, "PARCEL TO BE LEASED BY METRO MOBILE CTS OF HARTFORD, INC. FROM TERENCE D. & JOAN J. NEWBURY, GOODRICH LANE, PORTLAND, CONNECTICUT, Greiner SURVEYING & MAPPING, WALLINGFORD, CONNECTICUT, SCALE 1" = 40', DATE AUG. 1986, JOB NO. F014011 F016011, REF SEARCH #3052, DRAWN BY S. KALINKA, OFFICE M. WILMES, COMPUTED M. WILMES, MAP CHECK S. KALINKA, CREW CHIEF J. LECHOWICZ, REVISION 1 3-5-1987 UTILITY EASEMENT REVISED, REVISION 2 5-27-1987 UTILITY EASEMENT REVISED", which map is on file in the office of the Town Clerk as Map #1441.

PARCEL 1 Proposed Utility and Access Easement:

Beginning at a point along the apparent northerly street line of Goodrich Lane, so-called, at the easterly end of the Proposed Utility Easement along the said northerly street line of Goodrich Lane as shown on said map; thence running Northerly along a line having a bearing N 07° 56' 27" W to an iron pin set, which point marks the southeasterly corner of the Proposed Leased Parcel (PARCEL 2 herein), a distance of 110.00 feet; thence turning and running Easterly along a line having a bearing N 82° 03' 33" E to an iron pin set, a distance of 15.00 feet; thence turning and running Southerly along a line having a bearing S 07° 56' 27" E to an iron pin set along the northerly street line of Goodrich Lane, so-called, a distance of 108.25 feet; thence turning and running Westerly along said northerly street line of Goodrich Lane and along a line having a bearing S 75° 23' 37" W to the point or place of beginning, a distance of 15.10 feet.

PARCEL 2 Proposed Lease Parcel:

Beginning at a point along the northerly end of the Proposed Utility and Access Easement (PARCEL 1 herein) described just above, which point is the Southwest corner of the herein described parcel; thence running Northerly along a line having a bearing N 07° 56' 27" W to a point marked by an iron pin set, a distance of 60.00 feet; thence turning and running Easterly and along a line having a bearing N 82° 03' 33" E to a point marked by an iron pin set, a distance of 60.00 feet; thence turning and running Southerly and along a line having a bearing S 07° 56' 27" E to a point marked by an iron pin set, a distance of 60.00 feet; thence turning and running Westerly and along a line having a bearing S 82° 03' 33" W to the point or place of beginning, a distance of 60.00 feet. The westerly line of this PARCEL 2 being a continuation of the westerly line of PARCEL 1 above.

SUBORDINATED RIGHT OF FIRST REFUSAL:

Reference is hereby made to a document entitled, "Notice of Lease and Commencement Date Agreement" dated September 18, 1986 and recorded

in Volume 188 at Page 1 of the Portland Land Records. Paragraph 6 of said document sets forth a Right of First Refusal granted by Lessors to Lessee.

It is the intention of the Releasor herein to create herein a new Right of First Refusal in his favor which is at all times subordinate and inferior to that Right of First Refusal in Metro Mobile CTS of Hartford, Inc. which was created in a document entitled, "Notice of Lease and Commencement Date Agreement" dated September 18, 1986 and recorded in Volume 188 at Page 1 of the Portland Land Records at Paragraph 6 thereof. The subject premises are quitclaimed to the Releasee subject to a Subordinated Right of First Refusal as described just above. In the event that the Lease between Terence D. Newbury and Joan J. Newbury as Lessors and Metro Mobile CTS of Hartford, Inc. as Lessee shall no longer be in full force and effect and in the further event that the said Metro Mobile CTS of Hartford, Inc. shall not have exercised the aforesaid Right of First Refusal granted in the aforesaid Lease, then and in such events and in the further event that a bonafide offer to purchase the subject premises hereinabove shall have been received by the Releasee, then and in all such events, the Releasor, his heirs, executors, administrators and assigns shall have the right but not the obligation to purchase the above described premises from the Releasee at the same price and upon the same terms and conditions as those received by the Releasee under any bonafide offer to purchase. It is the intention of the Releasor that subject to the aforesaid conditions, the Releasee may not sell the above described premises, except to Metro Mobile CTS of Hartford, Inc., to any other party without first giving to the Releasor, his heirs, executors, administrators or assigns Notice of the Releasee's receipt of a bonafide offer to purchase the subject premises. Said Notice shall be in writing and be accompanied by a photocopy of the bonafide offer. Thereafter the Releasor, his heirs, executors, administrators or assigns may exercise this Right of First Refusal at any time within sixty (60) days after receipt of said Notice from the Releasee. Exercise of the Right of First Refusal created herein shall take place within one hundred twenty (120) days after the date upon which the Releasor, his heirs, executors, administrators or assigns gave Notice of intent to exercise the Right of First Refusal. Said purchase shall be upon the same terms and conditions as those contained in said bonafide offer.

If the Releasor, his heirs, executors, administrators or assigns shall fail to exercise said Right of First Refusal within the time specified herein, this Right of First Refusal shall in all events expire.

Rec'd for Record December 23, 1992 At 11:00 A M
Recorded by Bernadette M. Dillon Town Clerk

vol 284 page 51

02492

RELEASE OF AGREEMENT

KNOW ALL PEOPLE BY THESE PRESENTS:

THAT, THE STATE OF CONNECTICUT,

acting therein by its Commissioner of Housing or its Designee, hereunto Duly authorized, does hereby release and discharge a certain Agreement from **Patrick A. Guida, Jr. and Nella Guida** to the State of Connecticut Heating Conversion Loan Program, c/o CHIF, Inc., 121 Tremont Street, Hartford, Connecticut, dated **January 12, 1987** and recorded in the Land Records of the Town of **Portland** County of **MIddlesex** and the State of Connecticut in Volume **194,** at Page **258,** to which reference may be had:

IN WITNESS WHEREOF, he has set his hand and seal this 9th day of November, 1992.

Signed, sealed, and delivered in the presence of:

William F. Fish

Frances Messina, Designee, Acting Director, Homeownership Division

Joseph A. D'Orso

State of Connecticut)
County of Hartford) ss: Hartford, November 9, 1992,

On this 9th day of November, 1992 before me Joseph A.D'Orso, the undersigned officer personally appeared Frances Messina, Acting Director, Department of Housing, of the State of Connecticut, known to me to be the person described in the foregoing instrument, and acknowledged that he executed the same in the capacity therein stated and for the purposes therein contained.

Notary Public

My Commission Expires: 6-30-96

Rec'd for Record December 23 1992 at 11:00 A M

Recorded by [illegible] Town Clerk

JOSEPH A D'ORSO,JR.
NOTARY PUBLIC
My Commission Expires June 30, 1996

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11252A
CROWN CASTLE BU #: 806382
SITE NAME: HRT 082 943274
OLD MARLBOROUGH TURNPIKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

VICINITY MAP

FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO W NEWBERRY RD. TURN LEFT ONTO WOODLAND AVE. TURN RIGHT ONTO CT-187 S. TURN LEFT ONTO CT-17B E. TURN RIGHT ONTO MATIANUCK AVE. TURN LEFT ONTO CT-218 E. TURN RIGHT ONTO BRIARWOOD DR. TURN LEFT ONTO E WOLCOTT AVE. TURN LEFT ONTO CT-159 N. TURN RIGHT ONTO DEERFIELD RD. TAKE THE ROUTE 291 E RAMP TO 4/ROUTE 5/ MANCHESTER. MERGE ONTO I-291 E. TAKE EXIT 4 TO MERGE ONTO US-5 S. CONTINUE ONTO MAIN ST. CONTINUE ONTO HIGH ST. SLIGHT LEFT TO MERGE ONTO CT-2 E TOWARD NORWICH. USE THE LEFT LANE TO TAKE EXIT 7 FOR CT-17 S TOWARD PORTLAND. CONTINUE ONTO CT-17 S/GLASTONBURY EXPY. TURN LEFT ONTO SAGE HOLLOW RD. TURN LEFT ONTO CORNWALL ST. TURN LEFT ONTO OLD MARLBOROUGH TURNPIKE. TURN RIGHT ONTO GOODRICH LN. SITE WILL BE ON THE LEFT.

ENGINEER
DEWBERRY ENGINEERS INC.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054

CONTACT: BRYAN HUFF
PHONE #: (973) 576-0147

CONSTRUCTION
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CONTACT: PATRICIA PELON
PHONE #: (518) 373-3507

CONSULTANT TEAM

SITE NAME:
HRT 082 943274

SITE NUMBER:
CT11252A

TOWER OWNER:
CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

COORDINATES:
LATITUDE: 41°-36'-29.9" N (NAD83)
LONGITUDE: 72°-35'-29.56" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
701D_WoutU21

PROJECT SUMMARY

SITE ADDRESS:
OLD MARLBOROUGH TURNPIKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

PROJECT DIRECTORY

- REMOVE AND REPLACE EXISTING ANTENNA MOUNT WITH A NEW ANTENNA MOUNT.
- REMOVE AND REPLACE (3) EXISTING ANTENNAS WITH (6) NEW ANTENNAS.
- REMOVE (6) EXISTING TMA'S.
- INSTALL (6) NEW RRU'S.
- REMOVE AND REPLACE (6) EXISTING LINES OF COAX WITH (1) NEW HYBRID CABLE.
- REMOVE AND REPLACE EXISTING EQUIPMENT CABINET WITH (1) NEW EQUIPMENT CABINET AT GRADE.

SCOPE OF WORK

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

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

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11252A
HRT 082 943274

CONSTRUCTION DRAWINGS

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A	04/07/16	ISSUED FOR REVIEW

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071482
SITE ADDRESS:	

OLD MARLBOROUGH TPKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

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

SITE WORK GENERAL NOTES:

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

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.

5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM–A–36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.

T-Mobile

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35 GRIFFIN ROAD SOUTH
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Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

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REVIEWED BY:	BSH
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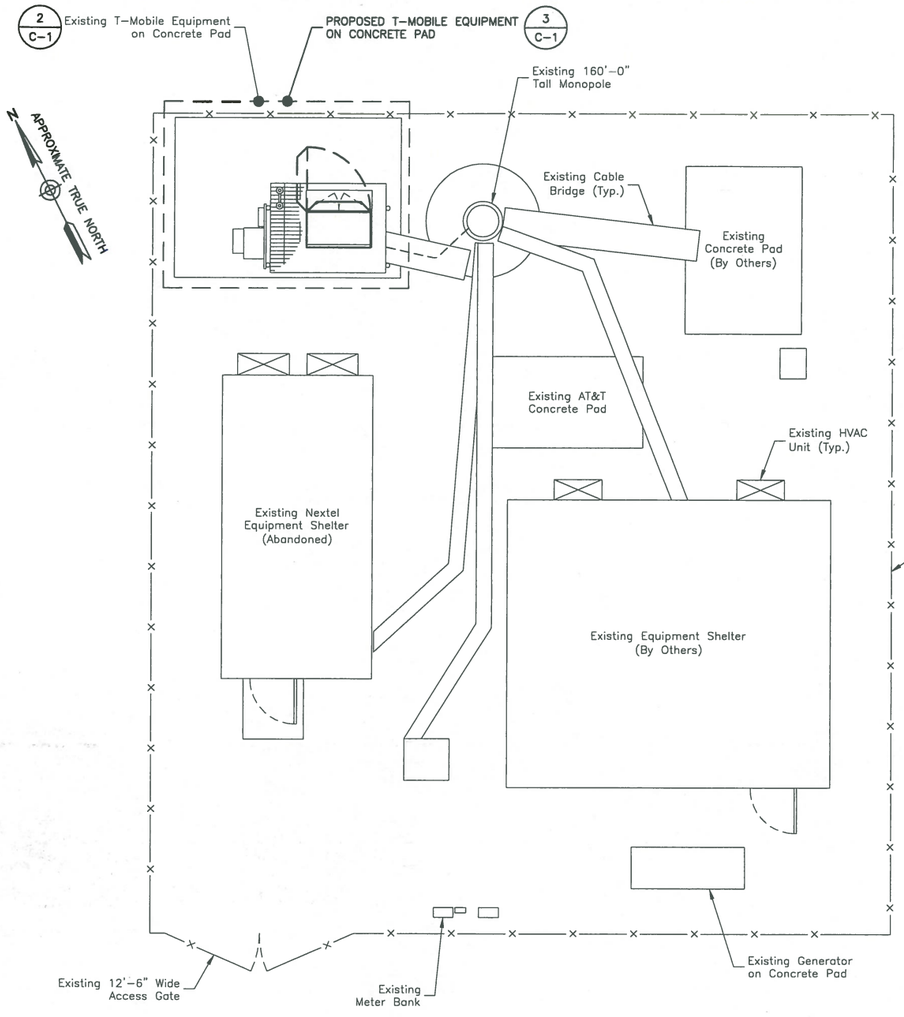
SHEET TITLE

GENERAL NOTES

SHEET NUMBER

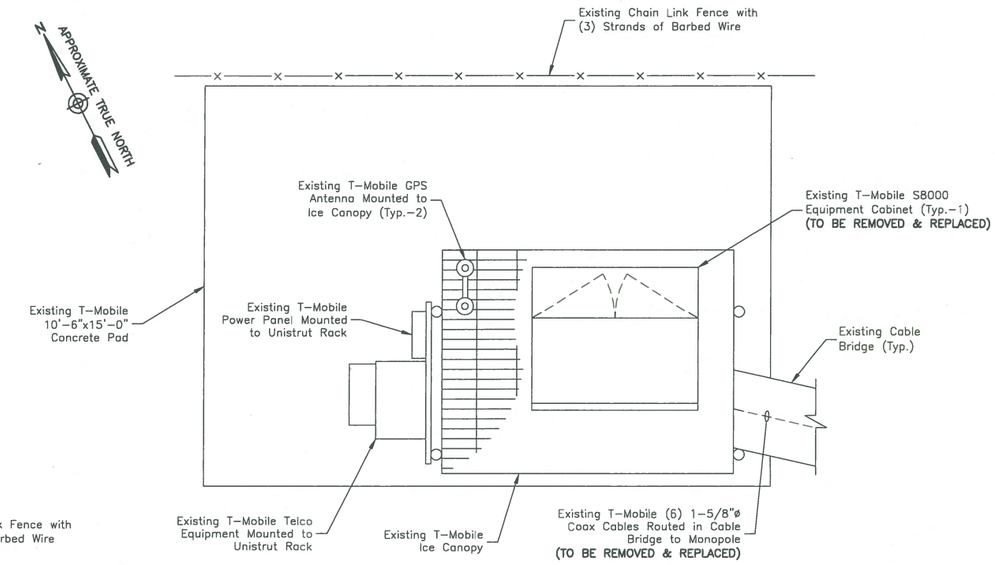
G–1



COMPOUND PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

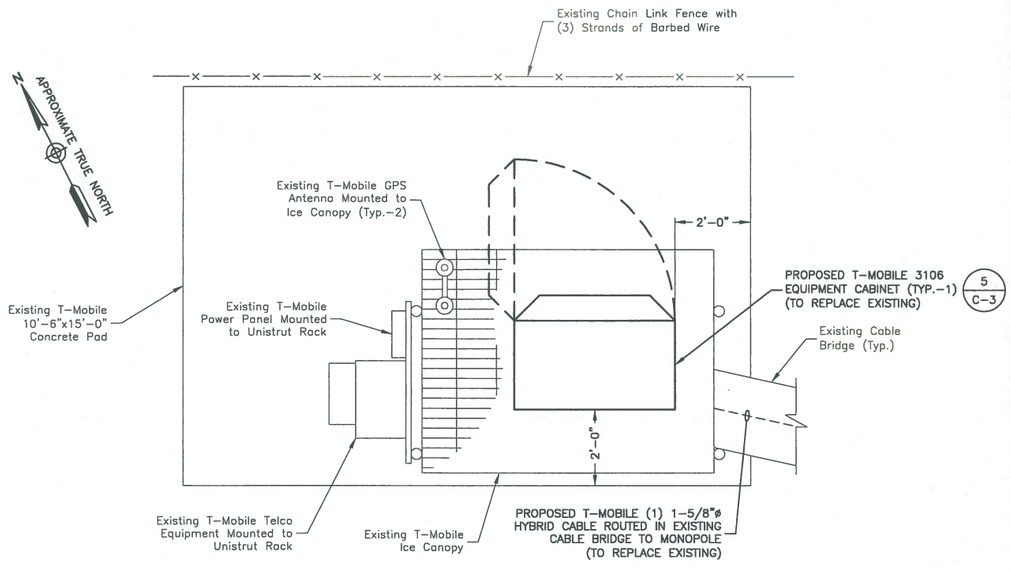
0' 5' 10'



EXISTING EQUIPMENT PLAN 2

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN 3

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY B+T GROUP DATED APRIL 18, 2016.

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COMPOUND PLAN & EQUIPMENT PLANS

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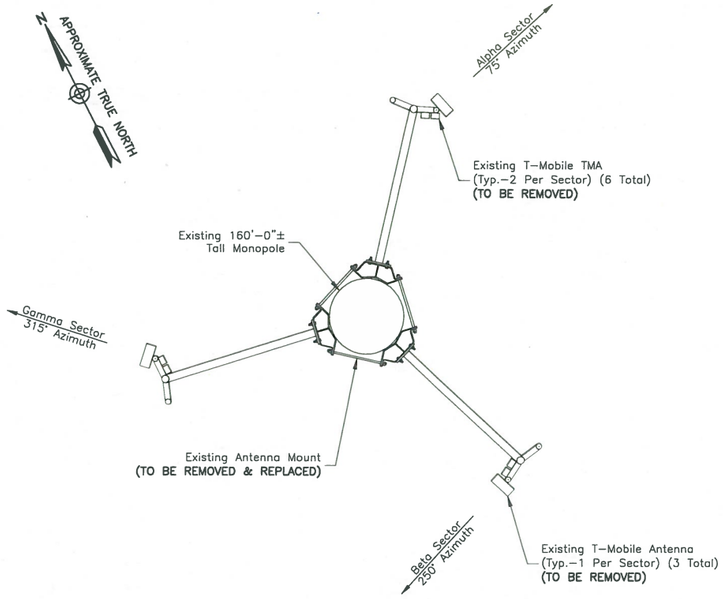
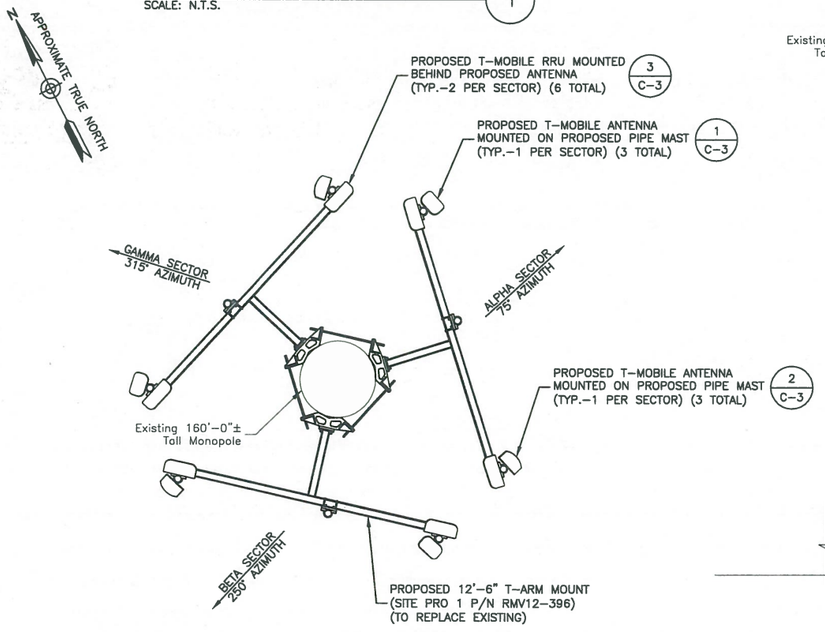
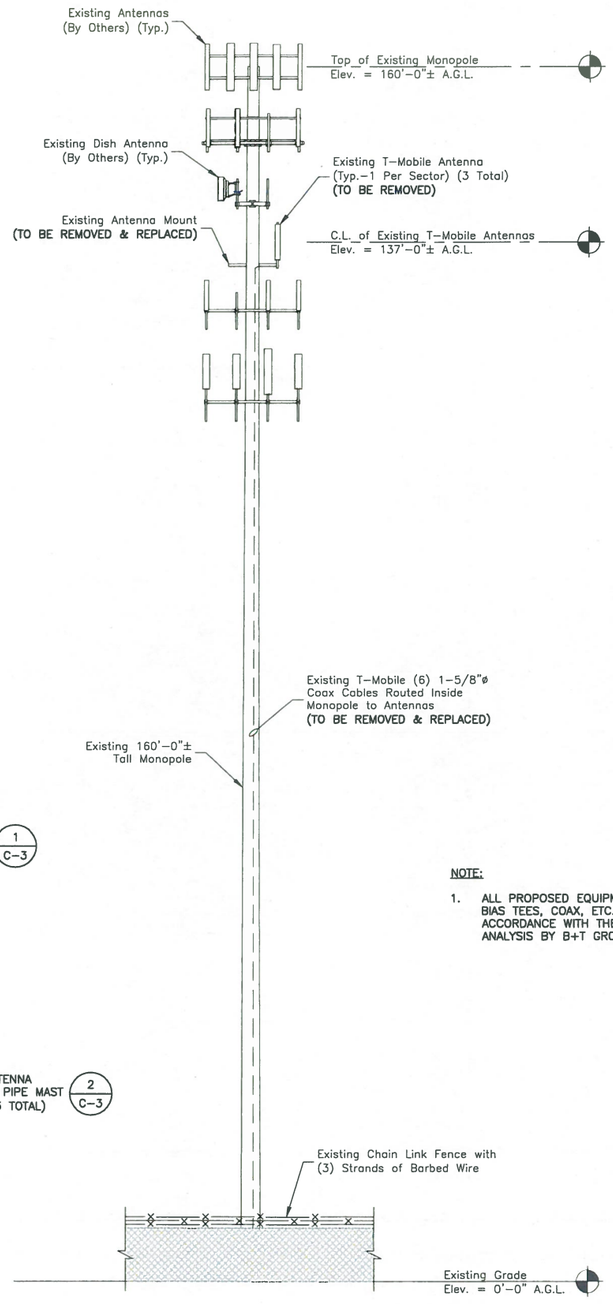


EXISTING ANTENNA LAYOUT (1)
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)
SCALE: N.T.S.

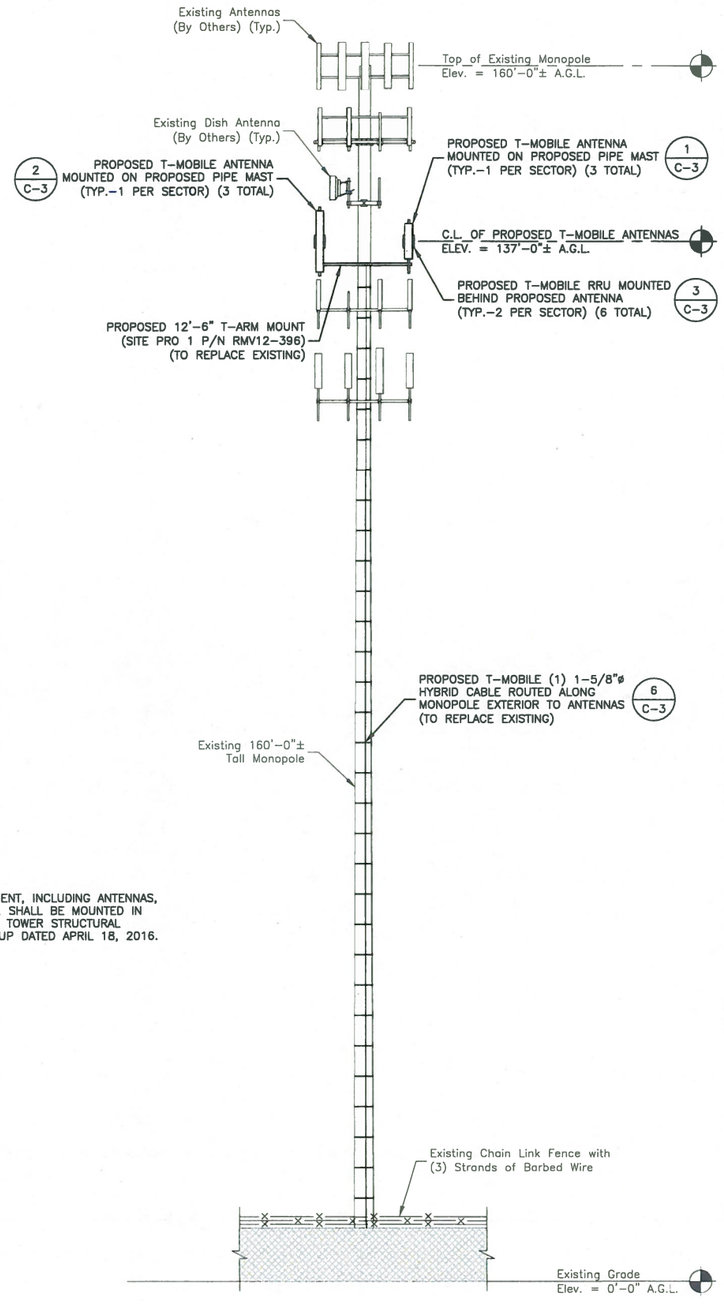


EXISTING ELEVATION (4)
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

NOTE:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY B+T GROUP DATED APRIL 18, 2016.



PROPOSED ELEVATION (4)
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

T-Mobile

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

CROWN CASTLE

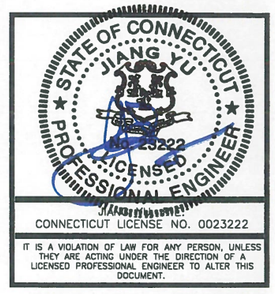
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11252A
HRT 082 943274

CONSTRUCTION DRAWINGS

0	05/11/16	ISSUED AS FINAL
B	05/06/16	REVISED PER COMMENTS
A	04/07/16	ISSUED FOR REVIEW

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071482
SITE ADDRESS:	

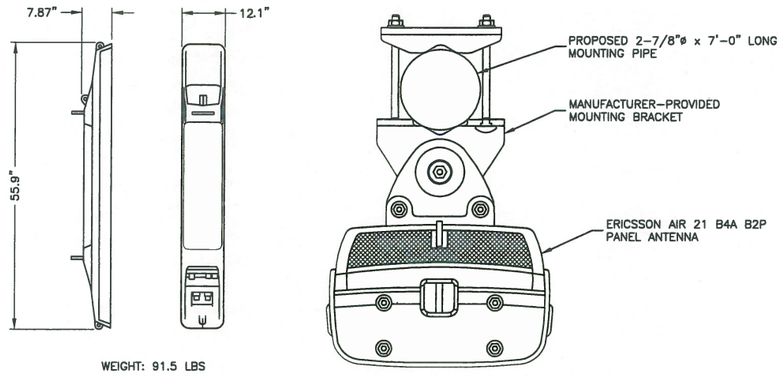
OLD MARLBOROUGH TPKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

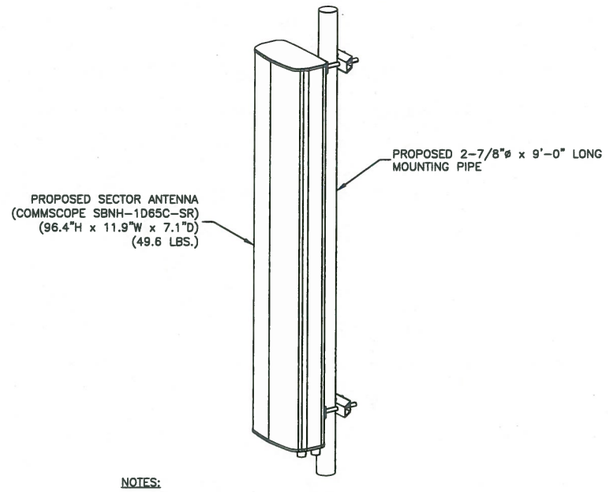
C-2



NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

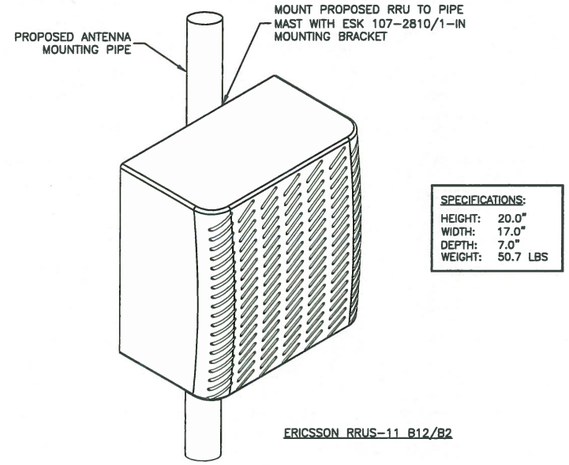
ANTENNA DETAIL 1
SCALE: N.T.S.



NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL 2
SCALE: N.T.S.

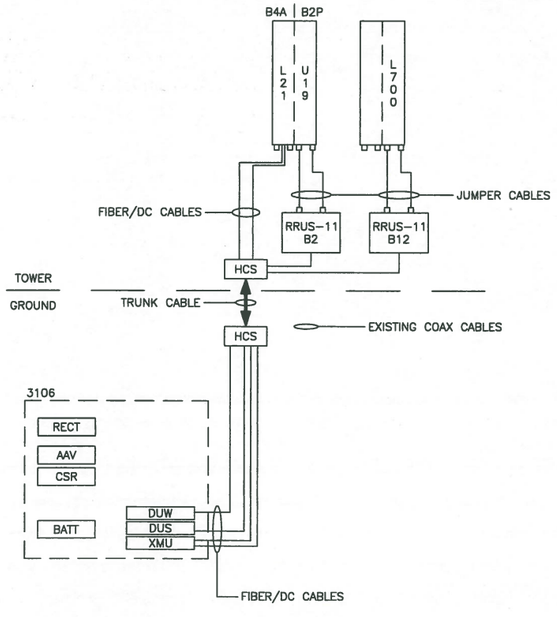


SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

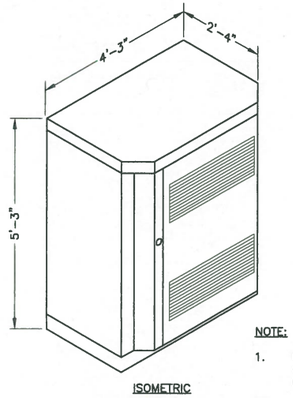
RRU NOTES:

1. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

RRUS-11 - REMOTE RADIO UNIT 3
SCALE: N.T.S.



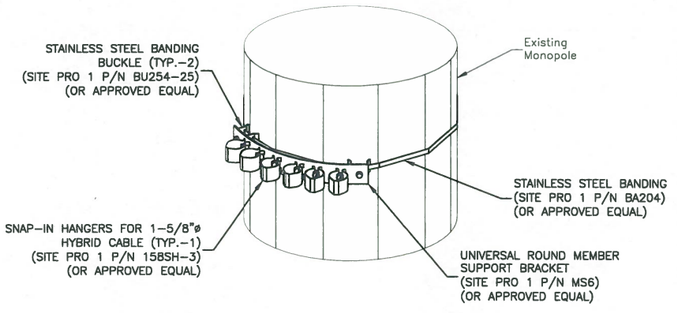
SITE CONFIGURATION 701D_WoutU21 4
SCALE: N.T.S.



NOTE:

1. CONTRACTOR SHALL SECURE CABINET AS PER MANUFACTURER RECOMENDATIONS.

ERICSON RBS 3106 CABINET 5
SCALE: N.T.S.



NOTE:

1. SUPPORT BRACKETS SHALL BE SPACED AT 4'-0" C-C MAX.

COAX SUPPORT DETAIL 6
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		HYBRID	HYBRID LENGTH	TMA	RRU
	EXISTING	PROPOSED	EXISTING	PROPOSED	PROPOSED		PROPOSED	PROPOSED
ALPHA	EMS RR90-17-00DP	ERICSSON AIR 21 B4A B2P	(4) 1-5/8"ø	(4) 1-5/8"ø TO BE REMOVED	(1) 1-5/8"ø	184'-0"	-	(1) RRUS-11 B2
	-	COMMSCOPE SBNH-1D65C-SR					-	(1) RRUS-11 B12
BETA	EMS RR90-17-00DP	ERICSSON AIR 21 B4A B2P	(4) 1-5/8"ø	(4) 1-5/8"ø TO BE REMOVED		184'-0"	-	(1) RRUS-11 B2
	-	COMMSCOPE SBNH-1D65C-SR					-	(1) RRUS-11 B12
GAMMA	EMS RR90-17-00DP	ERICSSON AIR 21 B4A B2P	(4) 1-5/8"ø	(4) 1-5/8"ø TO BE REMOVED		184'-0"	-	(1) RRUS-11 B2
	-	COMMSCOPE SBNH-1D65C-SR					-	(1) RRUS-11 B12

T-Mobile
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CT11252A
HRT 082 943274

CONSTRUCTION DRAWINGS

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Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071482
SITE ADDRESS:	

OLD MARLBOROUGH TPKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

SHEET TITLE

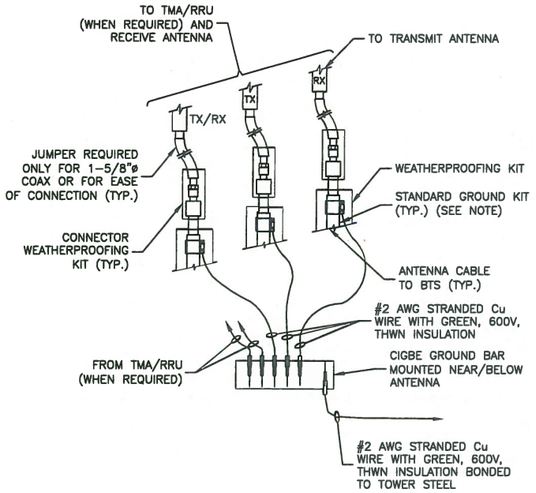
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM T-MOBILE MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

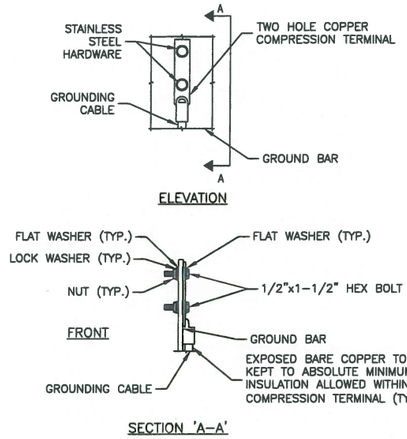


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

SCALE: N.T.S.

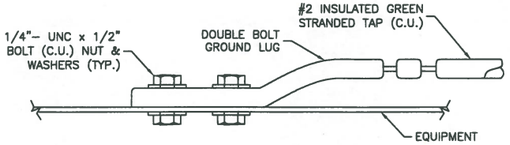


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

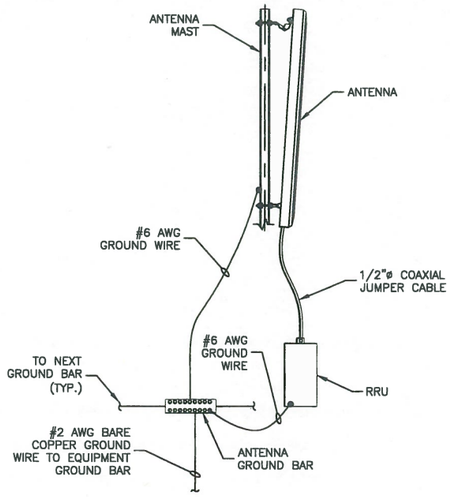
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



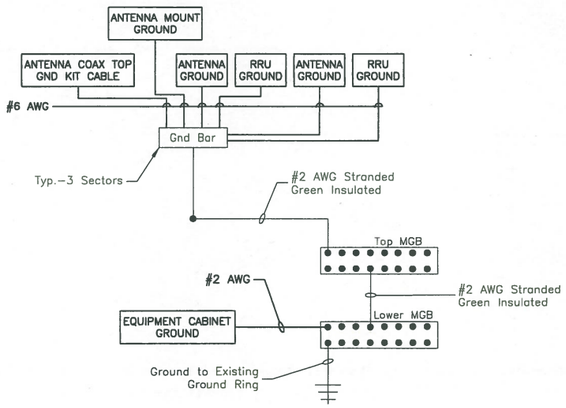
CONNECTION TO EQUIPMENT DETAIL — 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 4

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
4. VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM — 5

SCALE: N.T.S.

T-Mobile

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

CROWN CASTLE

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3 CORPORATE PARK DRIVE, SUITE 101
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600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT — JIANG YU — LICENSED PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
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OLD MARLBOROUGH TPKE
PORTLAND, CT 06480
MIDDLESEX COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

April 18, 2016

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6565

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11252A
	Carrier Site Name:	Portland Rt. 66/Rt. 151
Crown Castle Designation:	**Crown Castle BU Number:**	806382
	Crown Castle Site Name:	HRT 082 943274
	Crown Castle JDE Job Number:	365817
	Crown Castle Work Order Number:	1223331
	Crown Castle Application Number:	333625 Rev. 9
Engineering Firm Designation:	**B+T Group Project Number:**	81363.013.01
Site Data:	**Old Marlborough Turnpike, Portland, Middlesex County, CT** **Latitude *41° 36' 29.9"*, Longitude *-72° 35' 29.56"*** **160 Foot - Monopole Tower**	

Dear Sean Dempsey,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 893351, in accordance with application 333625, revision 9.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA-222-G, as allowed by Sections 104.10 and 104.11 of the 2005 CT State Building Code with 2009 Amendments, based upon a wind speed of 105 mph 3-second gust, exposure category B with topographic category 1 and crest height of 0 feet.

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

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:
B+T Engineering, Inc.

Jennifer Tillson, E.I.
Project Engineer

Chad E. Tuttle, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2017

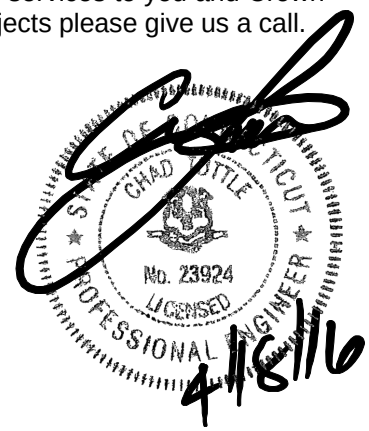


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft. Monopole tower designed by Valmont in January of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. This tower has been modified by B+T Group in May of 2013 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 105 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134.0	137.0	3	Commscope	SBNH-1D65C-SR	1	1-5/8	--
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	RRUS 11 B12			
		3	Ericsson	RRUS 11 B2			
	134.0	3	--	RMV12-396			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	3	Alcatel Lucent	RRH2X60-AWS	--	--	2
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		6	Andrew	SBNHH-1D65B			
		1	RFS Celwave	DB-B1-6C-8AB-0Z			
		3	Andrew	HBXX-6517DS-A2M	11 2 1	1-5/8 1-1/4 1/2	1
		2	Decibel	DB846F65ZAXY			
		4	Decibel	DB846H80E-SX			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		2	RFS Celwave	FD9R6004/2C-3L			
		1	--	Platform Mount [LP 602-1]			
150.0	152.0	6	Decibel	DB980H90E-M	6 1	1-5/8 1/2	1
	150.0	1	--	Platform Mount [LP 602-1]			
142.0	144.0	2	Radiowaves	HP3-11	2	1/2	1
	142.0	1	--	Side Arm Mount [SO 101-3]			
134.0	137.0	**3**	**Ems Wireless**	**RR90-17-00DP**	**6**	**1-5/8**	**4**
	134.0	**6**	**Ericsson**	**KRY 112 71/1**			
		1	**--**	**Miscellaneous [NA 508-3]**			
116.0	120.0	3	Ericsson	RRUS-11	12 2 1	1-1/4 3/4 3/8	1
		3	KMW Comm.	AM-X-CD-16-65-00T-RET			
		6	Powerwave Tech.	7770.00			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	Raycap	DC6-48-60-18-8F			
	116.0	6	Powerwave Tech.	LGP21401			
		6	Powerwave Tech.	LGP21901			
		1	--	Platform Mount [LP 303-1]			
61.0	61.0	2	--	Side Arm Mount [SO 701-1]	2	1/2	1
		2	Unknown	GPS			
50.0	50.0	2	--	Side Arm Mount [SO 701-1]	--	--	3

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Empty Mount; Considered in This Analysis
4) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
157	157	12	Swedcom	ALP 9212-N	--	--
		1	Valmont	Platform w/rail		
148	148	12	Swedcom	ALP 9212-N	--	--
		1	Valmont	Platform w/rail		
138	138	12	Swedcom	ALP 9212-N	--	--
		1	Valmont	Platform w/rail		
128	128	12	Swedcom	ALP 9212-N	--	--
		1	Valmont	Platform w/rail		
60	60	2	Generic	GPS	--	--
		2	Generic	Short Straight Arm		
50	50	2	Generic	GPS	--	--
		2	Generic	Short Straight Arm		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	T-Mobile Co-locate, Rev# 9	333625	CCI Sites
Tower Manufacturer Drawing	Valmont, Order No: 16750-98	255193	CCI Sites
Tower Modification Drawing	B+T Group, Date: 05/29/2013	3865159	CCI Sites
Post Modification Inspection	TEP, Date: 09/17/2013	3996803	CCI Sites
Foundation Drawing	Valmont, Order No: 16750-98	301226	CCI Sites
Geotech Report	TGG, Project No. GTX-1694	1041653	CCI Sites
Antenna Configuration	Crown CAD Package	Date:03/08/2016	CCI Sites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-8.706	965.169	85.7	Pass
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-20.310	2534.090	82.1	Pass
L3	76.25 - 51	Pole	TP48.398x39.715x0.344	3	-29.707	3182.680	87.4	Pass
L4	51 - 37	Pole	TP52.32x48.398x0.433	4	-32.291	3098.060	95.0	Pass
L5	37 - 0	Pole	TP62x49.672x0.406	5	-50.425	4570.550	82.6	Pass
							Summary	
						Pole (L4)	95.0	Pass
						Rating =	95.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	79.9	Pass
1	Base Plate	Base	43.2	Pass
1	Base Foundation (Structural)	Base	52.2	Pass
1	Base Foundation (Soil Interaction)	Base	71.1	Pass

Structure Rating (max from all components) =	95.0%

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

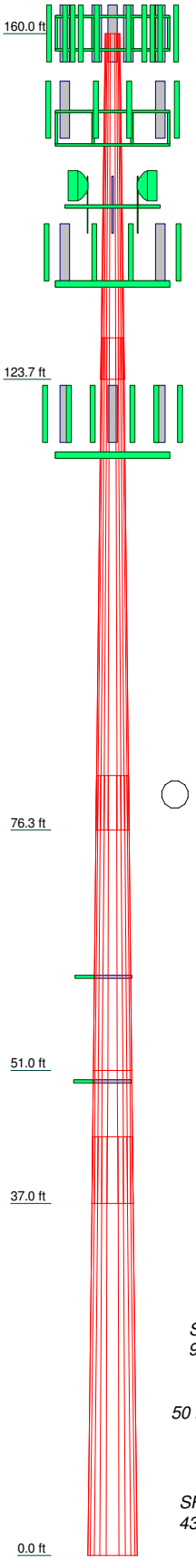
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	36.333	12	0.188	4.333	18.870	29.050	A572-65	1.8
2	51.750	12	0.313	5.750	27.461	41.950	A572-65	6.1
3	31.000	12	0.344		39.715	48.398	A572-65	5.1
4	14.000	12	0.433	7.000	48.398	52.320	A572-65	3.3
5	44.000	12	0.406		49.672	62.000	A572-65	10.9
							40.042185ksi	27.1



ALL REACTIONS ARE FACTORED

AXIAL 88 K

SHEAR 9 K

MOMENT 1037 kip-ft

TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 50 K

SHEAR 43 K

MOMENT 4696 kip-ft

TORQUE 2 kip-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB846H80E-SX w/ Mount Pipe (E)	160	RRUS 11 B2 (P)	134
(2) DB846H80E-SX w/ Mount Pipe (E)	160	RRUS 11 B2 (P)	134
(2) DB846F65ZAXY w/ Mount Pipe (E)	160	RRUS 11 B2 (P)	134
HBXX-6517DS-A2M w/ Mount Pipe (E)	160	RRUS 11 B12 (P)	134
HBXX-6517DS-A2M w/ Mount Pipe (E)	160	RRUS 11 B12 (P)	134
HBXX-6517DS-A2M w/ Mount Pipe (E)	160	RRUS 11 B12 (P)	134
(2) FD9R6004/2C-3L (E)	160	T-Arm Mount [TA 602-3] (P-RMV12-396)	134
DB-T1-6Z-8AB-0Z (E)	160		
(2) SBNHH-1D65B w/ Mount Pipe (R)	160	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	134
(2) SBNHH-1D65B w/ Mount Pipe (R)	160		
(2) SBNHH-1D65B w/ Mount Pipe (R)	160	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	134
DB-B1-6C-8AB-0Z (R)	160		
RRH2x60-700 (R)	160	(2) 7770.00 w/ Mount Pipe (E)	116
RRH2x60-700 (R)	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	116
RRH2x60-700 (R)	160		
RRH2X60-PCS (R)	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	116
RRH2X60-PCS (R)	160		
RRH2X60-PCS (R)	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	116
RRH2X60-AWS (R)	160		
RRH2X60-AWS (R)	160	(2) LGP21401 (E)	116
RRH2X60-AWS (R)	160	(2) LGP21401 (E)	116
Platform Mount [LP 602-1] (E)	160	(2) LGP21401 (E)	116
(2) DB980H90E-M w/ Mount Pipe (E)	150	(2) LGP21901 (E)	116
(2) DB980H90E-M w/ Mount Pipe (E)	150	(2) LGP21901 (E)	116
(2) DB980H90E-M w/ Mount Pipe (E)	150	(2) LGP21901 (E)	116
(2) 6' x 2" Mount Pipe (E-Empty)	150	RRUS-11 (E)	116
(2) 6' x 2" Mount Pipe (E-Empty)	150	RRUS-11 (E)	116
(2) 6' x 2" Mount Pipe (E-Empty)	150	RRUS-11 (E)	116
Platform Mount [LP 602-1] (E)	150	DC6-48-60-18-8F (E)	116
4' x 2" Horizontal Face Mount Pipe (E-Dish Tie Back)	145	3' x 2" Pipe Mount (E-For TMA)	116
		3' x 2" Pipe Mount (E-For TMA)	116
		(2) 3' x 2" Pipe Mount (E-For TMA)	116
4' x 2" Horizontal Face Mount Pipe (E-Dish Tie Back)	145	Platform Mount [LP 303-1] (E)	116
		(2) 7770.00 w/ Mount Pipe (E)	116
J-Box - 1' x 1' x 4" (E-Per Photo)	145	(2) 7770.00 w/ Mount Pipe (E)	116
(2) 6' x 3" Mount Pipe (E)	142	2' x 2" Pipe Mount (E)	61
(2) 6' x 3" Mount Pipe (E)	142	2' x 2" Pipe Mount (E)	61
(2) 6' x 3" Mount Pipe (E)	142	Side Arm Mount [SO 701-1] (E)	61
Side Arm Mount [SO 101-3] (E)	142	Side Arm Mount [SO 701-1] (E)	61
Radiowaves HP3-11 (E)	142	GPS (E)	61
Radiowaves HP3-11 (E)	142	GPS (E)	61
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	134	Side Arm Mount [SO 701-1] (E)	50
		Side Arm Mount [SO 701-1] (E)	50
SBNH-1D65C-SR w/ Mount Pipe (P)	134	2' x 2" Pipe Mount (E)	50
SBNH-1D65C-SR w/ Mount Pipe (P)	134	2' x 2" Pipe Mount (E)	50
SBNH-1D65C-SR w/ Mount Pipe (P)	134		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	40.042185ksi	40 ksi	55 ksi

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 95%

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 81363.013.01 - HRT 082 943274, CT (BU# 806382)			
Project:			
Client: Crown Castle	Drawn by: Vignesh Prabhu K	App'd:	
Code: TIA-222-G	Date: 04/16/16	Scale: NTS	
Path:		Dwg No. E-1	

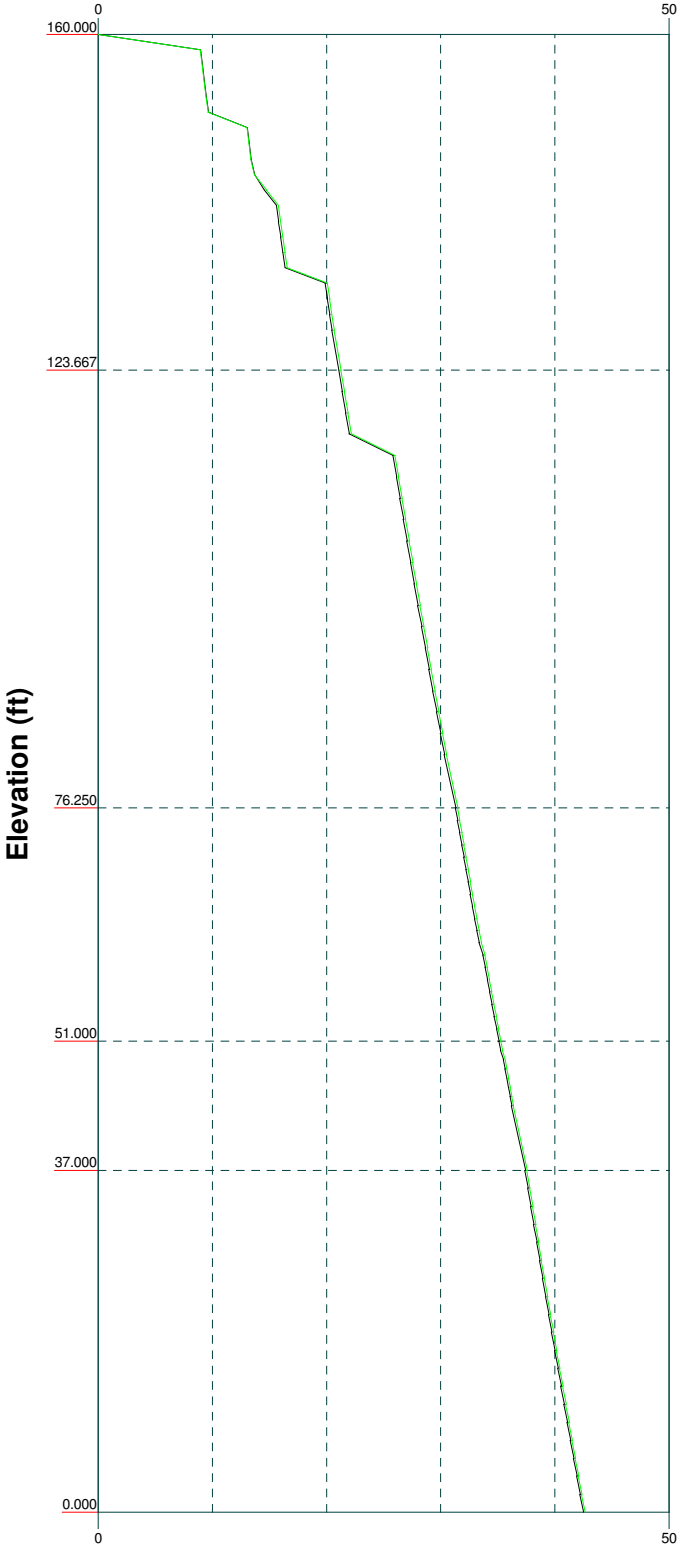
TIA-222-G - 105 mph/50 mph 0.750 in Ice Exposure B

Vx Vz

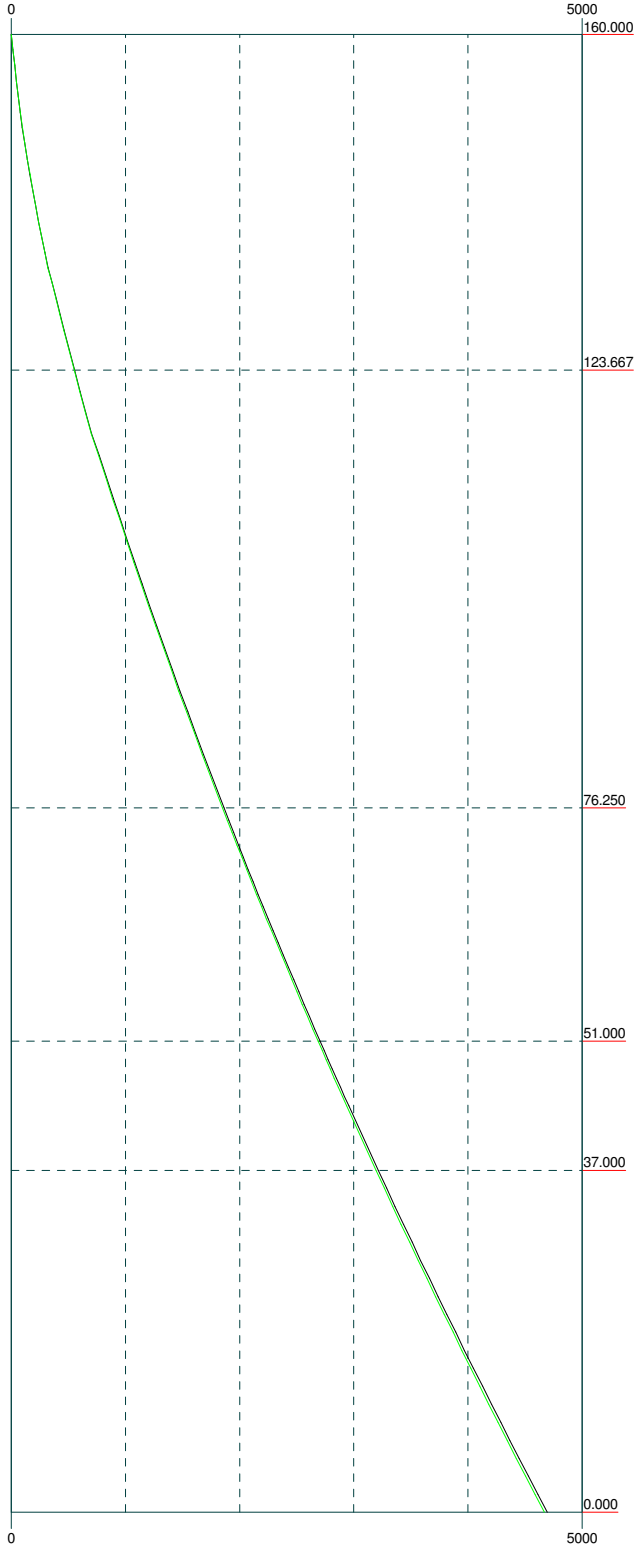
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
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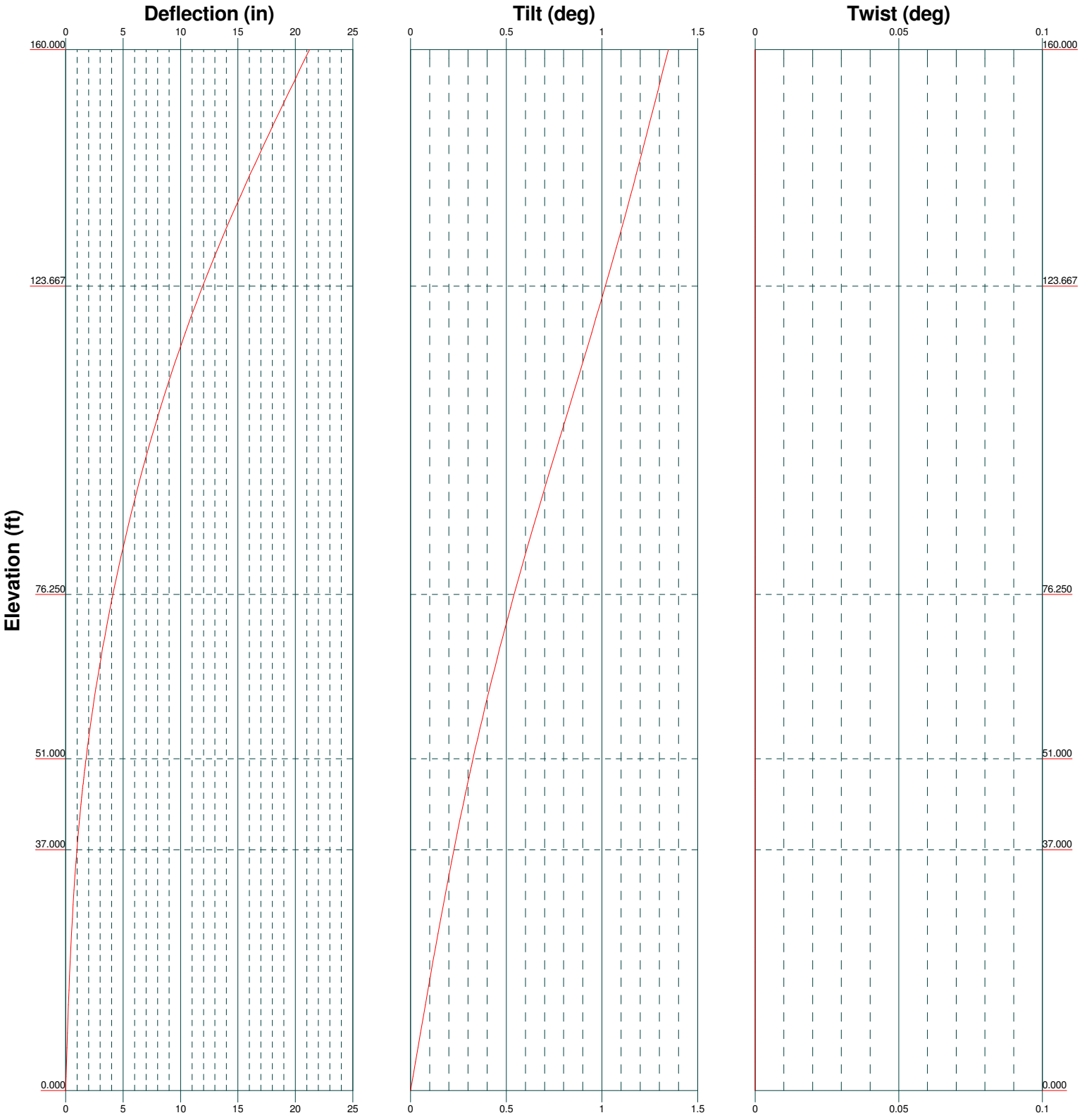
Job: 81363.013.01 - HRT 082 943274, CT (BU# 806382)			
Project:			
Client: Crown Castle	Drawn by: Vignesh Prabhu K	App'd:	
Code: TIA-222-G	Date: 04/16/16	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



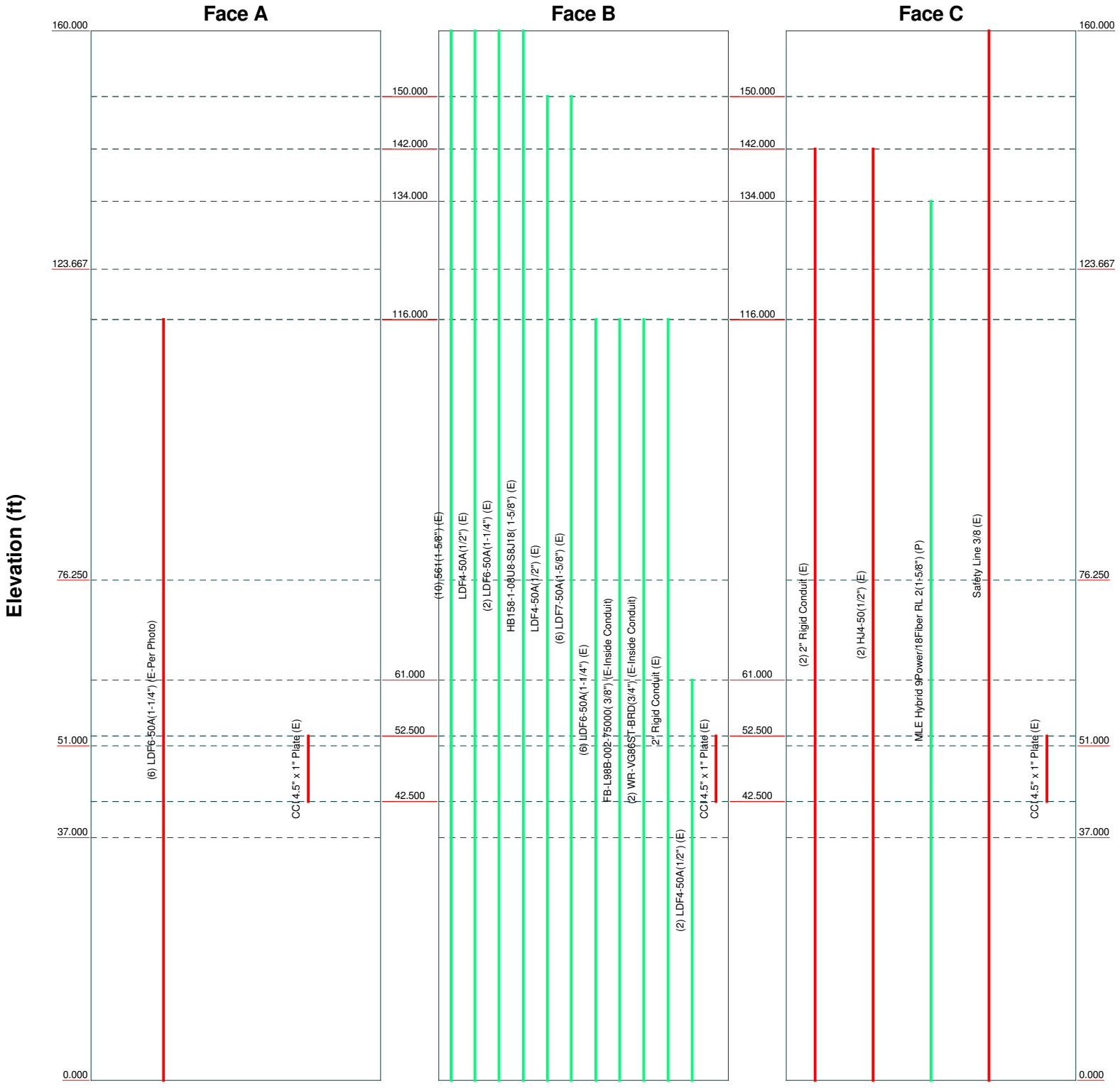
B+T GRP

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***81363.013.01 - HRT 082 943274, CT (BU# 806382)***		
Project:			
Client: Crown Castle	Drawn by: Vignesh Prabhu K		App'd:
Code: TIA-222-G	Date: 04/16/16		Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 160'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job:	***81363.013.01 - HRT 082 943274, CT (BU# 806382)***		
Project:			
Client: Crown Castle	Drawn by: Vignesh Prabhu K	App'd:	
Code: TIA-222-G	Date: 04/16/16	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	160.000-123.667	36.333	4.333	12	18.870	29.050	0.188	0.750	A572-65 (65 ksi)
L2	123.667-76.250	51.750	5.750	12	27.461	41.950	0.313	1.250	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	76.250-51.000	31.000	0.000	12	39.715	48.398	0.344	1.375	A572-65 (65 ksi)
L4	51.000-37.000	14.000	7.000	12	48.398	52.320	0.433	1.731	40.042185ksi (40 ksi)
L5	37.000-0.000	44.000		12	49.672	62.000	0.406	1.625	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.536	11.280	502.514	6.688	9.775	51.410	1018.229	5.551	4.555	24.292
	30.075	17.426	1852.870	10.333	15.048	123.131	3754.417	8.576	7.283	38.842
L2	29.686	27.318	2569.965	9.719	14.225	180.668	5207.445	13.445	6.522	20.871
	43.430	41.898	9271.410	14.906	21.730	426.662	18786.390	20.621	10.405	33.296
L3	42.784	43.579	8622.350	14.095	20.572	419.122	17471.219	21.448	9.722	28.283
	50.106	53.191	15678.080	17.204	25.070	625.362	31768.040	26.179	12.050	35.053
L4	50.106	66.843	19629.140	17.172	25.070	782.960	39773.960	32.898	11.811	27.291
	54.166	72.308	24847.930	18.576	27.102	916.838	50348.643	35.588	12.862	29.719
L5	53.454	64.445	19964.737	17.637	25.730	775.933	40453.969	31.718	12.223	30.088
	64.187	80.572	39016.215	22.051	32.116	1214.853	79057.429	39.655	15.527	38.221

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.000-123.667				1	1	1			
L2 123.667-76.250				1	1	1			
L3 76.250-51.000				1	1	1			
L4 51.000-37.000				1	1	0.987468			
L5 37.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
v									
2" Rigid Conduit (E)	C	Surface Ar (CaAa)	142.000 - 0.000	2	2	0.300 0.400	2.000		0.003
HJ4-50(1/2") (E)	C	Surface Ar (CaAa)	142.000 - 0.000	2	2	0.410 0.450	0.580		0.000
v									
LDF6-50A(1-1/4")	A	Surface Ar	116.000 - 0.000	6	6	-0.490	1.550		0.001

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
(E-Per Photo) **V**		(CaAa)				-0.350			
Safety Line 3/8 (E) **V**	C	Surface Ar (CaAa)	160.000 - 0.000	1	1	-0.490 -0.480	0.375		0.000
CCI 4.5" x 1" Plate (E)	A	Surface Af (CaAa)	52.500 - 42.500	1	1	0.000 0.050	4.500	11.000	0.000
CCI 4.5" x 1" Plate (E)	B	Surface Af (CaAa)	52.500 - 42.500	1	1	0.000 0.050	4.500	11.000	0.000
CCI 4.5" x 1" Plate (E) **V**	C	Surface Af (CaAa)	52.500 - 42.500	1	1	0.000 0.050	4.500	11.000	0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
561(1-5/8") (E)	B	No	Inside Pole	160.000 - 0.000	10	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF4-50A(1/2") (E)	B	No	Inside Pole	160.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF6-50A(1-1/4") (E)	B	No	Inside Pole	160.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
HB158-1-08U8-S8J18(1-5/8") (E) **V**	B	No	Inside Pole	160.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF4-50A(1/2") (E)	B	No	Inside Pole	150.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF7-50A(1-5/8") (E) **V**	B	No	Inside Pole	150.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
MLE Hybrid 9Power/18Fiber RL 2(1-5/8") (P)	C	No	Inside Pole	134.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF6-50A(1-1/4") (E)	B	No	Inside Pole	116.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
FB-L98B-002-75000(3/8") (E-Inside Conduit)	B	No	Inside Pole	116.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
WR-VG86ST-BRD(3/4") (E-Inside Conduit)	B	No	Inside Pole	116.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
2" Rigid Conduit (E) **V**	B	No	Inside Pole	116.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.003 0.003 0.003
LDF4-50A(1/2") (E)	B	No	Inside Pole	61.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
V							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.000-123.667	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.725
		C	0.000	0.000	10.822	0.000	0.131
L2	123.667-76.250	A	0.000	0.000	36.968	0.000	0.157
		B	0.000	0.000	0.000	0.000	1.329
		C	0.000	0.000	26.245	0.000	0.350
L3	76.250-51.000	A	0.000	0.000	24.608	0.000	0.100
		B	0.000	0.000	1.125	0.000	0.743
		C	0.000	0.000	15.101	0.000	0.187
L4	51.000-37.000	A	0.000	0.000	19.395	0.000	0.055
		B	0.000	0.000	6.375	0.000	0.415
		C	0.000	0.000	14.124	0.000	0.103
L5	37.000-0.000	A	0.000	0.000	34.410	0.000	0.147
		B	0.000	0.000	0.000	0.000	1.096
		C	0.000	0.000	20.480	0.000	0.273

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.000-123.667	A	1.734	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.725
		C		0.000	0.000	41.684	0.000	0.599
L2	123.667-76.250	A	1.674	0.000	0.000	63.442	0.000	0.889
		B		0.000	0.000	0.000	0.000	1.329
		C		0.000	0.000	89.920	0.000	1.352
L3	76.250-51.000	A	1.601	0.000	0.000	41.340	0.000	0.563
		B		0.000	0.000	1.420	0.000	0.760
		C		0.000	0.000	48.240	0.000	0.709
L4	51.000-37.000	A	1.543	0.000	0.000	29.571	0.000	0.367
		B		0.000	0.000	7.894	0.000	0.501
		C		0.000	0.000	32.575	0.000	0.438
L5	37.000-0.000	A	1.411	0.000	0.000	57.290	0.000	0.744
		B		0.000	0.000	0.000	0.000	1.096
		C		0.000	0.000	65.228	0.000	0.931

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.000-123.667	-0.228	0.303	-0.220	0.603
L2	123.667-76.250	-1.137	0.705	-1.139	0.961

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L3	76.250-51.000	-1.269	0.755	-1.356	1.081
L4	51.000-37.000	-1.082	0.644	-1.248	0.981
L5	37.000-0.000	-1.371	0.816	-1.560	1.227

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	9	2" Rigid Conduit	123.67 - 142.00	1.0000	1.0000
L1	10	HJ4-50(1/2")	123.67 - 142.00	1.0000	1.0000
L1	23	Safety Line 3/8	123.67 - 160.00	1.0000	1.0000
L1	15	LDF6-50A(1-1/4")	123.67 - 116.00	1.0000	1.0000
L2	9	2" Rigid Conduit	76.25 - 123.67	1.0000	1.0000
L2	10	HJ4-50(1/2")	76.25 - 123.67	1.0000	1.0000
L2	15	LDF6-50A(1-1/4")	76.25 - 116.00	1.0000	1.0000
L2	23	Safety Line 3/8	76.25 - 123.67	1.0000	1.0000
L2	25	CCI 4.5" x 1" Plate	76.25 - 52.50	1.0000	1.0000
L2	26	CCI 4.5" x 1" Plate	76.25 - 52.50	1.0000	1.0000
L2	27	CCI 4.5" x 1" Plate	76.25 - 52.50	1.0000	1.0000
L4	9	2" Rigid Conduit	37.00 - 51.00	1.0000	1.0000
L4	10	HJ4-50(1/2")	37.00 - 51.00	1.0000	1.0000
L4	15	LDF6-50A(1-1/4")	37.00 - 51.00	1.0000	1.0000
L4	23	Safety Line 3/8	37.00 - 51.00	1.0000	1.0000
L4	25	CCI 4.5" x 1" Plate	42.50 - 51.00	1.0000	1.0000
L4	26	CCI 4.5" x 1" Plate	42.50 - 51.00	1.0000	1.0000
L4	27	CCI 4.5" x 1" Plate	42.50 - 51.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
(2) DB846H80E-SX w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	160.000	No Ice 1/2" Ice	5.331 5.888	7.735 8.930	0.041 0.099
(E)			0.000			1" Ice	6.412	9.843	0.165
(2) DB846H80E-SX w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	160.000	No Ice 1/2" Ice	5.331 5.888	7.735 8.930	0.041 0.099
(E)			0.000			1" Ice	6.412	9.843	0.165
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	160.000	No Ice 1/2" Ice	7.271 7.832	7.821 9.010	0.047 0.114

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1" Ice	8.348	9.912	0.189
HBXX-6517DS-A2M w/	A	From Leg	4.000	0.000	160.000	No Ice	8.765	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.342	8.182	0.137
(E)			0.000			1" Ice	9.889	9.144	0.215
HBXX-6517DS-A2M w/	B	From Leg	4.000	0.000	160.000	No Ice	8.765	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.342	8.182	0.137
(E)			0.000			1" Ice	9.889	9.144	0.215
HBXX-6517DS-A2M w/	C	From Leg	4.000	0.000	160.000	No Ice	8.765	6.963	0.067
Mount Pipe			0.000			1/2" Ice	9.342	8.182	0.137
(E)			0.000			1" Ice	9.889	9.144	0.215
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	160.000	No Ice	0.314	0.076	0.003
(E)			0.000			1/2" Ice	0.386	0.119	0.005
			0.000			1" Ice	0.466	0.169	0.009
DB-T1-6Z-8AB-0Z	B	From Leg	4.000	0.000	160.000	No Ice	4.800	2.000	0.044
(E)			0.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
(2) SBNHH-1D65B w/	A	From Leg	4.000	0.000	160.000	No Ice	8.397	7.071	0.066
Mount Pipe			0.000			1/2" Ice	8.960	8.260	0.135
(R)			0.000			1" Ice	9.490	9.170	0.212
(2) SBNHH-1D65B w/	B	From Leg	4.000	0.000	160.000	No Ice	8.397	7.071	0.066
Mount Pipe			0.000			1/2" Ice	8.960	8.260	0.135
(R)			0.000			1" Ice	9.490	9.170	0.212
(2) SBNHH-1D65B w/	C	From Leg	4.000	0.000	160.000	No Ice	8.397	7.071	0.066
Mount Pipe			0.000			1/2" Ice	8.960	8.260	0.135
(R)			0.000			1" Ice	9.490	9.170	0.212
DB-B1-6C-8AB-0Z	A	From Leg	4.000	0.000	160.000	No Ice	4.800	2.000	0.044
(R)			0.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
RRH2x60-700	A	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
RRH2x60-700	B	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
RRH2x60-700	C	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
RRH2X60-PCS	A	From Leg	4.000	0.000	160.000	No Ice	2.200	1.723	0.055
(R)			0.000			1/2" Ice	2.393	1.901	0.075
			0.000			1" Ice	2.593	2.087	0.099
RRH2X60-PCS	B	From Leg	4.000	0.000	160.000	No Ice	2.200	1.723	0.055
(R)			0.000			1/2" Ice	2.393	1.901	0.075
			0.000			1" Ice	2.593	2.087	0.099
RRH2X60-PCS	C	From Leg	4.000	0.000	160.000	No Ice	2.200	1.723	0.055
(R)			0.000			1/2" Ice	2.393	1.901	0.075
			0.000			1" Ice	2.593	2.087	0.099
RRH2X60-AWS	A	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
RRH2X60-AWS	B	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
RRH2X60-AWS	C	From Leg	4.000	0.000	160.000	No Ice	3.500	1.816	0.060
(R)			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
Platform Mount [LP 602-1]	C	None		0.000	160.000	No Ice	32.030	32.030	1.343
(E)						1/2" Ice	38.710	38.710	1.800

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	45.390	45.390	2.257
V									
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	4.036 4.499	3.619 4.481	0.030 0.066
(E)			2.000			1" Ice	4.947	5.219	0.109
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	4.036 4.499	3.619 4.481	0.030 0.066
(E)			2.000			1" Ice	4.947	5.219	0.109
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	150.000	No Ice 1/2" Ice	4.036 4.499	3.619 4.481	0.030 0.066
(E)			2.000			1" Ice	4.947	5.219	0.109
(2) 6' x 2" Mount Pipe (E-Empty)	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe (E-Empty)	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe (E-Empty)	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
Platform Mount [LP 602-1] (E)	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice	32.030 38.710 45.390	32.030 38.710 45.390	1.343 1.800 2.257
V									
(2) 6' x 3" Mount Pipe (E)	A	From Leg	2.000 0.000 0.000	0.000	142.000	No Ice 1/2" Ice 1" Ice	1.767 2.129 2.501	1.767 2.129 2.501	0.030 0.044 0.061
(2) 6' x 3" Mount Pipe (E)	B	From Leg	2.000 0.000 0.000	0.000	142.000	No Ice 1/2" Ice 1" Ice	1.767 2.129 2.501	1.767 2.129 2.501	0.030 0.044 0.061
(2) 6' x 3" Mount Pipe (E)	C	From Leg	2.000 0.000 0.000	0.000	142.000	No Ice 1/2" Ice 1" Ice	1.767 2.129 2.501	1.767 2.129 2.501	0.030 0.044 0.061
4' x 2" Horizontal Face Mount Pipe (E-Dish Tie Back)	B	From Face	0.500 0.000 0.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.043 0.087 0.131	0.010 0.017 0.027
4' x 2" Horizontal Face Mount Pipe (E-Dish Tie Back)	C	From Face	0.500 0.000 0.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	0.866 1.111 1.365	0.043 0.087 0.131	0.010 0.017 0.027
J-Box - 1' x 1' x 4" (E-Per Photo)	C	From Leg	0.500 0.000 0.000	0.000	145.000	No Ice 1/2" Ice 1" Ice	2.133 2.315 2.504	1.200 1.343 1.493	0.020 0.039 0.061
Side Arm Mount [SO 101-3] (E)	C	None		0.000	142.000	No Ice 1/2" Ice 1" Ice	7.500 8.900 10.300	7.500 8.900 10.300	0.252 0.333 0.414
V									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	A	From Leg	4.000 0.000 3.000	0.000	134.000	No Ice 1/2" Ice 1" Ice	6.329 6.775 7.214	5.642 6.426 7.131	0.112 0.169 0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	B	From Leg	4.000 0.000 3.000	0.000	134.000	No Ice 1/2" Ice 1" Ice	6.329 6.775 7.214	5.642 6.426 7.131	0.112 0.169 0.233
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	C	From Leg	4.000 0.000 3.000	0.000	134.000	No Ice 1/2" Ice 1" Ice	6.329 6.775 7.214	5.642 6.426 7.131	0.112 0.169 0.233
SBNH-1D65C-SR w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	134.000	No Ice 1/2" Ice	11.683 12.404	9.842 11.366	0.083 0.172

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(P)			3.000			1" Ice	13.135	12.914	0.272
SBNH-1D65C-SR w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	134.000	No Ice 1/2" Ice	11.683 12.404	9.842 11.366	0.083 0.172
(P)			3.000			1" Ice	13.135	12.914	0.272
SBNH-1D65C-SR w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	134.000	No Ice 1/2" Ice	11.683 12.404	9.842 11.366	0.083 0.172
(P)			3.000			1" Ice	13.135	12.914	0.272
RRUS 11 B2	A	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
RRUS 11 B2	B	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
RRUS 11 B2	C	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
RRUS 11 B12	A	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
RRUS 11 B12	B	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
RRUS 11 B12	C	From Leg	4.000	0.000	134.000	No Ice	2.833	1.182	0.051
(P)			0.000 3.000			1/2" Ice 1" Ice	3.043 3.259	1.330 1.485	0.072 0.095
T-Arm Mount [TA 602-3] (P-RMV12-396)	C	None		0.000	134.000	No Ice 1/2" Ice 1" Ice	11.590 15.440 19.290	11.590 15.440 19.290	0.774 0.990 1.206
v									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
(E)			0.000 4.000			1/2" Ice 1" Ice	6.179 6.607	5.014 5.711	0.103 0.157
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
(E)			0.000 4.000			1/2" Ice 1" Ice	6.179 6.607	5.014 5.711	0.103 0.157
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	116.000	No Ice	5.746	4.254	0.055
(E)			0.000 4.000			1/2" Ice 1" Ice	6.179 6.607	5.014 5.711	0.103 0.157
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	116.000	No Ice 1/2" Ice	8.262 8.822	6.304 7.479	0.074 0.139
(E)			4.000			1" Ice	9.346	8.368	0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	116.000	No Ice 1/2" Ice	8.262 8.822	6.304 7.479	0.074 0.139
(E)			4.000			1" Ice	9.346	8.368	0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	116.000	No Ice 1/2" Ice	8.262 8.822	6.304 7.479	0.074 0.139
(E)			4.000			1" Ice	9.346	8.368	0.212
(2) LGP21401	A	From Leg	4.000	0.000	116.000	No Ice	1.104	0.207	0.014
(E)			0.000 0.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
(2) LGP21401	B	From Leg	4.000	0.000	116.000	No Ice	1.104	0.207	0.014
(E)			0.000 0.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
(2) LGP21401	C	From Leg	4.000	0.000	116.000	No Ice	1.104	0.207	0.014
(E)			0.000 0.000			1/2" Ice 1" Ice	1.239 1.381	0.274 0.348	0.021 0.030
(2) LGP21901	A	From Leg	4.000	0.000	116.000	No Ice	0.231	0.158	0.006

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	0.294	0.213	0.008
			0.000			1" Ice	0.365	0.276	0.011
(2) LGP21901	B	From Leg	4.000	0.000	116.000	No Ice	0.231	0.158	0.006
(E)			0.000			1/2" Ice	0.294	0.213	0.008
			0.000			1" Ice	0.365	0.276	0.011
(2) LGP21901	C	From Leg	4.000	0.000	116.000	No Ice	0.231	0.158	0.006
(E)			0.000			1/2" Ice	0.294	0.213	0.008
			0.000			1" Ice	0.365	0.276	0.011
RRUS-11	A	From Leg	4.000	0.000	116.000	No Ice	2.784	1.187	0.048
(E)			0.000			1/2" Ice	2.992	1.334	0.068
			4.000			1" Ice	3.207	1.490	0.092
RRUS-11	B	From Leg	4.000	0.000	116.000	No Ice	2.784	1.187	0.048
(E)			0.000			1/2" Ice	2.992	1.334	0.068
			4.000			1" Ice	3.207	1.490	0.092
RRUS-11	C	From Leg	4.000	0.000	116.000	No Ice	2.784	1.187	0.048
(E)			0.000			1/2" Ice	2.992	1.334	0.068
			4.000			1" Ice	3.207	1.490	0.092
DC6-48-60-18-8F	C	From Leg	4.000	0.000	116.000	No Ice	0.917	0.917	0.019
(E)			0.000			1/2" Ice	1.458	1.458	0.037
			4.000			1" Ice	1.643	1.643	0.057
3' x 2" Pipe Mount	A	From Leg	4.000	0.000	116.000	No Ice	0.583	0.583	0.011
(E-For TMA)			0.000			1/2" Ice	0.770	0.770	0.017
			4.000			1" Ice	0.967	0.967	0.024
3' x 2" Pipe Mount	B	From Leg	4.000	0.000	116.000	No Ice	0.583	0.583	0.011
(E-For TMA)			0.000			1/2" Ice	0.770	0.770	0.017
			4.000			1" Ice	0.967	0.967	0.024
(2) 3' x 2" Pipe Mount	C	From Leg	4.000	0.000	116.000	No Ice	0.583	0.583	0.011
(E-For TMA)			0.000			1/2" Ice	0.770	0.770	0.017
			4.000			1" Ice	0.967	0.967	0.024
Platform Mount [LP 303-1]	C	None		0.000	116.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
V									
GPS	A	From Leg	3.000	0.000	61.000	No Ice	0.150	0.150	0.000
(E)			0.000			1/2" Ice	0.204	0.204	0.002
			0.000			1" Ice	0.265	0.265	0.005
GPS	C	From Leg	3.000	0.000	61.000	No Ice	0.150	0.150	0.000
(E)			0.000			1/2" Ice	0.204	0.204	0.002
			0.000			1" Ice	0.265	0.265	0.005
2' x 2" Pipe Mount	A	From Leg	3.000	0.000	61.000	No Ice	0.023	0.023	0.007
(E)			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
2' x 2" Pipe Mount	C	From Leg	3.000	0.000	61.000	No Ice	0.023	0.023	0.007
(E)			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	61.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	61.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
V									
2' x 2" Pipe Mount	A	From Leg	3.000	0.000	50.000	No Ice	0.023	0.023	0.007
(E)			0.000			1/2" Ice	0.049	0.049	0.008
			0.000			1" Ice	0.085	0.085	0.009
2' x 2" Pipe Mount	C	From Leg	3.000	0.000	50.000	No Ice	0.023	0.023	0.007
(E)			0.000			1/2" Ice	0.049	0.049	0.008

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	0.085	0.085	0.009
Side Arm Mount [SO 701-1] (E)	A	From Leg	1.500 0.000 0.000	0.000	50.000	No Ice 1/2" Ice 1" Ice	0.850 1.140 1.430	1.670 2.340 3.010	0.065 0.079 0.093
Side Arm Mount [SO 701-1] (E)	C	From Leg	1.500 0.000 0.000	0.000	50.000	No Ice 1/2" Ice 1" Ice	0.850 1.140 1.430	1.670 2.340 3.010	0.065 0.079 0.093
v									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Radiowaves HP3-11 (E)	B	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 2.000	70.000		142.000	3.167	No Ice 1/2" Ice 1" Ice	7.876 8.296 8.716	0.050 0.093 0.135
Radiowaves HP3-11 (E)	C	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 2.000	78.000		142.000	3.167	No Ice 1/2" Ice 1" Ice	7.876 8.296 8.716	0.050 0.093 0.135
v											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 123.667	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-26.892	-0.310	-1.072
			Max. Mx	8	-8.735	-460.845	-2.348
			Max. My	14	-8.707	-2.459	-462.973
			Max. Vy	8	20.488	-460.845	-2.348
			Max. Vx	2	-20.672	1.218	462.956
			Max. Torque	9			-1.734
L2	123.667 - 76.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.988	2.606	-3.444
			Max. Mx	8	-20.331	-1674.343	-9.834
			Max. My	2	-20.310	6.040	1685.188
			Max. Vy	8	30.346	-1674.343	-9.834
			Max. Vx	2	-30.532	6.040	1685.188
			Max. Torque	9			-1.885
L3	76.25 - 51	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-60.419	5.094	-4.813
			Max. Mx	8	-29.718	-2687.646	-14.863
			Max. My	2	-29.707	9.739	2704.628
			Max. Vy	8	35.113	-2687.646	-14.863
			Max. Vx	2	-35.282	9.739	2704.628
			Max. Torque	9			-1.877
L4	51 - 37	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-64.026	5.997	-4.939
			Max. Mx	8	-32.300	-2937.117	-16.031
			Max. My	2	-32.291	10.950	2955.647
			Max. Vy	8	36.237	-2937.117	-16.031
			Max. Vx	2	-36.390	10.950	2955.647
			Max. Torque	9			-1.744
L5	37 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-88.070	9.290	-7.527
			Max. Mx	8	-50.425	-4669.690	-24.405
			Max. My	2	-50.425	16.986	4695.050
			Max. Vy	8	42.524	-4669.690	-24.405
			Max. Vx	2	-42.671	16.986	4695.050
			Max. Torque	9			-1.625

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	32	88.070	-4.383	-7.613
	Max. H_x	20	50.450	42.445	0.076
	Max. H_z	2	50.450	0.113	42.642
	Max. M_x	2	4695.050	0.113	42.642
	Max. M_z	8	4669.690	-42.495	-0.170
	Max. Torsion	21	1.342	42.445	0.076
	Min. Vert	7	37.837	-36.715	21.363
	Min. H_x	8	50.450	-42.495	-0.170
	Min. H_z	14	50.450	-0.181	-42.614
	Min. M_x	14	-4694.473	-0.181	-42.614
	Min. M_z	20	-4668.049	42.445	0.076
	Min. Torsion	9	-1.624	-42.494	-0.170

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	42.041	0.000	0.000	1.466	2.350	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	50.450	-0.113	-42.642	-4695.050	16.986	-0.169
0.9 Dead+1.6 Wind 0 deg - No Ice	37.837	-0.113	-42.642	-4656.196	16.126	-0.175
1.2 Dead+1.6 Wind 30 deg - No Ice	50.450	21.124	-36.981	-4074.941	-2317.393	0.118
0.9 Dead+1.6 Wind 30 deg - No Ice	37.837	21.124	-36.981	-4041.257	-2298.724	0.116
1.2 Dead+1.6 Wind 60 deg - No Ice	50.450	36.715	-21.363	-2355.312	-4032.253	1.088
0.9 Dead+1.6 Wind 60 deg - No Ice	37.837	36.715	-21.363	-2336.020	-3999.233	1.090
1.2 Dead+1.6 Wind 90 deg - No Ice	50.450	42.495	0.170	24.405	-4669.690	1.617
0.9 Dead+1.6 Wind 90 deg - No	37.837	42.494	0.170	23.744	-4631.334	1.624

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.6 Wind 120 deg - No Ice	50.450	36.803	21.470	2370.116	-4042.443	1.172
0.9 Dead+1.6 Wind 120 deg - No Ice	37.837	36.803	21.470	2349.813	-4009.338	1.181
1.2 Dead+1.6 Wind 150 deg - No Ice	50.450	21.250	36.982	4075.980	-2331.364	0.767
0.9 Dead+1.6 Wind 150 deg - No Ice	37.837	21.250	36.982	4041.402	-2312.583	0.776
1.2 Dead+1.6 Wind 180 deg - No Ice	50.450	0.181	42.614	4694.473	-21.320	0.637
0.9 Dead+1.6 Wind 180 deg - No Ice	37.837	0.181	42.614	4654.727	-21.845	0.643
1.2 Dead+1.6 Wind 210 deg - No Ice	50.450	-21.054	36.886	4064.535	2312.753	0.075
0.9 Dead+1.6 Wind 210 deg - No Ice	37.837	-21.054	36.886	4030.051	2292.701	0.077
1.2 Dead+1.6 Wind 240 deg - No Ice	50.450	-36.719	21.269	2345.026	4038.547	-0.963
0.9 Dead+1.6 Wind 240 deg - No Ice	37.837	-36.719	21.269	2324.937	4004.044	-0.965
1.2 Dead+1.6 Wind 270 deg - No Ice	50.450	-42.445	-0.076	-6.761	4668.049	-1.335
0.9 Dead+1.6 Wind 270 deg - No Ice	37.837	-42.445	-0.076	-7.156	4628.287	-1.342
1.2 Dead+1.6 Wind 300 deg - No Ice	50.450	-36.690	-21.442	-2362.365	4031.435	-0.460
0.9 Dead+1.6 Wind 300 deg - No Ice	37.837	-36.690	-21.442	-2343.030	3997.009	-0.469
1.2 Dead+1.6 Wind 330 deg - No Ice	50.450	-21.183	-36.992	-4073.899	2327.202	-0.134
0.9 Dead+1.6 Wind 330 deg - No Ice	37.837	-21.183	-36.992	-4040.238	2307.034	-0.142
1.2 Dead+1.0 Ice+1.0 Temp	88.070	-0.000	0.000	7.527	9.290	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	88.070	-0.024	-8.461	-994.200	12.259	-0.097
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	88.070	4.195	-7.334	-861.424	-486.159	-0.053
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	88.070	7.292	-4.233	-494.514	-852.159	0.126
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	88.070	8.440	0.034	11.970	-987.968	0.246
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	88.070	7.312	4.260	512.366	-854.293	0.208
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	88.070	4.383	7.613	905.241	-505.731	0.174
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	88.070	0.036	8.457	1008.756	4.839	0.177
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	88.070	-4.183	7.318	874.238	503.197	0.087
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	88.070	-7.292	4.218	507.360	871.129	-0.104
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	88.070	-8.431	-0.018	5.810	1005.538	-0.198
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	88.070	-7.293	-4.256	-496.328	870.204	-0.087
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	88.070	-4.372	-7.615	-890.209	522.859	-0.067
Dead+Wind 0 deg - Service	42.041	-0.021	-7.786	-852.827	4.967	-0.031
Dead+Wind 30 deg - Service	42.041	3.857	-6.753	-740.026	-419.644	0.024
Dead+Wind 60 deg - Service	42.041	6.704	-3.901	-427.228	-731.557	0.204

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 90 deg - Service	42.041	7.759	0.031	5.621	-847.500	0.301
Dead+Wind 120 deg - Service	42.041	6.720	3.920	432.290	-733.417	0.218
Dead+Wind 150 deg - Service	42.041	3.880	6.753	742.580	-422.186	0.142
Dead+Wind 180 deg - Service	42.041	0.033	7.781	855.082	-1.998	0.118
Dead+Wind 210 deg - Service	42.041	-3.844	6.735	740.487	422.552	0.013
Dead+Wind 240 deg - Service	42.041	-6.705	3.884	427.721	736.455	-0.180
Dead+Wind 270 deg - Service	42.041	-7.750	-0.014	-0.047	850.956	-0.249
Dead+Wind 300 deg - Service	42.041	-6.699	-3.915	-428.512	735.164	-0.087
Dead+Wind 330 deg - Service	42.041	-3.868	-6.755	-739.838	425.185	-0.025

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-42.041	0.000	0.000	42.041	0.000	0.000%
2	-0.113	-50.450	-42.642	0.113	50.450	42.642	0.000%
3	-0.113	-37.837	-42.642	0.113	37.837	42.642	0.000%
4	21.124	-50.450	-36.981	-21.124	50.450	36.981	0.000%
5	21.124	-37.837	-36.981	-21.124	37.837	36.981	0.000%
6	36.715	-50.450	-21.363	-36.715	50.450	21.363	0.000%
7	36.715	-37.837	-21.363	-36.715	37.837	21.363	0.000%
8	42.494	-50.450	0.170	-42.495	50.450	-0.170	0.000%
9	42.494	-37.837	0.170	-42.494	37.837	-0.170	0.000%
10	36.803	-50.450	21.470	-36.803	50.450	-21.470	0.000%
11	36.803	-37.837	21.470	-36.803	37.837	-21.470	0.000%
12	21.250	-50.450	36.982	-21.250	50.450	-36.982	0.000%
13	21.250	-37.837	36.982	-21.250	37.837	-36.982	0.000%
14	0.181	-50.450	42.614	-0.181	50.450	-42.614	0.000%
15	0.181	-37.837	42.614	-0.181	37.837	-42.614	0.000%
16	-21.054	-50.450	36.886	21.054	50.450	-36.886	0.000%
17	-21.054	-37.837	36.886	21.054	37.837	-36.886	0.000%
18	-36.719	-50.450	21.269	36.719	50.450	-21.269	0.000%
19	-36.719	-37.837	21.269	36.719	37.837	-21.269	0.000%
20	-42.445	-50.450	-0.076	42.445	50.450	0.076	0.000%
21	-42.445	-37.837	-0.076	42.445	37.837	0.076	0.000%
22	-36.690	-50.450	-21.442	36.690	50.450	21.442	0.000%
23	-36.690	-37.837	-21.442	36.690	37.837	21.442	0.000%
24	-21.183	-50.450	-36.992	21.183	50.450	36.992	0.000%
25	-21.183	-37.837	-36.992	21.183	37.837	36.992	0.000%
26	0.000	-88.070	0.000	0.000	88.070	-0.000	0.000%
27	-0.024	-88.070	-8.461	0.024	88.070	8.461	0.000%
28	4.195	-88.070	-7.334	-4.195	88.070	7.334	0.000%
29	7.292	-88.070	-4.233	-7.292	88.070	4.233	0.000%
30	8.440	-88.070	0.034	-8.440	88.070	-0.034	0.000%
31	7.312	-88.070	4.260	-7.312	88.070	-4.260	0.000%
32	4.383	-88.070	7.613	-4.383	88.070	-7.613	0.000%
33	0.036	-88.070	8.457	-0.036	88.070	-8.457	0.000%
34	-4.183	-88.070	7.318	4.183	88.070	-7.318	0.000%
35	-7.292	-88.070	4.217	7.292	88.070	-4.218	0.000%
36	-8.431	-88.070	-0.018	8.431	88.070	0.018	0.000%
37	-7.293	-88.070	-4.256	7.293	88.070	4.256	0.000%
38	-4.372	-88.070	-7.615	4.372	88.070	7.615	0.000%
39	-0.021	-42.041	-7.786	0.021	42.041	7.786	0.000%
40	3.857	-42.041	-6.753	-3.857	42.041	6.753	0.000%
41	6.704	-42.041	-3.901	-6.704	42.041	3.901	0.000%
42	7.759	-42.041	0.031	-7.759	42.041	-0.031	0.000%
43	6.720	-42.041	3.920	-6.720	42.041	-3.920	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
44	3.880	-42.041	6.753	-3.880	42.041	-6.753	0.000%
45	0.033	-42.041	7.781	-0.033	42.041	-7.781	0.000%
46	-3.844	-42.041	6.735	3.844	42.041	-6.735	0.000%
47	-6.705	-42.041	3.884	6.705	42.041	-3.884	0.000%
48	-7.750	-42.041	-0.014	7.750	42.041	0.014	0.000%
49	-6.699	-42.041	-3.915	6.699	42.041	3.915	0.000%
50	-3.868	-42.041	-6.755	3.868	42.041	6.755	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00033474
3	Yes	4	0.00000001	0.00015258
4	Yes	5	0.00000001	0.00061289
5	Yes	5	0.00000001	0.00024191
6	Yes	5	0.00000001	0.00059880
7	Yes	5	0.00000001	0.00023531
8	Yes	4	0.00000001	0.00096606
9	Yes	4	0.00000001	0.00055923
10	Yes	5	0.00000001	0.00062399
11	Yes	5	0.00000001	0.00024618
12	Yes	5	0.00000001	0.00060616
13	Yes	5	0.00000001	0.00023838
14	Yes	4	0.00000001	0.00033728
15	Yes	4	0.00000001	0.00015459
16	Yes	5	0.00000001	0.00060369
17	Yes	5	0.00000001	0.00023813
18	Yes	5	0.00000001	0.00062050
19	Yes	5	0.00000001	0.00024541
20	Yes	4	0.00000001	0.00060438
21	Yes	4	0.00000001	0.00033770
22	Yes	5	0.00000001	0.00060773
23	Yes	5	0.00000001	0.00023928
24	Yes	5	0.00000001	0.00060864
25	Yes	5	0.00000001	0.00023982
26	Yes	4	0.00000001	0.00006009
27	Yes	5	0.00000001	0.00063304
28	Yes	5	0.00000001	0.00068322
29	Yes	5	0.00000001	0.00068114
30	Yes	5	0.00000001	0.00063102
31	Yes	5	0.00000001	0.00069310
32	Yes	5	0.00000001	0.00071217
33	Yes	5	0.00000001	0.00064340
34	Yes	5	0.00000001	0.00069840
35	Yes	5	0.00000001	0.00069857
36	Yes	5	0.00000001	0.00063872
37	Yes	5	0.00000001	0.00069016
38	Yes	5	0.00000001	0.00070805
39	Yes	4	0.00000001	0.00006435
40	Yes	4	0.00000001	0.00019896
41	Yes	4	0.00000001	0.00018719
42	Yes	4	0.00000001	0.00007304
43	Yes	4	0.00000001	0.00020767
44	Yes	4	0.00000001	0.00019344

45	Yes	4	0.00000001	0.00006465
46	Yes	4	0.00000001	0.00019408
47	Yes	4	0.00000001	0.00020763
48	Yes	4	0.00000001	0.00006973
49	Yes	4	0.00000001	0.00019413
50	Yes	4	0.00000001	0.00019612

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	21.226	45	1.344	0.003
L2	128 - 76.25	12.906	45	1.063	0.002
L3	82 - 51	4.815	45	0.593	0.000
L4	51 - 37	1.776	45	0.326	0.000
L5	44 - 0	1.335	45	0.277	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	(2) DB846H80E-SX w/ Mount Pipe	45	21.226	1.344	0.003	28598
150.000	(2) DB980H90E-M w/ Mount Pipe	45	18.497	1.260	0.002	14299
145.000	4' x 2" Horizontal Face Mount Pipe	45	17.158	1.217	0.002	9532
144.000	Radiowaves HP3-11	45	16.894	1.208	0.002	8936
142.000	(2) 6' x 3" Mount Pipe	45	16.370	1.190	0.002	7943
134.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	45	14.339	1.119	0.002	5499
116.000	(2) 7770.00 w/ Mount Pipe	45	10.318	0.943	0.001	4858
61.000	GPS	45	2.563	0.403	0.000	6509
50.000	2' x 2" Pipe Mount	45	1.708	0.319	0.000	6564

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 123.667	116.417	2	7.379	0.016
L2	128 - 76.25	70.846	2	5.836	0.009
L3	82 - 51	26.451	2	3.261	0.003
L4	51 - 37	9.758	2	1.790	0.001
L5	44 - 0	7.332	2	1.520	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	(2) DB846H80E-SX w/ Mount Pipe	2	116.417	7.379	0.016	5368
150.000	(2) DB980H90E-M w/ Mount Pipe	2	101.472	6.916	0.014	2682
145.000	4' x 2" Horizontal Face Mount Pipe	2	94.142	6.680	0.012	1787
144.000	Radiowaves HP3-11	2	92.695	6.633	0.012	1675
142.000	(2) 6' x 3" Mount Pipe	2	89.823	6.537	0.012	1488
134.000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	2	78.701	6.144	0.010	1028
116.000	(2) 7770.00 w/ Mount Pipe	2	56.657	5.182	0.007	901
61.000	GPS	2	14.078	2.217	0.001	1188
50.000	2' x 2" Pipe Mount	2	9.381	1.750	0.001	1197

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	36.333	0.000	0.0	16.693	-8.706	965.169	0.009
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	51.750	0.000	0.0	40.278	-20.310	2534.090	0.008
L3	76.25 - 51 (3)	TP48.398x39.715x0.344	31.000	0.000	0.0	53.191	-29.707	3182.680	0.009
L4	51 - 37 (4)	TP52.32x48.398x0.433	14.000	0.000	0.0	69.575	-32.291	3098.060	0.010
L5	37 - 0 (5)	TP62x49.672x0.406	44.000	0.000	0.0	80.572	-50.425	4570.550	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	463.080	544.269	0.851	0.000	544.269	0.000
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	1685.200	2066.708	0.815	0.000	2066.708	0.000
L3	76.25 - 51 (3)	TP48.398x39.715x0.344	2704.642	3118.233	0.867	0.000	3118.233	0.000
L4	51 - 37 (4)	TP52.32x48.398x0.433	2955.667	3148.817	0.939	0.000	3148.817	0.000
L5	37 - 0 (5)	TP62x49.672x0.406	4695.625	5742.817	0.818	0.000	5742.817	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 123.667 (1)	TP29.05x18.87x0.188	20.652	482.585	0.043	0.217	1103.608	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	123.667 - 76.25 (2)	TP41.95x27.461x0.313	30.532	1267.040	0.024	0.262	4190.633	0.000
L3	76.25 - 51 (3)	TP48.398x39.715x0.344	35.282	1591.340	0.022	0.038	6322.808	0.000
L4	51 - 37 (4)	TP52.32x48.398x0.433	36.390	1549.030	0.023	0.169	6384.817	0.000
L5	37 - 0 (5)	TP62x49.672x0.406	42.682	2285.280	0.019	0.767	11644.667	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 123.667 (1)	0.009	0.851	0.000	0.043	0.000	0.857 ✔	1.000	4.8.2 ✔
L2	123.667 - 76.25 (2)	0.008	0.815	0.000	0.024	0.000	0.821 ✔	1.000	4.8.2 ✔
L3	76.25 - 51 (3)	0.009	0.867	0.000	0.022	0.000	0.874 ✔	1.000	4.8.2 ✔
L4	51 - 37 (4)	0.010	0.939	0.000	0.023	0.000	0.950 ✔	1.000	4.8.2 ✔
L5	37 - 0 (5)	0.011	0.818	0.000	0.019	0.000	0.826 ✔	1.000	4.8.2 ✔

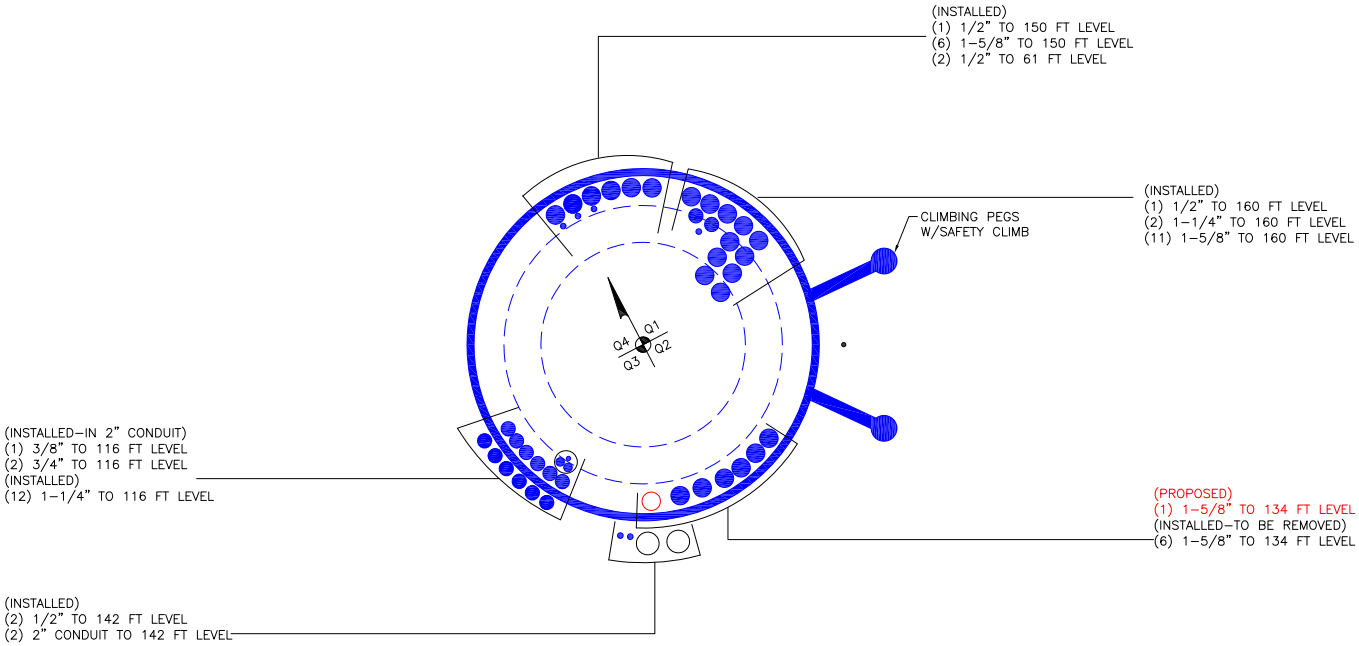
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 123.667	Pole	TP29.05x18.87x0.188	1	-8.706	965.169	**	**
L2	123.667 - 76.25	Pole	TP41.95x27.461x0.313	2	-20.310	2534.090	**	**
L3	76.25 - 51	Pole	TP48.398x39.715x0.344	3	-29.707	3182.680	**	**
L4	51 - 37	Pole	TP52.32x48.398x0.433	4	-32.291	3098.060	**	**
L5	37 - 0	Pole	TP62x49.672x0.406	5	-50.425	4570.550	**	**
						Summary		
						Pole (L4)	**	**
						RATING =	**	**

** See Appendix-C for Additional Calculations

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806382

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
42.5	51	3	CI-XFP-0451(	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 2

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Reinforcement 3

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.		Bottom Elevation Failure	Top Elevation Failure	Section Failure %
123.6670	160.0000	0.1875	65	80	85.7%										**85.7%**	160.0000	36.3330	4.3330	12	18.8700	29.0500	0.1875	65.0	1.00	1			
76.2500	128.0000	0.3125	65	80	82.1%										**82.1%**	128.0000	51.7500	5.7500	12	27.4610	41.9500	0.3125	65.0	1.00	2			
51.0000	82.0000	0.3438	65	80	87.4%										**87.4%**	82.0000	31.0000	0.0000	12	39.7151	48.3985	0.3438	65.0	1.00	3			
37.0000	51.0000	0.3438	65	80	77.9%	3	CI-XFP-0451(	95.0%							**95.0%**	51.0000	14.0000	7.0000	12	48.3985	52.3200	0.4328	40.0	0.99	4			
0.0000	44.0000	0.4063	65	80	82.6%										**82.6%**	44.0000	44.0000	0.0000	12	49.6717	62.0000	0.4063	65.0	1.00	5			
																									6			
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Section		Loads				Pole											Unreinforced Pole - Rev. G														Reinforced Pole					Rev. G				Reinforcement 1								Composite							
Section	Elevation (ft)	Moment (ft-kip)	Compression (kip)	Shear (kip)	Torsion (kip-ft)	Number of Sides	OD (in)	Thickness (in)	Yield Strength (ksi)	Flat Width (in)	Area (in^2)	Moment of Inertia (in^4)	Percent of Composite Moment of Inertia	Angle Offset to Pole Flat	Distance to Extreme Fiber (in)	Section Modulus (in^3)	Torsion Constant (in^4)	Effective Yield Stress (ksi)	Nominal Bending Moment Strength (ft-kip)	Strength Resistance Factor	Design Bending Moment Strength (ft-kip)	Nominal Compressive Strength (kip)	Strength Resistance Factor	Design Compressive Strength (kip)	Nominal Shear Strength (kip)	Strength Resistance Factor	Design Shear Strength (kip)	Nominal Torsion Shear Strength (kip-ft)	Strength Resistance Factor	Design Torsion Shear Strength (kip-ft)	Stress Ratio	Moment in Pole when Reinforced	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Allowable Bending Stress (ksi)	Allowable Compressive Stress (ksi)	Allowable Shear Stress (ksi)	Allowable Torsion Shear Stress (ksi)	Reinforced Pole Stress Ratio	Qty	Model	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Rein. (in)	Tension only or Tension & Comp.	Total Moment of Inertia (in^4)	Axial Force (ksi)	Stress Ratio	Centroid Offset (in)	Area (in^2)	Moment of Inertia (in^4)	Controlling Stress Ratio	Thickness (in)	Weight Multiplier	Derated Yield Stress (ksi)	% Error in Derated Yield Stress
Section	*Elevation*	*Moment*	*Compression*	*Shear*	*Torsion*	*PoleSides*	*PoleOD*	*PoleT*	*PoleFy*	*PoleW*	*PoleA*	*PoleI*	*PolePctMom*	*PoleCPoint*	*PoleC*	*PoleS*	*PoleJ*	*PoleFye*	*PoleMn*	*PolePhiMn*	*PolePn*	*PolePhiC*	*PolePhiPn*	*PoleVn*	*PolePhiV*	*PolePhiVn*	*PoleTn*	*PolePhiTn*	*PolePhiTn*	*PoleSRI*	*PoleMoment*	*RPoleBa*	*RPoleAa*	*RPoleFa*	*RPoleFv*	*RPoleFb*	*RPoleFa*	*RPoleFv*	*RPoleSRI*	*RvinQty*	*RvinModel*	*RvinPos*	*RvinGap*	*RvinTC*	*RvinITotal*	*RvinF*	*RvinSR*	*CentrOffset*	*CompA*	*CompI*	*CompSR*	*EPoleT*	*EPoleWM*	*EDPoleFy*	*EDPoleSRCheck*
1	380	0.7	10.2	1.7	0.1	12	18.8700	0.1875	65	4.55	11.2	502	100%	TRUE	9.73	52	985	78.2	336.2	0.9	302.6	879.3	0.9	791.3	439.6	0.9	395.7	7911.3	0.9	7120.1	**0.015**	0.7	0.2	0.91	0.00	0.00	70.4	70.4	70.4	70.4	**0.015**									0.000	11.2	502	**0.015**	**0.1875**	**1.00**	**65.0**	**0.1%**
2	128	463.1	8.7	20.7	0.2	12	27.8360	0.1875	65	6.96	16.6	1628	100%	TRUE	14.38	113	3189	64.3	606.5	0.9	545.9	1069.5	0.9	962.6	534.8	0.9	481.3	14255.2	0.9	12829.7	**0.859**	463.1	49.1	0.52	0.00	0.00	57.8	57.8	57.8	57.8	**0.857**									0.000	16.6	1628	**0.857**	**0.1875**	**1.00**	**65.0**	**0.5%**
3	123.667	553.9	9.7	21.2	0.2	12	29.0500	0.5000	65	6.44	45.7	4769	100%	TRUE	14.95	319	9376	81.9	2177.4	0.9	1959.6	3745.6	0.9	3371.0	1872.8	0.9	1685.5	51399.7	0.9	46232.7	**0.286**	553.9	20.8	0.21	0.00	0.00	73.7	73.7	73.7	73.7	**0.286**									0.000	45.7	4769	**0.286**	**0.5000**	**1.00**	**65.0**	**0.4%**
4	82	1685.2	20.3	30.5	0.3	12	40.3401	0.3125	65	9.97	40.2	8234	100%	TRUE	20.85	395	16133	69.9	2303.9	0.9	2073.6	3807.4	0.9	3426.6	1403.7	0.9	1263.3	54154.7	0.9	48740.1	**0.822**	1685.2	51.2	0.51	0.00	0.00	62.3	62.2	62.3	62.3	**0.821**									0.000	40.2	8234	**0.821**	**0.3125**	**1.00**	**65.0**	**0.4%**
5	76.25	1863.4	22.7	33.5	0.3	12	41.9500	0.4563	65	9.48	86.8	18948	100%	TRUE	21.60	877	37232	81.9	5987.1	0.9	5388.4	7112.8	0.9	6401.6	3556.4	0.9	3200.8	141176.7	0.9	127059.0	**0.349**	1863.4	25.5	0.26	0.00	0.00	73.7	73.7	73.7	73.7	**0.349**									0.000	86.8	18948	**0.349**	**0.4563**	**1.00**	**65.0**	**0.4%**
6	51	2704.6	29.7	35.3	0.0	12	48.3985	0.3438	65	12.05	53.0	15674	100%	TRUE	24.99	627	30703	66.5	3475.0	0.9	3127.5	3526.4	0.9	3173.8	1763.2	0.9	1586.9	81685.0	0.9	73516.5	**0.875**	2704.6	51.8	0.56	0.00	0.00	59.8	59.8	59.8	59.8	**0.874**									0.000	53.0	15674	**0.874**	**0.3438**	**1.00**	**65.0**	**0.3%**
7	44	2955.7	32.3	36.4	0.2	12	50.3592	0.3438	65	12.57	55.2	17673	80%	0	25.18	702	34616	58.3	3412.6	0.9	3071.4	3220.9	0.9	2898.8	1610.4	0.9	1449.4	80210.4	0.9	72189.4	**0.974**	2359.7	40.3	0.58	0.00	0.00	52.5	52.5	52.5	52.5	**0.779**	3	CCI-XFP-045100	F	0	T&C	4463	185.2	**0.950**	0.000	68.7	22136	**0.950**	**0.4328**	**0.99**	**40.0**	**0.1%**
8	42.5	3010.4	33.1	36.6	0.2	12	50.7794	0.7500	65	11.60	120.3	39518	89%	TRUE	26.15	1473	75665	65.0	7977.6	0.9	7179.8	7817.8	0.9	7036.1	3908.9	0.9	3518.0	188055.3	0.9	169249.8	**0.424**	2693.2	21.9	0.27	0.00	0.00	58.5	58.5	58.5	58.5	**0.380**	3	CCI-XFP-045100	F	0	T&C	4536	97.8	**0.501**	0.000	133.8	43054	**0.501**	**0.8411**	**0.99**	**38.6**	**1.7%**
9	37	3214.1	36.6	37.5	0.2	12	52.3200	0.7500	65	12.01	124.0	42192	100%	TRUE	26.95	1566	82869	81.9	10694.6	0.9	9626.2	10254.8	0.9	9139.3	5077.4	0.9	4569.6	251830.2	0.9	226647.2	**0.338**	3214.3	24.6	0.30	0.00	0.00	73.7	73.7	73.7	73.7	**0.338**									0.000	124.0	42192	**0.338**	**0.7500**	**1.00**	**65.0**	**0.4%**
10	0	4695.6	50.4	42.7	0.8	12	62.0000	0.4063	65	15.52	80.9	39011	100%	TRUE	32.02	1218	76401	63.0	6399.5	0.9	5759.6	5064.8	0.9	4558.4	2532.4	0.9	2279.2	150299.5	0.9	135359.6	**0.827**	4695.6	46.3	0.63	0.00	0.00	56.7	56.7	56.7	56.7	**0.826**									0.000	80.1	39011	**0.826**	**0.4063**	**1.00**	**65.0**	**0.3%**
																													0.974								**0.874**						**0.950**				**0.950**				

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
42.5	51	3	FP-045100	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		1				1				1							

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
	0			F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure

5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
CCI-XFP-045100	15.3	4.50	0.38	7.59	0.5	0	1	4.5	0	0	1.1875	65	80	0.80	20	1.00	20	129.7	172.9	Compress.	195.0	Rupture

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Materi

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(F

Site Data

BU#:	*806382*
Site Name:	*HRT 082 943274*
App #:	*333625 Rev. 9*
Pole Manufacturer:	*Other*

Reactions		
Mu:	4695.6227	ft-kips
Axial, Pu:	50.4246	kips
Shear, Vu:	42.682136	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffene

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	70.69	in

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	207.8	Kips
Allowable Axial, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	79.9%	**Pass**

Plate Data		
Diam:	76.69	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.46	in

Base Plate Results Flexural Check

Base Plate Stress:	23.4	ksi
Allowable Plate Stress:	54.0	ksi
Base Plate Stress Ratio:	43.2%	**Pass**

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

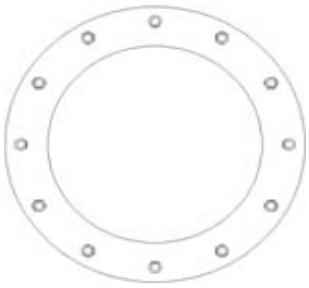
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	62	in
Thick:	0.40625	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

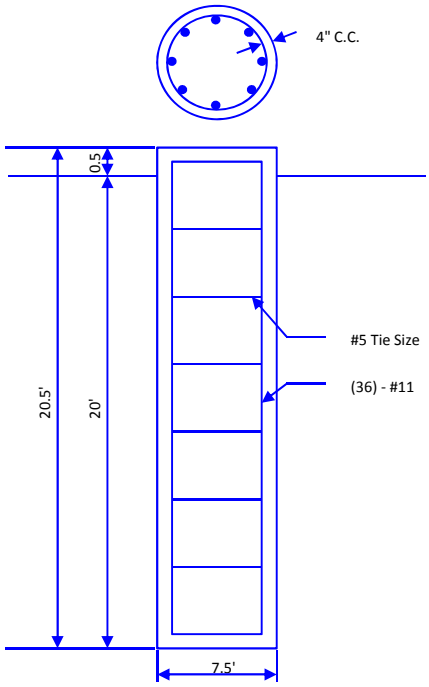
CCI Foundation Tool Suite - Monopole Pier

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 4/18/2016

BU:	806382
Site Name:	HRT 082 943274, CT
App Number:	333625 Rev. 9
Work Order:	1223331

Monopole Drilled Pier

Input



Criteria

TIA Revision:	G
ACI 318 Revision:	2008
Seismic Category:	B

Forces

Compression	50	kips
Shear	43	kips
Moment	4696	k-ft
Swelling Force	0	kips

Foundation Dimensions

Pier Diameter:	7.5	ft
Ext. above grade:	0.5	ft
Depth below grade:	20	ft

Material Properties

Number of Rebar:	36	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	4000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	4	in

Soil Profile: Soil

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	1	0	1	100	0	0	0	0	0	
2	5	1	6	110		34			0	
3	3.5	6	9.5	115		38			0	
4	10.5	9.5	20	145		45			30	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	4.47	ft
Max Moment, Mu:	4870.28	k-ft
Soil Safety Factor:	1.87	
Safety Factor Req'd:	1.33	
RATING:	71.1%	

Soil Axial Capacity

Skin Friction (k):	280.02	kips
End Bearing (k):	994.02	kips
Comp. Capacity (k), ϕCn:	1274.04	kips
Comp. (k), Cu:	50.00	kips
RATING:	3.9%	

Concrete/Steel Check

Mu (from soil analysis)	4870.28	k-ft
ϕMn	9335.02	k-ft
RATING:	52.2%	

rho provided	0.88	
rho required	0.33	OK

Rebar Spacing	5.51	
Spacing required	22.56	OK

Dev. Length required	15.19	
Dev. Length provided	53.51	OK

Overall Foundation Rating: 71.1%

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: CT11252A

Portland Rt 66 / Rt 151
74 Goodrich Lane
Portland, CT 06480

May 11, 2016

EBI Project Number: 6216002280

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	7.35 %

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

EBI Consulting
environmental | engineering | due diligence

May 11, 2016

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

Emissions Analysis for Site: **CT11252A – Portland Rt 66 / Rt 151**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **74 Goodrich Lane, Portland, CT**, 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 (μW/cm2). 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 public 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 public 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 limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS 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 **74 Goodrich Lane, Portland, CT**, 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 manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 GSM / UMTS 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

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

3) 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.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) 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.

6) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB 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.

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope SBNH-1D65C-SR** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope SBNH-1D65C-SR** has a maximum gain of **13.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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.

8) The antenna mounting height centerline of the proposed antennas is **137 feet** above ground level (AGL).

9) 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.

All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	137	Height (AGL):	137	Height (AGL):	137
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	1.96	Antenna B1 MPE%	1.96	Antenna C1 MPE%	1.96
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope SBNH-1D65C-SR	Make / Model:	Commscope SBNH-1D65C-SR	Make / Model:	Commscope SBNH-1D65C-SR
Gain:	13.6 dBd	Gain:	13.6 dBd	Gain:	13.6 dBd
Height (AGL):	137	Height (AGL):	137	Height (AGL):	137
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	687.26	ERP (W):	687.26	ERP (W):	687.26
Antenna A3 MPE%	0.31	Antenna B3 MPE%	0.31	Antenna C3 MPE%	0.31

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.26 %**
AT&T	2.47 %
Verizon Wireless	1.94 %
Clearwire	0.10 %
Sprint	0.22 %
Nextel	0.36 %
Site Total MPE %:	**7.35 %**

T-Mobile Sector 1 Total:	2.26 %
T-Mobile Sector 2 Total:	2.26 %
T-Mobile Sector 3 Total:	2.26 %
Site Total:	7.35 %

T-Mobile _Max per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**137**	**9.78**	**2100**	**1000**	**0.98 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**137**	**4.89**	**1900**	**1000**	**0.49 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**137**	**4.89**	**2100**	**1000**	**0.49 %**
T-Mobile 700 MHz LTE	**1**	**687.26**	**137**	**1.44**	**700**	**467**	**0.31 %**
						Total:	**2.26%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.26 %
Sector 2:	2.26 %
Sector 3:	2.26 %
T-Mobile Per Sector Maximum:	2.26 %
Site Total:	7.35 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.35%** of the allowable FCC established general public 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.