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May 11, 2016

OVERNIGHT DELIVERY
Executive Director Melanie Bachman, Esq.
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Petition No. 443B - New Cingular Wireless PCS LLC ("AT&T")
Amended Petition for Declaratory Ruling
1 River Road, Greenwich, Connecticut

Dear Executive Director Bachman:

On behalf of New Cingular Wireless PCS, LLC ("AT&T") please find enclosed an original and fifteen (15) copies of an amendment to petition 443 (respectfully requested to be identified as Petition 443B) for a temporary tower facility to be located at 1 River Road in Greenwich. Also included are five (5) full copies of a complete structural analysis including calculations for the Council's use and review as a bulk file and a CD with an electronic version of the Petition.

As set forth in the amended petition, AT&T proposes the temporary tower facility to assure the continuity of AT&T's wireless service in the area as an existing temporary facility must be removed and a planned and approved permanent facility on an existing transmission line tower is not yet available.

We respectfully request a waiver of the petition filing fee as this submission is directly related to the recent review of AT&T's Petition 443A and the temporary facility contemplated in that proceeding.

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

Very truly yours,

Daniel M. Laub
Enclosures

cc: Peter Tesi, First Selectman Town of Greenwich
Katie Deluca, Director of Planning, Town of Greenwich
Michele Briggs, AT&T
Dan Bilezikian, SAI
Christopher B. Fisher, Esq.

CONNECTICUT SITING COUNCIL

AMENDED PETITION OF NEW CINGULAR WIRELESS PCS, LLC ("AT&T") TO THE CONNECTICUT SITING COUNCIL FOR A DECLARATORY RULING THAT NO CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS REQUIRED FOR A PROPOSED TEMPORARY TOWER TO BE LOCATED AT 1 RIVER ROAD IN THE TOWN OF GREENWICH, CONNECTICUT	)	**PETITION NO. 443B**
	)	**MAY 11, 2016**

AMENDED PETITION FOR DECLARATORY RULING

PROPOSED TEMPORARY TOWER

1 RIVER ROAD IN GREENWICH

I. Introduction

New Cingular Wireless PCS, LLC ("AT&T") (the "Petitioner") hereby petitions the Connecticut Siting Council ("Council") pursuant to Sections 16-50j-38 and 16-50j-39 of the Regulations of Connecticut State Agencies ("R.C.S.A.") for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need ("Certificate") is required to install a temporary tower facility ("Temporary Facility") at 1 River Road in the Town of Greenwich, Connecticut (the "Site"). AT&T is licensed by the Federal Communications Commission ("FCC") to provide wireless services in this area of the State of Connecticut. AT&T is currently coordinating with Eversource, the Department of Transportation and other parties to relocate an existing wireless facility mounted on an electrical transmission tower to a different existing transmission tower at the same site adjacent to the Cos Cob train station off Shore Road. AT&T is proposing a temporary tower to ensure continuity of service in this area of Greenwich based on several variables associated with a permanent relocation that are beyond its control.

II. AT&T Facilities Planning & Need For A New Temporary Tower Site

CL&P structure #1292 is a lattice tower structure supporting a transmission line at an existing electric substation in the Town of Greenwich. In Siting Council Petition #443, the Council approved an AT&T "power mount" facility with antennas installed on a small pole at the top of transmission tower #1292 ("Original Facility"). AT&T's Original Facility extended approximately 20' above the top of the existing transmission line lattice tower with associated equipment located at grade in a 30' x 30' fenced compound beneath the lattice tower.

Last year Eversource notified AT&T that it must remove the Original Facility on tower #1292 as part of Eversource's plans to deconstruct and remove that transmission tower. In written notice to AT&T, Eversource provided February 1, 2016 as a deadline for the permanent removal of the Original Facility.

AT&T and Eversource subsequently coordinated on a plan to relocate an AT&T facility to Eversource tower structure #1279 oatn the same site ("Replacement Facility"). This Replacement Facility includes installation of AT&T antennas on a different existing lattice tower structure extending approximately 13' above the top of the existing transmission tower structure. In December 2015, AT&T and Eversource's plans were approved as part of Petition 443A. Due to the need for a power outage, which are infrequent and the schedule subject to change beyond control of Eversource, the Council also approved use of a temporary tower facility by AT&T at a location near to the Original Facility.

Notably, the Council delegated to the Council's Executive Director the ability to authorize the final location of such temporary facility at the Shore Road property once AT&T finalized plans with the underlying property owner the Connecticut Department of Transportation as well as Eversource and Metro North Railroad which have infrastructure and easements in the area. As part of AT&T's ongoing evaluation of placing a temporary tower adjacent to the Original Facility, it was concluded that a location and utility connections could not be agreed upon among the various parties due to, *inter alia*, the significant amount of above and below-ground infrastructure already in place in the area, Eversource's own ongoing plans in the area and the difficulty in obtaining distribution and fiber connections to the temporary tower.

Thereafter, communication and coordination with Eversource revealed that if AT&T could modify the Original Facility by bolting the antennas directly to tower #1292 then those antennas could serve as a temporary facility until mid-June 2016. This solution was adopted by the parties and by letter dated December 29, 2015, the Siting Council Executive Director authorized this modification as the temporary facility in keeping with the Siting Council in Petition 443A. AT&T subsequently removed the Original Facility and bolted antennas directly on to tower #1279.

Continued coordination with Eversource since December 2015 revealed no outages of sufficient timing or duration to allow construction of the Replacement Facility on tower #1279. Further, AT&T remains on notice from Eversource that it must remove its temporary facility on tower #1292 by mid-June. Given the tenuous situation associated with AT&T's current service in the area and AT&T's need to ensure continuity of service to its customers in the Cos Cob area, a viable temporary tower solution is still required.

III. Proposed New Temporary Tower Facility

The Site consists of a parcel of land with an address of 1 River Road and is identified by the Greenwich Tax Assessor as Parcel ID 08-1898/S. The property is approximately 1.84 acres in size and includes the Greenwich Racquet Club and an approximately 4,000 s.f. office building. The property is classified in the Town's WB commercial zoning district.

Interstate 95 abuts the property to the west and north where the highway is elevated and traverses from southwest to northeast. To the south is Cos Cob Harbor with marina and residential development to the east.

Figure 1 Satellite photo of 1 River Road and surrounding area

Originally, AT&T identified two potential locations for temporary facility at the Site but as a result of Connecticut DOT input only one location is feasible. The feasible and only proposed option is along the south side of the Greenwich Racquet Club building. This originally was identified as "Option B" and is called out as such on the attached drawings. The other identified area ("Option A" on the drawings) was between the west side of the Greenwich Racquet Club Building and I-95 and is still included on the drawings for the Council's understanding of prior communications with DOT. Consultation with DOT representatives resulted in a rejection of the use of the Option A location based on the limited highway access line location.

The temporary tower at the Option B location would be a ballast-weighted product requiring no permanent foundation. The temporary tower itself would be a 94' tall monopole tower mounted on a 14' x 14' ballast (weighted) steel base. Three (3) AT&T antennas would be located at a centerline height of 89' AGL. AT&T equipment including remote radio heads would be installed on the weighted base that includes a connected fence (altogether the "Temporary Tower Facility").

Some minor grading and use of gravel is required for deployment of the Temporary Tower Facility. AT&T proposes to connect the Temporary Tower Facility to electric and communication utilities inside the existing Racquet Club building. Detailed drawings prepared by Centek Engineering, last revised May 6, 2016, including an abutters map, site plan, site surveys of the two original options, elevation, construction and other aspects of the proposed facility are included in Exhibit A. A Structural Analysis, dated March 16, 2016, prepared by Centek Engineering is included in Exhibit B.[1]

V. The Temporary Tower Facility Will Not Have a Substantial Adverse Environmental Effect

The proposed Temporary Tower Facility will not create permanent substantial adverse environmental effects as more fully set forth herein.

A. Visibility

A visibility assessment prepared by All Points Technology will follow this submission under separate cover. In general, the proposed temporary tower will be seen within the context of the existing elevated highway infrastructure and be largely obscured from River Road at the base by the existing racquet club building. Preliminary review and consultation indicates that the there will be no significant negative visual impact. The Petitioner submits that visibility of the temporary tower is limited in duration and reversible and therefore does not represent an adverse visual effect for purposes of the Council's regulatory considerations in ruling on this Petition.

B. Physical Impacts

No trees will be removed and only minimal grading typically associated with minor construction or landscaping activities is proposed. The Option B location is adjacent to Cos Cob Harbor and an analysis of short-term potential impacts and any recommended mitigation measures is being prepared by AT&T's consultant All Points Technology which preliminarily has indicated that no significant impacts are anticipated from the proposal. A complete analysis will follow under separate cover as a supplement to this Petition. Due to the minimal grading, small footprint and limited duration of this Temporary Tower Facility AT&T does not anticipate any significant impacts resulting from this petition.

C. Compliance with MPE Limits

The operation of AT&T antennas on the temporary tower will be well within standards adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and the MPE limits established by the FCC. A power density report is included in Exhibit C.

D. Department of Transportation Regulation

The State of Connecticut Department of Transportation ("DOT") Highway No Access Line runs parallel to I-95 and a portion of the 1 River Road property is therefore in an area regulated by the DOT. Representatives for AT&T contacted DOT for review of

[1] The temporary tower product being deployed has an option for an additional 10' optional extension when a carrier requires additional height. AT&T does not intend on using this extension but it is nevertheless conservatively included in the structural analysis.

locating a temporary tower proposal. DOT is not prepared to grant any approvals for the above-noted Option A facility. The Option B location is outside this regulated area and is the only siting option available.

VI. Notice

Pursuant to Section 16-50j-40(a) of the Council's regulations, notice of AT&T's intent to file this petition was sent to each person appearing of record as an owner of property that abuts proposed site, as well as municipal officials and government agencies as listed in Section 16-50e of the General Statutes. Certification of such notice, a copy of the notice and the list of property owners, municipal officials, and government agencies to whom AT&T sent notice are included in Exhibit D and E.

VII. Council Regulation of Temporary Towers and Declaratory Ruling Sought by AT&T

The Public Utility Environmental Standards Act ("PUESA") provides the Siting Council with jurisdiction over telecommunications towers and several other types of utility infrastructure defined as "facilities". See C.G.S. § 16-50i(a). However, not every "facility" requires a Certificate of Environmental Compatibility and Public Need. Indeed, state law specifically provides that only a facility that "may have a substantial adverse environmental effect" requires a Certificate. C.G.S. § 16-50k.

The Siting Council's regulations contain several exemptions for certain types of tower facilities including temporary towers. For example, Section 16-50j-72(a)(2) of the Council's regulations includes an exemption for installation of a tower next to an existing tower that is damaged or inoperable and required in order to maintain continuity of services. Section 16-50j-72(d) of the Council's regulations also incorporate an exemption for temporary towers provided that the temporary use is "necessary to provide emergency or essential telecommunications services to ....events of statewide significance". Historically, wireless carriers have filed and received acknowledgment of notices for cell on wheels, temporary distribution pole sets and other types of temporary facilities needed during construction of new wireless facilities or for special events. See e.g. EM-CING-052-131023, EM-CING-038-120816.

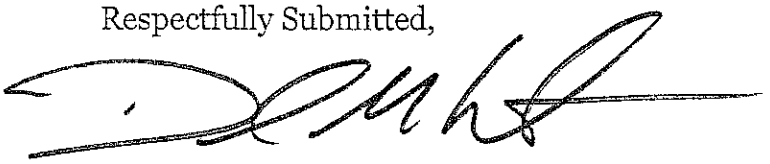
In cases where a tower facility is not otherwise exempt under Council regulations, the Council has discretion to determine that a proposed facility will not have a substantial adverse environmental effect and that no Certificate is required. See Section 4-176 of the Uniform Administrative Procedure Act and Sections 16-50j-38 and 39 of the Council's own regulations specifically provide the Siting Council with the regulatory authority to render case-by-case declaratory rulings in a petition process. As relevant to this Petition, the Council has previously issued declaratory rulings that no Certificate was required for: an 85' temporary tower needed to avoid service disruption during maintenance of a water tank site (Petition 1062); and a 55' permanent tower site with minimal environmental impacts (Petition 626T) and more recently a 120' ballast temporary monopole tower in Bridgeport (Petition 1169). AT&T has filed this Petition with the Council to address the need for a temporary tower to be deployed in a new site location to address potential disruption to its service associated with relocation plans for its facility on Eversource transmission lines. AT&T specifically seeks a ruling that the environmental effects associated with the construction of a temporary tower at the

Greenwich Racquet Club adjacent to the I-95 elevated highway and Cos Cob Harbor are not substantial for purposes of Section 16-50k, reversible and temporary in duration. AT&T only plans to construct the temporary tower facility if and as needed to until a permanent replacement for the facility located on tower #1292 can be deployed in coordination with Eversource.

VIII. Conclusion

AT&T respectfully submits its opinion that the proposed temporary tower does not present substantial adverse environmental effects for purposes of Section 16-50p of the General Statutes. AT&T petitions the Connecticut Siting Council for a determination that development of the Temporary Tower Site and operation of the Temporary Tower Facility do not require a Certificate of Environmental Compatibility and Public Need and that the Council issue an order approving same. AT&T seeks such a ruling and that it be effective during the time until a permanent replacement site is constructed and operational.

Respectfully Submitted,



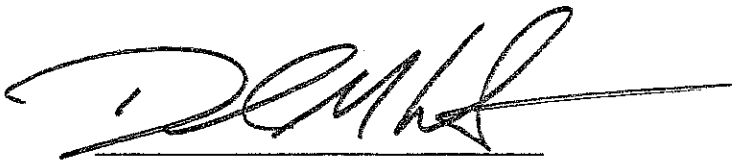
Daniel M. Laub
On behalf of the Petitioner
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

cc: Town of Greenwich
Michelle Briggs, AT&T
Kelly Wade Bettuchi, AT&T
Dan Bilizekian, SAI

CERTIFICATE OF SERVICE

I hereby certify that on this day, an original and fifteen copies of the foregoing were sent electronically and by overnight delivery to the Connecticut Siting Council:

Dated: May 11, 2016



A

at&t

WIRELESS COMMUNICATIONS FACILITY

CT5006
COS COB RELO.
TEMPORARY TOWER INSTALL
1 RIVER ROAD
GREENWICH, CT 06807

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT **TO:** 1 RIVER ROAD GREENWICH, CT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.3 MI.
2.	TURN LEFT ONTO CAPITAL BLVD	0.2 MI.
3.	TURN LEFT ONTO WEST ST	0.3 MI.
4.	TURN LEFT TO MERGE ONTO I-91 S	0.3 MI.
5.	MERGE ONTO I-91 S TOWARD NEW HAVEN	9.6 MI.
6.	MERGE ONTO CT-15 S VIA EXIT 17 TOWARD E. MAIN ST.	30.2 MI.
7.	MERGE ONTO CT-8 S VIA EXIT 52 TOWARD BRIDGEPORT	5.6 MI.
8.	MERGE ONTO I-95 S TOWARD NY CITY/NY CITY	23.4 MI.
9.	TAKE US-1 EXIT 5 TOWARD RIVERSIDE/OLD GREENWICH	0.1 MI.
10.	TAKE A SLIGHT LEFT ONTO E PUTNAM AVE/US-1 S	0.7 MI.
11.	TURN LEFT ONTO RIVER RD.	0.6MI.

GENERAL NOTES

1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY AT&T.

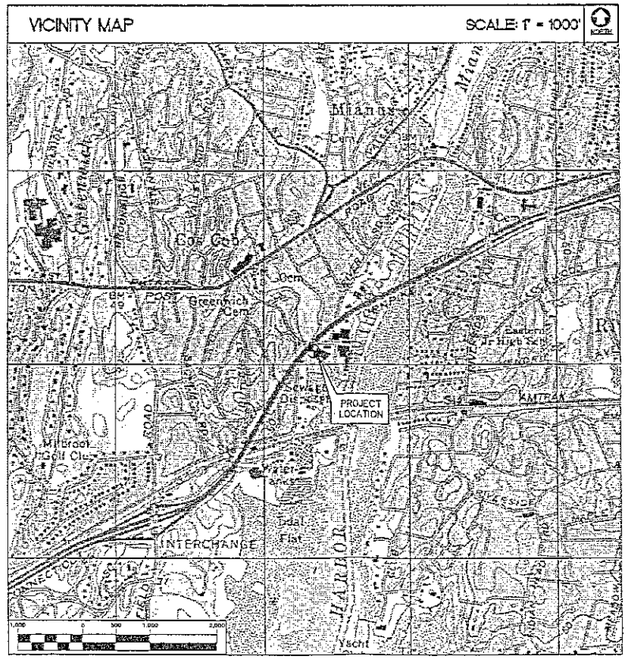
SITE INFORMATION

THE SCOPE OF WORK SHALL INCLUDE:

1. THE INSTALLATION OF A ±94' TEMPORARY TOWER THAT IS ON A 14'X14' STEEL BALLAST FRAME SUPPORTED BY 80,000 LBS OF CONCRETE DISTRIBUTED EVENLY THROUGHOUT THE FRAME.
2. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.
3. POWER, TELCO AND GROUND CONDUITS UTILITIES SHALL BE ROUTED ABOVE THE EXISTING ACOUSTIC CEILING THEN ROUTED ALONG THE EXTERIOR BUILDING WALL TO THE PROPOSED LOCATION OF THE TEMPORARY TOWER.
4. A 12' WIDE GRAVEL ACCESS DRIVE WILL BE PROPOSED FOR ACCESS TO THE TOWER.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	COS COB RELO. – CT5006 (TEMPORARY TOWER INSTALL)
SITE ADDRESS:	1 RIVER ROAD GREENWICH, CT 06807
PROPERTY OWNER:	ONE RIVER ROAD LLC 1 RIVER ROAD GREENWICH, CT 06807
LESSEE/TENANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
CONTACT PERSON:	DAN BILEZIKIAN SAI COMMUNICATIONS (401) 368-0005
ENGINEER:	CENTEK ENGINEERING 63-2 NORTH BRANFORD ROAD, BRANFORD, CT 06405 (203) 488-0580
TEMPORARY TOWER COORDINATES:	LATITUDE: 41°-02'-02.033" LONGITUDE: 73°-35'-48.058" EX. GROUND ELEVATION: 9.4'± A.M.S.L. COORDINATES AND GROUND ELEVATION BASED ON FAA 1-A CERTIFICATION PREPARED BY CENTEK ENGINEERING AND ASSOCIATES, DATED MARCH 15, 2016.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	5
C-1.0	ABUTTERS MAP	1
C-2.0	PARTIAL SITE PLAN	4
C-3.0	SITE/SURVEY PLAN – OPTION "A"	1
C-3.1	SITE/SURVEY PLAN – OPTION "B"	1
C-4.0	SITE CONSTRUCTION, S&E CONTROL NOTES AND DETAILS	0
C-5.0	ELEVATION, ANTENNA CONFIGURATION & TEMP. TOWER PLAN	4
C-6.0	SITE DETAILS	2

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	5/16/16	CAG	LVP	CSC – CORRECTED TOWER HEIGHT
4	05/02/16	CAG	LVP	CSC – REMOVAL OF PROPOSED COMPOUND FENCE
3	4/25/16	CAG	LVP	CSC – REVISE "TEMP" TOWER HEIGHT
2	4/19/16	CAG	LVP	CSC– REVISED PER CLIENT'S COMMENTS
1	4/01/16	CAG	LVP	CSC – REVISED TO INCLUDE OPTION "B" TOWER LOCATION
0	03/21/16	BJR	DMD	CSC – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI COMMUNICATIONS

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

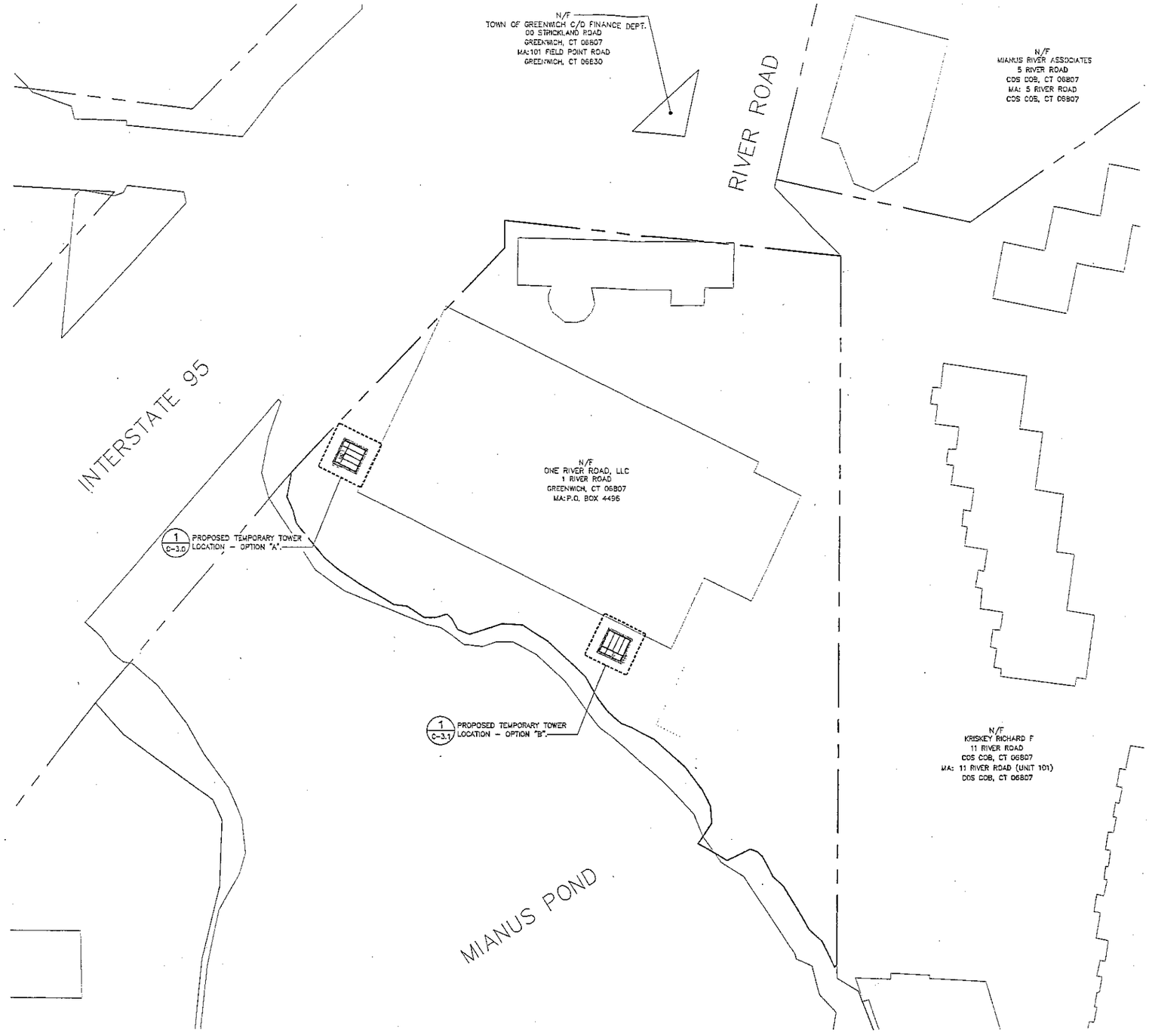
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
COS COB RELO.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16005.002

TITLE SHEET

T-1

Sheet No. 1 of 7



1 ABUTTERS MAP
C-1.0 SCALE: 1" = 30'

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	04/01/16	CAG	LVP	CSC - REVISED TO INCLUDE OPTION "B", TOWER LOCATION
0	03/21/16	BJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI COMMUNICATIONS

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
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Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY

COS COB REL.O.

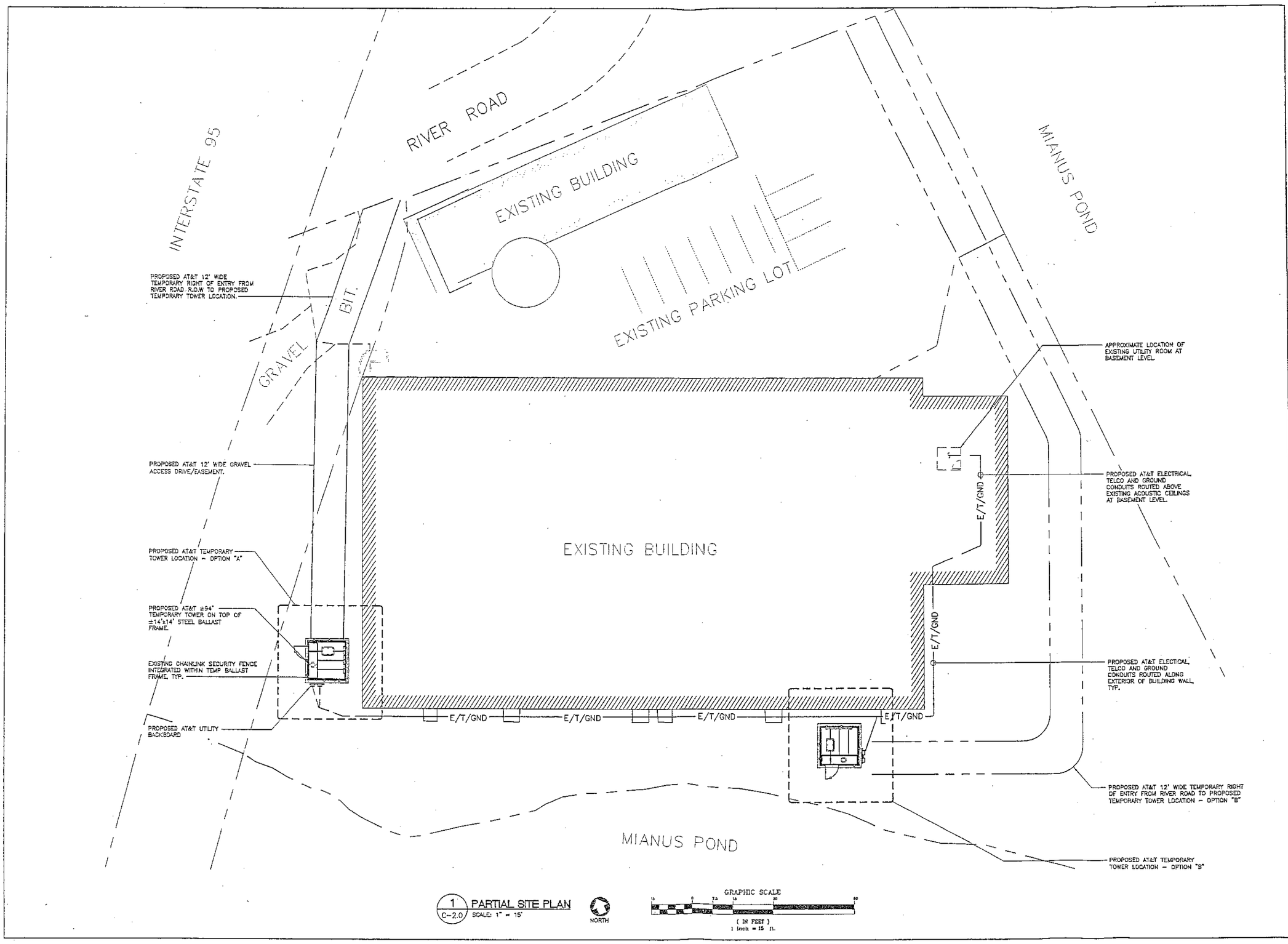
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16008.002

ABUTTERS MAP

C-1.0

Sheet No. 2 of 7



1 / C-2.0 PARTIAL SITE PLAN
SCALE: 1" = 15'

NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 15 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
4	5/6/16	GAG	LVP	CSC - CORRECTED TOWER HEIGHT
3	05/02/16	GAG	LVP	CSC - REMOVAL OF PROPOSED COMPOUND FENCE
2	4/18/16	GAG	LVP	CSC - REVISED PER CLIENT'S COMMENTS
1	04/07/16	GAG	LVP	CSC - REVISED TO INCLUDE OPTION "B" TOWER LOCATION
0	03/21/16	BJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

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AT&T MOBILITY
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CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16008.002

PARTIAL SITE PLAN

C-2.0
Sheet No. 3 of 7

SURVEY NOTES

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THRU 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPT. 26, 1996. THIS SURVEY CONFORMS TO A HORIZONTAL ACCURACY OF CLASS A-2 AND A VERTICAL ACCURACY OF CLASS T-2 AND IS INTENDED TO BE USED TO DEPICT A PROPOSED TELECOMMUNICATION SITE.

COORDINATES REFER TO NAD 83.

VERTICAL DATUM IS BASED ON NGVD 29.

PARCEL UNIT 1 OWNER OF RECORD: ONE RIVER ROAD, LLC
PARCEL UNIT 2 OWNER OF RECORD: R & R TENNIS, LLC

PARCEL AREA UNIT 1= 0.478 ACRES.
PARCEL AREA UNIT 2= 1.36± ACRES.

PARCEL IS IN WB ZONING DISTRICT.

TAX PARCEL NUMBER 08-1898/S.

A PORTION OF THE SUBJECT PROPERTIES ARE IN THE AE FLOOD ZONE (EL. 11, NAVD 88 DATUM, EL. 12 NGVD 1929 DATUM) AS SHOWN ON THE FLOOD INSURANCE RATE MAP, FAIRFIELD COUNTY, CONNECTICUT PANEL 511 OF 626, MAP NUMBER 09001C0511G, MAP EFFECTIVE DATE JUNE 8, 2013, BY FEDERAL EMERGENCY MANAGEMENT AGENCY.

NOT ALL IMPROVEMENTS SHOWN.

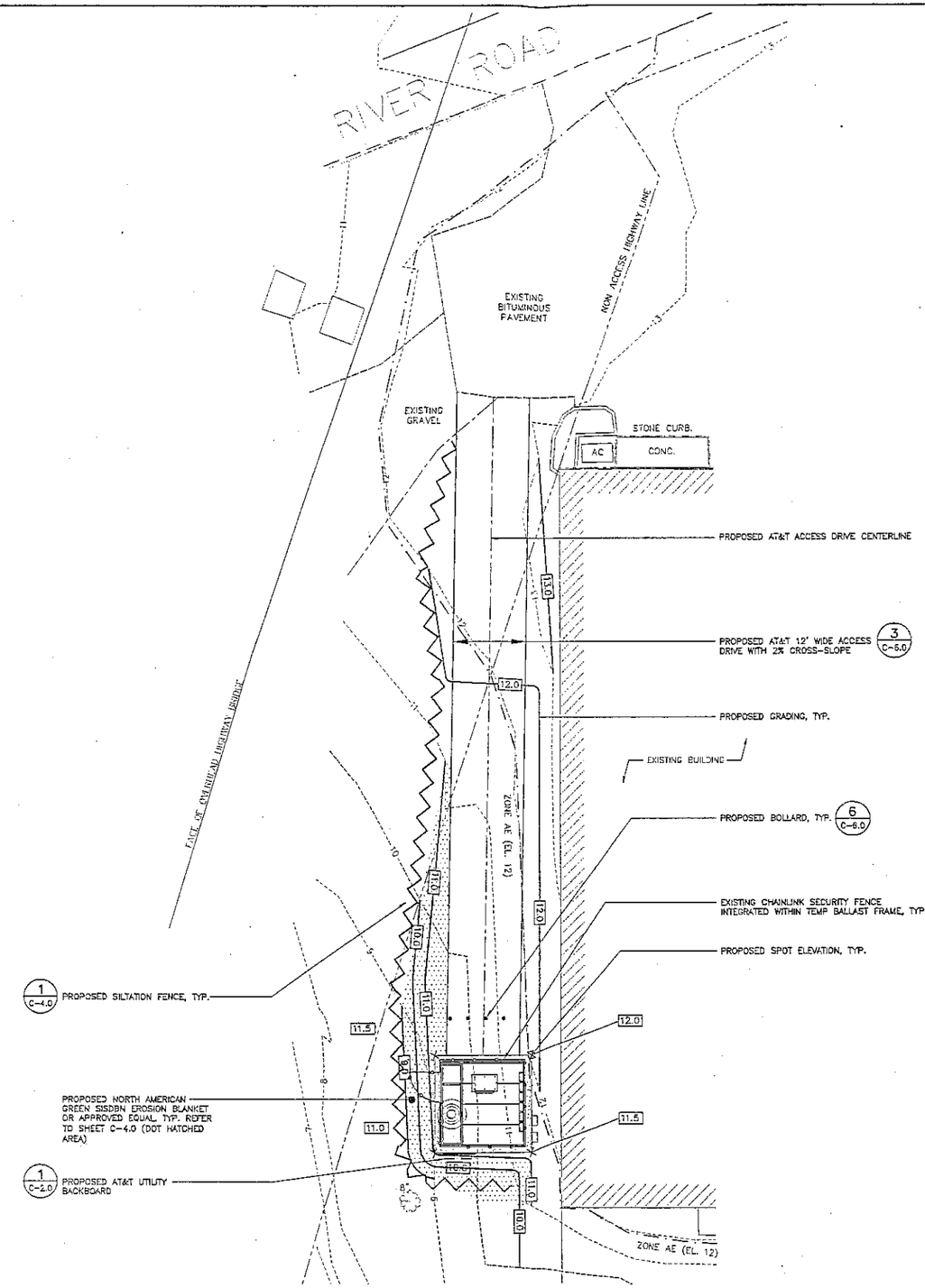
REFERENCE IS MADE TO THE FOLLOWING MAPS:

1. SURVEY AND PLAN OF ONE RIVER ROAD A CONDOMINIUM COMMON INTEREST COMMUNITY DECLARED BY VIEWPOINT COMPANY GREENWICH, CONN. SCALE 1"=40'. DATE JULY 14, 1988. PREPARED BY E. MINOR & CO.

2. EASEMENT TO BE GRANTED TO THE CONNECTICUT LIGHT AND POWER COMPANY ON THE PROPERTY OF PALMER POINT ASSOCIATES ET AL TOWN OF GREENWICH, CONN. SCALE 1"=20'. DATE MARCH 29, 1979.

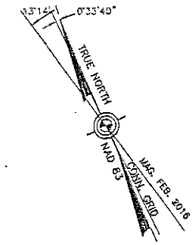
3. MAP SHOWING PARCEL I AND PARCEL II PALMER POINT RIVER ROAD GREENWICH, CONN. SCALE 1"=20'. DATE MARCH 24, 1978. REVISED THRU JULY 10, 1978. PREPARED BY J.A. KIRBY COMPANY.

4. CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS RIGHT OF WAY MAP TOWN OF GREENWICH CONNECTICUT TURNPIKE FROM STEAMBOAT ROAD, TO THE GREENWICH-STAMFORD TOWN LINE. NUMBER 56-06. SCALE 1"=80'. DATE SEPTEMBER 21, 1977.



1 C-3.0 SITE/SURVEY PLAN – OPTION "A"
SCALE: 1/8"=1'

GRAPHIC SCALE
(IN FEET)
1 inch = 8 ft



MISCELLANEOUS SITE INFORMATION

TOTAL NUMBER OF TREES TO BE REMOVED:	±0
TOTAL AREA OF DISTURBANCE:	±15,350 S.F.

SYMBOLS LEGEND

- 650 — CONTOUR LINE
- 650 — GRADING LINE
- SILTATION FENCE
- OVERHEAD UTILITY

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

A. RAFAEL MARTINEZ LLS #16833 DATE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	05/02/16	CAS	LVP	CSC – REMOVAL OF PROPOSED COMPOUND FENCE
0	03/21/16	BJR	DMD	CSC – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

CENTEK Engineering
Centered on Solutions℠
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WIRELESS COMMUNICATIONS FACILITY
COS COB REL.0.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16009.002

SITE/SURVEY PLAN
OPTION "A"

C-3.0
Sheet No. 4 of 7

SURVEY NOTES

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THRU 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPT. 26, 1996. THIS SURVEY CONFORMS TO A HORIZONTAL ACCURACY OF CLASS A-2 AND A VERTICAL ACCURACY OF CLASS T-2 AND IS INTENDED TO BE USED TO DEPICT A PROPOSED TELECOMMUNICATION SITE.

COORDINATES REFER TO NAD 83.

VERTICAL DATUM IS BASED ON NGVD 29.

PARCEL UNIT 1 OWNER OF RECORD: ONE RIVER ROAD, LLC
PARCEL UNIT 2 OWNER OF RECORD: R & R TENNIS, LLC

PARCEL AREA UNIT 1= 0.479 ACRES.
PARCEL AREA UNIT 2= 1.36± ACRES.

PARCEL IS IN WB ZONING DISTRICT.

TAX PARCEL NUMBER 05-1898/S.

A PORTION OF THE SUBJECT PROPERTIES ARE IN THE AE FLOOD ZONE (EL. 11, NAVD 88 DATUM, EL. 12 NGVD 1929 DATUM) AS SHOWN ON THE FLOOD INSURANCE RATE MAP, FAIRFIELD COUNTY, CONNECTICUT PANEL 511 OF 626, MAP NUMBER 09001C0511G, MAP EFFECTIVE DATE JUNE 8, 2013, BY FEDERAL EMERGENCY MANAGEMENT AGENCY.

NOT ALL IMPROVEMENTS SHOWN.

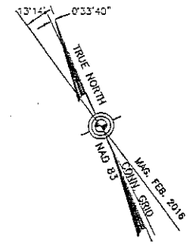
REFERENCE IS MADE TO THE FOLLOWNG MAPS:

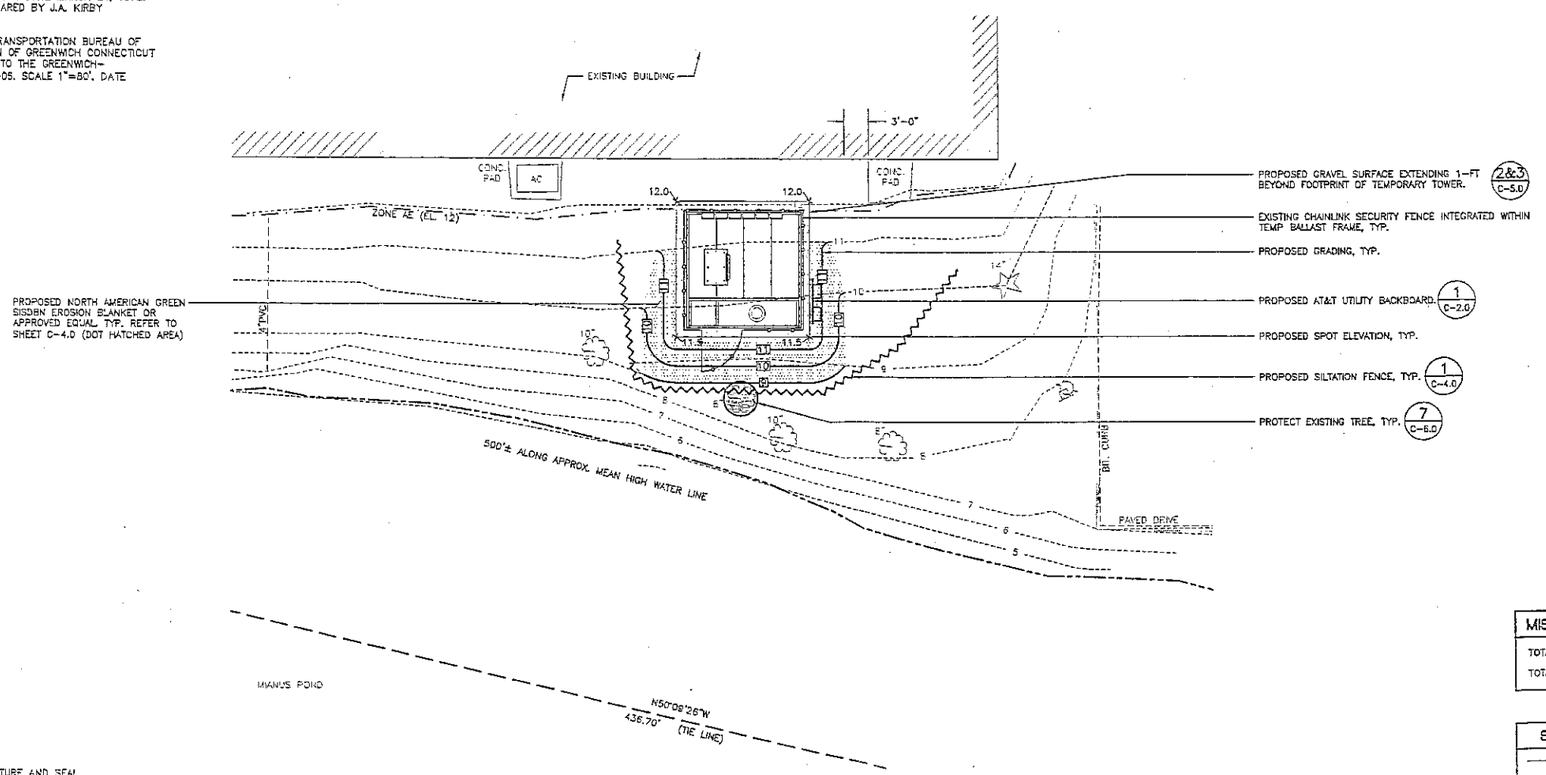
1. SURVEY AND PLAN OF ONE RIVER ROAD A CONDOMINIUM COMMON INTEREST COMMUNITY DECLARED BY VIEWPOINT COMPANY GREENWICH, CONN. SCALE 1"=40'. DATE JULY 14, 1958. PREPARED BY E. MINOR & CO.

2. EASEMENT TO BE GRANTED TO THE CONNECTICUT LIGHT AND POWER COMPANY ON THE PROPERTY OF PALMER POINT ASSOCIATES ET AL TOWN OF GREENWICH, CONN. SCALE 1"=20'. DATE MARCH 29, 1979.

3. MAP SHOWING PARCEL I AND PARCEL II PALMER POINT RIVER ROAD GREENWICH, CONN. SCALE 1"=20'. DATE MARCH 24, 1978. REVISED THRU JULY 10, 1978. PREPARED BY J.A. KIRBY COMPANY.

4. CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS RIGHT OF WAY MAP TOWN OF GREENWICH CONNECTICUT TURNPIKE FROM STEAMBOAT ROAD, TO THE GREENWICH-STAMFORD TOWN LINE. NUMBER 56-05. SCALE 1"=80'. DATE SEPTEMBER 21, 1977.





MISCELLANEOUS SITE INFORMATION	
TOTAL NUMBER OF TREES TO BE REMOVED:	±0
TOTAL AREA OF DISTURBANCE:	±15,350 S.F.

SYMBOLS LEGEND

650 CONTOUR LINE
650 GRADING LINE
SILTATION FENCE
OVERHEAD UTILITY

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

A. RAFAEL MARTINEZ LLS #18833 DATE

1/C-3.1 SITE/SURVEY PLAN - OPTION "B"
SCALE: 1/8"=1'

GRAPHIC SCALE
(IN FEET)
1 inch = 8 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	05/02/16	DAG	LVP	CSC - REMOVAL OF PROPOSED COMPOUND FENCE
0	04/01/16	DAG	LVP	CSC - REVISED TO INCLUDE OPTION "B" TOWER LOCATION

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SAI communications

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(203) 488-8587 Fax
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Branford, CT 06405
www.CentekEng.com

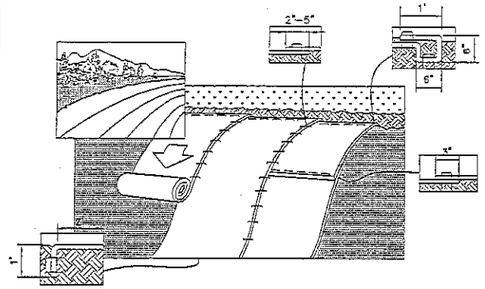
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
COS COB RELO.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16009.002

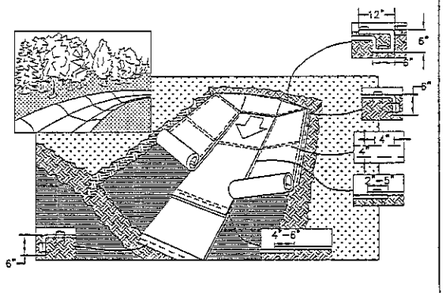
SITE/SURVEY PLAN
OPTION "B"

C-3.1
Sheet No. 5 of 7

EROSION CONTROL BLANKET STABILIZATION



4 C-4.0 TYPICAL EROSION MAT INSTALLATION ON SLOPE
NOT TO SCALE



5 C-4.0 TYPICAL EROSION MAT INSTALLATION IN CHANNEL
NOT TO SCALE

STABILIZATION CRITERIA

1. CONTRACTOR SHALL IMPLEMENT EROSION CONTROL BLANKET SLOPE STABILIZATION & SWALE CONSTRUCTION WHEN STABLE EARTH CUTS ARE PREVALENT (IN LOCATIONS WITHOUT LEDGE OR LARGE AMOUNTS OF SUBGRADE ROCK)

STABILIZATION PRODUCT SPECIFICATION

NORTH AMERICAN GREEN, PRODUCT NUMBER SC150BN, 18 MONTH BIODEGARDABLE.

EROSION MAT ON SLOPES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

   NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLE/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.

3. ROLL THE BLANKET DOWN OR HORIZONTALLY ACROSS THE SLOPE. BLANKET WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL ROLLED EROSION CONTROL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM[TM], STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY A 2"-5" OVERLAP DEPENDING ON BLANKET TYPE.

5. CONSECUTIVE ROLLED EROSION CONTROL BLANKET SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

   * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKET.

6. THE EDGE OF THE BLANKET IS TO EXTEND A MINIMUM 24 INCHES BEYOND THE TOE OF THE SLOPE AND ANCHORED BY PLACING THE STAPLES/STAKES IN A 12 INCH DEEP x 6 INCH WIDE ANCHOR TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12 INCH APART IN THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING (STONE OR SOIL MAY BE USED AS BACKFILL).

7. REFER TO MANUFACTURERS STAPLE GUIDE FOR CORRECT STAPLE PATTERN. MINIMUM 4 SPIKES PER ONE SQ. FT.

EROSION MAT IN CHANNEL

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLE/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.

3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM[TM], STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.

5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"- 5" AND STAPLED TO ENSURE PROPER SEAM ALIGNMENT. PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH[TM] ON THE BLANKET BEING OVERLAPPED.

7. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

8. REFER TO MANUFACTURERS STAPLE GUIDE FOR CORRECT STAPLE PATTERN. MINIMUM 4 SPIKES PER ONE SQ. FT. THE CONTRACTOR SHALL MAINTAIN THE BLANKET UNTIL ALL WORK ON THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MAINTENANCE SHALL CONSIST OF THE REPAIR OF AREAS WHERE DAMAGED BY ANY CAUSE. ALL DAMAGED AREAS SHALL BE REPAIRED TO REESTABLISH THE CONDITIONS AND GRADE OF THE SOIL PRIOR TO APPLICATION OF THE COVERING AND SHALL BE REFERTILIZED, RESEEDED, AND REMULCHED AS DIRECTED.

MAINTENANCE

THE CONTRACTOR SHALL MAINTAIN THE BLANKET UNTIL ALL WORK ON THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MAINTENANCE SHALL CONSIST OF THE REPAIR OF AREAS WHERE DAMAGED BY ANY CAUSE. ALL DAMAGED AREAS SHALL BE REPAIRED TO RE-ESTABLISH THE CONDITIONS AND GRADE OF THE SOIL PRIOR TO APPLICATION OF THE COVERING AND SHALL BE REFERTILIZED, RESEEDED, AND REMULCHED AS DIRECTED.

SITE DECOMMISSIONING AND RESTORATION PLAN

A. REMOVE TOWER, ANTENNAS, MOUNTS, CABLING AND ALL APPURTENANCES.

B. REMOVE ANY/ALL EQUIPMENT SHELTERS/BUILDINGS AND PAD MOUNTED EQUIPMENT AND ASSOCIATED COAX CABLE ICE BRIDGING AND BRIDGE SUPPORT POSTS IN THEIR ENTIRETY.

C. DISMANTLE AND REMOVE CHAIN LINK FENCING AND ASSOCIATES POSTS IN THEIR ENTIRETY.

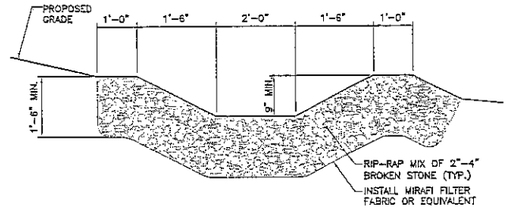
D. REMOVE GRAVEL COMPOUND SURFACE IN ITS ENTIRETY. GRAVEL DRIVEWAY TO REMAIN.

E. REMOVE ALL UNDERGROUND UTILITY CONDUCTORS ASSOCIATED WITH UTILITY SERVICE DISTRIBUTION FROM UTILITY BACKBOARD DEMARCS TO ALL EQUIPMENT.

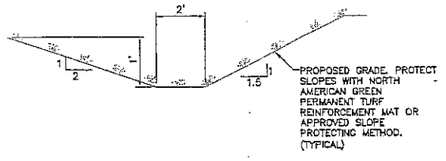
F. UNIFORMLY REGRADE ALL AREAS DISTURBED BY SITE REMOVAL OPERATIONS. GRADED AREAS TO RECEIVE 6" OF CLEAN LOOM TOPSOIL SUITABLE FOR ESTABLISHMENT OF A SEEDING BED. SEED TO BE USED IN ALL DISTURBED AREAS SHALL CONSIST OF NEW ENGLAND CONSERVATION/WILDLIFE SEED MIX PROVIDED BY NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT.

G. GOOD SEED/SOIL CONTACT SHALL BE ESTABLISHED BY EITHER LIGHT RAKING OR LIGHT COMPACTION WITH A HAND ROLLER OR BY FOOT.

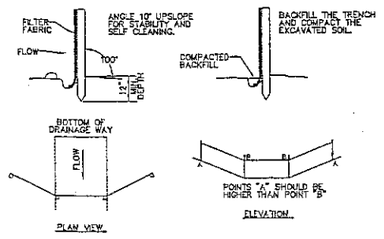
GENERAL NOTE:
ALL MATERIALS ASSOCIATED WITH THE DECOMMISSIONING OF THE SITE SHALL BE REMOVED AND DISPOSED OF LEGALLY OFF SITE.



3 C-4.0 TYPICAL LEVEL SPREADER SECTION
NOT TO SCALE



2 C-4.0 TYPICAL SWALE SECTION
NOT TO SCALE



SOURCE: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, STORRS, CONNECTICUT

1 C-4.0 SILTATION FENCE
NOT TO SCALE

GENERAL CONSTRUCTION / PRE-CONSTRUCTION NOTES

1. PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES, A MANDATORY ON-SITE PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED WITH THE VERIZON WIRELESS CONSTRUCTION MANAGER, CONTRACTOR'S CONSTRUCTION MANAGER, THE PROJECT EROSION AND SEDIMENTATION CONTROL/ENVIRONMENTAL MONITOR AND THE ENGINEER OF RECORD.

GENERAL CONSTRUCTION SEQUENCE

THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.

1. CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
2. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
3. REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
4. CONSTRUCT CLOSED DRAINAGE SYSTEM. PRECEPT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS.
5. CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
6. INSTALL UNDERGROUND UTILITIES.
7. BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
8. DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
9. BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
10. FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
12. NO FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGARDED AREAS.
13. AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

SOIL EROSION AND SEDIMENT CONTROL SEQUENCE

1. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS CONSTRUCTION ENTRANCE / ANTI TRACKING PAD, SILTATION FENCE, AND SILTATION FENCE / HAY BALE SHALL BE IN PLACE PRIOR TO ANY GRADING ACTIVITY, INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES. MEASURES SHALL BE LEFT IN PLACE AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND/OR AREA IS STABILIZED.
2. THE ENTRANCE TO THE PROJECT SITE IS TO BE PROTECTED BY STONE ANTI TRACKING PAD OF ASTM C-33, SIZE NO. 2 OR 3, OR D.O.T. 2" CRUSHED GRAVEL. THE STONE ANTI TRACKING PAD IS TO BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
3. LAND DISTURBANCE WILL BE KEPT TO A MINIMUM AND RESTABILIZATIONS WILL BE SCHEDULED AS SOON AS PRACTICAL.
4. ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL INCLUDING THE LATEST DATE FROM THE COUNCIL ON SOIL AND WATER CONSERVATION.
5. ANY ADDITIONAL EROSION/SEDIMENTATION CONTROL DEEMED NECESSARY BY TOWN STAFF DURING CONSTRUCTION, SHALL BE INSTALLED BY THE DEVELOPER. IN ADDITION, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE REPAIR/REPLACEMENT/MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE TOWN STAFF.
6. IN ALL AREAS, REMOVAL OF TREES, BUSHES AND OTHER VEGETATION AS WELL AS DISTURBANCE OF THE SOIL IS TO BE KEPT TO AN ABSOLUTE MINIMUM, WHILE ALLOWING PROPER DEVELOPMENT OF THE SITE. DURING CONSTRUCTION, EXPOSE AS SMALL AN AREA OF SOIL AS POSSIBLE FOR AS SHORT A TIME AS POSSIBLE.
7. SILTATION FENCE SHALL BE PLACED AS INDICATED BEFORE A CUT SLOPE HAS BEEN CREATED. SEDIMENT DEPOSITS SHOULD BE PERIODICALLY REMOVED FROM THE UPSTREAM SIDES OF SILTATION FENCE. THIS MATERIAL IS TO BE SPREAD AND STABILIZED IN AREAS NOT SUBJECT TO EROSION, OR TO BE USED IN AREAS WHICH ARE NOT TO BE PAVED OR BUILT ON. SILTATION FENCE IS TO BE REPLACED AS NECESSARY TO PROVIDE PROPER FILTERING ACTION. THE FENCE IS TO REMAIN IN PLACE AND BE MAINTAINED TO INSURE EFFICIENT SILTATION CONTROL UNTIL ALL AREAS ABOVE THE EROSION CHECKS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED.
8. SWALE DISCHARGE AREA WILL BE PROTECTED WITH RIP RAP SPLASH PAD/ ENERGY DISSIPATER.
9. ALL FILL AREAS SHALL BE COMPACTED SUFFICIENTLY FOR THEIR INTENDED PURPOSE AND AS REQUIRED TO REDUCE SLIPPING, EROSION OR EXCESS SATURATION.
10. THE SOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
11. AFTER CONSTRUCTION IS COMPLETE AND GROUND IS STABLE, REMOVE SILTS IN THE RIP RAP ENERGY DISSIPATERS. REMOVE OTHER EROSION AND SEDIMENT DEVICES.

CONSTRUCTION SPECIFICATIONS - SILT FENCE

1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BUILD UP IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.

MAINTENANCE - SILT FENCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACHED APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	03/21/16	BJR	DMD	CSC – ISSUED FOR CLIENT REVIEW

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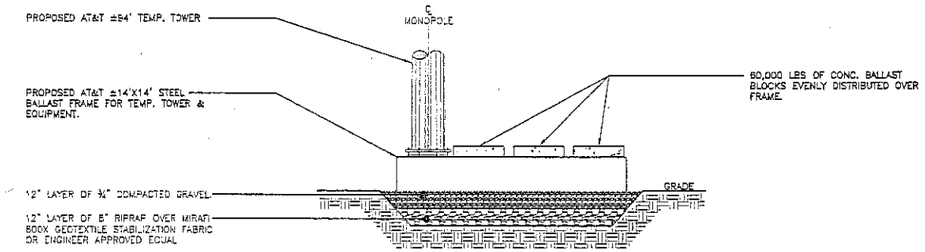
WIRELESS COMMUNICATIONS FACILITY
COS COB RELO.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16009.002

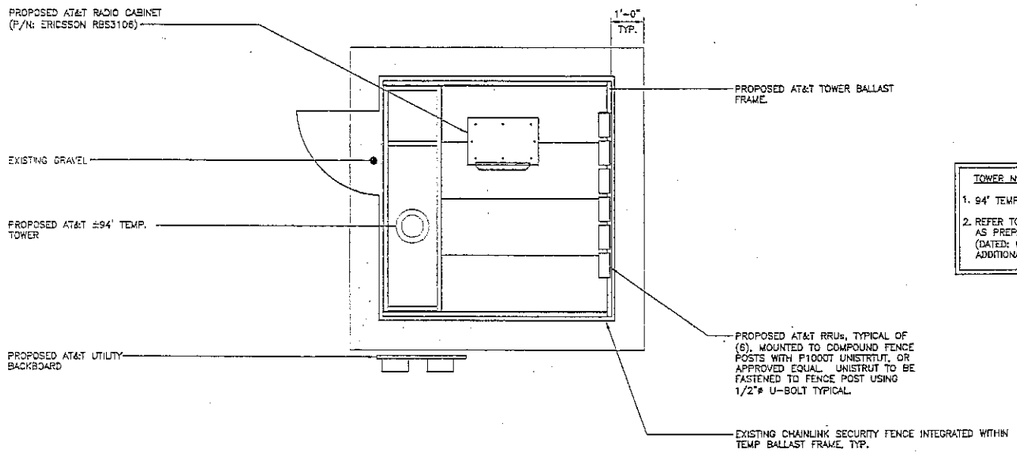
SITE CONSTRUCTION, S&E CONTROL NOTES AND DETAILS

C-4.0

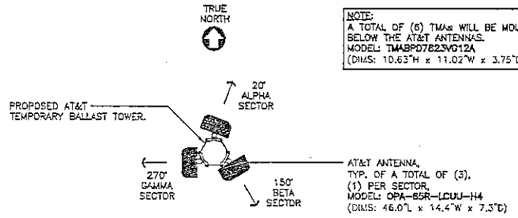
NOTE:
REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY CENTEK ENGINEERING (DATED: 03/16/16 PN: 16009.002) FOR ADDITIONAL INFORMATION.



3 / C-5.0 TEMP. BALLAST TOWER SECTION
SCALE: 1/4" = 1'-0"
NOTE: EQUIPMENT NOT SHOWN FOR CLARITY.

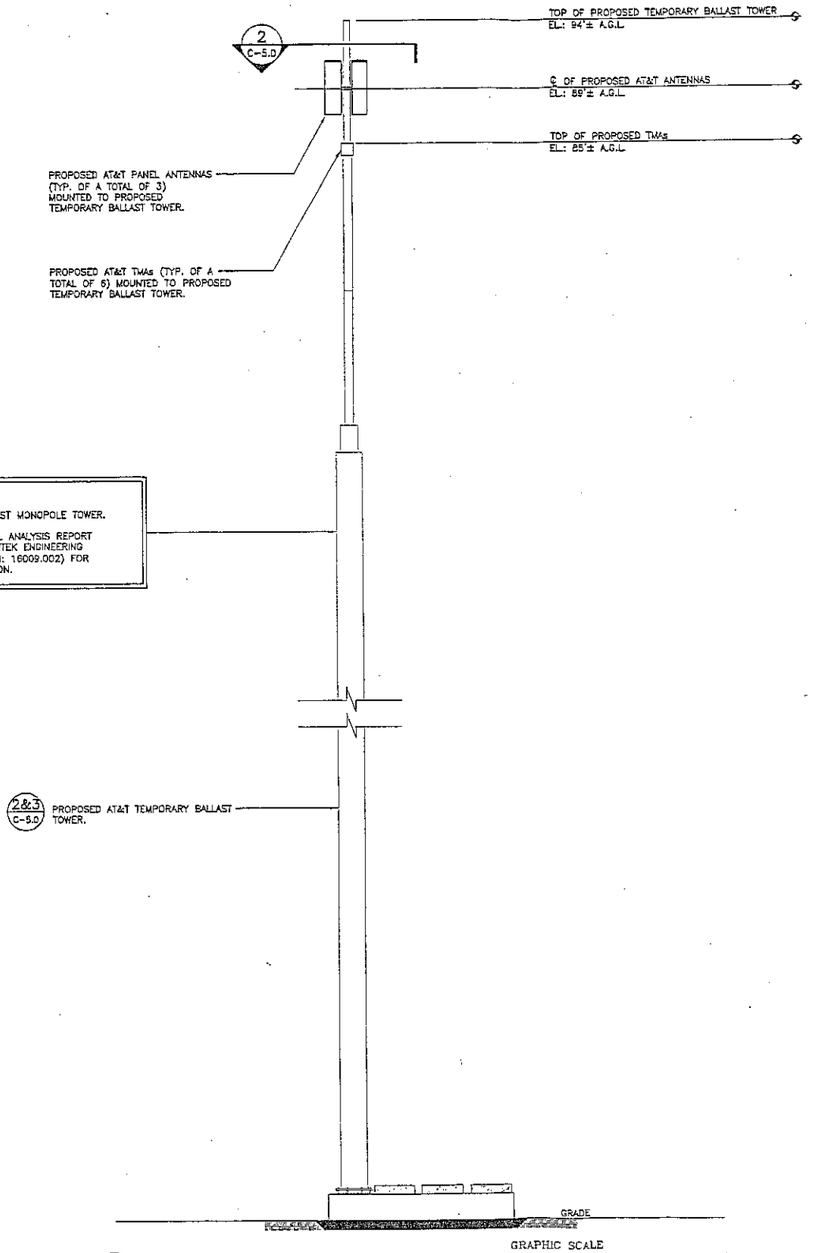


2 / C-5.0 TEMP. BALLAST TOWER PLAN
SCALE: 1/4" = 1'-0"



ANTENNA ℄ EL.: 89'± A.G.L.

4 / C-5.0 AT+T ANTENNA MOUNTING CONFIGURATION
NOT TO SCALE



1 / C-5.0 SOUTH TOWER ELEVATION
SCALE: 1" = 5'

GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	5/10/16	CAG	LVP	CSC - CORRECTED TOWER HEIGHT
4	4/22/16	CAG	LVP	CSC - REMOVAL OF PROPOSED COMPOUND FENCE
3	4/19/16	CAG	LVP	CSC - REVISED TEMP. TOWER HEIGHT
2	4/19/16	CAG	LVP	CSC - REVISED PER CLIENT'S COMMENTS
1	03/21/16	BJR	BMD	CSC - ISSUED FOR CLIENT REVIEW
0				

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SAI communications

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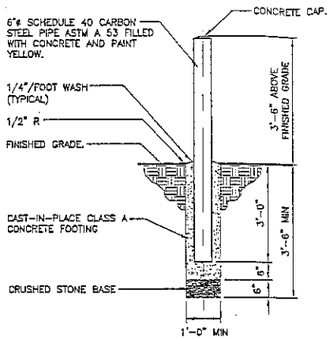
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
COS COB REL.O.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

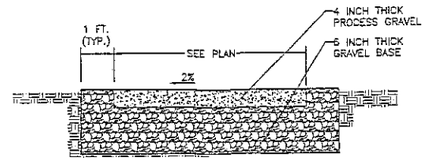
DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16008.022

ELEVATION
ANTENNA CONFIG.
TEMP. TOWER PLAN

C-5.0
Sheet No. 6 of 7



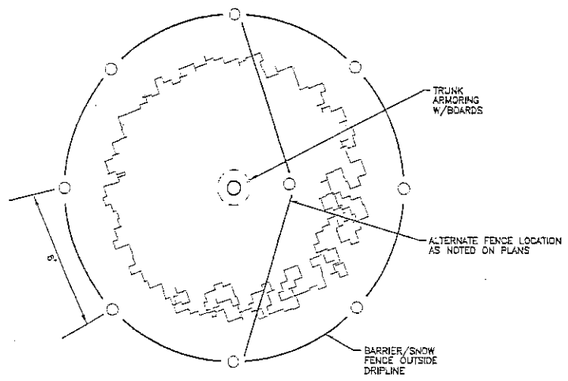
6 C-6.0 **BOLLARD DETAIL**
NOT TO SCALE

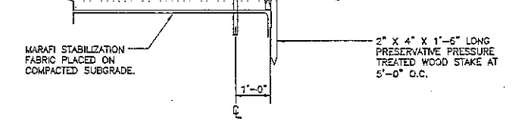


3 C-6.0 **GRAVEL DRIVEWAY SECTION**
NOT TO SCALE

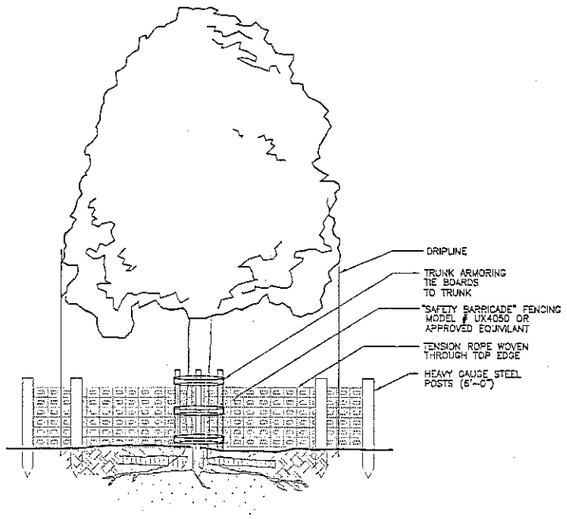
WOVEN WIRE FENCE NOTES

1. GATE POST, CORNER, TERMINAL OR PULL POST 2 1/2" ø SCHEDULE 40 FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING GATE PER ASTM-F1083.
2. LINE POST: 2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
3. GATE FRAME: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
4. TOP RAIL & BRACE RAIL: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
5. FABRIC: 12 GA. CORE WIRE SIZE 1 1/4" MESH, CONFORMING TO ASTM-A392.
6. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL AT POSTS AND RAILS A SINGLE WRAP OF FABRIC TIE AND AT TENSION WIRE BY HOG RINGS SPACED MAX 24" INTERVALS.
7. TENSION WIRE: 7 GA. GALVANIZED STEEL.
8. BARBED WIRE: DOUBLE STRAND 12-1/2" O.D. TWISTED WIRE TO MATCH W/FABRIC 14 GA., 4 PT. BARBS SPACED ON APPROXIMATELY 5" CENTERS.
9. GATE LATCH: DROP DOWN LOCKABLE FORK LATCH AND LOCK, KEYED ALIKE FOR ALL SITES IN A GIVEN MTA.
10. LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLIED WITH IF REQUIRED.
11. HEIGHT = 8' VERTICAL
12. ALL SECTIONS OF FENCE, INCLUDING GATE, SHALL RECEIVE VINYL PRIVACY SLATS. COORDINATE COLOR WITH OWNER.

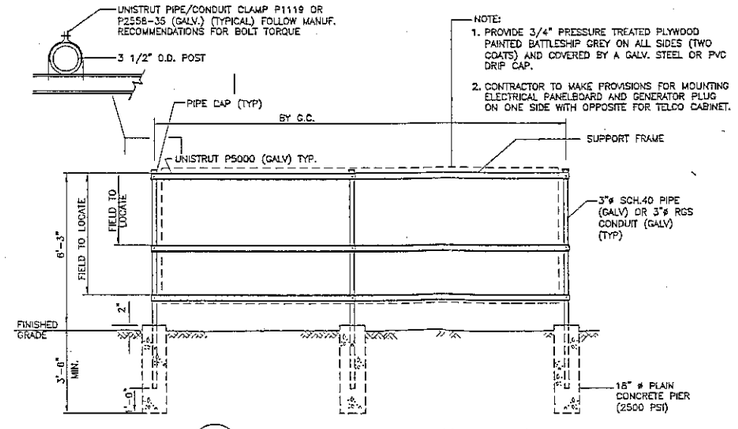




5 C-6.0 **COMPOUND SURFACING DETAIL**
NOT TO SCALE



7 C-6.0 **TREE PROTECTION DETAIL**
NOT TO SCALE



4 C-6.0 **UTILITY SUPPORT FRAME (TYP)**
NOT TO SCALE

2 C-6.0 **DELETED**
NOT TO SCALE

1 C-6.0 **DELETED**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	05/02/16	CAG	LVP	CSC - REMOVAL OF PROPOSED COMPOUND FENCE
1	01/01/16	CAG	LVP	CSC - REVISED TO INCLUDE OPTION "D" TOWER LOCATION
0	01/21/16	BJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
COS COB RELO.
CT5006 (TEMPORARY SITE)
1 RIVER ROAD
GREENWICH, CT 06807

DATE: 03/10/16
SCALE: AS NOTED
JOB NO. 16026.032

SITE DETAILS

C-6.0
Sheet No. 7 of 7

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

104-ft Ballast Monopole

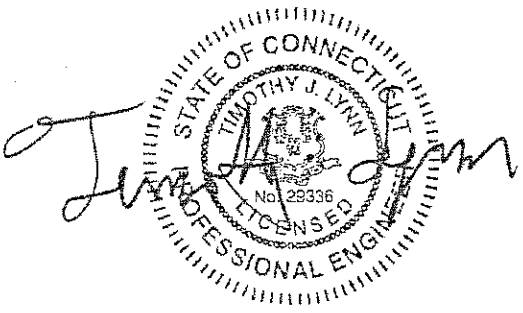
Proposed Temporary Antenna Installation

AT&T Site Ref: CT5006 Relo Cow

1 River Road
Greenwich, CT

Centek Project No. 16009.02

Date: March 16, 2016



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

CENTEK Engineering, Inc.
Structural Analysis - 104-ft Ballast Monopole
AT&T Site Ref – CT5006
Greenwich, CT
March 16, 2016

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the temporary antenna installation proposed by AT&T Mobility on the ballast monopole (tower) located in Greenwich, CT.

The host tower is a 104-ft tall, six-section, ballasted monopole original designed by Tobias West structural engineers project no. 09-136 dated June 8, 2009. Tower information was obtained from the original design documents

Antenna and appurtenance information were obtained from an AT&T RF data sheet.

The tower consists of six (6) vertical steel pipe sections conforming to ASTM A53 Grade B (35ksi). The diameter of the pole (flat-flat) is 6.625-in at the top and 24.00-in at the base.

AT&T proposes the installation of three (3) panel antennas and six (6) TMA's on the temporary ballast monopole. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- **AT&T (Proposed):**
  Antennas: Three (3) CCI OPA-65R-LCUU-H4 panel antennas and six (6) CCI TMABPDB7823VG12A TMA's flush mounted with a RAD center elevation of 89-ft above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the inside of the monopole.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables routed as specified in Section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Greenwich; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA-222-F wind speed controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **96.8%** of its total capacity.

Tower Section	Elevation (AGL)	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L7)	2.0'-41.25'	96.8%	**PASS**

Anchors and Ballast

The base of the tower is connected to the ballast frame by means of (4) 2.25"Ø, ASTM F1554-55 anchor bolts on a 30" Ø bolt circle.

- The tower reactions developed from the governing Load Case 1 were used in the verification of the foundation:

Reactions	Vector	Proposed Base Reactions
Base	Shear	4 kips
	Compression	7 kips
	Moment	243 kip-ft

- The anchor bolts were found to be within allowable limits.

Tower Component	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Compression and Shear	69.3%	**PASS**
Base Plate	Bending	55.1%	**PASS**

- The ballast frame was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Ballast frame w/ 60,000 lbs of conc. blocks	OTM[2]	2.0	2.07	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment

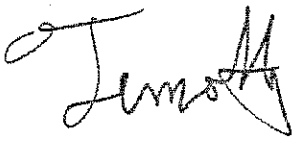
Conclusion

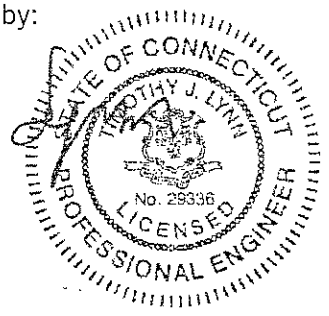
This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:





Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

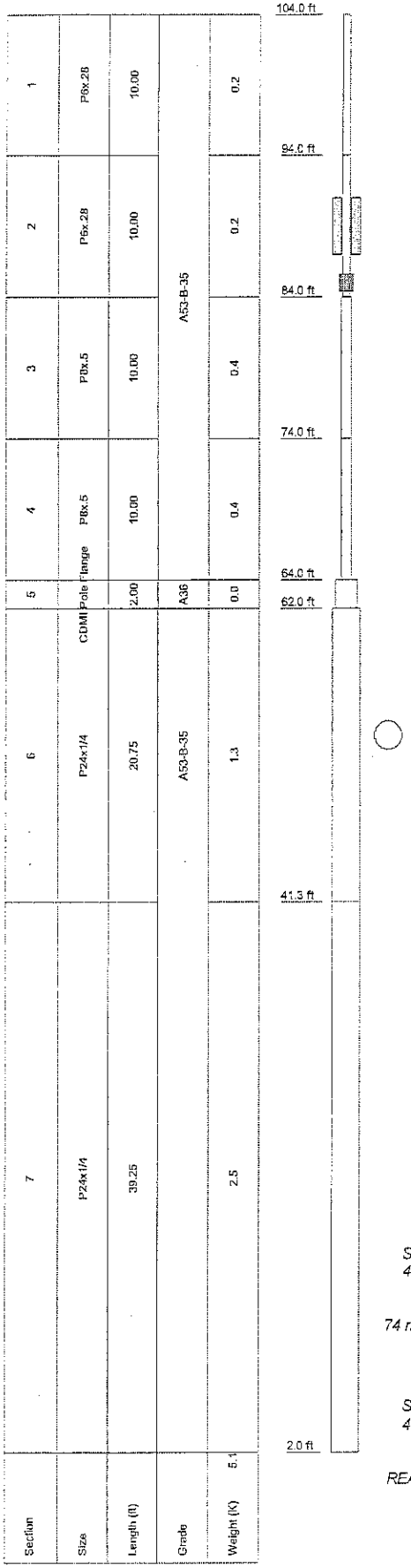
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provide to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

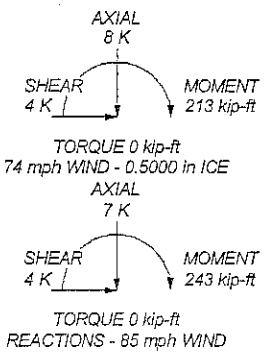
General Description of Structural Analysis Program

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
TMABPDB7823VG12A (ATI Proposed)	85	Valmont Uni-Tri Bracket (ATI Proposed)	85
TMABPDB7823VG12A (ATI Proposed)	85		
TMABPDB7823VG12A (ATI Proposed)	85		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

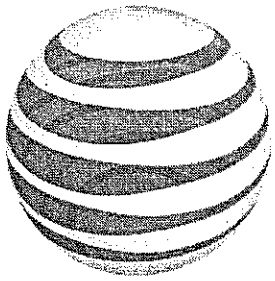
TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 96.8%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: *16009.02 - CT5006 Relo COW*			
Project: *104-ft Temporary Monopole - Greenwich, CT*			
Client: AT&T	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 03/16/16	Scale: NTS	
Path:		Dwg No. E-1	

C



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut
06067

Radu Alecsandru
RF Engineer
at&t mobility

Transmission Mode	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
AT&T UMTS	89	800 Band	2	500	0.0454	0.5867	7.74
AT&T UMTS	89	1900 Band	0	500	0.0000	1.0000	0.00
AT&T LTE	89	700 Band	1	500	0.0227	0.4667	4.86
AT&T LTE	89	1900 Band	1	500	0.0227	1.0000	2.27
AT&T LTE	89	2300 Band	0	500	0.0000	1.0000	0.00
Total							**14.9%**

D

EVERSOURCE
ENERGY

107 Selden Street
Berlin, CT 06037
(860) 665-6926
michael.green@eversource.com

June 16, 2015

VIA FEDERAL EXPRESS
Michele G. Briggs, Real Estate Manager
AT&T Mobility – NE Market
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Re: Notice of Termination under Master Lease Agreements dated May 27, 1998, July 16, 1999, and Amendment to Site Lease Acknowledgments and MLA dated April 30, 2009 (collectively, the "MLA") between Southwestern Bell Mobile Systems, LLC, AT&T Wireless, LLC, New Cingular Wireless PCS, LLC, Southern New England Telecommunication Corporation, AT&T Wireless Services, SNET Mobility, (collectively, "Lessee") and The Connecticut Light and Power Company dba Eversource Energy, et al. (collectively, "Lessor") and the Original Site Lease Acknowledgment dated March 9, 2000, amended by the First Amendment and the Second Amendment dated September 29, 2011 (collectively, the "SLA")

AT&T Site #5006, FA # 10070970, Pole #1292, Line #1750 – Sound Shore Drive, Greenwich, CT (the "Premises")

Dear Ms. Briggs:

The Connecticut Light and Power Company doing business as Eversource Energy, as Lessor, is hereby providing notice to New Cingular Wireless PCS, LLC, as Lessee, pursuant to Section 6 (b) of the MLA, that the Premises (defined above) on which Lessee's Communications Facilities are located are reasonably needed by Lessor for Lessor's electric utility operations, and therefore, the Premises will no longer be available to Lessee. Accordingly, Lessor is terminating the SLA with Lessee, which is applicable to the Premises. Consequently, Lessee will need to remove its Communications Facilities from the Premises and site by no later than February 1, 2016, in accordance with this notice of termination.

As Lessor has previously discussed with Lessee's representatives, one possible new location for Lessee's telecommunication facilities in the same general area that Lessor is willing to evaluate is Lessor's structure 1279, which is located on property that is owned by ConnDOT Rails. Lessee has indicated that it is willing to consider this structure 1279 as a new location for its telecommunication facilities. As previously explained, use of that structure for Lessee's facilities would need to be reviewed and accepted by Lessor's representatives. For purpose of that review, Lessee would need to obtain a structural report to verify that structure 1279 can handle the additional loading from Lessee's telecommunication facilities. Because this structure is located on property owned by ConnDOT Rails, Lessee would also need to work with ConnDOT Rails to acquire any needed ground rights for access to and use of that property and pay any associated costs to obtain such rights. Also, Lessee would be responsible for obtaining all required siting approvals for use of this structure as a

new site for its telecommunication facilities and all costs of installing its facilities on this structure and installing any associated ground equipment at an appropriate location.
If you have any questions, I can be reached at the above address and phone number.

Sincerely,

Michael J. Green
Senior Real Estate Analyst

E

April 27, 2016

VIA CERTIFIED MAIL

Re: New Cingular Wireless PCS, LLC ("AT&T")
Proposed Temporary Tower Facility
1 River Road, Greenwich, Connecticut

Dear Sir or Madam:

We are writing to you on behalf of our client New Cingular Wireless PCS, LLC ("AT&T") with respect to the above referenced matter and our client's intent to file an amended petition (likely to be identified as Petition 443B) with the State of Connecticut Siting Council for approval of a proposed temporary wireless communications tower facility (the "Facility") within the Town of Greenwich.

State law requires that record owners of property abutting a parcel on which a facility is proposed be sent notice of an applicant's intent to file a petition with the Siting Council.

Included with this letter please find a Notice of this petition with details of the proposed temporary tower Facility. Of note, the location, height and other features of the Facility are subject to review and potential change by the Connecticut Siting Council under the provisions of Connecticut General Statutes §16-50g et seq.

If you have any questions concerning this petition, please contact the Connecticut Siting Council or the undersigned after April 29, 2016, the date which the amended petition is expected to be on file.

Very truly yours,

Daniel M. Laub
Enclosure

NOTICE

Notice is hereby given, pursuant to Section 16-50j-40(a) of the Regulations of Connecticut State Agencies of an Amendment of Petition 443 to be filed with the Connecticut Siting Council ("Siting Council") on or after April 29, 2016 by New Cingular Wireless PCS, LLC ("AT&T") the ("Petitioner"). AT&T will seek a declaratory ruling that a temporary tower proposed on property located at 1 River Road in the Town of Greenwich, Connecticut (the "River Road Temporary Facility") does not have significant adverse environmental effects that might otherwise require a certificate of environmental compatibility and public need ("Certificate").

AT&T currently maintains an operational facility on an existing electrical transmission tower off Shore Road that serves the Cos Cob area. AT&T received notice from Eversource that AT&T must remove that wireless telecommunications facility as the underlying transmission tower is being removed. AT&T has approvals in place and plans to construct a new permanent wireless facility on a different transmission tower on the same Shore Road property. However, AT&T must wait for an electrical outage of the transmission lines before building this new permanent site. The River Road Temporary Facility will provide service in the area until AT&T can safely install its antennas and equipment on the transmission tower on Shore Road.

The proposed River Road Temporary Facility consists of an approximately 94' tall ballast tower with three (3) AT&T antennas located at a centerline height of 89' AGL. Access to the River Road Temporary Facility would be from River Road and utility connections would run from an existing building on site. The temporary tower would be removed entirely once a permanent facility is operational.

The Amended Petition will provide details of the River Road Temporary Facility and explain why AT&T submits that the proposed temporary tower presents no significant adverse environmental effects. The location, height and other features of the facility are subject to review and potential change under provisions of the Connecticut General Statutes Sections 16-50g et. seq.

Copies of the Amended Petition will be available for review during normal business hours on or after May 2, 2016 at the following:

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Town of Greenwich
Town Clerk - Carmella C. Budkins
101 Field Point Road
Greenwich, CT 06830

or the offices of the undersigned. All inquiries should be addressed to the Connecticut Siting Council or to the undersigned.

Daniel M. Laub, Esq.
Cuddy & Feder LLP
445 Hamilton Ave, 14th Floor
White Plains, New York 10601
(914) 761-1300
Attorneys for the Petitioner

CERTIFICATION OF SERVICE

I hereby certify that on the 27th of April 2016, a copy of the foregoing letter and notice were mailed by certified mail, return receipt requested to each of the abutting properties owners on the accompanying list.

Date May 9, 2016

Daniel M. Laub
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, New York 10601

Attorneys for:
New Cingular Wireless PCS, LLC (AT&T)

ADJACENT PROPERTY OWNERS
1 River Road

Town of Greenwich c/o Finance Department
101 Field Point Road
Greenwich, CT 06830

Mianus River Associates
5 River Road
Cos Cob, CT 06807

Richard F. Kriskey
11 River Road, Unit 101
Cos Cob, CT 06807

Mianus River Boat and Yacht Club
98 Strickland Road
Cos Cob, CT 06807

One River Road, LLC
PO Box 4496
Greenwich, CT 06807

F

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Notice is hereby given, pursuant to Section 16-50j-40(a) of the Regulations of Connecticut State Agencies of an Amendment of Petition 443 to be filed with the Connecticut Siting Council ("Siting Council") on or after April 29, 2016 by New Cingular Wireless PCS, LLC ("AT&T") the ("Petitioner"). AT&T will seek a declaratory ruling that a temporary tower proposed on property located at 1 River Road in the Town of Greenwich, Connecticut (the "River Road Temporary Facility") does not have significant adverse environmental effects that might otherwise require a certificate of environmental compatibility and public need ("Certificate").

AT&T currently maintains an operational facility on an existing electrical transmission tower off Shore Road that serves the Cos Cob area. AT&T received notice from Eversource that AT&T must remove that wireless telecommunications facility as the underlying transmission tower is being removed. AT&T has approvals in place and plans to construct a new permanent wireless facility on a different transmission tower on the same Shore Road property. However, AT&T must wait for an electrical outage of the transmission lines before building this new permanent site. The River Road Temporary Facility will provide service in the area until AT&T can safely install its antennas and equipment on the transmission tower on Shore Road.

The proposed River Road Temporary Facility consists of an approximately 94' tall ballast tower with three (3) AT&T antennas located at a centerline height of 89' AGL. Access to the River Road Temporary Facility would be from River Road and utility connections would run from an existing building on site. The temporary tower would be removed entirely once a permanent facility is operational.

The Amended Petition will provide details of the River Road Temporary Facility and explain why AT&T submits that the proposed temporary tower presents no significant adverse environmental effects. The location, height and other features of the facility are subject to review and potential change under provisions of the Connecticut General Statutes Sections 16-50g et. seq.

Copies of the Amended Petition will be available for review during normal business hours on or after May 2, 2016 at the following:

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Town of Greenwich
Town Clerk - Carmella C. Budkins
101 Field Point Road
Greenwich, CT 06830

or the offices of the undersigned. All inquiries should be addressed to the Connecticut Siting Council or to the undersigned.

Daniel M. Laub, Esq.
Cuddy & Feder LLP
445 Hamilton Ave, 14th Floor
White Plains, New York 10601
(914) 761-1300
Attorneys for the Petitioner

CERTIFICATION OF SERVICE

I hereby certify that on the 27th day of April 2016, a copy of the foregoing notice of the filing of an Amended Petition with the Connecticut Siting Council for a declaratory ruling was sent by certified mail, return receipt requested, to the list below:

Dated: May 9, 2016

Cuddy & Feder LLP
45 Hamilton Avenue, 14th Floor
White Plains, New York 10601
Attorneys for:
New Cingular Wireless PCS, LLC (AT&T)

State and Regional

The Honorable George Jepsen Attorney General Office of the Attorney General 55 Elm Street Hartford, CT 06106	Department of Economic and Community Development Catherine Smith, Commissioner 505 Hudson Street Hartford, CT 06106
Department of Public Health Dr. Raul Pino, Commissioner 410 Capitol Avenue P.O. Box 340308 Hartford, CT 06134	Department of Energy and Environmental Protection Public Utilities Regulatory Authority Chairman Arthur House Ten Franklin Square New Britain, CT 06051
Council on Environmental Quality Karl J. Wagener, Executive Director 79 Elm Street Hartford, CT 06106	Department of Transportation James P. Redeker, Commissioner 2800 Berlin Turnpike Newington, CT 06111

Department of Energy & Environmental Protection Rob Klee, Commissioner 79 Elm Street Hartford, CT 06106	Department of Agriculture Steven K. Reviczky, Commissioner 165 Capitol Avenue Hartford, CT 06106
Office of Policy and Management Benjamin Barnes, Secretary 450 Capitol Avenue Hartford, CT 06106	State House Representative - 150th General Assembly District Mike Bocchino Legislative Office Building Room 4200 Hartford, CT 06106
Department of Emergency Services & Public Protection Division of Emergency Management and Homeland Security William Shea, Deputy Commissioner 25 Sigourney Street, 6th Floor Hartford, CT 06106-5042	State Senator - 36th District L. Scott Frantz Legislative Office Building Room 3400 Hartford, CT 06106
Department of Economic and Community Development-Offices of Culture and Tourism Todd Levine, State Historic Preservation Officer, Historian/Environmental Reviewer One Constitution Plaza, 2nd Floor Hartford, CT 06103	Western Connecticut Council of Governments Executive Director: Francis Pickering 888 Washington Boulevard - 3rd Floor Stamford, Connecticut 06901

Federal

Federal Communications Commission 445 12th Street SW Washington, D.C. 20554	Federal Aviation Administration 800 Independence Avenue, SW Washington, DC 20591
U.S. Congressman Jim Himes 211 State Street, 2nd Floor Bridgeport, CT 06604	U.S. Senator Richard Blumenthal 90 State House Square, 10th Floor Hartford, CT 06103
U.S. Senator Christopher Murphy One Constitution Plaza, 7th Floor Hartford, CT 06103	

Town of Greenwich

First Selectman Peter Tesei Town Hall, First Floor 101 Field Point Road Greenwich, CT 06830	Chairman Donald Heller Planning & Zoning Commission Town Hall, First Floor 101 Field Point Road Greenwich, CT 06830
Town Clerk Carmella C. Budkins Town Hall, First Floor 101 Field Point Road Greenwich, CT 06830	William Rutherford, Chair Conservation Commission Town Hall, 2nd Floor 101 Field Point Road Greenwich, CT 06830
Director Katie DeLuca, AICP Planning and Zoning Department Town Hall, Second Floor 101 Field Point Road Greenwich, CT 06830	Chairman David Weisbrod Planning & Zoning Board of Appeals Town Hall 101 Field Point Road Greenwich, CT 06830
Chairman Brian Harris Inland Wetlands & Watercourses Agency Town Hall, Second Floor 101 Field Point Road Greenwich, CT 06830	

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

104-ft Ballast Monopole

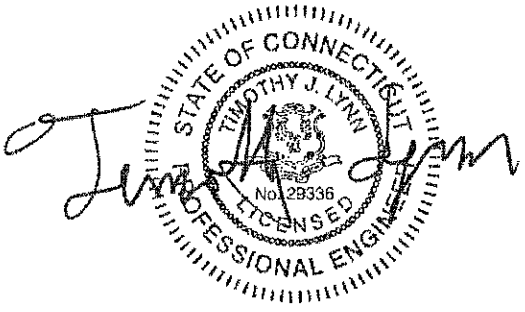
Proposed Temporary Antenna Installation

AT&T Site Ref: CT5006 Relo Cow

1 River Road
Greenwich, CT

Centek Project No. 16009.02

Date: March 16, 2016



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the temporary antenna installation proposed by AT&T Mobility on the ballast monopole (tower) located in Greenwich, CT.

The host tower is a 104-ft tall, six-section, ballasted monopole original designed by Tobias West structural engineers project no. 09-136 dated June 8, 2009. Tower information was obtained from the original design documents

Antenna and appurtenance information were obtained from an AT&T RF data sheet.

The tower consists of six (6) vertical steel pipe sections conforming to ASTM A53 Grade B (35ksi). The diameter of the pole (flat-flat) is 6.625-in at the top and 24.00-in at the base.

AT&T proposes the installation of three (3) panel antennas and six (6) TMA's on the temporary ballast monopole. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- **AT&T (Proposed):**
  Antennas: Three (3) CCI OPA-65R-LCUU-H4 panel antennas and six (6) CCI TMABPDB7823VG12A TMA's flush mounted with a RAD center elevation of 89-ft above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables running on the inside of the monopole.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables routed as specified in Section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Greenwich; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA-222-F wind speed controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **96.8%** of its total capacity.

Tower Section	Elevation (AGL)	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L7)	2.0'-41.25'	96.8%	**PASS**

Anchors and Ballast

The base of the tower is connected to the ballast frame by means of (4) 2.25"∅, ASTM F1554-55 anchor bolts on a 30" ∅ bolt circle.

- The tower reactions developed from the governing Load Case 1 were used in the verification of the foundation:

Reactions	Vector	Proposed Base Reactions
Base	Shear	4 kips
	Compression	7 kips
	Moment	243 kip-ft

- The anchor bolts were found to be within allowable limits.

Tower Component	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Compression and Shear	69.3%	**PASS**
Base Plate	Bending	55.1%	**PASS**

- The ballast frame was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Ballast frame w/ 60,000 lbs of conc. blocks	OTM[2]	2.0	2.07	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment

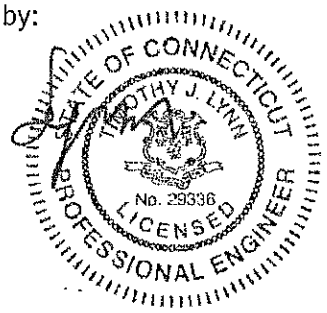
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

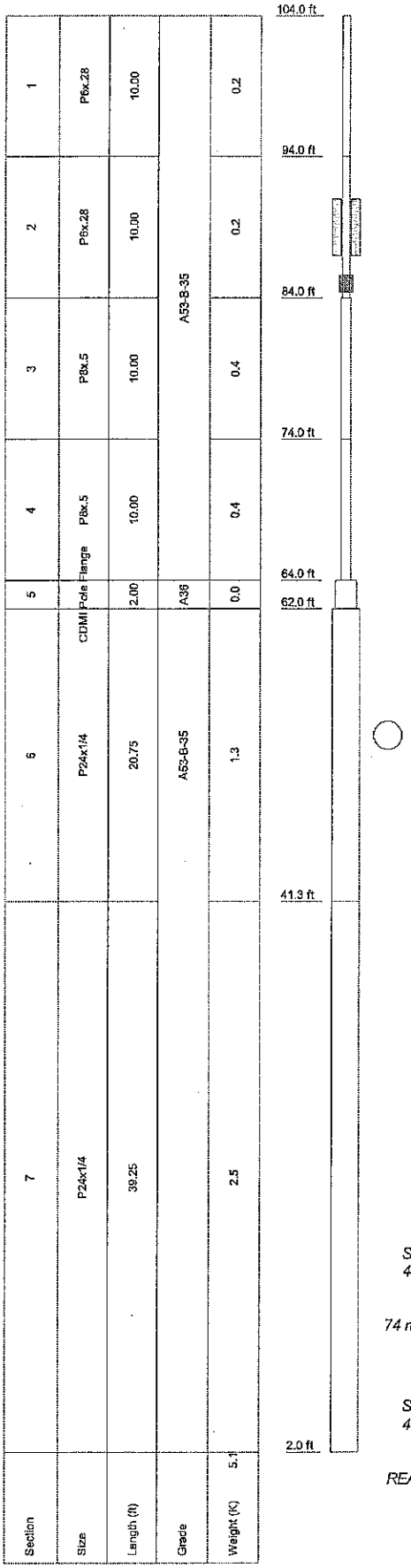
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provide to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

General Description of Structural Analysis Program

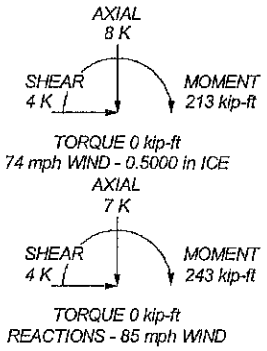
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



Section	Size	Length (ft)	Grade	Weight (K)
1	P6x.28	10.00	A53-B-35	0.2
2	P6x.28	10.00		0.2
3	P8x.5	10.00		0.4
4	P8x.5	10.00		0.4
	Flange			
5	CDMI Pole	2.00	A36	0.0
6	P24x1/4	20.75	A53-B-35	1.3
7	P24x1/4	39.25		2.5
				5.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
OPA-65R-LCUU-H4 (ATI Proposed)	89	TMABPDB7823VG12A (ATI Proposed)	85
TMABPDB7823VG12A (ATI Proposed)	85	Valmont Uni-Tri Bracket (ATI Proposed)	85
TMABPDB7823VG12A (ATI Proposed)	85		
TMABPDB7823VG12A (ATI Proposed)	85		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 96.8%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: *16009.02 - CT5006 Relo COW*		
Project: *104-ft Temporary Monopole - Greenwich, CT*		
Client: AT&T	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 03/16/16	Scale: NTS
Path:		Dwg No. E-1

Tower Input Data

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

Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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		

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	104.00-94.00	10.00	P6x.28	A53-B-35 (35 ksi)	
L2	94.00-84.00	10.00	P6x.28	A53-B-35 (35 ksi)	
L3	84.00-74.00	10.00	P8x.5	A53-B-35 (35 ksi)	
L4	74.00-64.00	10.00	P8x.5	A53-B-35 (35 ksi)	
L5	64.00-62.00	2.00	CDMI Pole Flange	A36 (36 ksi)	
L6	62.00-41.25	20.75	P24x1/4	A53-B-35 (35 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L7	41.25-2.00	39.25	P24x1/4	A53-B-35 (35 ksi)	

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 104.00-94.00				1	1	1			
L2 94.00-84.00				1	1	1			
L3 84.00-74.00				1	1	1			
L4 74.00-64.00				1	1	1			
L5 64.00-62.00				1	1	1			
L6 62.00-41.25				1	1	1			
L7 41.25-2.00				1	1	1			

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 plf
1 5/8 (AT&T Proposed)	C	No	Inside Pole	67.00 - 2.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (AT&T Proposed)	C	No	CaAa (Out Of Face)	82.00 - 64.00	2	No Ice	0.20	1.04
						1/2" Ice	0.30	2.55
1 5/8 (AT&T Proposed)	C	No	CaAa (Out Of Face)	82.00 - 64.00	10	No Ice	0.00	1.04
						1/2" Ice	0.00	2.55

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	104.00-94.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	94.00-84.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	84.00-74.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.168	0.10
L4	74.00-64.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.960	0.16
L5	64.00-62.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L6	62.00-41.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.26

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
L7	41.25-2.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.49

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	104.00-94.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	94.00-84.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	84.00-74.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.768	0.24
L4	74.00-64.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.960	0.34
L5	64.00-62.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L6	62.00-41.25	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.26
L7	41.25-2.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.49

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	104.00-94.00	0.0000	0.0000	0.0000	0.0000
L2	94.00-84.00	0.0000	0.0000	0.0000	0.0000
L3	84.00-74.00	-0.2856	0.1649	-0.3481	0.2010
L4	74.00-64.00	-0.3317	0.1915	-0.3980	0.2298
L5	64.00-62.00	0.0000	0.0000	0.0000	0.0000
L6	62.00-41.25	0.0000	0.0000	0.0000	0.0000
L7	41.25-2.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

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
OPA-65R-LCUU-H4	A	From Face	0.50	0.0000	89.00	No Ice	6.72	3.41	0.06
(AT&T Proposed)			0.00			1/2" Ice	7.13	3.77	0.10
			0.00						
OPA-65R-LCUU-H4	B	From Face	0.50	0.0000	89.00	No Ice	6.72	3.41	0.06
(AT&T Proposed)			0.00			1/2" Ice	7.13	3.77	0.10
			0.00						
OPA-65R-LCUU-H4	C	From Face	0.50	0.0000	89.00	No Ice	0.00	3.41	0.06
(AT&T Proposed)			0.00			1/2" Ice	0.00	3.77	0.10
			0.00						
TMABPDB7823VG12A	A	None		0.0000	85.00	No Ice	1.53	0.57	0.03
(AT&T Proposed)						1/2" Ice	1.70	0.69	0.03
TMABPDB7823VG12A	A	None		0.0000	85.00	No Ice	0.00	0.00	0.03
(AT&T Proposed)						1/2" Ice	0.00	0.00	0.03
TMABPDB7823VG12A	B	None		0.0000	85.00	No Ice	1.53	0.57	0.03
(AT&T Proposed)						1/2" Ice	1.70	0.69	0.03
TMABPDB7823VG12A	B	None		0.0000	85.00	No Ice	0.00	0.00	0.03
(AT&T Proposed)						1/2" Ice	0.00	0.00	0.03
TMABPDB7823VG12A	C	None		0.0000	85.00	No Ice	1.53	0.57	0.03
(AT&T Proposed)						1/2" Ice	1.70	0.69	0.03
TMABPDB7823VG12A	C	None		0.0000	85.00	No Ice	0.00	0.00	0.03
(AT&T Proposed)						1/2" Ice	0.00	0.00	0.03
Valmont Uni-Tri Bracket	C	None		0.0000	85.00	No Ice	1.75	1.75	0.29
(AT&T Proposed)						1/2" Ice	1.94	1.94	0.31

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	99.00	1.369	25	5.521	A	0.000	5.521	5.521	100.00	0.000	0.000
104.00-94.00					B	0.000	5.521		100.00	0.000	0.000
					C	0.000	5.521		100.00	0.000	0.000
L2 94.00-84.00	89.00	1.328	25	5.521	A	0.000	5.521	5.521	100.00	0.000	0.000
					B	0.000	5.521		100.00	0.000	0.000
					C	0.000	5.521		100.00	0.000	0.000
L3 84.00-74.00	79.00	1.283	24	7.188	A	0.000	7.188	7.188	100.00	0.000	0.000
					B	0.000	7.188		100.00	0.000	0.000
					C	0.000	7.188		100.00	0.000	3.168
L4 74.00-64.00	69.00	1.235	23	7.188	A	0.000	7.188	7.188	100.00	0.000	0.000
					B	0.000	7.188		100.00	0.000	0.000
					C	0.000	7.188		100.00	0.000	3.960
L5 64.00-62.00	63.00	1.203	22	3.000	A	3.000	0.000	3.000	100.00	0.000	0.000
					B	3.000	0.000		100.00	0.000	0.000
					C	3.000	0.000		100.00	0.000	0.000
L6 62.00-41.25	51.63	1.136	21	41.500	A	0.000	41.500	41.500	100.00	0.000	0.000
					B	0.000	41.500		100.00	0.000	0.000
					C	0.000	41.500		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L7 41.25-2.00	21.63	1	18	78.500	A	0.000	78.500	78.500	100.00	0.000	0.000
					B	0.000	78.500		100.00	0.000	0.000
					C	0.000	78.500		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 104.00-94.00	99.00	1.369	19	0.5000	6.354	A	0.000	6.354	6.354	100.00	0.000	0.000
						B	0.000	6.354		100.00	0.000	0.000
						C	0.000	6.354		100.00	0.000	0.000
L2 94.00-84.00	89.00	1.328	18	0.5000	6.354	A	0.000	6.354	6.354	100.00	0.000	0.000
						B	0.000	6.354		100.00	0.000	0.000
						C	0.000	6.354		100.00	0.000	0.000
L3 84.00-74.00	79.00	1.283	18	0.5000	8.021	A	0.000	8.021	8.021	100.00	0.000	0.000
						B	0.000	8.021		100.00	0.000	0.000
						C	0.000	8.021		100.00	0.000	4.768
L4 74.00-64.00	69.00	1.235	17	0.5000	8.021	A	0.000	8.021	8.021	100.00	0.000	0.000
						B	0.000	8.021		100.00	0.000	0.000
						C	0.000	8.021		100.00	0.000	5.960
L5 64.00-62.00	63.00	1.203	17	0.5000	3.167	A	3.111	0.000	3.111	100.00	0.000	0.000
						B	3.111	0.000		100.00	0.000	0.000
						C	3.111	0.000		100.00	0.000	0.000
L6 62.00-41.25	51.63	1.136	16	0.5000	43.229	A	0.000	43.229	43.229	100.00	0.000	0.000
						B	0.000	43.229		100.00	0.000	0.000
						C	0.000	43.229		100.00	0.000	0.000
L7 41.25-2.00	21.63	1	14	0.5000	81.771	A	0.000	81.771	81.771	100.00	0.000	0.000
						B	0.000	81.771		100.00	0.000	0.000
						C	0.000	81.771		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	99.00	1.369	9	5.521	A	0.000	5.521	5.521	100.00	0.000	0.000
104.00-94.00					B	0.000	5.521		100.00	0.000	0.000
					C	0.000	5.521		100.00	0.000	0.000
L2 94.00-84.00	89.00	1.328	8	5.521	A	0.000	5.521	5.521	100.00	0.000	0.000
					B	0.000	5.521		100.00	0.000	0.000
					C	0.000	5.521		100.00	0.000	0.000
L3 84.00-74.00	79.00	1.283	8	7.188	A	0.000	7.188	7.188	100.00	0.000	0.000
					B	0.000	7.188		100.00	0.000	0.000
					C	0.000	7.188		100.00	0.000	3.168
L4 74.00-64.00	69.00	1.235	8	7.188	A	0.000	7.188	7.188	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	0.000	7.188		100.00	0.000	0.000
					C	0.000	7.188		100.00	0.000	3.960
L5 64.00-62.00	63.00	1.203	8	3.000	A	3.000	0.000	3.000	100.00	0.000	0.000
					B	3.000	0.000		100.00	0.000	0.000
					C	3.000	0.000		100.00	0.000	0.000
L6 62.00-41.25	51.63	1.136	7	41.500	A	0.000	41.500	41.500	100.00	0.000	0.000
					B	0.000	41.500		100.00	0.000	0.000
					C	0.000	41.500		100.00	0.000	0.000
L7 41.25-2.00	21.63	1	6	78.500	A	0.000	78.500	78.500	100.00	0.000	0.000
					B	0.000	78.500		100.00	0.000	0.000
					C	0.000	78.500		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	0.712	1	1	1	5.521	0.17	16.82	C
104.00-94.00			B	1	0.712	1	1	1	5.521			
			C	1	0.712	1	1	1	5.521			
L2	0.00	0.19	A	1	0.726	1	1	1	5.521	0.17	16.64	C
94.00-84.00			B	1	0.726	1	1	1	5.521			
			C	1	0.726	1	1	1	5.521			
L3	0.10	0.43	A	1	0.59	1	1	1	7.188	0.30	29.72	C
84.00-74.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L4	0.16	0.43	A	1	0.59	1	1	1	7.188	0.32	31.65	C
74.00-64.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1	1	3.000	0.23*	112.80	C
64.00-62.00			B	1	2.1	1	1	1	3.000			
			C	1	2.1	1	1	1	3.000			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.87	41.92	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	1.45	36.88	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*$2A_g$ limit			OTM	160.21 kip-ft	3.49		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	0.712	1	1	1	5.521	0.17	16.82	C
104.00-94.00			B	1	0.712	1	1	1	5.521			
			C	1	0.712	1	1	1	5.521			
L2	0.00	0.19	A	1	0.726	1	1	1	5.521	0.17	16.64	C
94.00-84.00			B	1	0.726	1	1	1	5.521			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	1	0.726	1	1	1	5.521			
L3	0.10	0.43	A	1	0.59	1	1	1	7.188	0.30	29.72	C
84.00-74.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L4	0.16	0.43	A	1	0.59	1	1	1	7.188	0.32	31.65	C
74.00-64.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1.2	1.2	3.600	0.23*	112.80	C
64.00-62.00			B	1	2.1	1	1.2	1.2	3.600			
			C	1	2.1	1	1.2	1.2	3.600			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.87	41.92	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	1.45	36.88	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	160.21 kip-ft	3.49		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	0.712	1	1	1	5.521	0.17	16.82	C
104.00-94.00			B	1	0.712	1	1	1	5.521			
			C	1	0.712	1	1	1	5.521			
L2	0.00	0.19	A	1	0.726	1	1	1	5.521	0.17	16.64	C
94.00-84.00			B	1	0.726	1	1	1	5.521			
			C	1	0.726	1	1	1	5.521			
L3	0.10	0.43	A	1	0.59	1	1	1	7.188	0.30	29.72	C
84.00-74.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L4	0.16	0.43	A	1	0.59	1	1	1	7.188	0.32	31.65	C
74.00-64.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1.2	1.2	3.600	0.23*	112.80	C
64.00-62.00			B	1	2.1	1	1.2	1.2	3.600			
			C	1	2.1	1	1.2	1.2	3.600			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.87	41.92	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	1.45	36.88	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	160.21 kip-ft	3.49		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	0.712	1	1	1	5.521	0.17	16.82	C
104.00-94.00			B	1	0.712	1	1	1	5.521			
			C	1	0.712	1	1	1	5.521			
L2	0.00	0.19	A	1	0.726	1	1	1	5.521	0.17	16.64	C
94.00-84.00			B	1	0.726	1	1	1	5.521			
			C	1	0.726	1	1	1	5.521			
L3	0.10	0.43	A	1	0.59	1	1	1	7.188	0.30	29.72	C
84.00-74.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L4	0.16	0.43	A	1	0.59	1	1	1	7.188	0.32	31.65	C
74.00-64.00			B	1	0.59	1	1	1	7.188			
			C	1	0.59	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1	1	3.000	0.23*	112.80	C
64.00-62.00			B	1	2.1	1	1	1	3.000			
			C	1	2.1	1	1	1	3.000			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.87	41.92	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	1.45	36.88	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2Ag limit			OTM	160.21 kip-ft	3.49		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	0.858	1	1	1	6.354	0.18	17.50	C
104.00-94.00			B	1	0.858	1	1	1	6.354			
			C	1	0.858	1	1	1	6.354			
L2	0.00	0.23	A	1	0.876	1	1	1	6.354	0.17	17.32	C
94.00-84.00			B	1	0.876	1	1	1	6.354			
			C	1	0.876	1	1	1	6.354			
L3	0.24	0.49	A	1	0.635	1	1	1	8.021	0.30	29.67	C
84.00-74.00			B	1	0.635	1	1	1	8.021			
			C	1	0.635	1	1	1	8.021			
L4	0.34	0.49	A	1	0.651	1	1	1	8.021	0.32	32.37	C
74.00-64.00			B	1	0.651	1	1	1	8.021			
			C	1	0.651	1	1	1	8.021			
L5	0.02	0.00	A	0.982	2.064	1	1	1	3.111	0.18*	89.30	C
64.00-62.00			B	0.982	2.064	1	1	1	3.111			
			C	0.982	2.064	1	1	1	3.111			
L6	0.26	1.63	A	1	0.59	1	1	1	43.229	0.68	32.75	C
62.00-41.25			B	1	0.59	1	1	1	43.229			
			C	1	0.59	1	1	1	43.229			
L7 41.25-2.00	0.49	3.08	A	1	0.59	1	1	1	81.771	1.13	28.82	C
			B	1	0.59	1	1	1	81.771			
			C	1	0.59	1	1	1	81.771			
Sum Weight:	1.36	6.15			*2Ag limit			OTM	143.39 kip-ft	2.96		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	0.858	1	1	1	6.354	0.18	17.50	C
104.00-94.00			B	1	0.858	1	1	1	6.354			
			C	1	0.858	1	1	1	6.354			
L2	0.00	0.23	A	1	0.876	1	1	1	6.354	0.17	17.32	C
94.00-84.00			B	1	0.876	1	1	1	6.354			
			C	1	0.876	1	1	1	6.354			
L3	0.24	0.49	A	1	0.635	1	1	1	8.021	0.30	29.67	C
84.00-74.00			B	1	0.635	1	1	1	8.021			
			C	1	0.635	1	1	1	8.021			
L4	0.34	0.49	A	1	0.651	1	1	1	8.021	0.32	32.37	C
74.00-64.00			B	1	0.651	1	1	1	8.021			
			C	1	0.651	1	1	1	8.021			
L5	0.02	0.00	A	0.982	2.064	1	1.2	1.2	3.733	0.18*	89.30	C
64.00-62.00			B	0.982	2.064	1	1.2	1.2	3.733			
			C	0.982	2.064	1	1.2	1.2	3.733			
L6	0.26	1.63	A	1	0.59	1	1	1	43.229	0.68	32.75	C
62.00-41.25			B	1	0.59	1	1	1	43.229			
			C	1	0.59	1	1	1	43.229			
L7 41.25-2.00	0.49	3.08	A	1	0.59	1	1	1	81.771	1.13	28.82	C
			B	1	0.59	1	1	1	81.771			
			C	1	0.59	1	1	1	81.771			
Sum Weight:	1.36	6.15			*$2A_g$ limit			OTM	143.39 kip-ft	2.96		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	0.858	1	1	1	6.354	0.18	17.50	C
104.00-94.00			B	1	0.858	1	1	1	6.354			
			C	1	0.858	1	1	1	6.354			
L2	0.00	0.23	A	1	0.876	1	1	1	6.354	0.17	17.32	C
94.00-84.00			B	1	0.876	1	1	1	6.354			
			C	1	0.876	1	1	1	6.354			
L3	0.24	0.49	A	1	0.635	1	1	1	8.021	0.30	29.67	C
84.00-74.00			B	1	0.635	1	1	1	8.021			
			C	1	0.635	1	1	1	8.021			
L4	0.34	0.49	A	1	0.651	1	1	1	8.021	0.32	32.37	C
74.00-64.00			B	1	0.651	1	1	1	8.021			
			C	1	0.651	1	1	1	8.021			
L5	0.02	0.00	A	0.982	2.064	1	1.2	1.2	3.733	0.18*	89.30	C
64.00-62.00			B	0.982	2.064	1	1.2	1.2	3.733			
			C	0.982	2.064	1	1.2	1.2	3.733			
L6	0.26	1.63	A	1	0.59	1	1	1	43.229	0.68	32.75	C
62.00-41.25			B	1	0.59	1	1	1	43.229			
			C	1	0.59	1	1	1	43.229			
L7 41.25-2.00	0.49	3.08	A	1	0.59	1	1	1	81.771	1.13	28.82	C
			B	1	0.59	1	1	1	81.771			
			C	1	0.59	1	1	1	81.771			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	1.36	6.15			*2Ag limit			OTM	143.39 kip-ft	2.96		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	0.858	1	1	1	6.354	0.18	17.50	C
104.00-94.00			B	1	0.858	1	1	1	6.354			
			C	1	0.858	1	1	1	6.354			
L2	0.00	0.23	A	1	0.876	1	1	1	6.354	0.17	17.32	C
94.00-84.00			B	1	0.876	1	1	1	6.354			
			C	1	0.876	1	1	1	6.354			
L3	0.24	0.49	A	1	0.635	1	1	1	8.021	0.30	29.67	C
84.00-74.00			B	1	0.635	1	1	1	8.021			
			C	1	0.635	1	1	1	8.021			
L4	0.34	0.49	A	1	0.651	1	1	1	8.021	0.32	32.37	C
74.00-64.00			B	1	0.651	1	1	1	8.021			
			C	1	0.651	1	1	1	8.021			
L5	0.02	0.00	A	0.982	2.064	1	1	1	3.111	0.18*	89.30	C
64.00-62.00			B	0.982	2.064	1	1	1	3.111			
			C	0.982	2.064	1	1	1	3.111			
L6	0.26	1.63	A	1	0.59	1	1	1	43.229	0.68	32.75	C
62.00-41.25			B	1	0.59	1	1	1	43.229			
			C	1	0.59	1	1	1	43.229			
L7 41.25-2.00	0.49	3.08	A	1	0.59	1	1	1	81.771	1.13	28.82	C
			B	1	0.59	1	1	1	81.771			
			C	1	0.59	1	1	1	81.771			
Sum Weight:	1.36	6.15			*2Ag limit			OTM	143.39 kip-ft	2.96		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.81	C
104.00-94.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L2	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.51	C
94.00-84.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L3	0.10	0.43	A	1	1.05	1	1	1	7.188	0.15	14.88	C
84.00-74.00			B	1	1.05	1	1	1	7.188			
			C	1	1.05	1	1	1	7.188			
L4	0.16	0.43	A	1	1.077	1	1	1	7.188	0.16	15.63	C
74.00-64.00			B	1	1.077	1	1	1	7.188			
			C	1	1.077	1	1	1	7.188			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L5	0.02	0.00	A	1	2.1	1	1	1	3.000	0.08*	39.03	C
64.00-62.00			B	1	2.1	1	1	1	3.000			
			C	1	2.1	1	1	1	3.000			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.30	14.50	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	0.50	12.76	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	69.24 kip-ft	1.38		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.81	C
104.00-94.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L2	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.51	C
94.00-84.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L3	0.10	0.43	A	1	1.05	1	1	1	7.188	0.15	14.88	C
84.00-74.00			B	1	1.05	1	1	1	7.188			
			C	1	1.05	1	1	1	7.188			
L4	0.16	0.43	A	1	1.077	1	1	1	7.188	0.16	15.63	C
74.00-64.00			B	1	1.077	1	1	1	7.188			
			C	1	1.077	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1.2	1.2	3.600	0.08*	39.03	C
64.00-62.00			B	1	2.1	1	1.2	1.2	3.600			
			C	1	2.1	1	1.2	1.2	3.600			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.30	14.50	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	0.50	12.76	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	69.24 kip-ft	1.38		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.81	C
104.00-94.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L2	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.51	C
94.00-84.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L3	0.10	0.43	A	1	1.05	1	1	1	7.188	0.15	14.88	C
84.00-74.00			B	1	1.05	1	1	1	7.188			
			C	1	1.05	1	1	1	7.188			
L4	0.16	0.43	A	1	1.077	1	1	1	7.188	0.16	15.63	C
74.00-64.00			B	1	1.077	1	1	1	7.188			
			C	1	1.077	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1.2	1.2	3.600	0.08*	39.03	C
64.00-62.00			B	1	2.1	1	1.2	1.2	3.600			
			C	1	2.1	1	1.2	1.2	3.600			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.30	14.50	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	0.50	12.76	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	69.24 kip-ft	1.38		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.81	C
104.00-94.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L2	0.00	0.19	A	1	1.2	1	1	1	5.521	0.10	9.51	C
94.00-84.00			B	1	1.2	1	1	1	5.521			
			C	1	1.2	1	1	1	5.521			
L3	0.10	0.43	A	1	1.05	1	1	1	7.188	0.15	14.88	C
84.00-74.00			B	1	1.05	1	1	1	7.188			
			C	1	1.05	1	1	1	7.188			
L4	0.16	0.43	A	1	1.077	1	1	1	7.188	0.16	15.63	C
74.00-64.00			B	1	1.077	1	1	1	7.188			
			C	1	1.077	1	1	1	7.188			
L5	0.02	0.00	A	1	2.1	1	1	1	3.000	0.08*	39.03	C
64.00-62.00			B	1	2.1	1	1	1	3.000			
			C	1	2.1	1	1	1	3.000			
L6	0.26	1.32	A	1	0.59	1	1	1	41.500	0.30	14.50	C
62.00-41.25			B	1	0.59	1	1	1	41.500			
			C	1	0.59	1	1	1	41.500			
L7 41.25-2.00	0.49	2.49	A	1	0.59	1	1	1	78.500	0.50	12.76	C
			B	1	0.59	1	1	1	78.500			
			C	1	0.59	1	1	1	78.500			
Sum Weight:	1.04	5.06			*2A_g limit			OTM	69.24 kip-ft	1.38		

Force Totals

Load Case	*Vertical Forces* K	*Sum of Forces X* K	*Sum of Forces Z* K	*Sum of Overturning Moments, M_x* kip-ft	*Sum of Overturning Moments, M_z* kip-ft	*Sum of Torques* kip-ft
Leg Weight	5.06					
Bracing Weight	0.00					
Total Member Self-Weight	5.06			0.04	0.07	
Total Weight	6.74			0.04	0.07	
Wind 0 deg - No Ice		0.00	-4.10	-212.29	0.07	-0.02
Wind 30 deg - No Ice		2.19	-3.55	-183.84	-118.23	-0.01
Wind 45 deg - No Ice		3.10	-2.90	-150.10	-167.23	-0.00
Wind 60 deg - No Ice		3.79	-2.05	-106.12	-204.83	0.00
Wind 90 deg - No Ice		4.38	0.00	0.04	-236.52	0.01
Wind 120 deg - No Ice		3.79	2.05	106.20	-204.83	0.02
Wind 135 deg - No Ice		3.10	2.90	150.18	-167.23	0.02
Wind 150 deg - No Ice		2.19	3.55	183.92	-118.23	0.02
Wind 180 deg - No Ice		0.00	4.10	212.37	0.07	0.02
Wind 210 deg - No Ice		-2.19	3.55	183.92	118.37	0.01
Wind 225 deg - No Ice		-3.10	2.90	150.18	167.37	0.00
Wind 240 deg - No Ice		-3.79	2.05	106.20	204.97	0.00
Wind 270 deg - No Ice		-4.38	0.00	0.04	236.66	-0.01
Wind 300 deg - No Ice		-3.79	-2.05	-106.12	204.97	-0.02
Wind 315 deg - No Ice		-3.10	-2.90	-150.10	167.37	-0.02
Wind 330 deg - No Ice		-2.19	-3.55	-183.84	118.37	-0.02
Member Ice	1.10					
Total Weight Ice	8.33			0.10	0.17	
Wind 0 deg - Ice		0.00	-3.46	-186.18	0.17	-0.02
Wind 30 deg - Ice		1.84	-3.00	-161.22	-102.62	-0.01
Wind 45 deg - Ice		2.60	-2.45	-131.62	-145.20	-0.01
Wind 60 deg - Ice		3.19	-1.73	-93.04	-177.87	0.00
Wind 90 deg - Ice		3.68	0.00	0.10	-205.41	0.01
Wind 120 deg - Ice		3.19	1.73	93.24	-177.87	0.02
Wind 135 deg - Ice		2.60	2.45	131.82	-145.20	0.02
Wind 150 deg - Ice		1.84	3.00	161.42	-102.62	0.02
Wind 180 deg - Ice		0.00	3.46	186.38	0.17	0.02
Wind 210 deg - Ice		-1.84	3.00	161.42	102.96	0.01
Wind 225 deg - Ice		-2.60	2.45	131.82	145.54	0.01
Wind 240 deg - Ice		-3.19	1.73	93.24	178.21	0.00
Wind 270 deg - Ice		-3.68	0.00	0.10	205.76	-0.01
Wind 300 deg - Ice		-3.19	-1.73	-93.04	178.21	-0.02
Wind 315 deg - Ice		-2.60	-2.45	-131.62	145.54	-0.02
Wind 330 deg - Ice		-1.84	-3.00	-161.22	102.96	-0.02
Total Weight	6.74			0.04	0.07	
Wind 0 deg - Service		0.00	-1.59	-87.28	0.00	-0.01
Wind 30 deg - Service		0.84	-1.38	-75.58	-47.84	-0.00
Wind 45 deg - Service		1.19	-1.12	-61.71	-67.65	-0.00
Wind 60 deg - Service		1.46	-0.79	-43.64	-82.85	0.00
Wind 90 deg - Service		1.69	0.00	0.00	-95.67	0.00
Wind 120 deg - Service		1.46	0.79	43.64	-82.85	0.01
Wind 135 deg - Service		1.19	1.12	61.71	-67.65	0.01
Wind 150 deg - Service		0.84	1.38	75.58	-47.84	0.01
Wind 180 deg - Service		0.00	1.59	87.28	0.00	0.01
Wind 210 deg - Service		-0.84	1.38	75.58	47.84	0.00
Wind 225 deg - Service		-1.19	1.12	61.71	67.65	0.00
Wind 240 deg - Service		-1.46	0.79	43.64	82.85	0.00
Wind 270 deg - Service		-1.69	0.00	0.00	95.67	-0.00
Wind 300 deg - Service		-1.46	-0.79	-43.64	82.85	-0.01
Wind 315 deg - Service		-1.19	-1.12	-61.71	67.65	-0.01
Wind 330 deg - Service		-0.84	-1.38	-75.58	47.84	-0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	104 - 94	Pole	Max Tension	14	0.00	0.00	0.00
			Max. Compression	18	-0.23	0.00	-0.00
			Max. Mx	31	-0.22	0.93	-0.00
			Max. My	27	-0.23	0.00	-0.93
			Max. Vy	31	-0.19	0.93	-0.00
			Max. Vx	27	0.19	0.00	-0.93
			Max. Torque	33			-0.00
L2	94 - 84	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-1.28	0.00	-0.00
			Max. Mx	14	-0.97	7.04	-0.00
			Max. My	10	-0.99	0.00	-5.60
			Max. Vy	14	-1.28	7.04	-0.00
			Max. Vx	10	0.99	0.00	-5.60
			Max. Torque	8			0.00
L3	84 - 74	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-2.01	0.08	-0.05
			Max. Mx	14	-1.49	21.40	-0.02
			Max. My	10	-1.52	0.03	-17.08
			Max. Vy	14	-1.59	21.40	-0.02
			Max. Vx	10	1.30	0.03	-17.08
			Max. Torque	34			0.01
L4	74 - 64	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-2.85	0.17	-0.10
			Max. Mx	14	-2.10	38.93	-0.04
			Max. My	10	-2.12	0.07	-31.71
			Max. Vy	14	-1.90	38.93	-0.04
			Max. Vx	10	1.62	0.07	-31.71
			Max. Torque	34			0.02
L5	64 - 62	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-2.87	0.17	-0.10
			Max. Mx	14	-2.12	42.96	-0.04
			Max. My	10	-2.14	0.07	-35.17
			Max. Vy	14	-2.13	42.96	-0.04
			Max. Vx	10	1.84	0.07	-35.17
			Max. Torque	34			0.02
L6	62 - 41.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-4.76	0.17	-0.10
			Max. Mx	14	-3.69	96.47	-0.04
			Max. My	10	-3.70	0.07	-82.69
			Max. Vy	14	-3.03	96.47	-0.04
			Max. Vx	10	2.74	0.07	-82.69
			Max. Torque	34			0.02
L7	41.25 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-8.33	0.17	-0.10
			Max. Mx	14	-6.74	242.66	-0.04
			Max. My	10	-6.74	0.07	-217.64
			Max. Vy	14	-4.39	242.66	-0.04
			Max. Vx	10	4.11	0.07	-217.64
			Max. Torque	34			0.02

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	8.33	3.68	0.00
	Max. H_x	14	6.74	4.38	0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	2	6.74	0.00	4.10
	Max. M_x	2	217.56	0.00	4.10
	Max. M_z	6	242.52	-4.38	0.00
	Max. Torsion	34	0.02	1.84	3.00
	Min. Vert	1	6.74	0.00	0.00
	Min. H_x	6	6.74	-4.38	0.00
	Min. H_z	10	6.74	0.00	-4.10
	Min. M_x	10	-217.64	0.00	-4.10
	Min. M_z	14	-242.66	4.38	0.00
	Min. Torsion	26	-0.02	-1.84	-3.00

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	6.74	0.00	0.00	0.04	0.07	0.00
Dead+Wind 0 deg - No Ice	6.74	0.00	-4.10	-217.56	0.07	-0.02
Dead+Wind 30 deg - No Ice	6.74	2.19	-3.55	-188.40	-121.23	-0.01
Dead+Wind 45 deg - No Ice	6.74	3.10	-2.90	-153.82	-171.47	-0.00
Dead+Wind 60 deg - No Ice	6.74	3.79	-2.05	-108.75	-210.02	0.00
Dead+Wind 90 deg - No Ice	6.74	4.38	0.00	0.04	-242.52	0.01
Dead+Wind 120 deg - No Ice	6.74	3.79	2.05	108.84	-210.02	0.02
Dead+Wind 135 deg - No Ice	6.74	3.10	2.90	153.90	-171.47	0.02
Dead+Wind 150 deg - No Ice	6.74	2.19	3.55	188.49	-121.23	0.02
Dead+Wind 180 deg - No Ice	6.74	0.00	4.10	217.64	0.07	0.02
Dead+Wind 210 deg - No Ice	6.74	-2.19	3.55	188.49	121.37	0.01
Dead+Wind 225 deg - No Ice	6.74	-3.10	2.90	153.90	171.62	0.00
Dead+Wind 240 deg - No Ice	6.74	-3.79	2.05	108.84	210.16	0.00
Dead+Wind 270 deg - No Ice	6.74	-4.38	0.00	0.04	242.66	-0.01
Dead+Wind 300 deg - No Ice	6.74	-3.79	-2.05	-108.75	210.16	-0.02
Dead+Wind 315 deg - No Ice	6.74	-3.10	-2.90	-153.82	171.62	-0.02
Dead+Wind 330 deg - No Ice	6.74	-2.19	-3.55	-188.40	121.37	-0.02
Dead+Ice+Temp	8.33	0.00	0.00	0.10	0.17	0.00
Dead+Wind 0 deg+Ice+Temp	8.33	0.00	-3.46	-192.23	0.18	-0.02
Dead+Wind 30 deg+Ice+Temp	8.33	1.84	-3.00	-166.46	-106.02	-0.01
Dead+Wind 45 deg+Ice+Temp	8.33	2.60	-2.45	-135.89	-150.00	-0.01
Dead+Wind 60 deg+Ice+Temp	8.33	3.19	-1.73	-96.06	-183.75	0.00
Dead+Wind 90 deg+Ice+Temp	8.33	3.68	0.00	0.10	-212.21	0.01
Dead+Wind 120 deg+Ice+Temp	8.33	3.19	1.73	96.27	-183.75	0.02
Dead+Wind 135 deg+Ice+Temp	8.33	2.60	2.45	136.10	-150.00	0.02
Dead+Wind 150 deg+Ice+Temp	8.33	1.84	3.00	166.67	-106.02	0.02
Dead+Wind 180 deg+Ice+Temp	8.33	0.00	3.46	192.44	0.18	0.02
Dead+Wind 210 deg+Ice+Temp	8.33	-1.84	3.00	166.67	106.38	0.01
Dead+Wind 225 deg+Ice+Temp	8.33	-2.60	2.45	136.10	150.37	0.01
Dead+Wind 240 deg+Ice+Temp	8.33	-3.19	1.73	96.27	184.12	0.00
Dead+Wind 270 deg+Ice+Temp	8.33	-3.68	0.00	0.10	212.57	-0.01
Dead+Wind 300 deg+Ice+Temp	8.33	-3.19	-1.73	-96.06	184.12	-0.02
Dead+Wind 315 deg+Ice+Temp	8.33	-2.60	-2.45	-135.89	150.37	-0.02
Dead+Wind 330 deg+Ice+Temp	8.33	-1.84	-3.00	-166.46	106.38	-0.02
Dead+Wind 0 deg - Service	6.74	0.00	-1.59	-89.48	0.07	-0.01
Dead+Wind 30 deg - Service	6.74	0.84	-1.38	-77.49	-49.02	-0.00
Dead+Wind 45 deg - Service	6.74	1.19	-1.12	-63.26	-69.35	-0.00
Dead+Wind 60 deg - Service	6.74	1.46	-0.79	-44.72	-84.95	0.00
Dead+Wind 90 deg - Service	6.74	1.69	0.00	0.04	-98.10	0.00
Dead+Wind 120 deg - Service	6.74	1.46	0.79	44.80	-84.95	0.01
Dead+Wind 135 deg - Service	6.74	1.19	1.12	63.34	-69.35	0.01

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+Wind 150 deg - Service	6.74	0.84	1.38	77.57	-49.02	0.01
Dead+Wind 180 deg - Service	6.74	0.00	1.59	89.56	0.07	0.01
Dead+Wind 210 deg - Service	6.74	-0.84	1.38	77.57	49.16	0.00
Dead+Wind 225 deg - Service	6.74	-1.19	1.12	63.34	69.49	0.00
Dead+Wind 240 deg - Service	6.74	-1.46	0.79	44.80	85.10	0.00
Dead+Wind 270 deg - Service	6.74	-1.69	0.00	0.04	98.25	-0.00
Dead+Wind 300 deg - Service	6.74	-1.46	-0.79	-44.72	85.10	-0.01
Dead+Wind 315 deg - Service	6.74	-1.19	-1.12	-63.26	69.49	-0.01
Dead+Wind 330 deg - Service	6.74	-0.84	-1.38	-77.49	49.16	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-6.74	0.00	0.00	6.74	0.00	0.000%
2	0.00	-6.74	-4.10	0.00	6.74	4.10	0.000%
3	2.19	-6.74	-3.55	-2.19	6.74	3.55	0.000%
4	3.10	-6.74	-2.90	-3.10	6.74	2.90	0.000%
5	3.79	-6.74	-2.05	-3.79	6.74	2.05	0.000%
6	4.38	-6.74	0.00	-4.38	6.74	0.00	0.000%
7	3.79	-6.74	2.05	-3.79	6.74	-2.05	0.000%
8	3.10	-6.74	2.90	-3.10	6.74	-2.90	0.000%
9	2.19	-6.74	3.55	-2.19	6.74	-3.55	0.000%
10	0.00	-6.74	4.10	0.00	6.74	-4.10	0.000%
11	-2.19	-6.74	3.55	2.19	6.74	-3.55	0.000%
12	-3.10	-6.74	2.90	3.10	6.74	-2.90	0.000%
13	-3.79	-6.74	2.05	3.79	6.74	-2.05	0.000%
14	-4.38	-6.74	0.00	4.38	6.74	0.00	0.000%
15	-3.79	-6.74	-2.05	3.79	6.74	2.05	0.000%
16	-3.10	-6.74	-2.90	3.10	6.74	2.90	0.000%
17	-2.19	-6.74	-3.55	2.19	6.74	3.55	0.000%
18	0.00	-8.33	0.00	0.00	8.33	0.00	0.000%
19	0.00	-8.33	-3.46	0.00	8.33	3.46	0.000%
20	1.84	-8.33	-3.00	-1.84	8.33	3.00	0.000%
21	2.60	-8.33	-2.45	-2.60	8.33	2.45	0.000%
22	3.19	-8.33	-1.73	-3.19	8.33	1.73	0.000%
23	3.68	-8.33	0.00	-3.68	8.33	0.00	0.000%
24	3.19	-8.33	1.73	-3.19	8.33	-1.73	0.000%
25	2.60	-8.33	2.45	-2.60	8.33	-2.45	0.000%
26	1.84	-8.33	3.00	-1.84	8.33	-3.00	0.000%
27	0.00	-8.33	3.46	0.00	8.33	-3.46	0.000%
28	-1.84	-8.33	3.00	1.84	8.33	-3.00	0.000%
29	-2.60	-8.33	2.45	2.60	8.33	-2.45	0.000%
30	-3.19	-8.33	1.73	3.19	8.33	-1.73	0.000%
31	-3.68	-8.33	0.00	3.68	8.33	0.00	0.000%
32	-3.19	-8.33	-1.73	3.19	8.33	1.73	0.000%
33	-2.60	-8.33	-2.45	2.60	8.33	2.45	0.000%
34	-1.84	-8.33	-3.00	1.84	8.33	3.00	0.000%
35	0.00	-6.74	-1.59	0.00	6.74	1.59	0.000%
36	0.84	-6.74	-1.38	-0.84	6.74	1.38	0.000%
37	1.19	-6.74	-1.12	-1.19	6.74	1.12	0.000%
38	1.46	-6.74	-0.79	-1.46	6.74	0.79	0.000%
39	1.69	-6.74	0.00	-1.69	6.74	0.00	0.000%
40	1.46	-6.74	0.79	-1.46	6.74	-0.79	0.000%
41	1.19	-6.74	1.12	-1.19	6.74	-1.12	0.000%
42	0.84	-6.74	1.38	-0.84	6.74	-1.38	0.000%
43	0.00	-6.74	1.59	0.00	6.74	-1.59	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	-0.84	-6.74	1.38	0.84	6.74	-1.38	0.000%
45	-1.19	-6.74	1.12	1.19	6.74	-1.12	0.000%
46	-1.46	-6.74	0.79	1.46	6.74	-0.79	0.000%
47	-1.69	-6.74	0.00	1.69	6.74	0.00	0.000%
48	-1.46	-6.74	-0.79	1.46	6.74	0.79	0.000%
49	-1.19	-6.74	-1.12	1.19	6.74	1.12	0.000%
50	-0.84	-6.74	-1.38	0.84	6.74	1.38	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	0.00011457
3	Yes	5	0.00000001	0.00008810
4	Yes	5	0.00000001	0.00010465
5	Yes	5	0.00000001	0.00009379
6	Yes	4	0.00000001	0.00009622
7	Yes	5	0.00000001	0.00009543
8	Yes	5	0.00000001	0.00010515
9	Yes	5	0.00000001	0.00008780
10	Yes	4	0.00000001	0.00011469
11	Yes	5	0.00000001	0.00008945
12	Yes	5	0.00000001	0.00010483
13	Yes	5	0.00000001	0.00009417
14	Yes	4	0.00000001	0.00009638
15	Yes	5	0.00000001	0.00009261
16	Yes	5	0.00000001	0.00010443
17	Yes	5	0.00000001	0.00008985
18	Yes	4	0.00000001	0.00000001
19	Yes	5	0.00000001	0.00014663
20	Yes	5	0.00000001	0.00025396
21	Yes	5	0.00000001	0.00028327
22	Yes	5	0.00000001	0.00026011
23	Yes	5	0.00000001	0.00016129
24	Yes	5	0.00000001	0.00026223
25	Yes	5	0.00000001	0.00028435
26	Yes	5	0.00000001	0.00025422
27	Yes	5	0.00000001	0.00014695
28	Yes	5	0.00000001	0.00025677
29	Yes	5	0.00000001	0.00028512
30	Yes	5	0.00000001	0.00026194
31	Yes	5	0.00000001	0.00016181
32	Yes	5	0.00000001	0.00025995
33	Yes	5	0.00000001	0.00028418
34	Yes	5	0.00000001	0.00025662
35	Yes	4	0.00000001	0.00003282
36	Yes	4	0.00000001	0.00026615
37	Yes	4	0.00000001	0.00032098
38	Yes	4	0.00000001	0.00028536
39	Yes	4	0.00000001	0.00002975
40	Yes	4	0.00000001	0.00029817
41	Yes	4	0.00000001	0.00032503
42	Yes	4	0.00000001	0.00026418
43	Yes	4	0.00000001	0.00003289
44	Yes	4	0.00000001	0.00027692

45	Yes	4	0.00000001	0.00032281
46	Yes	4	0.00000001	0.00028826
47	Yes	4	0.00000001	0.00002987
48	Yes	4	0.00000001	0.00027724
49	Yes	4	0.00000001	0.00032084
50	Yes	4	0.00000001	0.00028078

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	104 - 94	15.920	47	1.4032	0.0019
L2	94 - 84	12.990	47	1.3859	0.0019
L3	84 - 74	10.197	47	1.2368	0.0020
L4	74 - 64	7.752	47	1.0715	0.0018
L5	64 - 62	5.837	47	0.7225	0.0015
L6	62 - 41.25	5.538	47	0.7084	0.0002
L7	41.25 - 2	2.708	47	0.5774	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
89.00	OPA-65R-LCUU-H4	47	11.564	1.3156	0.0020	4988
85.00	TMABPDB7823VG12A	47	10.464	1.2507	0.0020	3551

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	104 - 94	37.831	14	3.2431	0.0050
L2	94 - 84	31.059	14	3.2130	0.0051
L3	84 - 74	24.534	14	2.9205	0.0052
L4	74 - 64	18.745	14	2.5449	0.0048
L5	64 - 62	14.177	14	1.7400	0.0038
L6	62 - 41.25	13.455	14	1.7077	0.0005
L7	41.25 - 2	6.612	14	1.4018	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
89.00	OPA-65R-LCUU-H4	14	27.737	3.0770	0.0053	2539

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
85.00	TMABPDB7823VG12A	14	25.162	2.9488	0.0053	1717

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	104 - 94 (1)	P6x.28	10.00	0.00	0.0	21.000	5.5813	-0.22	117.21	0.002
L2	94 - 84 (2)	P6x.28	10.00	0.00	0.0	21.000	5.5813	-0.97	117.21	0.008
L3	84 - 74 (3)	P8x.5	10.00	0.00	0.0	21.000	12.7627	-1.49	268.02	0.006
L4	74 - 64 (4)	P8x.5	10.00	0.00	0.0	21.000	12.7627	-2.10	268.02	0.008
L5	64 - 62 (5)	CDMI Pole Flange	2.00	0.00	0.0	21.600	16.1781	-2.12	349.45	0.006
L6	62 - 41.25 (6)	P24x1/4	20.75	0.00	0.0	20.896	18.6532	-3.69	389.77	0.009
L7	41.25 - 2 (7)	P24x1/4	39.25	0.00	0.0	20.896	18.6532	-6.74	389.77	0.017

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	104 - 94 (1)	P6x.28	0.93	1.319	23.100	0.057	0.00	0.000	23.100	0.000
L2	94 - 84 (2)	P6x.28	7.04	9.938	23.100	0.430	0.00	0.000	23.100	0.000
L3	84 - 74 (3)	P8x.5	21.40	10.478	23.100	0.454	0.00	0.000	23.100	0.000
L4	74 - 64 (4)	P8x.5	38.93	19.058	23.100	0.825	0.00	0.000	23.100	0.000
L5	64 - 62 (5)	CDMI Pole Flange	42.96	7.091	21.600	0.328	0.00	0.000	21.600	0.000
L6	62 - 41.25 (6)	P24x1/4	96.47	10.561	20.896	0.505	0.00	0.000	20.896	0.000
L7	41.25 - 2 (7)	P24x1/4	242.66	26.566	20.896	1.271	0.00	0.000	20.896	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V	Actual f_v	Allow. F_v	Ratio $\frac{f_v}{F_v}$	Actual T	Actual f_{vt}	Allow. F_{vt}	Ratio $\frac{f_{vt}}{F_{vt}}$
	ft		K	ksi	ksi		kip-ft	ksi	ksi	
L1	104 - 94 (1)	P6x.28	0.19	0.067	14.000	0.005	0.00	0.000	14.000	0.000
L2	94 - 84 (2)	P6x.28	1.28	0.457	14.000	0.033	0.00	0.000	14.000	0.000
L3	84 - 74 (3)	P8x.5	1.59	0.249	14.000	0.018	0.00	0.001	14.000	0.000
L4	74 - 64 (4)	P8x.5	1.90	0.298	14.000	0.021	0.01	0.002	14.000	0.000
L5	64 - 62 (5)	CDMI Pole Flange	2.13	0.132	14.400	0.009	0.01	0.131	14.400	0.009
L6	62 - 41.25 (6)	P24x1/4	3.03	0.324	14.000	0.023	0.01	0.000	11.901	0.000
L7	41.25 - 2 (7)	P24x1/4	4.39	0.470	14.000	0.034	0.01	0.000	11.901	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	104 - 94 (1)	0.002	0.057	0.000	0.005	0.000	0.059 ✔	1.333	H1-3+VT ✔
L2	94 - 84 (2)	0.008	0.430	0.000	0.033	0.000	0.440 ✔	1.333	H1-3+VT ✔
L3	84 - 74 (3)	0.006	0.454	0.000	0.018	0.000	0.459 ✔	1.333	H1-3+VT ✔
L4	74 - 64 (4)	0.008	0.825	0.000	0.021	0.000	0.833 ✔	1.333	H1-3+VT ✔
L5	64 - 62 (5)	0.006	0.328	0.000	0.009	0.009	0.335 ✔	1.333	H1-3+VT ✔
L6	62 - 41.25 (6)	0.009	0.505	0.000	0.023	0.000	0.515 ✔	1.333	H1-3+VT ✔
L7	41.25 - 2 (7)	0.017	1.271	0.000	0.034	0.000	1.290 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	104 - 94	Pole	P6x.28	1	-0.22	156.24	4.4	Pass
L2	94 - 84	Pole	P6x.28	2	-0.97	156.24	33.0	Pass
L3	84 - 74	Pole	P8x.5	3	-1.49	357.27	34.5	Pass
L4	74 - 64	Pole	P8x.5	4	-2.10	357.27	62.5	Pass
L5	64 - 62	Pole	CDMI Pole Flange	5	-2.12	465.81	25.1	Pass
L6	62 - 41.25	Pole	P24x1/4	6	-3.69	519.57	38.7	Pass
L7	41.25 - 2	Pole	P24x1/4	7	-6.74	519.57	96.8	Pass
							Summary	
						Pole (L7)	96.8	Pass
						RATING =	**96.8**	**Pass**

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Subject:		Anchor Bolt and Base Plate Anlaysis
Location:		104-ft Temporary Ballast Monopole Greenwich, CT
Rev. 0: 3/16/16		Prepared by: T.J.L. Checked by: C.F.C. Job No. 16009.02

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	OM := 243·ft·kips	(Input From tnxTower)
Shear Force =	Shear := 4·kips	(Input From tnxTower)
Axial Force =	Axial := 7·kips	(Input From tnxTower)

Anchor Bolt Data:

Use ASTM F1554 Grade 55

Number of Anchor Bolts =	N := 4	(User Input)
Diameter of Bolt Circle =	D_{bc} := 30·in	(User Input)
Bolt "Column" Distance =	l := 3.0·in	(User Input)
Bolt Ultimate Strength =	F_u := 75·ksi	(User Input)
Bolt Yield Strength =	F_y := 55·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 2.25·in	(User Input)
Threads per Inch =	n := 4.5	(User Input)

Base Plate Data:

Use ASTM A36

Plate Yield Strength =	Fy_{bp} := 36·ksi	(User Input)
Base Plate Thickness =	t_{bp} := 2.5·in	(User Input)
Base Plate Diameter =	D_{bp} := 30·in	(User Input)
Outer Pole Diameter =	D_{pole} := 24·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 15 \cdot in$

Distance to Bolts = $i := 1 .. N$

$$d_i := \left| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 15.00 \cdot in$ $d_7 = \blacksquare \cdot in$

$d_2 = 0.00 \cdot in$ $d_8 = \blacksquare \cdot in$

$d_3 = -15.00 \cdot in$ $d_9 = \blacksquare \cdot in$

$d_4 = -0.00 \cdot in$ $d_{10} = \blacksquare \cdot in$

$d_5 = \blacksquare \cdot in$ $d_{11} = \blacksquare \cdot in$

$d_6 = \blacksquare \cdot in$ etc.

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 12 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 3.00 \cdot in$ $MA_7 = \blacksquare \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = \blacksquare \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = \blacksquare \cdot in$

$MA_4 = 0.00 \cdot in$ $MA_{10} = \blacksquare \cdot in$

$MA_5 = \blacksquare \cdot in$ $MA_{11} = \blacksquare \cdot in$

$MA_6 = \blacksquare \cdot in$ etc

Effective Width of Baseplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 14.4 \cdot in$

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 450 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.508 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.826 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 95.4 \cdot kips$

Allowable Tensile Force = $T_{ALL.Gross} := 1.333 \cdot \left(0.33 \cdot A_g \cdot F_u\right) = 131.2 \cdot kips$ (1.333 increase allowed per TIA/EIA)

$T_{ALL.Net} := 1.333 \cdot \left(0.60 \cdot A_n \cdot F_y\right) = 142.862 \cdot kips$ (1.333 increase allowed per TIA/EIA)

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} \cdot 100 = 67$ Bolts are "upset bolts". Use net area per AISC

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL.Net}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

Check Anchor Bolt Bending Stress:

Maximum Bending Moment = $M_x := \left(\frac{Shear}{N}\right) \cdot l = 0.25 \cdot ft \cdot kips$

Maximum Bending Stress = $f_{bx} := \frac{M_x}{S_x} = 3.6 \cdot ksi$

Allowable Bending Stress = $F_{bx} := 1.333 \cdot 0.6 \cdot F_y = 44 \cdot ksi$ (1.333 increase allowed per TIA/EIA)

Check Combined Stress Requirement:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required.

$$l := \begin{cases} l & \text{if } l > 2 \cdot D_n = 0 \cdot in \\ 0 & \text{otherwise} \end{cases}$$

$$f_{bx} := \begin{cases} f_{bx} & \text{if } l > 2 \cdot D_n = 0 \cdot ksi \\ 0 & \text{otherwise} \end{cases}$$

Check Anchor Bolt Compression/Combined Stress:

Maximum Compressive Force =

$$C_{Max} := OM \cdot \frac{R_{bc}}{I_p} + \frac{Axial}{N} = 98.9 \cdot kips$$

Maximum Compressive Stress =

$$f_a := \frac{C_{Max}}{A_n} = 30.5 \cdot ksi$$

$$K := 0.65$$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} = 102.019$$

$$F_a := \begin{cases} \dfrac{\left[1 - \dfrac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^2}\right] \cdot F_y}{\dfrac{5}{3} + \dfrac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \dfrac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^3}} & \text{if } \dfrac{K \cdot l}{r} \le C_c = 33 \cdot ksi \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} & \text{if } \dfrac{K \cdot l}{r} > C_c \end{cases}$$

Allowable Compressive Stress =

$$F_a := 1.333 \cdot F_a = 44 \cdot ksi$$

(1.333 increase allowed per TIA/EIA)

Combined Stress % of Capacity =

$$\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}}\right) \cdot 100 = 69.3$$

Condition 2 =

$$Condition2 := if\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \le 1.00, "OK", "Overstressed"\right)$$

Condition2 = "OK"

Base Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 98.9 \cdot kips$ $C_7 = \blacksquare \cdot kips$

$C_2 = 1.8 \cdot kips$ $C_8 = \blacksquare \cdot kips$

$C_3 = -95.4 \cdot kips$ $C_9 = \blacksquare \cdot kips$

$C_4 = 1.7 \cdot kips$ $C_{10} = \blacksquare \cdot kips$

$C_5 = \blacksquare \cdot kips$ $C_{11} = \blacksquare \cdot kips$

$C_6 = \blacksquare \cdot kips$ etc.

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} t_{bp}^2\right)} = 19.8 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 1.33 \cdot 0.75 \cdot Fy_{bp} = 35.9 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} \cdot 100 = 55.1$

Condition3 = $Condition3 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition3 = "Ok"

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Subject:	Ballast Calculation
Location:	104-ft Temporary Ballast Monopole Greenwich, CT
Rev. 0: 3/16/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16009.02

Ballast Calculation:

Input Data:

Tower Reactions:

Overturning Moment = $OM := 243 \cdot ft \cdot kips$ (Input From tnxTower)

Shear Force = $Shear := 4 \cdot kips$ (Input From tnxTower)

Axial Force = $Axial := 7 \cdot kips$ (Input From tnxTower)

Overturning Factor of Safety Required = $FS_{req} := 2.0$ (User Input)

Ballast Data:

Weight of Base Frame = $WT_{frame} := 5kips$ (User Input)

Distance From Center of Monopole to Extreme Edge of Base Frame = $c := 7.0 \cdot ft$ (User Input)

Total Dead Weight = $P_{tot} := Axial + WT_{frame} = 12 \cdot kips$

Net Resisting Moment Required = $M_{rnet} := \left(FS_{req} \cdot OM\right) - \left(P_{tot} \cdot c\right) = 402 \cdot kip \cdot ft$

Total Ballast Weight Required = $W_{req} := \frac{M_{rnet}}{c} = 57.43 \cdot kips$

Total Ballast = $Ballast := 60 \cdot kips$

Resisting Moment = $M_r := \left(Ballast + P_{tot}\right) \cdot c = 504 \cdot kip \cdot ft$

Actual Factor of Safety = $FS := \frac{M_r}{OM} = 2.07$

$FOS\_Check := if\left(FS \geq FS_{req}, "Okay", "No\ Good"\right)$

$FOS\_Check = "Okay"$

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	5006 RELO COW	DATE:	3/15/2016	RF DESIGN ENG:	RADU ALECSANDRU	RF PERF ENG:	Folarin Ayo	RFDS PROGRAM TYPE:	2016COW
ISSUE:	FINAL	Approved? (Y/N):	YES	RF DESIGN PHONE:	+1 (860) 258-6395	RF PERF PHONE:	508-271-8158	RFDS TECHNOLOGY:	UMTS
REVISION:	4	RF MANAGER:	CAMERON SYME	RF DESIGN EMAIL:	ra9161@att.com	RF PERF EMAIL:	fa6860@att.com	SMDC:	PLANNED
						TRIDENT:	N/A	Status:	APPROVED
						GSM FREQUENCY:	NONE	RFDS ID:	XXXX
						UMTS FREQUENCY:	850	RFDS Version:	4
						LTE FREQUENCY:	DUAL BAND	Created By:	RADU ALECSANDRU
								Date Created:	3/15/2016
								Date Updated:	
								Updated By:	
						[illegible] JOB # 1:		PLAN PROGRP SUBGRP #1:	
						[illegible] JOB # 2:		PLAN PROGRP SUBGRP #2:	
						[illegible] JOB # 3:		PLAN PROGRP SUBGRP #3:	
						[illegible] JOB # 4:		PLAN PROGRP SUBGRP #4:	

INITIATIVE / PROJECT: Greenwich, CT COW CT5992S;- 2ea. 850-UMTS; 1ea 700 AND 1ea. 1900+A2 LTE. TO REPLACE CTL05006.

Section 2 - LOCATION INFORMATION

USID:		FA LOCATION CODE:	10070970	LOCATION NAME:	5006 RELO COW	ORACLE PTN # 1:		PACE JOB # 1:	
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	NEW ENGLAND	ORACLE PTN # 2:		PACE JOB # 2:	
ADDRESS:	1 River Rd	CITY:	Greenwich	STATE:	CT	ORACLE PTN # 3:		PACE JOB # 3:	
ZIP CODE:	06830	COUNTY:	FAIRFIELD	MSA / RSA:		ORACLE PTN # 4:		PACE JOB # 4:	
LATITUDE (D-M-S):	41-2-2.88	LONGITUDE (D-M-S):	73-35-47.57	LAT (DEC. DEG):	41.034132	SEARCH RING NAME:			
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:						SEARCH RING ID:		CASPR INITIATIVE # 1:	
						MTA:		CASPR INITIATIVE # 2:	
						LONG (DEC. DEG):	-73.596548	CASPR INITIATIVE # 3:	
						[illegible]:		CASPR INITIATIVE # 4:	
						AIA STUDY REQ'D (Y/N):			
						FREQ COORD:			

Section 3 - LEASE / COVERAGE / FILING INFORMATION

[illegible]:		CSSA LOSS:		PCS REDUCED - UPS 2B:		CSSA DATE SIGNED:	
[illegible]:		CSSA EXT AGMT NEEDED:		PCS OOPS REDUCED:			
[illegible]:		CSSA SCORECARD UPDATED:					

Section 4 - TOWER / REGULATORY INFORMATION

[illegible]:		GROUND ELEVATION (ft):		STRUCTURE TYPE:		MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY:		HEIGHT OVERALL (ft):		FCC ASR NUMBER:		MARKET LOCATION 850 MHz Band:	
[illegible]:		STRUCTURE HEIGHT (ft):				MARKET LOCATION 1900 MHz Band:	
[illegible]:						MARKET LOCATION AWS Band:	
						MARKET LOCATION 700 MHz Band:	

Section 5 - E911 INFORMATION (existing)

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC S/P PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A								
SECTOR B								
SECTOR C								
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E911 INFORMATION (final)

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC S/P PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A								
SECTOR B								
SECTOR C								
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 6 - RBS GENERAL INFORMATION (existing)

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS
[illegible]										

Section 6 - RBS GENERAL INFORMATION (final)

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS
[illegible]										
[illegible]			CTU5992						CTL05002	
[illegible]										
[illegible]			5992						5992	
[illegible]			COW						COW	
[illegible]			SECTORIZED						SECTORIZED	
[illegible]			MACRO-CONVENTIONAL						MACRO-CONVENTIONAL	
[illegible]									CINGULAR	
[illegible]			CINGULAR						GOLD	
[illegible]			GOLD							
[illegible]										
[illegible]										
[illegible]										
[illegible]										
BASE STATION TYPE:			BASE						BASE	
[illegible]										
[illegible]										

Section 7 - RBS SPECIFIC INFORMATION - Existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS
RNC										
[illegible]										
LAC										
RAC										
MANUFACTURER										
EQUIPMENT TYPE										
LOCATION										
CABINET LOCATION										
MARKET ZIP CODE										
AGPS										
NODE B NUMBER										
PARENT NAME										

Section 7 - RBS SPECIFIC INFORMATION - Final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS
RNC										
[illegible]			BRPTCT04CR0RDS						FF03	
LAC			5992							
RAC			255							
MANUFACTURER			ERICSSON						ERICSSON	
EQUIPMENT TYPE			RBS3206						RBS 6601	
LOCATION										
CABINET LOCATION										
MARKET ZIP CODE			CT						CT	
AGPS			Yes						Yes	
NODE B NUMBER			5992						5992	
PARENT NAME			BRIDGEPORT RNC05 ERICSSON 3820							

Section 8 - RBS INDIVIDUAL INFORMATION - Existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
[illegible]																								
[illegible]																								
[illegible]																								

Section 8 - RBS INDIVIDUAL INFORMATION - Final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
[illegible]																								
[illegible]					CTU5992		CTU5992										CTL05992		CTL05992					
[illegible]					CTU5992		CTU5992										CTL05992		CTL05992					

Section 9 - SOFT SECTOR ID - Existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
ISDD (excluding hard sector)																								
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR ID - Final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
ISDD (excluding hard sector)																								
SECTOR A [illegible]					CTU59921		CTU5992A										CTL05992_7A_1		CTL05992_9A_1					
SECTOR B					CTU59922		CTU5992B										CTL05992_7B_1		CTL05992_9B_1					
SECTOR C					CTU59923		CTU5992C										CTL05992_7C_1		CTL05992_9C_1					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A [illegible]					YES		YES										YES		YES					
SECTOR B					YES		YES										YES		YES					
SECTOR C					YES		YES										YES		YES					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/LAC - Existing

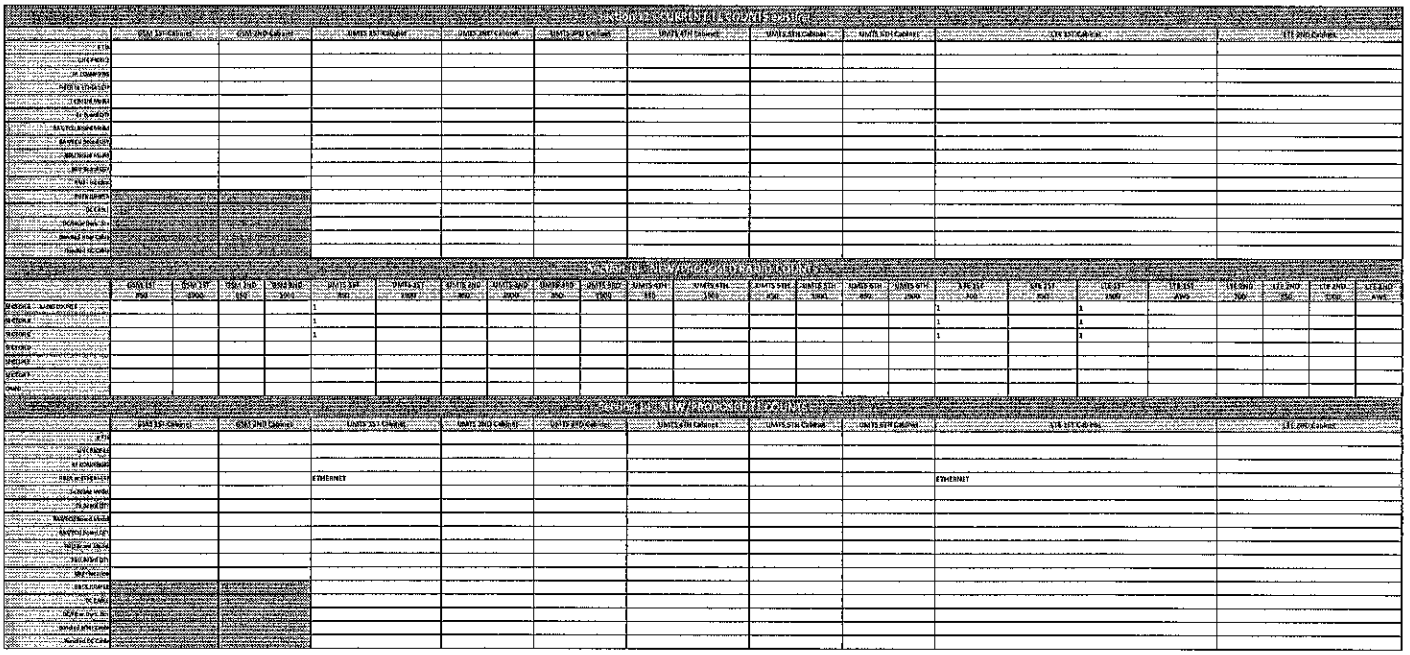
	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

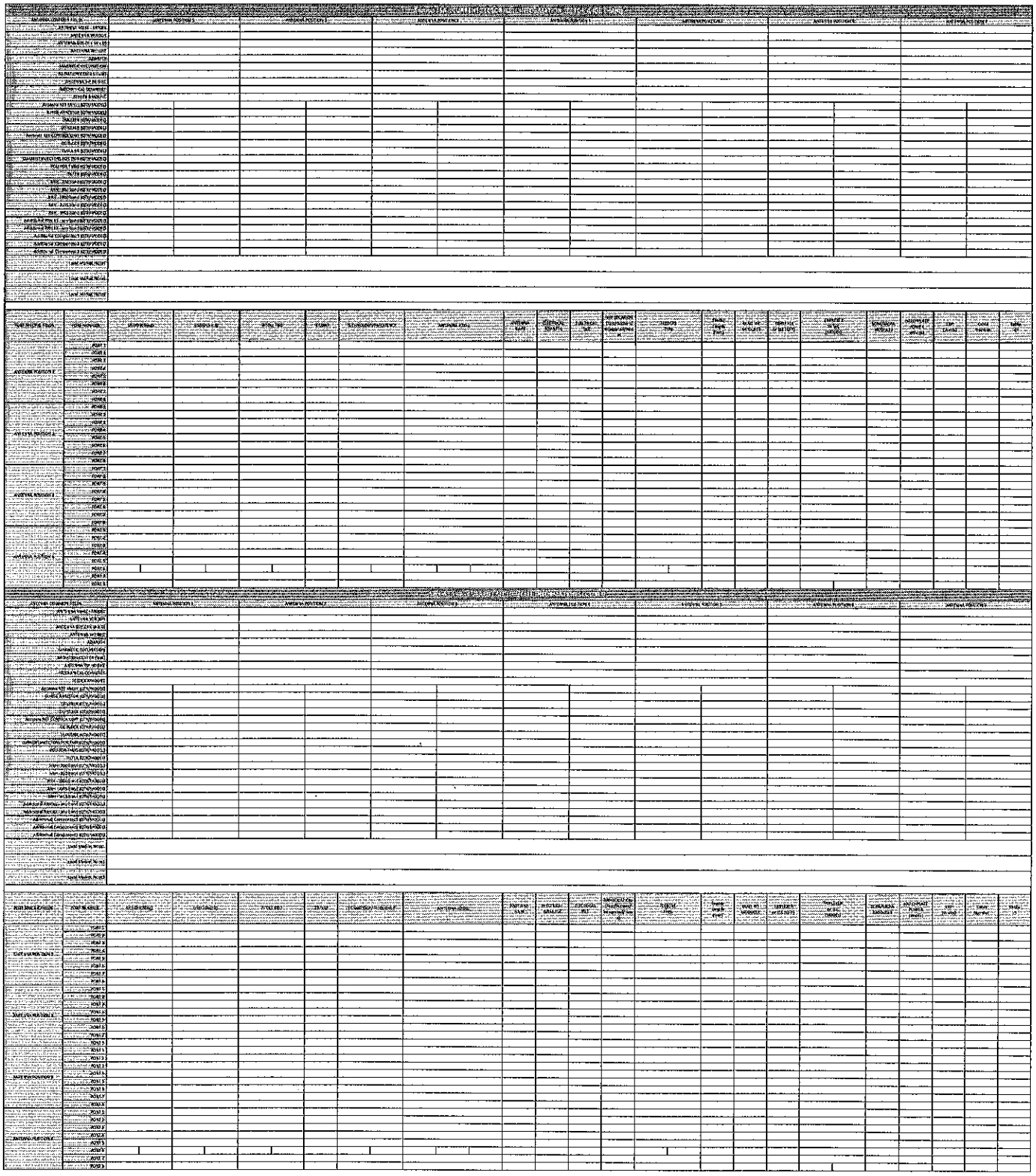
Section 11 - CID/LAC - Final

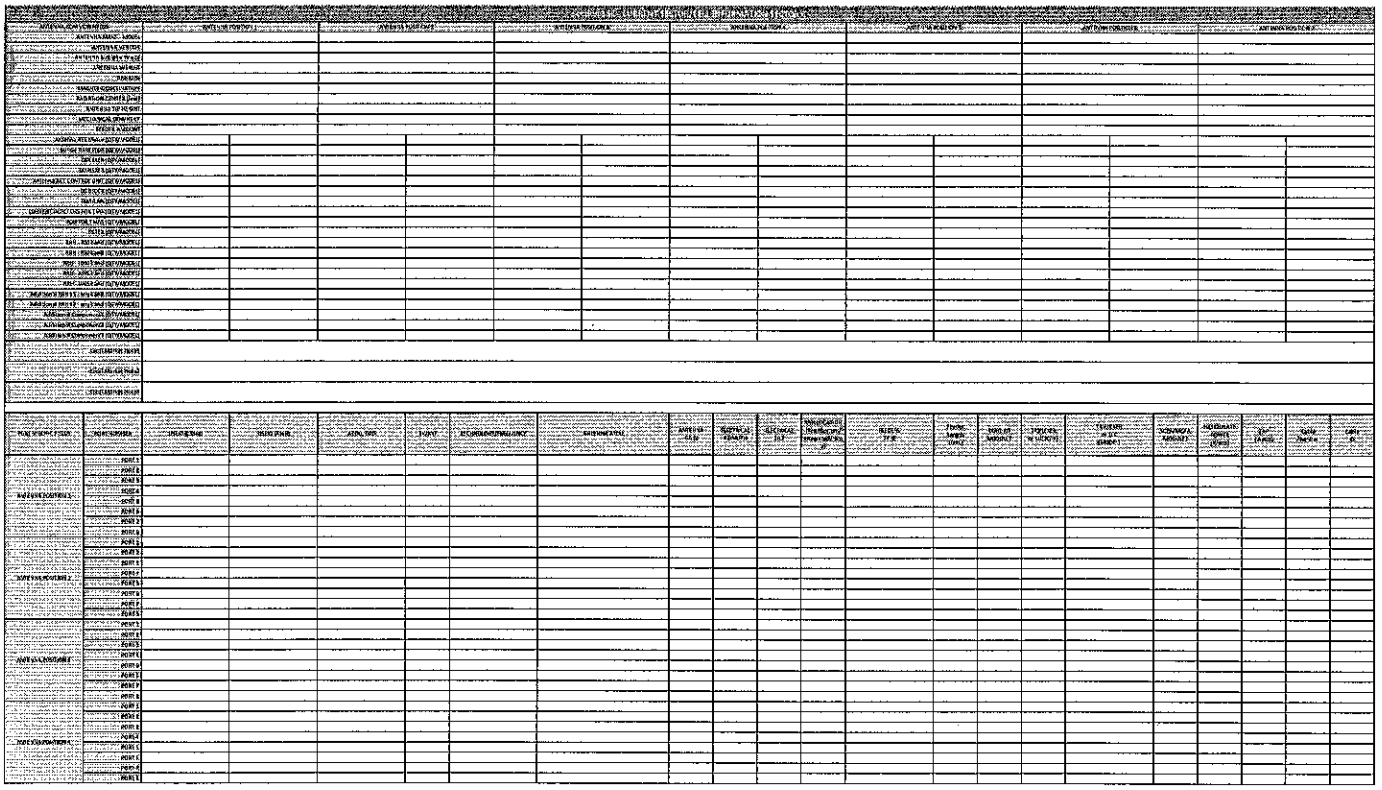
	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A [illegible]					59921		59924										15		8					
SECTOR B					59922		59925										16		9					
SECTOR C					59923		59926										17		10					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

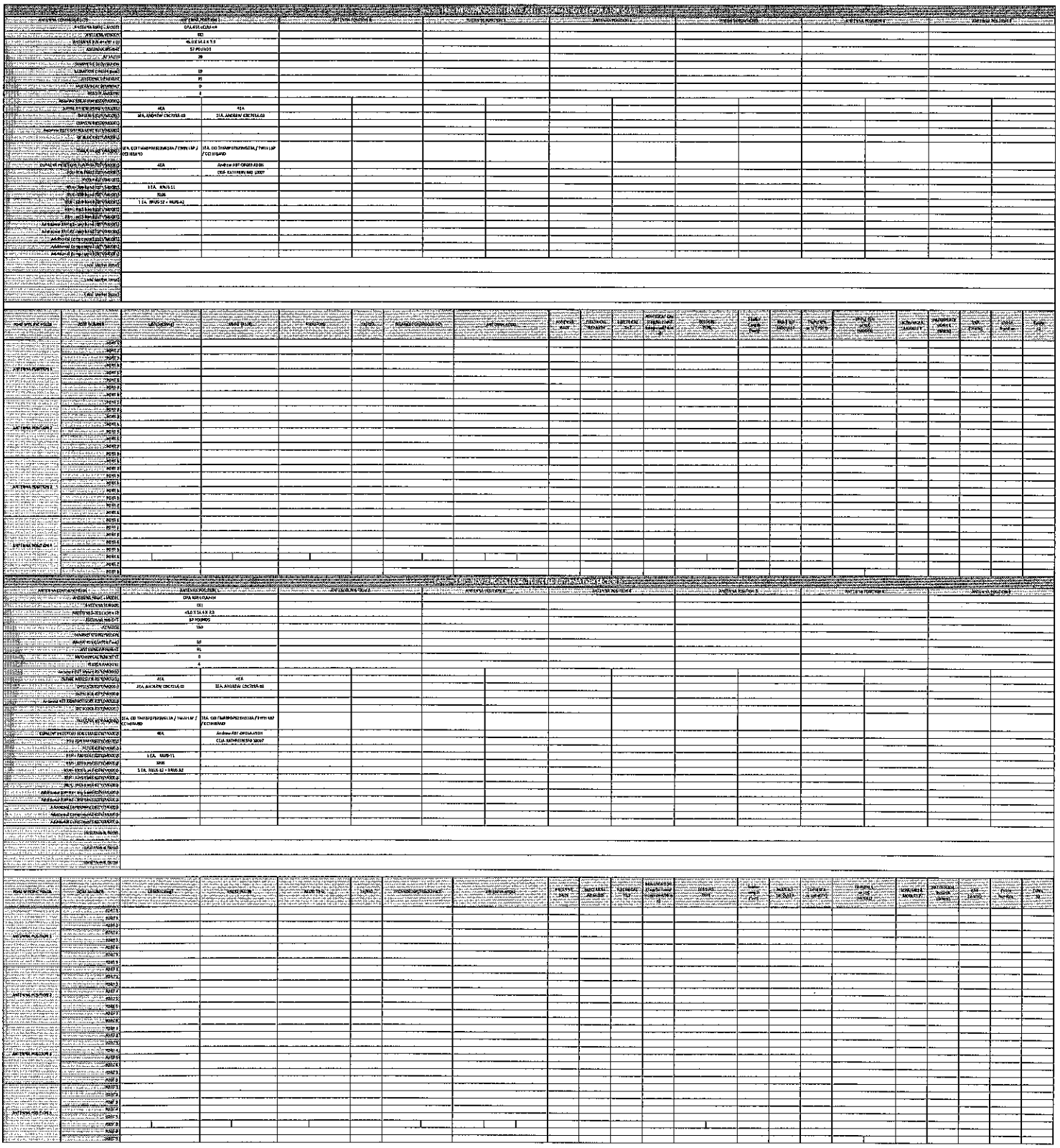
Section 12 - CURRENT RADIO COUNTS - Existing

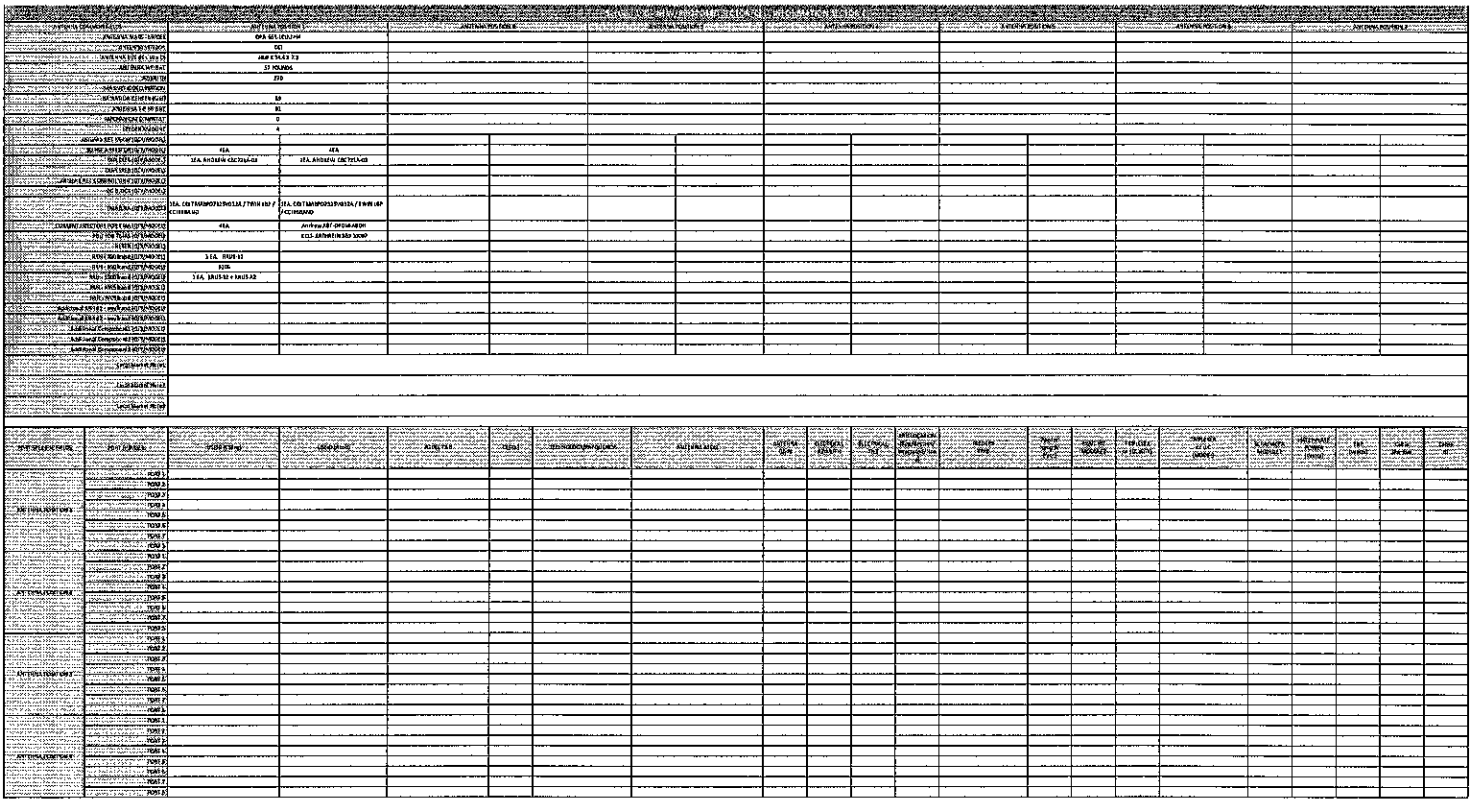
	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A [illegible]																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

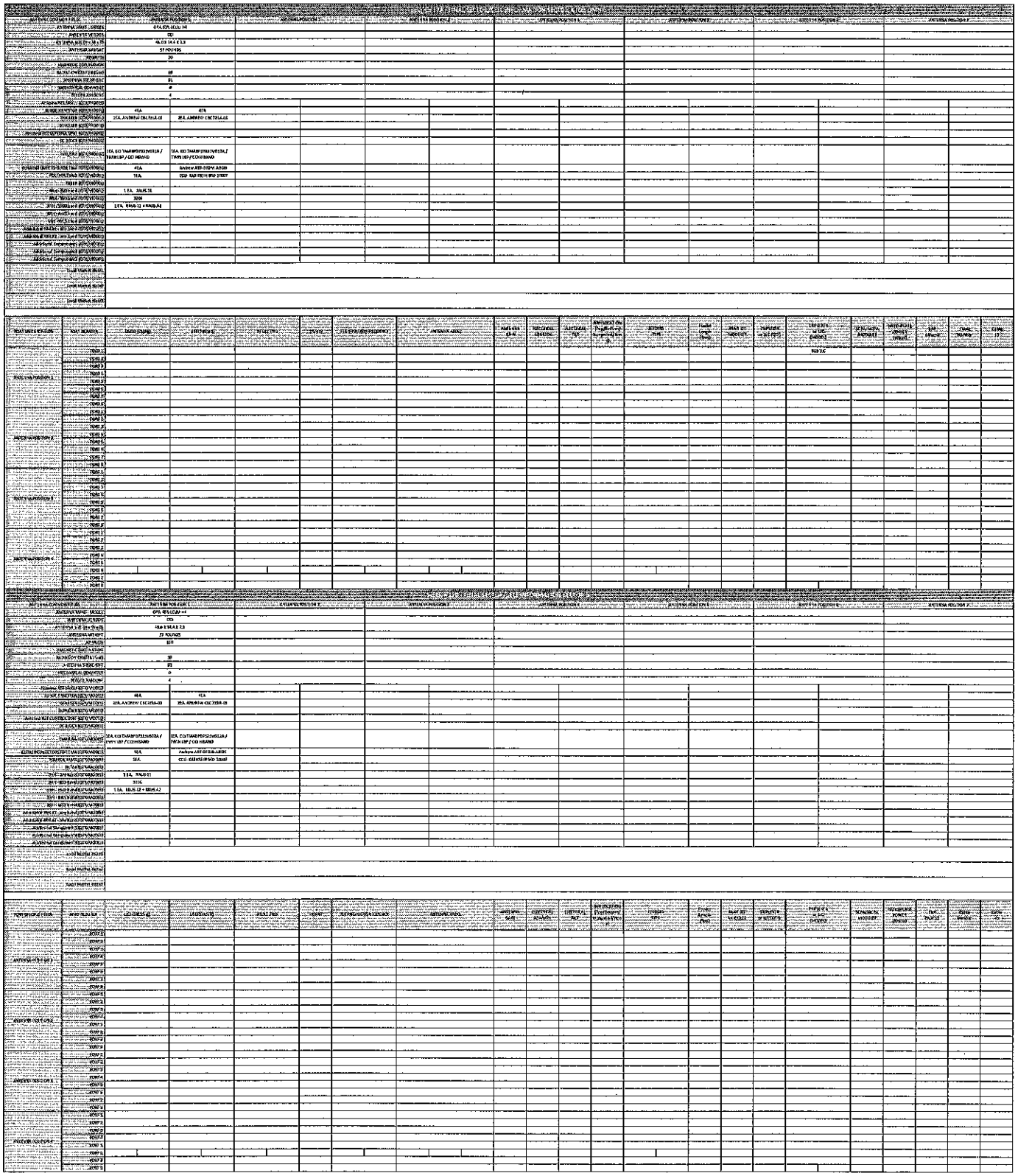










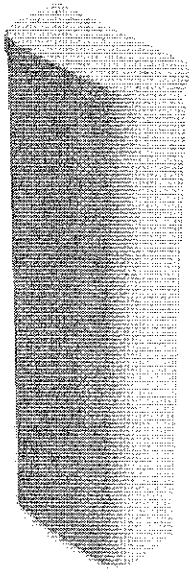


ANTENNA EQUIPMENT DETAIL	ANTENNA POSITION 1		ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MANUFACTURER / MODEL	OPA 65R-LCUU-H6							
ANTENNA VENDOR	CCI							
ANTENNA SIZE (H x W x D)	49.0 X 14.4 X 7.3							
ANTENNA WEIGHT	57 POUNDS							
AZIMUTH	270							
MAGNETIC DECLINATION								
RADIATION CENTER (feet)	62							
ANTENNA TIP HEIGHT	91							
MECHANICAL DOWNTILT	0							
FEEDER AMOUNT	4							
Antenna RET Motor (QTY/MODEL)								
SURGE ARRESTOR (QTY/MODEL)	4EA	4EA						
DIPLEXER (QTY/MODEL)	2EA. ANDREW CBC721A-43	2EA. ANDREW CBC721A-00						
DUPLEXER (QTY/MODEL)								
Antenna RET CONTROL UNIT (QTY/MODEL)								
DC BLOCK (QTY/MODEL)								
TMA/LNA (QTY/MODEL)	1EA. CCI TMABPD7823VG12A / TWIN LBP / CCI HBAND	1EA. CCI TMABPD7823VG12A / TWIN LBP / CCI HBAND						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	4EA	Andrew ABT-DFDM-ADBH						
PDU FOR TMAS (QTY/MODEL)	1EA	CCU [illegible]						
FILTER (QTY/MODEL)								
RRH - 700 band (QTY/MODEL)	1EA. RRUS-11							
RRH - 850 band (QTY/MODEL)	3106							
RRH - 1900 band (QTY/MODEL)	1EA. RRUS-32 + RRUS A2							
RRH - AWS band (QTY/MODEL)								
RRH - WCS band (QTY/MODEL)								
Additional RRH #1 - any band (QTY/MODEL)								
Additional RRH #2 - any band (QTY/MODEL)								
Additional Component 1 (QTY/MODEL)								
Additional Component 2 (QTY/MODEL)								
Additional Component 3 (QTY/MODEL)								
Local Market Note 1								
Local Market Note 2								
Local Market Note 3								

PORT SPECIFIC DATA	PORT NUMBER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ANTENNA GAIN	[illegible]	ELECTRICAL TILT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ANTENNA POSITION 1	PORT 1																				
	PORT 2																				
	PORT 3																				
	PORT 4																				
	PORT 5																				
	PORT 6																				
	PORT 7																				
	PORT 8																				
ANTENNA POSITION 2	PORT 1																				
	PORT 2																				
	PORT 3																				
	PORT 4																				
	PORT 5																				
	PORT 6																				
	PORT 7																				
	PORT 8																				
ANTENNA POSITION 3	PORT 1																				
	PORT 2																				
	PORT 3																				
	PORT 4																				
	PORT 5																				
	PORT 6																				
	PORT 7																				
	PORT 8																				
ANTENNA POSITION 4	PORT 1																				
	PORT 2																				
	PORT 3																				
	PORT 4																				
	PORT 5																				
	PORT 6																				
	PORT 7																				
	PORT 8																				

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H4



The CCI Octoport Multi-Band Antenna Array is an industry first 8-port antenna with full WCS Band Coverage. With four high band ports covering PCS, AWS and WCS bands, two 700 MHZ ports, and two 850 MHz ports our octoport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2155 MHz and WCS 2300 MHz coverage in a single enclosure.

Octoport Multi-Band Antenna Array

Benefits

- **RET System allows Independent Tilt of each band specific paired port**
- **Reduces tower loading**
- **Frees up space for tower mounted Remote Radio Heads**
- **Single radome with eight ports**
- **All Band design simplifies radio assignments**
- **Sharp elevation beam eases network planning**

Features

- High Band Ports include WCS Band
- Four High Band ports with four Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome

Applications

- 4x4 MIMO on High Band and Dual 2x2 MIMO on 700 & 850 Low Bands
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count

ISO 9001:2008

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H4

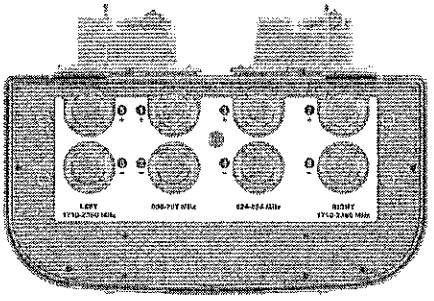
OPA-65R Multi-Band Antenna

Electrical Specifications

Frequency Range	2 X Low Band Ports (L) which cover the range from 698-787	2 X Low Band Ports (C) which cover the range from 824-894	4 X High Band Ports (H1 & H2) which cover the full range from 1710-2360 MHz			
			1850-1990 MHz	1710-1755/2110-2170 MHz		2305-2360 MHz
Gain	12.7 dBi	13.3 dBi	15.7 dBi	14.9 dBi	16.4 dBi	16.8 dBi
Azimuth Beamwidth (-3dB)	65°	63°	63°	68°	62°	58°
Elevation Beamwidth (-3dB)	18.9°	16.5°	8.9°	9.8°	7.7°	6.9°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -20 dB	< -18 dB	< -20 dB	< -20 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 28 dB	> 28 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Front-to-Back Ratio over ± 20°	> 28 dB	> 27 dB	> 28 dB	> 28 dB	> 26 dB	> 26 dB
Cross-Polar Discrimination (at Peak)	> 20 dB	> 20 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 15 dB	> 13 dB	> 17 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc	≤ -150dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical Specifications

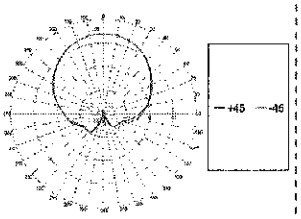
Dimensions (LxWxD)	48.0 x 14.4 x 7.3 inches (1218 x 366 x 185 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	152 lbs (676 N) @ 100 mph (161 kph)
Side Wind Load	86 lbs (381 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	5.9 ft^2 (0.60 m^2)
Weight (w/o RET/Mounting)	57 lbs (26 kg)
RET System Weight	7.0 lbs (3.0 kg)
Connector	8; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



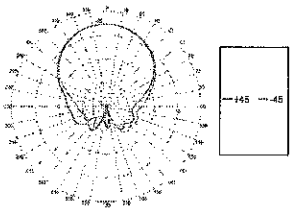
Bottom View

Rear View

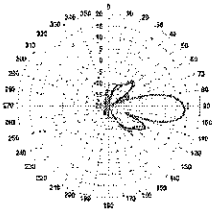
Antenna Patterns*



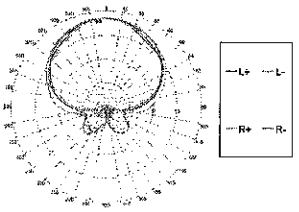
737 MHz Azimuth



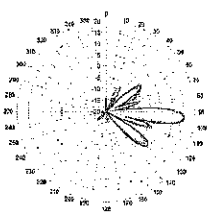
887 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



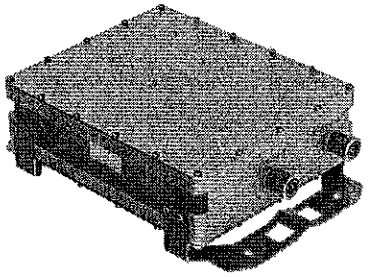
Elevation 4°

*Typical antenna patterns. For detail information on antenna pattern, please contact us at info@cciproducts.com. All specifications are subject to change without notice.

Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass

Tel: 201-342-3338 Fax: 201-342-3339 www.cciproducts.com

General Information



CCI's Triple Band TMA with 700/850 bypass contains two triple band TMA's in a single housing. The TMA's are fully duplexed and share a single LNA for all three bands. The bypass path provides excellent isolation to the TMA path. Separate antenna ports for the bypass path and TMA path are combined onto a single BTS port. Low noise high linearity amplifiers improve the uplink sensitivity and the receive performance of base stations. The TMA is fully compliant with the latest AISG 2.0 specification. The TMA supports CDMA, EDGE/GSM, UMTS and LTE BTS equipment. The TMA is ideally suited for sites upgraded to quad-band using the existing infrastructure. The TMA allows the sharing of feeder lines for both AWS and PCS bands thus reducing tower loading, leasing, and installation costs. The input and output connectors are located inline for ease of installation in space constrained areas such as uni-pole structures and stealth antennas.

ModelTMABPDB7823VG12A

Contents:

Features:

- Small lightweight unit
- Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass
- Independent Gain Control
- High linearity
- Lightning protected
- Fail-safe bypass mode
- High reliability

Technical Description

The TMA system is an outdoor quad band tower mount unit which provides low noise amplification of PCS, AWS, and WCS uplink signals combined with 700/850 bypassed signals from separate antenna ports to a common BTS port. The tower mount unit consists of 14 band-pass filters, two redundant low noise amplifiers (LNA) with bypass failure circuitry, two bias tees, AISG control circuitry, and lightning protection circuitry all housed in an IP68 enclosure suited to long life masthead mounting. The AWS, PCS and WCS paths are dual duplexed to separate the low power uplink signals from the high power down link signals at the BTS and antenna ports. The AWS, PCS, and WCS uplink signals are amplified with a dedicated ultra-low noise PHEMT LNA with adjustable gain control. The unit provides protection against lightning strikes via a multistage surge protection circuit. DC power and AISG 2.0 control is provided via the BTS feeder cable. The unit operates in current window alarm (CWA) mode until a valid AISG message is detected, at which point it automatically switches to AISG mode. Once in AISG mode, the unit can only switch back to CWA mode with the receipt of an AISG CCI vendor defined command. In CWA mode, the unit requires 12VDC at each BTS port and follows typical current window convention. In AISG mode, the unit will accept 10-30 VDC from either BTS port. In AISG mode, the unit does not require an AISG 2.0 compatible site control unit (SCU) and may also be powered by a standard power distribution unit (PDU).

An optional Site Control Unit (SCU) is available to power up to 32 AISG modules per sector and to provide the monitoring and alarm functions for the system. The SCU is housed in a single (1U) 1.75" x 19" rack and contains dual redundant power supplies capable of being "hot swapped" that provide a regulated DC supply voltage on the RF coax for the tower mount amplifiers.

CCI Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass Typical Specifications

Description	Typical Specifications			
Electrical Specifications	**700/850**	**PCS**	**AWS**	**WCS**
Receive Frequency Range	-	1850 – 1910 MHz	1710 – 1755 MHz	2305 – 2320 MHz
Transmit Frequency Range	-	1930 – 1990 MHz	2110 – 2155 MHz	2345 – 2360 MHz
Bypass Frequency Range	698 - 894 MHz	-	-	-
Amplifier Gain	-	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG
Gain Variation	-	±1.0 dB	±1.0 dB	±1.0 dB
System Noise Figure	-	1.4 dB Typ.	1.3 dB Typ.	1.3 dB Typ.
Input Third Order Intercept Point	-	+12 dBm Min at Max. Gain		
Input / Output Return Loss	18 dB Min all ports, 12 dB Min. Bypass Mode			
Insertion Loss	0.25 dB Typ.			
Transmit Passband	-	0.5 dB Typical	0.4 dB Typical	0.4 dB Typical
Bypass Mode, (PCS/AWS/WCS) Rx Passband	-	2.5 dB Typ.	2.5 dB Typ.	2.5 dB Typ.
Filter Characteristics				
Continuous Average Power	200 Watts max			
Peak Envelope Power	2 KW max			
Intermodulation Performance				
IMD at ANT port in Rx Band	< -112 dBm (-155 dBc) [2 tones at +43 dBm]			
Operating Voltage	+10V to +30V DC provided via coax or AISG			
Power Consumption	<2.0 Watts			
Mechanical Specifications				
Connectors	DIN 7-16 female x 2; AISG x 1			
Dimensions (Body Only)	10.63" (H) x 11.024" (W) x 3.72" (D); (290.60 (H) x 280.00 (W) x 95.0 (D) mm)			
Dimensions (with Conn. & Bracket)	14.25" (H) x 11.024" (W) x 4.11" (D); (362.00 (H) x 280.00 (W) x 104.40 (D) mm)			
Weight	23.1 Lbs. (10.5 Kg) - with Brackets; 22 Lbs. (10 Kg) - without brackets			
Mounting	Pole/Wall Mounting Bracket			
Environmental Specifications				
Operating Temperature	-40° C to +65°C			
Lightning Protection	8/20us, ±2KA max, 10 strikes each, IEC61000-4-5			
Enclosure	IP68			
MTBF	>500,000 hours			

All specifications are subject to change. The latest specifications are available at www.cciproducts.com

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Greenwich; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA-222-F wind speed controls.	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)