

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

NOV 22 2013

PUBLIC SERVICE
COMMISSION

CASE NO.: 2013-00397

In the Matter of:

THE APPLICATION OF)
NEW CINGULAR WIRELESS PCS, LLC)
FOR ISSUANCE OF A CERTIFICATE OF PUBLIC)
CONVENIENCE AND NECESSITY TO CONSTRUCT)
A WIRELESS COMMUNICATIONS FACILITY)
IN THE COMMONWEALTH OF KENTUCKY)
IN THE COUNTY OF PULASKI)

SITE NAME: INGLE

APPLICATION FOR
CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY
FOR CONSTRUCTION OF A WIRELESS COMMUNICATIONS FACILITY

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility ("Applicant"), by counsel, pursuant to (i) KRS §§ 278.020, 278.040, 278.650, 278.665, and other statutory authority, and the rules and regulations applicable thereto, and (ii) the Telecommunications Act of 1996, respectfully submits this Application requesting issuance of a Certificate of Public Convenience and Necessity ("CPCN") from the Kentucky Public Service Commission ("PSC") to construct, maintain, and operate a Wireless Communications Facility ("WCF") to serve the customers of the Applicant with wireless communications services.

In support of this Application, Applicant respectfully provides and states the following information:

1. The complete name and address of the Applicant: New Cingular Wireless

PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility, having a local address of 601 West Chestnut Street, Louisville, Kentucky 40203.

2. Applicant proposes construction of an antenna tower for communications services, which is to be located in an area outside the jurisdiction of a planning commission, and Applicant submits this application to the PSC for a certificate of public convenience and necessity pursuant to KRS §§ 278.020(1), 278.040, 278.650, 278.665, and other statutory authority.

3. The Certificate of Authority filed with the Kentucky Secretary of State for the Applicant entity was attached to a prior application and is part of the case record for PSC case number 2011-00473 and is hereby incorporated by reference.

4. The Applicant operates on frequencies licensed by the Federal Communications Commission ("FCC") pursuant to applicable FCC requirements. A copy of the Applicant's FCC license to provide wireless services is attached to this Application or described as part of **Exhibit A**, and the facility will be constructed and operated in accordance with applicable FCC regulations.

5. The public convenience and necessity require the construction of the proposed WCF. The construction of the WCF will bring or improve the Applicant's services to an area currently not served or not adequately served by the Applicant by increasing coverage or capacity and thereby enhancing the public's access to innovative and competitive wireless communications services. The WCF will provide a necessary link in the Applicant's communications network that is designed to meet the increasing demands for wireless services in Kentucky's wireless communications service area. The WCF is an

integral link in the Applicant's network design that must be in place to provide adequate coverage to the service area.

6. To address the above-described service needs, Applicant proposes to construct a WCF at 1867 New Hope Road, Nancy, KY 42544 (37°06'13.87" North latitude, 84°50'17.67" West longitude), on a parcel of land located entirely within the county referenced in the caption of this application. The property on which the WCF will be located is owned by Larry and Glenda Kay Lyons pursuant to a Deed recorded at Deed Book 503, Page 342 in the office of the Pulaski County Clerk. The proposed WCF will consist of a 250-foot tall tower, with an approximately 15-foot tall lightning arrestor attached at the top, for a total height of 265-feet. The WCF will also include concrete foundations and a shelter or cabinets to accommodate the placement of the Applicant's radio electronics equipment and appurtenant equipment. The Applicant's equipment cabinet or shelter will be approved for use in the Commonwealth of Kentucky by the relevant building inspector. The WCF compound will be fenced and all access gate(s) will be secured. A description of the manner in which the proposed WCF will be constructed is attached as **Exhibit B** and **Exhibit C**.

7. A list of utilities, corporations, or persons with whom the proposed WCF is likely to compete is attached as **Exhibit D**, along with a map of suitable scale showing the location of the proposed new construction as well as the location of any like facilities located anywhere within the map area, along with a map key showing the owner of such other facilities.

8. The site development plan and a vertical profile sketch of the WCF signed

and sealed by a professional engineer registered in Kentucky depicting the tower height, as well as a proposed configuration for the antennas of the Applicant has also been included as part of **Exhibit B**.

9. Foundation design plans signed and sealed by a professional engineer registered in Kentucky and a description of the standards according to which the tower was designed are included as part of **Exhibit C**.

10. Applicant has considered the likely effects of the installation of the proposed WCF on nearby land uses and values and has concluded that there is no more suitable location reasonably available from which adequate services can be provided, and that there are no reasonably available opportunities to co-locate Applicant's antennas on an existing structure. When suitable towers or structures exist, Applicant attempts to co-locate on existing structures such as communications towers or other structures capable of supporting Applicant's facilities; however, no other suitable or available co-location site was found to be located in the vicinity of the site. A report detailing Applicant's site selection process for the subject site (including documentation as to why co-location is not possible for this site) is attached as **Exhibit E**.

11. A Determination of No Hazard to Air Navigation has been issued by the Federal Aviation Administration ("FAA") and is attached as **Exhibit F**.

12. A copy of a Conditional Approval for the proposed WCF issued by the Kentucky Airport Zoning Commission ("KAZC") is attached as **Exhibit G**.

13. A geotechnical engineering firm has performed soil boring(s) and subsequent geotechnical engineering studies at the WCF site. A copy of the geotechnical engineering

report, signed and sealed by a professional engineer registered in the Commonwealth of Kentucky, is attached as **Exhibit H**. The name and address of the geotechnical engineering firm and the professional engineer registered in the Commonwealth of Kentucky who supervised the examination of this WCF site are included as part of this exhibit.

14. Clear directions to the proposed WCF site from the County seat are attached as **Exhibit I**. The name and telephone number of the preparer of **Exhibit I** are included as part of this exhibit.

15. Applicant, pursuant to a written agreement, has acquired the right to use the WCF site and associated property rights. A copy of the abbreviated form of the lease agreement is attached as **Exhibit J**.

16. Personnel directly responsible for the design and construction of the proposed WCF are well qualified and experienced. The tower and foundation drawings for the proposed tower submitted as part of **Exhibit C** bear the signature and stamp of a professional engineer registered in the Commonwealth of Kentucky. All tower designs meet or exceed the minimum requirements of applicable laws and regulations.

17. The Construction Manager for the proposed facility is Ron Rohr, and the identity and qualifications of each person directly responsible for design and construction of the proposed tower are contained **Exhibits B & C**.

18. As noted on the Survey attached as part of **Exhibit B**, the surveyor has determined that the site is not within any flood hazard area.

19. **Exhibit B** includes a map drawn to a scale of no less than 1 inch equals 200

feet that shows the location of the proposed tower and identifies every owner of real estate within 500 feet of the proposed tower (according to the records maintained by the County Property Valuation Administrator). Every structure and every easement within 500 feet of the proposed tower or within 200 feet of the access road including intersection with the public street system is illustrated in **Exhibit B**.

20. Applicant has notified every person who, according to the records of the County Property Valuation Administrator, owns property which is within 500 feet of the proposed tower or contiguous to the site property, by certified mail, return receipt requested, of the proposed construction. Each notified property owner has been provided with a map of the location of the proposed construction, the telephone number and address of the PSC, and has been informed of his or her right to request intervention. A list of the notified property owners and a copy of the form of the notice sent by certified mail to each landowner are attached as **Exhibit K** and **Exhibit L**, respectively.

21. Applicant has notified the applicable County Judge/Executive by certified mail, return receipt requested, of the proposed construction. This notice included the PSC docket number under which the application will be processed and informed the County Judge/Executive of his/her right to request intervention. A copy of this notice is attached as **Exhibit M**.

22. Notice signs meeting the requirements prescribed by 807 KAR 5:063, Section 1(2) that measure at least 2 feet in height and 4 feet in width and that contain all required language in letters of required height, have been posted, one in a visible location on the proposed site and one on the nearest public road. Such signs shall remain posted for at

least two weeks after filing of the Application, and a copy of the posted text is attached as **Exhibit N**. Notice of the location of the proposed facility has also been published in a newspaper of general circulation in the county in which the WCF is proposed to be located.

23. The general area where the proposed facility is to be located is rural. No residential structures are located within a 500-foot radius of the proposed tower location.

24. The process that was used by the Applicant's radio frequency engineers in selecting the site for the proposed WCF was consistent with the general process used for selecting all other existing and proposed WCF facilities within the proposed network design area. Applicant's radio frequency engineers have conducted studies and tests in order to develop a highly efficient network that is designed to handle voice and data traffic in the service area. The engineers determined an optimum area for the placement of the proposed facility in terms of elevation and location to provide the best quality service to customers in the service area. A radio frequency design search area prepared in reference to these radio frequency studies was considered by the Applicant when searching for sites for its antennas that would provide the coverage deemed necessary by the Applicant. A map of the area in which the tower is proposed to be located which is drawn to scale and clearly depicts the necessary search area within which the site should be located pursuant to radio frequency requirements is attached as **Exhibit O**.

25. All Exhibits to this Application are hereby incorporated by reference as if fully set out as part of the Application.

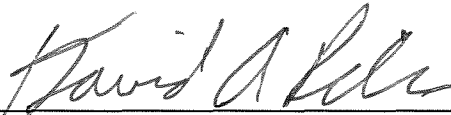
26. All responses and requests associated with this Application may be directed to:

David A. Pike
Pike Legal Group, PLLC
1578 Highway 44 East, Suite 6
P. O. Box 369
Shepherdsville, KY 40165-0369
Telephone: (502) 955-4400
Telefax: (502) 543-4410
Email: dpike@pikelegal.com

Patrick W. Turner
General Attorney-Kentucky
AT&T Kentucky
1600 Williams Street
Suite 5200
Columbia, South Carolina 29201
Telephone: (803) 401-2900
Telefax: (803) 254-1731
Email: pt1285@att.com

WHEREFORE, Applicant respectfully request that the PSC accept the foregoing Application for filing, and having met the requirements of KRS §§ 278.020(1), 278.650, and 278.665 and all applicable rules and regulations of the PSC, grant a Certificate of Public Convenience and Necessity to construct and operate the WCF at the location set forth herein.

Respectfully submitted,



David A. Pike
Pike Legal Group, PLLC
1578 Highway 44 East, Suite 6
P. O. Box 369
Shepherdsville, KY 40165-0369
Telephone: (502) 955-4400
Telefax: (502) 543-4410
Email: dpike@pikelegal.com
Attorney for New Cingular Wireless PCS, LLC
d/b/a AT&T Mobility

LIST OF EXHIBITS

- A - FCC License Documentation
- B - Site Development Plan:
 - 500' Vicinity Map
 - Legal Descriptions
 - Flood Plain Certification
 - Site Plan
 - Vertical Tower Profile
- C - Tower and Foundation Design
- D - Competing Utilities, Corporations, or Persons List and Map of Like Facilities in Vicinity
- E - Co-location Report
- F - FAA
- G - Kentucky Airport Zoning Commission
- H - Geotechnical Report
- I - Directions to WCF Site
- J - Copy of Real Estate Agreement
- K - Notification Listing
- L - Copy of Property Owner Notification
- M - Copy of County Judge/Executive Notice
- N - Copy of Posted Notices
- O - Copy of Radio Frequency Design Search Area



EXHIBIT A
FCC LICENSE DOCUMENTATION

ULS License

Cellular License - KNKN964 - NEW CINGULAR WIRELESS PCS, LLC

Call Sign	KNKN964	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA448 - Kentucky 6 - Madison	Channel Block	B
Submarket	0	Phase	2

Dates

Grant	10/05/2010	Expiration	10/01/2020
Effective	05/02/2013	Cancellation	

Five Year Buildout Date

05/30/1996

Control Points

1	2601 Palumbo Drive, Lexington, KY
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Licensee

FRN	0003291192	Type	Limited Liability Company
-----	------------	------	---------------------------

Licensee

NEW CINGULAR WIRELESS PCS, LLC 2200 N. Greenville Ave, 1W Richardson, TX 75082 ATTN Reginald Youngblood	P:(972)234-7003 F:(972)301-6893 E:FCCMW@att.com
--	---

Contact

AT&T MOBILITY LLC MICHAEL P GOGGIN 1120 20th Street, NW - Suite 1000 WASHINGTON, DC 20036 ATTN Michael P. Goggin	P:(202)457-2055 F:(202)457-3073 E:michael.p.goggin@att.com
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Ownership and Qualifications

Radio Service Type	Mobile
Regulatory Status	Common Carrier Interconnected Yes

Alien Ownership

The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Demographics

Race	
Ethnicity	Gender

ULS License

Cellular License - KNKN965 - New Cingular Wireless PCS, LLC

Call Sign	KNKN965	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA448 - Kentucky 6 - Madison	Channel Block	B
Submarket	0	Phase	2

Dates

Grant	08/30/2011	Expiration	10/01/2021
Effective	05/08/2013	Cancellation	

Five Year Buildout Date

03/20/1997

Control Points

3 500 W. Dove Rd., TARRANT, Southlake, TX
P: (800)264-6620

Licensee

FRN	0003291192	Type	Limited Liability Company
-----	------------	------	---------------------------

Licensee

New Cingular Wireless PCS, LLC 2200 N. Greenville Ave, 1W Richardson, TX 75082 ATTN Reginald Youngblood	P:(972)234-7003 F:(972)301-6893 E:FCCMW@att.com
--	---

Contact

AT&T Mobility LLC Michael P Goggin 1120 20th Street, NW - Suite 1000 Washington, DC 20036 ATTN Michael P. Goggin	P:(202)457-2055 F:(202)457-3073 E:michael.p.goggin@att.com
--	--

Ownership and Qualifications

Radio Service Type Mobile
Regulatory Status Common Carrier Interconnected Yes

Alien Ownership

The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Demographics

Race		Gender	
Ethnicity			

ULS License

PCS Broadband License - WPOI255 - NEW CINGULAR WIRELESS PCS, LLC

Call Sign	WPOI255	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Market

Market	MTA026 - Louisville-Lexington-Evansvill	Channel Block	A
Submarket	19	Associated Frequencies (MHz)	001850.00000000- 001865.00000000- 001930.00000000- 001945.00000000

Dates

Grant	07/07/2005	Expiration	06/23/2015
Effective	11/24/2012	Cancellation	

Buildout Deadlines

1st	06/23/2000	2nd	06/23/2005
-----	------------	-----	------------

Notification Dates

1st	07/07/2000	2nd	02/17/2005
-----	------------	-----	------------

Licensee

FRN	0003291192	Type	Limited Liability Company
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Licensee

NEW CINGULAR WIRELESS PCS, LLC 2200 N. Greenville Ave, 1W Richardson, TX 75082 ATTN Reginald Youngblood	P:(972)234-7003 F:(972)301-6893 E:FCCMW@att.com
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--	--

Ownership and Qualifications

Radio Service Type	Mobile
Regulatory Status	Common Carrier Interconnected Yes

Alien Ownership

The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

ULS License

PCS Broadband License - WPOK659 - New Cingular Wireless PCS, LLC

Call Sign	WPOK659	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Market

Market	BTA423 - Somerset, KY	Channel Block	C
Submarket	1	Associated Frequencies (MHz)	001895.00000000- 001910.00000000- 001975.00000000- 001990.00000000

Dates

Grant	10/29/2009	Expiration	09/29/2019
Effective	11/24/2012	Cancellation	

Buildout Deadlines

1st	09/29/2004	2nd	09/29/2009
-----	------------	-----	------------

Notification Dates

1st	09/12/2003	2nd	09/01/2009
-----	------------	-----	------------

Licensee

FRN	0003291192	Type	Limited Liability Company
-----	------------	------	---------------------------

Licensee

New Cingular Wireless PCS, LLC 2200 N. Greenville Ave, 1W Richardson, TX 75082 ATTN Reginald Youngblood	P:(972)234-7003 F:(972)301-6893 E:FCCMW@att.com
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Ownership and Qualifications

Radio Service Type	Mobile
Regulatory Status	Common Carrier Interconnected Yes

Alien Ownership

The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

ULS License

PCS Broadband License - WPXT205 - NEW CINGULAR WIRELESS PCS, LLC

Call Sign	WPXT205	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Market

Market	MTA026 - Louisville-Lexington-Evansvill	Channel Block	A
Submarket	8	Associated Frequencies (MHz)	001850.00000000-001865.00000000-001930.00000000-001945.00000000

Dates

Grant	08/01/2005	Expiration	06/23/2015
Effective	11/24/2012	Cancellation	

Buildout Deadlines

1st	06/23/2000	2nd	06/23/2005
-----	------------	-----	------------

Notification Dates

1st	07/07/2000	2nd	06/09/2005
-----	------------	-----	------------

Licensee

FRN	0003291192	Type	Limited Liability Company
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Licensee

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Demographics

Race

Ethnicity

Gender



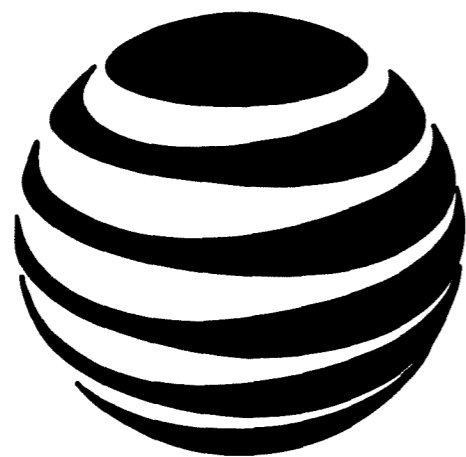
EXHIBIT B

SITE DEVELOPMENT PLAN:

**500' VICINITY MAP
LEGAL DESCRIPTIONS
FLOOD PLAIN CERTIFICATION
SITE PLAN
VERTICAL TOWER PROFILE**



EXHIBIT C
TOWER AND FOUNDATION DESIGN



at&t

SITE NAME:
INGLE

SITE NUMBER:
KYALU5160

PROPOSED RAW LAND SITE WITH
NEW 250 FT SELF SUPPORT TOWER
WITH A 15' LIGHTNING ARRESTOR



Know what's below.
Call before you dig.

SHEET INDEX

T1	TITLE SHEET
SURVEY	
B-1	SITE SURVEY
B-2	500' RADIUS AND ABBUTER'S MAP
ZONING	
A1	SITE PLAN
A2	COMPOUND PLAN
A3	TOWER ELEVATION

CONTACT INFORMATION

FIRE DEPARTMENT
NANCY FIRE DEPARTMENT
PHONE: (606) 636-6464

POLICE DEPARTMENT
SOMERSET POLICE DEPARTMENT
(606) 678-5176

ELECTRIC COMPANY
RECC
(606) 678-4121

TELEPHONE COMPANY
WINDSTREAM
(606) 679-4584

BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION FOR THE LOCATION.

CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE 318

AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION

TELECOMMUNICATIONS INDUSTRY ASSOCIATION TIA-222

STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND SUPPORTING STRUCTURES TIA-601.

COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS.

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS IEEE-81, IEEE 1100, IEEE C62.41.

ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

2012 IBC

2011 NEC

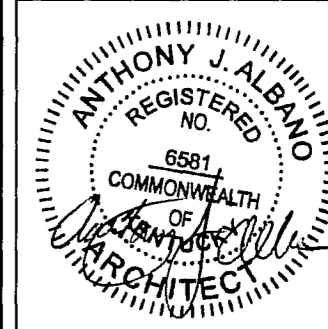
FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN.



FMHC DESIGN, INC
ARCHITECTURE/TELECOMMUNICATIONS
1700 SHERWIN AVENUE
DES PLAINES, IL 60018
TEL: 773-380-3800
FAX: 773-693-0850

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DRAWN BY : JD'E, AB

APPROVED BY : AA

09/04/13 ISSUED FOR ZONING

08/30/13 ISSUED FOR ZONING

SITE # KYALU5160
INGLE
1867 NEW HOPE ROAD
NANCY, KY 42544
PULASKI COUNTY

SHEET TITLE

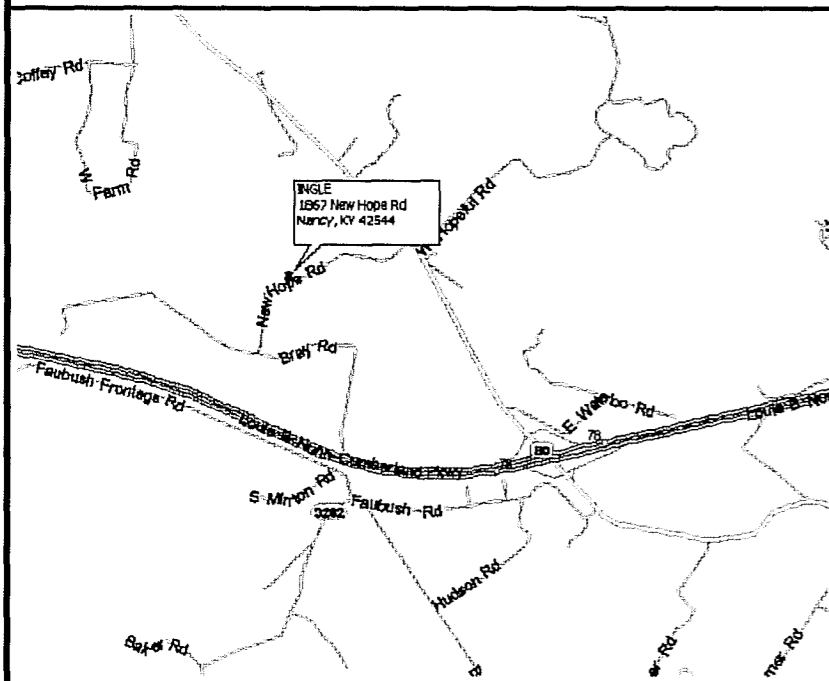
TITLE SHEET

SHEET NUMBER

T1

PROJECT NUMBER : 8207

VICINITY MAP



DRIVE DIRECTIONS

FROM PULASKI COUNTY COURTHOUSE AT 100 N MAIN #208 ST SOMERSET, KY 42501:

START OUT GOING NORTHEAST ON KY-1247 TOWARD S. VINE ST. 1.0 MILES 1.0 MILES

TURN LEFT ONTO KY-80 W. 3.1 MILES 3.1 MILES

TURN RIGHT ONTO KY-914 W/SOUTHEASTERN BYP. 0.4 MILES 0.4 MILES

TURN SLIGHT LEFT TO TAKE THE RAMP TOWARD BOWLING GREEN/CUMBERLAND PKY. 0.6 MILES 0.6 MILES

MERGE ONTO LOUIE B NUNN CUMBERLAND PKY. 7.7 MILES 7.7 MILES

TAKE THE KY-80 EXIT, EXIT 78, TOWARD NANCY 0.4 MILES 0.4 MILES

TURN RIGHT ONTO KY-80 W. 1.0 MILES 1.0 MILES

TURN LEFT ONTO NEW HOPE RD. 0.6 MILES 0.6 MILES

1867 NEW HOPE RD IS ON THE LEFT

SCOPE OF WORK

CONSTRUCTION DRAWINGS FOR:
CONSTRUCTION OF A NEW UNMANNED TELECOMMUNICATIONS FACILITY

SITE WORK:
NEW SELF SUPPORT TOWER, UNMANNED EQUIPMENT SHELTER ON A CONCRETE FOUNDATION, AND UTILITY INSTALLATIONS

PROJECT INFORMATION

COUNTY: PULASKI

GROUND LANDLORD/SITE ADDRESS: LARRY & GLENDA KAY LYONS, 1867 NEW HOPE ROAD, NANCY, KY 42544

APPLICANT/LESSEE: AT&T MOBILITY, FLOOR 1, 601 W CHESTNUT LOUISVILLE, KY 40203-2034

LATITUDE: 37° 06' 13.87" N
LONGITUDE: 84° 50' 17.67" W

GROUND ELEVATION: 1138' AMSL

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS IEEE-81, IEEE 1100, IEEE C62.41.

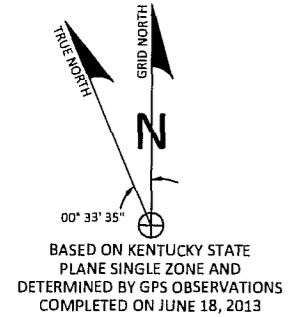
ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

2012 IBC

2011 NEC

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN.

DEPARTMENT	NAME / SIGNATURE	DATE
LAND/TOWER OWNER		
SITE ACQUISITION AGENT		
ZONING/PERMITTING AGENT		
A&E MANAGER		
CONSTRUCTION MANAGER		
RF ENGINEER		



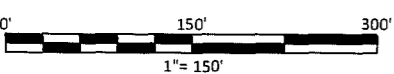
BASED ON KENTUCKY STATE PLANE SINGLE ZONE AND DETERMINED BY GPS OBSERVATIONS COMPLETED ON JUNE 18, 2013

TEMPORARY BENCHMARK
 NORTHING: 3562683.24
 EASTING: 5187075.81
 ELEVATION: 1131.52
 LOCATION: BEING A SET IPC LOCATED IN THE WEST CORNER OF THE PROPOSED LEASE AREA.

FAA COORDINATE POINT
 NAD 83
 LATITUDE: 37° 06' 13.87"
 LONGITUDE: 84° 50' 17.67"
 NAVD 88
 ELEVATION: 1138' AMSL
 NORTHING: 3562696.60
 EASTING: 5187145.33

LEGEND

	UTILITY POLE		EOP	EDGE OF PAVEMENT
	LIGHT POST		CONC	CONCRETE
	TELCO PEDESTAL		ROW	RIGHTS OF WAY
	TRANSFORMER		POB	POINT OF BEGINNING
	GUY WIRE		IPC	IRON PIN CAPPED
	OHE		OHE & T	EX. OVERHEAD ELECTRIC & TELEPHONE
	UGFO		UGFO	EX. UNDERGROUND FIBER OPTIC
	X		X	EX. FENCE LINE
	- - -		- - -	EX. DITCH
	●		●	SET 1/2" REBAR 18" LONG (UNLESS OTHERWISE NOTED)
	○		○	FOUND MONUMENT AS NOTED



GENERAL NOTES
 BASIS OF BEARING IS GPS OBSERVATIONS COMPLETED ON JUNE 18, 2013.
 NO SEARCH OF PUBLIC RECORDS HAS BEEN COMPLETED BY POD GROUP TO DETERMINE ANY DEFECTS AND/OR AMBIGUITIES IN THE TITLE OF THE SUBJECT PROPERTY.
 THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT TRACT.
 THIS PROPERTY IS SUBJECT TO ANY RECORDED EASEMENTS AND/OR RIGHTS OF WAY SHOWN HEREON OR NOT.
 THIS DRAWING IS NOT INTENDED FOR LAND TRANSFER.

LAND SURVEYOR'S CERTIFICATE
 I HEREBY CERTIFY THAT THE SURVEY OF THE LEASE AREA DEPICTED BY THE PLAT WAS PERFORMED BY PERSONS UNDER MY DIRECT SUPERVISION BY THE METHOD OF RANDOM TRAVERSE WITH SIDE SHOTS. THE UNADJUSTED PRECISION RATIO OF THE TRAVERSE EXCEEDED 1:10,000 AND WAS NOT ADJUSTED FOR CLOSURE. THIS SURVEY MEETS OR EXCEEDS THE MINIMUM STANDARDS FOR AN URBAN SURVEY FOR THE LEASE AREA AS ESTABLISHED BY THE STATE OF KENTUCKY, PER 201 KAR 18:150 AND IN EFFECT ON THE DATE OF THIS SURVEY.

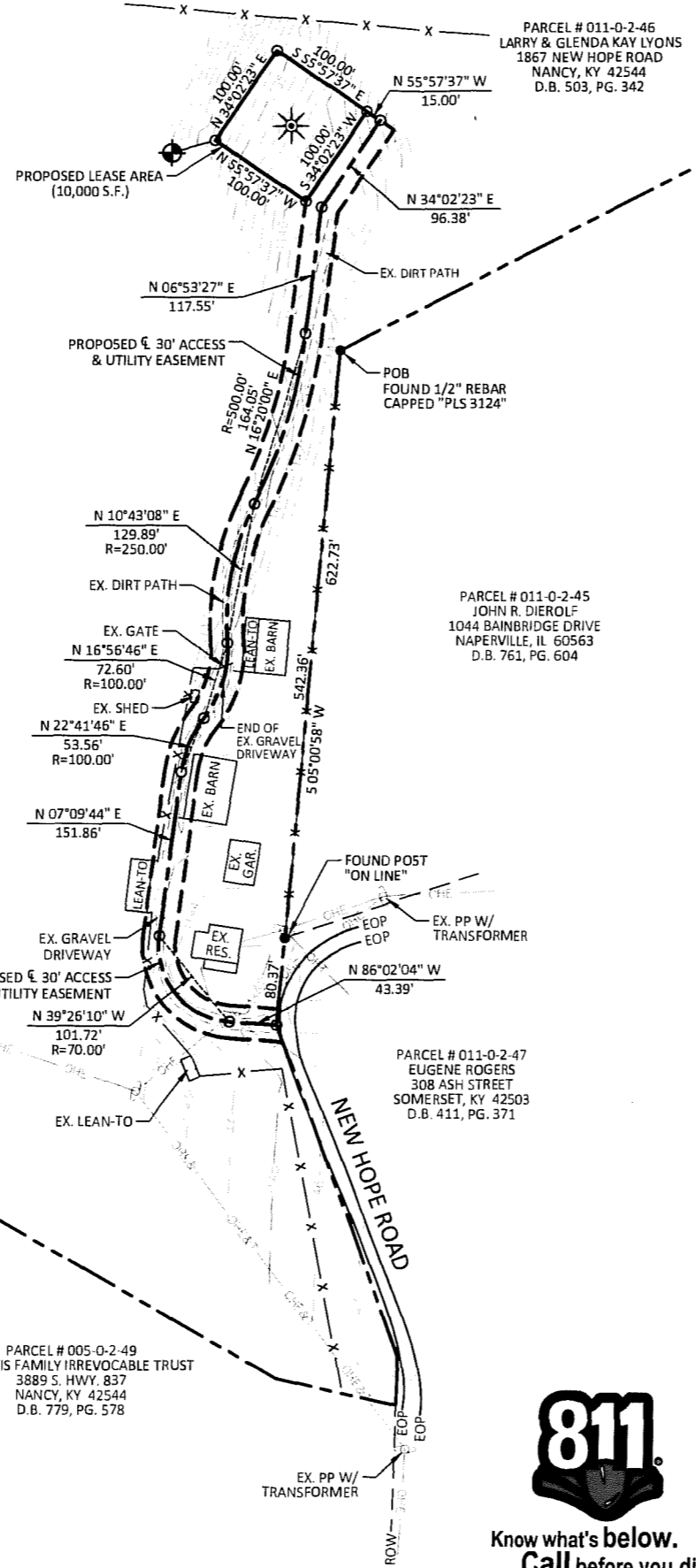
Mark Patterson 10-1-13
 MARK PATTERSON, LPLS #3136 DATE



PARCEL # 005-0-2-49
 ROY ERTIS FAMILY IRREVOCABLE TRUST
 3889 S. HWY. 837
 NANCY, KY 42544
 D.B. 779, PG. 578

PARCEL # 011-0-2-46
 LARRY & GLENDA KAY LYONS
 1867 NEW HOPE ROAD
 NANCY, KY 42544
 D.B. 503, PG. 342

PARCEL # 011-0-2-45
 JOHN R. DIEROLF
 1044 BAINBRIDGE DRIVE
 NAPERVILLE, IL 60563
 D.B. 761, PG. 604



LEGAL DESCRIPTIONS
 THE FOLLOWING IS A DESCRIPTION OF AN AREA TO BE LEASED FROM THE PROPERTY OF LARRY & GLENDA KAY LYONS, WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:
PROPOSED LEASE AREA
 BEGINNING AT A FOUND 1/2" REBAR CAPPED "PLS 3124" IN THE WEST PROPERTY LINE OF THE PROPERTY CONVEYED TO JOHN R. DIEROLF AS RECORDED IN DEED BOOK 761, PAGE 604 IN THE OFFICE OF THE CLERK OF PULASKI COUNTY, KENTUCKY; THENCE WITH SAID PROPERTY LINE AND FOLLOWING AN EXISTING FENCE, S 05°00'58" W PASSING A FOUND POST "ON LINE" AND THE END OF SAID FENCE AT 542.36', IN ALL 622.73' TO A SET 1/2" REBAR IN THE WEST RIGHT-OF-WAY LINE OF NEW HOPE ROAD; THENCE LEAVING SAID RIGHT-OF-WAY LINE AND TRAVERSING THE PROPERTY CONVEYED TO LARRY & GLENDA KAY LYONS AS RECORDED IN DEED BOOK 503, PAGE 342 IN THE AFORESAID CLERK'S OFFICE, N 86°02'04" W - 43.39' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 70.00' AND A CHORD OF N 39°26'10" W - 101.72' TO A SET 1/2" REBAR; THENCE N 07°09'44" E - 151.86' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 100.00' AND A CHORD OF N 22°41'46" E - 53.56' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 100.00' AND A CHORD OF N 16°56'46" E - 72.60' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 250.00' AND A CHORD OF N 10°43'08" E - 129.89' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 500.00' AND A CHORD OF N 16°20'00" E - 164.05' TO A SET 1/2" REBAR; THENCE N 06°53'27" E - 117.55' TO A SET 1/2" REBAR; THENCE N 34°02'23" E - 96.38' TO A SET 1/2" REBAR; THENCE S 55°57'37" W - 15.00' TO A SET 1/2" REBAR AND THE TRUE POINT OF BEGINNING OF THE PROPOSED LEASE AREA; THENCE S 34°02'23" W - 100.00' TO A SET 1/2" REBAR; THENCE N 55°57'37" W - 100.00' TO A SET 1/2" REBAR; THENCE N 34°02'23" E - 100.00' TO A SET 1/2" REBAR; THENCE S 55°57'37" E - 100.00' TO THE TRUE POINT OF BEGINNING CONTAINING 10,000 SQ. FT. AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED JUNE 25, 2013.

CENTERLINE PROPOSED 30' ACCESS & UTILITY EASEMENT
 BEGINNING AT A FOUND 1/2" REBAR CAPPED "PLS 3124" IN THE WEST PROPERTY LINE OF THE PROPERTY CONVEYED TO JOHN R. DIEROLF AS RECORDED IN DEED BOOK 761, PAGE 604 IN THE OFFICE OF THE CLERK OF PULASKI COUNTY, KENTUCKY; THENCE WITH SAID PROPERTY LINE AND FOLLOWING AN EXISTING FENCE, S 05°00'58" W PASSING A FOUND POST "ON LINE" AND THE END OF SAID FENCE AT 542.36', IN ALL 622.73' TO A SET 1/2" REBAR IN THE WEST RIGHT-OF-WAY LINE OF NEW HOPE ROAD AND THE TRUE POINT OF BEGINNING OF THE CENTERLINE OF THE PROPOSED 30' ACCESS & UTILITY EASEMENT; THENCE FOLLOWING SAID CENTERLINE AND LEAVING SAID RIGHT-OF-WAY LINE AND TRAVERSING THE PROPERTY CONVEYED TO LARRY & GLENDA KAY LYONS AS RECORDED IN DEED BOOK 503, PAGE 342 IN THE AFORESAID CLERK'S OFFICE, N 86°02'04" W - 43.39' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 70.00' AND A CHORD OF N 39°26'10" W - 101.72' TO A SET 1/2" REBAR; THENCE N 07°09'44" E - 151.86' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 100.00' AND A CHORD OF N 22°41'46" E - 53.56' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 100.00' AND A CHORD OF N 16°56'46" E - 72.60' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 250.00' AND A CHORD OF N 10°43'08" E - 129.89' TO A SET 1/2" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 500.00' AND A CHORD OF N 16°20'00" E - 164.05' TO A SET 1/2" REBAR; THENCE N 06°53'27" E - 117.55' TO A SET 1/2" REBAR; THENCE N 34°02'23" E - 96.38' TO A SET 1/2" REBAR AND THE END OF SAID EASEMENT AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED JUNE 25, 2013.

TITLE OF COMMITMENT
 THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY POD GROUP, LLC, AND AS SUCH WE ARE NOT RESPONSIBLE FOR THE INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS OF RECORD, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE, UNRECORDED EASEMENTS, AUGMENTING EASEMENTS, IMPLIED OR PRESCRIPTIVE EASEMENTS, OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. INFORMATION REGARDING THESE MATTERS WERE GAINED FROM STEWART TITLE GUARANTY COMPANY COMMITMENT FILE NO. 2013131, DATED MAY 17, 2013. THE FOLLOWING COMMENTS ARE IN REGARD TO SAID COMMITMENT AND THE NUMBERS IN THE COMMENTS CORRESPOND TO THE NUMBERING SYSTEM IN SAID POLICY.

SCHEDULE B SECTION II (EXCEPTIONS)

ITEM 1: RIGHTS OR CLAIMS OF PARTIES IN POSSESSION NOT SHOWN BY THE PUBLIC RECORDS. (POD GROUP, LLC, DID NOT EXAMINE OR ADDRESS THIS ITEM.)

ITEM 2: EASEMENTS, OR CLAIMS OF EASEMENTS, NOT SHOWN BY THE PUBLIC RECORDS. (NO UNRECORDED EASEMENTS ARE SHOWN.)

ITEM 3: ENCROACHMENTS, OVERLAPS, BOUNDARY LINE DISPUTES, OR OTHER MATTERS WHICH WOULD BE DISCLOSED BY AN ACCURATE SURVEY AND INSPECTION OF THE PREMISES. (NO ENCROACHMENTS, OVERLAPS, OR BOUNDARY DISPUTES WERE DISCOVERED.)

ITEM 4: ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR, OR MATERIAL HERETOFORE OF HEREAFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS. (POD GROUP, LLC, DID NOT EXAMINE OR ADDRESS THIS ITEM.)

ITEM 5: SUBJECT TO 2013 TAXES WHICH ARE NOT YET DUE AND PAYABLE. (POD GROUP, LLC, DID NOT EXAMINE OR ADDRESS THIS ITEM.)

ITEM 6: OIL AND GAS LEASE DATED SEPTEMBER 11, 1959, OF RECORD IN DEED BOOK 24, PAGE 577, IN THE OFFICE AFORESAID. (PDD GROUP, LLC, IS UNABLE TO DETERMINE IF LEASE IS STILL APPLICABLE; HOWEVER, THERE IS NO ABOVE GROUND VISIBLE EVIDENCE OF OIL OR GAS DRILLING OPERATIONS IN THE LEASE AREA OR ACCESS EASEMENT.)

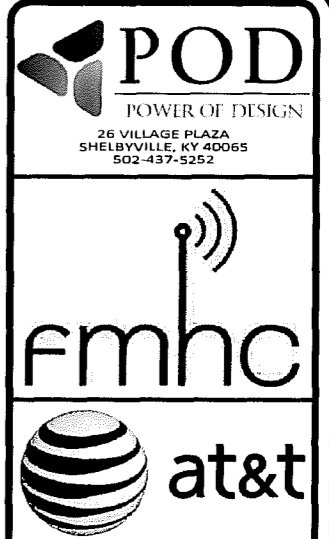
ITEM 7: THE RIGHT-OF-WAY EASEMENT DATED MAY 15, 1995, TO PULASKI COUNTY WATER DISTRICT NO. 2, OF RECORD IN BOOK 571, PAGE 23, IN THE OFFICE AFORESAID. (EASEMENT IN BOOK 571, PAGE 23, IS VAGUE AND AMBIGUOUS AND IS UNABLE TO ACCURATELY LOCATE.)

ITEM 8: SEE DEEDS IN DEED BOOK 828, PAGE 636, AND DEED BOOK 828, PAGE 639, CORRECTING AN OVERLAP OF PROPERTY. (OVERLAPS IN DEED BOOK 828, PAGE 636, AND DEED BOOK 828, PAGE 639, ARE NOT APPLICABLE TO LEASE AREA OR ACCESS EASEMENT.)



FLOOD NOTE
 THE PROPOSED LEASE AREA SHOWN HEREON IS NOT LOCATED IN A 100-YEAR FLOOD PLAIN PER FLOOD HAZARD BOUNDARY MAP, COMMUNITY-PANEL NUMBER 21199C0275C, DATED JULY 22, 2010. THE PROPOSED LEASE AREA IS LOCATED IN ZONE X.

SITE INFORMATION
 TAX PARCEL NUMBER: 011-0-2-46
 PROPERTY OWNER: LARRY & GLENDA KAY LYONS
 1867 NEW HOPE ROAD
 NANCY, KY 42544
 SOURCE OF TITLE: D.B. 503, PG. 342



SURVEY

REV.	DATE	DESCRIPTION
0	10.01.13	ISSUED AS FINAL

SITE INFORMATION:
INGLE
 1867 NEW HOPE ROAD
 NANCY, KY 42544

SITE NUMBER:
 POD NUMBER: 13-0621
 DRAWN BY: DSR
 CHECKED BY: MEP
 DATE: 06.25.13

SHEET TITLE:
SITE SURVEY
SHEET NUMBER:
B-1



SURVEY

REV.	DATE	DESCRIPTION
A	08.28.13	REV'D EASEMENT RADIUS
B	11.01.13	VERIFICATION

SITE INFORMATION:

INGLE

1867 NEW HOPE ROAD
NANCY, KY 42544

COUNTY: PULASKI

SITE NUMBER:

POD NUMBER: 13-0660

DRAWN BY: SMR

CHECKED BY: MEP

OATE: 06.21.13

SHEET TITLE:

**500' RADIUS &
ABUTTER'S MAP**

SHEET NUMBER:

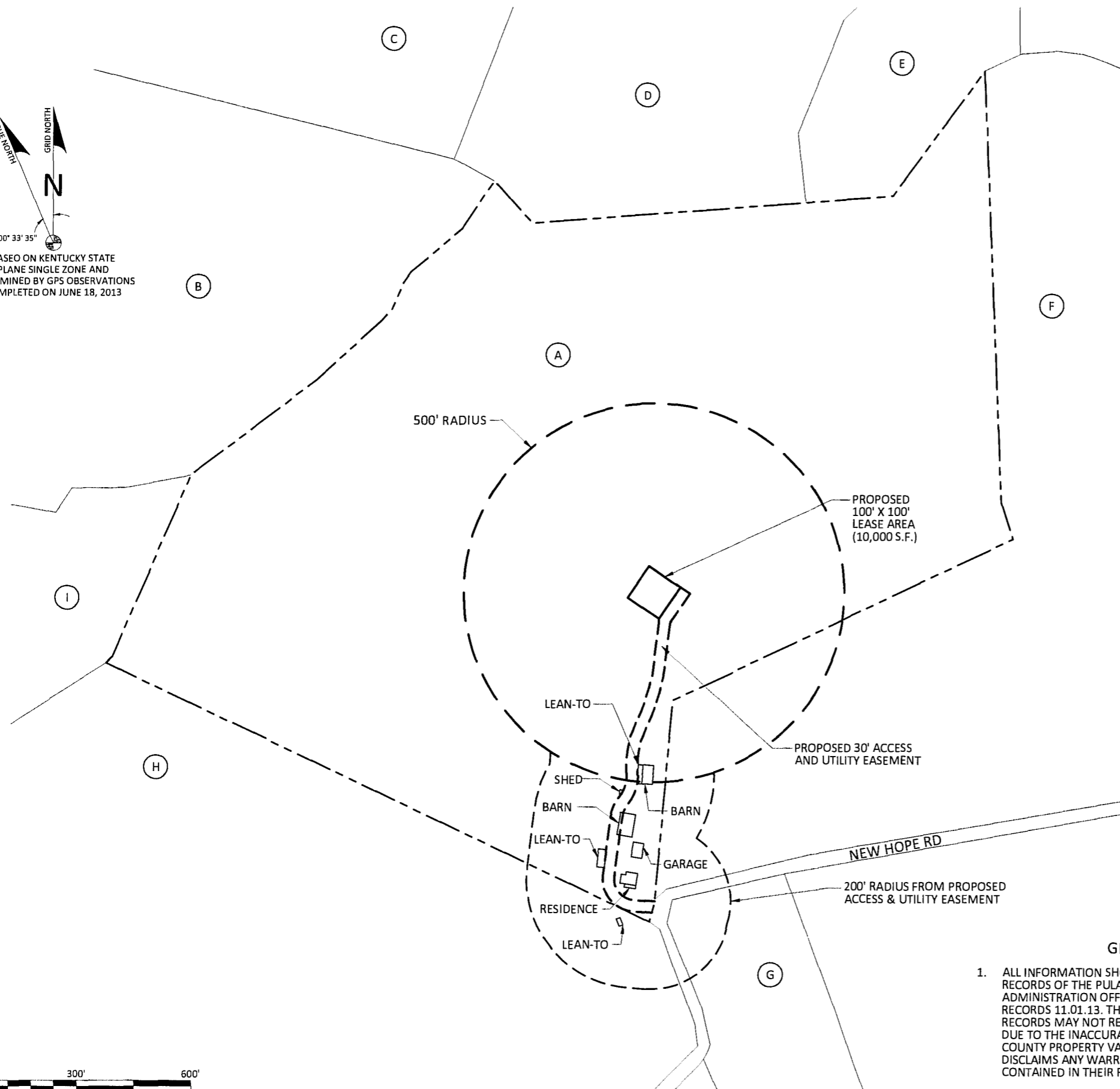
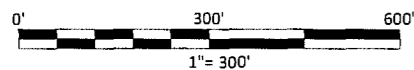
B-2

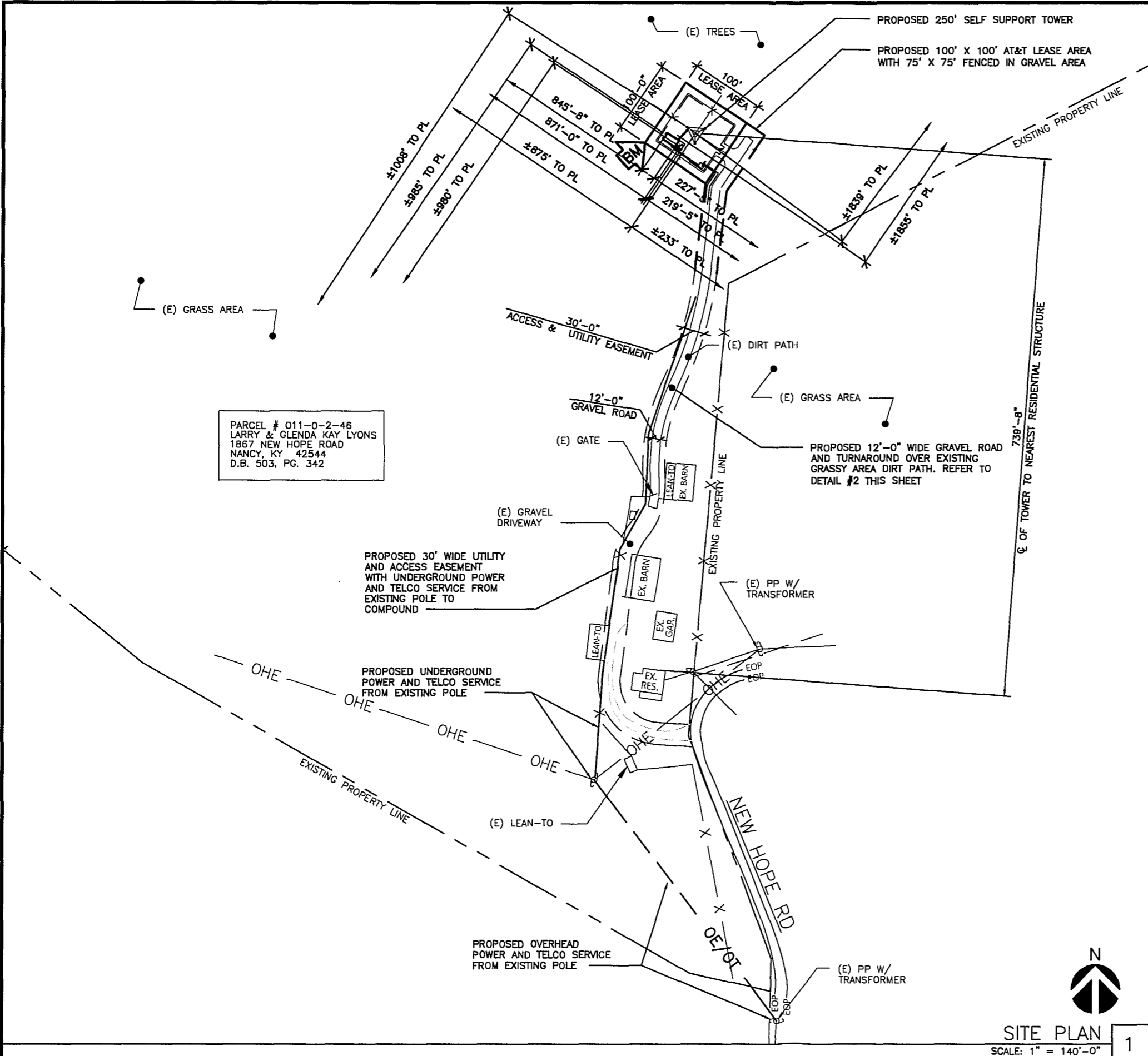
- (A) PARCEL # 011-0-2-46
LARRY AND GLENDA KAY LYDNS
1867 NEW HOPE ROAD
NANCY, KY 42544
D.B. 503, PG. 342
NO ZONING
- (B) PARCEL # 005-0-2-48.2
PAMELA TUCKER
PO BOX 87
NANCY, KY 42544
D.B. 609, PG. 111
NO ZONING
- (C) PARCEL # 005-0-2-34.2
WILLIAM K AND SAADIA SUE DANIELS
1062 COFFEY ROAD
NANCY, KY 42544
D.B. 616, PG. 483
NO ZONING
- (D) PARCEL # 011-0-2-08
KRISTINE BUTTO-BROWNLEE
9436 WHITALL LN
GROSSE ILE, MI 48138
D.B. 787, PG. 522
NO ZONING
- (E) PARCEL # 011-0-2-09.1
LJNDA M SEBER AND DOROTHEY F MORGAN
544 W FARM RD
NANCY, KY 42544
D.B. 829, PG. 070
NO ZONING
- (F) PARCEL # 011-0-2-45
JOHN R DIEROLF
1044 BAINBRIDGE DR
NAPERVILLE, IL 60563
D.B. 761, PG. 604
NO ZONING
- (G) PARCEL # 011-0-2-47
EUGENE ROGERS
308 ASH ST
SOMERSET, KY 42503
D.B. 411, PG. 371
NO ZONING
- (H) PARCEL # 005-0-2-49
ROY ERTIS FAMILY IRREVOCABLE TRUST
3889 S HIGHWAY 837
INGLE, KY 42544
D.B. 779, PG. 578
NO ZONING
- (I) PARCEL # 005-0-2-48
NORMAN HALCOMB
4919 S HIGHWAY 837
NANCY, KY 42544
D.B. 614, PG. 721
NO ZONING

GENERAL NOTE:

1. ALL INFORMATION SHOWN HEREON WAS OBTAINED FROM THE RECORDS OF THE PULASKI COUNTY KENTUCKY PROPERTY VALUATION ADMINISTRATION OFFICE ON 6.18.13, AND VERIFIED VIA ONLINE PVA RECORDS 11.01.13. THE PROPERTY VALUATION ADMINISTRATION RECORDS MAY NOT REFLECT THE CURRENT OWNERS AND ADDRESSES DUE TO THE INACCURACIES AND TIME LAPSE IN UPDATING FILES. THE COUNTY PROPERTY VALUATION ADMINISTRATION EXPRESSLY DISCLAIMS ANY WARRANTY FOR THE CONTENT AND ANY ERRORS CONTAINED IN THEIR FILES
2. THIS MAP IS FOR GENERAL INFORMATIONAL PURPOSES ONLY AND IS NOT A BOUNDARY SURVEY

TRUE NORTH
GRID NORTH
N
00° 33' 35"
BASED ON KENTUCKY STATE
PLANE SINGLE ZONE AND
DETERMINED BY GPS OBSERVATIONS
COMPLETED ON JUNE 18, 2013

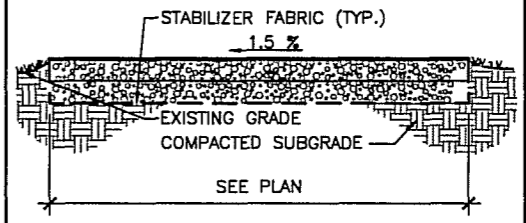




PARCEL # 011-0-2-46
 LARRY & GLENDA KAY LYONS
 1867 NEW HOPE ROAD
 NANCY, KY 42544
 D.B. 503, PG. 342

LEASE AREA
 BASE COURSE: 4" MIN.
 OF COMPACTED CA-6
 COARSE AGGREGATE.
 TOP COURSE: 4" MIN.
 OF COMPACTED CA-7
 COARSE AGGREGATE.

ACCESS DRIVE
 BASE COURSE: 6" MIN.
 OF COMPACTED CA-3
 COARSE AGGREGATE.
 TOP COURSE: 3" MIN.
 OF COMPACTED CA-6
 COARSE AGGREGATE.



GRAVEL PAVING DETAIL
 SCALE: 1/2" = 1'-0" 2

GENERAL NOTES:

- ELEVATIONS ARE ABOVE MEAN SEA LEVEL.
- DO NOT SCALE DIMENSIONS FROM THIS DRAWING.
- ALL EXISTING RECORDED EASEMENTS ARE INDICATED ON THIS DRAWING TO THE BEST OF THE ARCHITECT'S KNOWLEDGE PER VISUAL INSPECTION, SURVEY DRAWINGS, AND INFORMATION RECEIVED FROM AT&T.

BENCHMARK/PROJECT DATUM

LOCATION: BEING A SET IPC LOCATED IN THE WEST CORNER OF THE PROPOSED LEASE AREA.

ELEVATION: 1131.52' A.M.S.L.

LATITUDE: 37° 06' 13.87"

LONGITUDE: 84° 50' 17.67"

PROJECT DATUM:

LEGEND

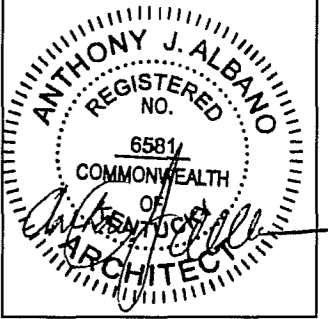
EXISTING	NEW
— SAS —	SANITARY SEWER — SAS —
— STS —	STORM SEWER — STS —
— W —	WATER MAIN — W —
⊙	SANITARY MANHOLE ELEVATIONS
⊙	STRUCTURE ELEVATIONS
---	PROPERTY LINE & R.O.W.
---	SURFACE DRAINAGE
⊙	LIGHT STANDARD
○	STREET LIGHT
672.75	SPOT ELEVATION 672.15
672	CONTOUR 672
672	CONTOUR TO BE REGRADED
- G - G -	GAS MAIN - G - G -
⊙	MANHOLE
⊞	CATCH BASIN
⊞	FIRE HYDRANT
---	EASEMENT LINE
- X - X -	FENCE - X - X -
- - UE/UT - -	BURIED UTILITY LINE - - UE/UT - -
⊙	UTILITY POLE
- OHE -	OVERHEAD UTILITY LINE - OHE -
▨	BUILDING



FMHC DESIGN, INC
 ARCHITECTURE/TELECOMMUNICATIONS
 1700 SHERWIN AVENUE
 DES PLAINES, IL 60018
 TEL: 773-380-3800
 FAX: 773-693-0850

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ALL RIGHTS RESERVED. 2013



DRAWN BY : JD'E, AB
 APPROVED BY : AA

09/04/13 ISSUED FOR ZONING
 08/30/13 ISSUED FOR ZONING

SITE # KYALU5160
INGLE
 1867 NEW HOPE ROAD
 NANCY, KY 42544
 PULASKI COUNTY

SHEET TITLE
SITE PLAN

SHEET NUMBER
A1
 PROJECT NUMBER : 8207

SITE PLAN
 SCALE: 1" = 140'-0" 1

TOP OF LIGHTNING ROD
ELEV.: 265'-0"

TOP OF TOWER & RAD @ PROPOSED AT&T ANTENNAS
ELEV.: 250'-0"

PROPOSED CABLES ROUTED UP
TOWER TO ANTENNA'S ON PROPOSED
WAVEGUIDE LADDER

PROPOSED 250'-0" HIGH
SELF SUPPORT TOWER

PROPOSED 12'-0"W X 20'-0"L
PREFABRICATED EQUIPMENT
SHELTER ON CONCRETE SLAB

PROPOSED 6'-0" HIGH CHAIN
LINK FENCE WITH THREE (3)
STRANDS OF BARBED WIRE ON
TOP FACING OUT

GRADE AT TOWER
ELEV.: (1138' A.M.S.L.)

PROPOSED 15'-0" HIGH
LIGHTNING ROD BY TOWER
MANUFACTURER

PROPOSED AT&T PANEL ANTENNAS
(2 PER SECTOR, 6 TOTAL) AND
SUPPORTING EQUIPMENT WITH (5)
RRUs PER SECTOR (15 TOTAL) ON
PROPOSED 12'-0" T-ARM ANTENNA
MOUNTS

FUTURE CARRIERS' ANTENNAS
CO-LOCATION

PROPOSED CABLE BRIDGE,
24"W X 12'-0" H (MAX.)

PROPOSED 50KW GENERATOR
ON CONCRETE SLAB (SHOWN
DASHED FOR CLARITY)

PROPOSED ELECTRIC AND
TELCO H-FRAME

TOWER GENERAL NOTES:

1. TOWER DESIGN AND SPECIFICATIONS TO BE PROVIDED BY THE TOWER MANUFACTURER AS DIRECTED BY AT&T. THIS SHALL INCLUDE (BUT NOT LIMITED TO) TOWER PROFILE, ERECTION DRAWINGS, MATERIAL LIST, TOWER DIMENSIONS, BASE PLATE DIMENSIONS AND ANCHOR BOLT CONFIGURATION.



FMHC DESIGN, INC
ARCHITECTURE/TELECOMMUNICATIONS

1700 SHERWIN AVENUE
DES PLAINES, IL 60018
TEL: 773-380-3800
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ALL RIGHTS RESERVED. 2013



DRAWN BY : JD'E, AB

APPROVED BY : AA

09/04/13 ISSUED FOR ZONING
08/30/13 ISSUED FOR ZONING

SITE # KYALU5160

INGLE

1887 NEW HOPE ROAD
NANCY, KY 42544
PULASKI COUNTY

SHEET TITLE

TOWER
ELEVATION

SHEET NUMBER

A3

PROJECT NUMBER : 8207

PROPOSED NORTH/WEST TOWER ELEVATION

SCALE: 1" = 30'-0"

1

AMERICAN TOWER™
CORPORATION

11/7/13

RE:

Dear Commissioners:

The construction manager for the proposed new communications facility will be Ron Rohr. His contact information is 740-438-9710. Ron Rohr has been involved in the construction of communications facilities for over 17 years, and general construction for over 20 years.

Some of the notable and most recent projects are:

2010 - Present

American Tower Corporation – Construction Manager

- Successfully led the construction team on the 140 site, Southern Ohio Launch while maintaining a respectful and professional demeanor under difficult circumstances.
- Played a key part in the collaborating efforts to build the scope of work, pricing matrix, and close out documentation on several projects.
- Have cultivated a pool of responsible, dependable and quality driven GC's to work on ATC projects throughout the Midwest and Northeast Region.

1990 – 2009

Superior Concepts – Owner

- Contract Project and Construction Manager to multiple wireless carriers. Work included, but not limited to, permitting all the way through to final construction close outs. Also managed several DAS projects in shopping malls and residential areas.
- Equipment operator, cell site super intendant, regional foreman, etc...
- Carpentry, Construction and Consulting

Accreditations and Licenses

OSHA Electrical Safety
Vallen Safety Knowledge Systems / Fall Protection
Builders Exchange of Central Ohio / Estimating & Bid Preparation
Amphenol Wireless Cable Connector Training
Commscope Connector Training
Andrew Connector Training
Current OSHA Safety Training
Current Haz Com Training
FAA/FCC Training

Thank you,



Ron Rohr
Construction Manager



November 12, 2013

Mr. Ron Rohr
American Tower Corp.

Reference: Valmont #239126 V-27.0 x 250' Self-Supporting Tower
Site Name: #282083 Ingle Site – Nancy, KY - Pulaski County

Dear Mr. Rohr:

Thank you for your inquiry concerning tower design codes and practices as they relate to your tower design in Nancy, KY.

Valmont has been designing and building guyed, self-supporting towers and monopoles since the early 1950's. During this time, we have sold thousands of structures ranging in height from as little as 50' high to in excess of 1400'. These structures were individually engineered to accommodate the loading requirements imparted by the design wind speed, ice considerations, antenna loading, and other factors dictated by the national code requirements existing at the time the tower was built.

The ANSI/TIA-222-G Standard represents the latest refinement of specific minimum requirements for tower engineers and manufacturers to follow to help assure that the tower structure and its foundations are designed to meet the most realistic conditions for local weather while assuring that the tower is designed to stringent factors of safety. This tower is designed to 90 MPH (no ice) and 30 MPH (3/4" ice) per ANSI/TIA-222-G with Class II, Topographical category 1 and Exposure C criteria.

The "G" version of the code incorporates an escalating wind factor based on tower height. Thus 90 mph is the basic design wind speed at the 10 meter height. This speed is then increased in stages up the tower. "Meeting the code" implies that the design quoted has all of the code requirements for safety factors intact at the wind speed specified. Thus, the ultimate survival speed would be considerably higher. Again, adding ice to the design loading also adds a further safety factor, in effect, to the final tower strength.

Americas Lighting and Communication Structures

Valmont Industries, Inc. 1545 Pidco Drive Plymouth, Indiana 46563-1354 USA

574-936-4221 877-467-4763 Fax 574-936-6796 valmont.com valmont-towers.com

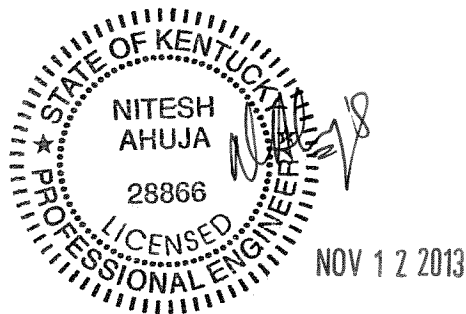
While failure is extremely rare in any kind of tower, it is especially so for monopoles and self-supporting towers. In fact, only if a self-supporting tower were subjected to a direct hit from a tornado or the severest of hurricanes would failure be predicted. We are aware of very few instances of self-supporting tower failure. The most common mode of failure would be in the middle region of the tower, with the upper portion of the tower remaining connected and "bowing over" against the base of the tower. The fact that the wind is normally greater on the upper portion of the structure contributes to the likelihood of this type of failure. Thus, if a failure condition is reached, it should be reached in the upper middle region of the tower first. This tower has a theoretical failure point to bow over or fall within a 125' point radius or 50% fall zone, using the total given loading & the design wind speed.

As Senior Project Engineer of the company and a registered P.E. in 18 states, I oversee all engineering and applications of our towers. Valmont Structures is an AISC approved shop. All Valmont Structures welders are AWS qualified. Mathematical and physical tests are performed routinely on tower sections and designs as required. Our total design, engineer and build process has been quality audited by our customers including public utilities, telephone companies, government agencies and of course AISC.

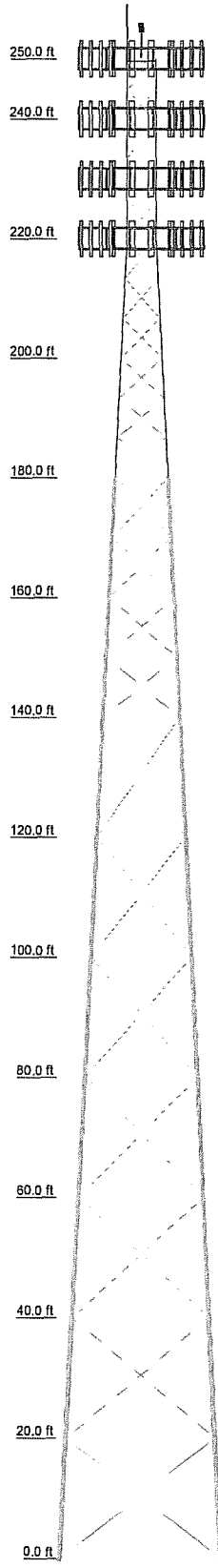
We trust the above and the attached will be helpful to you. If you should need anything else, please let us know at your convenience.

Sincerely,

Nitesh Ahuja
Senior Project Engineer
Extension #5257



T1	A	L2x2x1/8	J	5	K	0.2
T2	B	L2x2x3/16		1.0		
T3	C			1.3		
T4	D	L2 1/2x2 1/2x3/16		1.7		
T5	E	L3x3x3/16		3.1		
T6				3.2		
T7	F	A572-50		4.0		
T8	G	2L3x3x3/16	A36	4.6		
T9				4.7		
T10	H		N.A.	6.0		
T11				6.1		
T12	I	2L3 1/2x3 1/2x1/4		7.0		
T13				7.1		
Section				50.2		
Legs						
Leg Grade						
Diagonals						
Diagonal Grade						
Top Girts						
Face Width (ft)				27		
# Panels @ (ft)				9 @ 6.66667		
Weight (K)						



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Beacon	250	ATC Loading	240
Beacon Extender (4') 803062	250	ATC Loading	230
BR lightning rod	250	ATC Loading	220
ATC Loading	250		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P- 2.50" - 0.75" conn.-10' -C-(Pirod 226172)	G	#12ZG -2.25" - 0.875" conn. (Pirod 208334)
B	P- 4.00" - 0.75" conn.-20' -C-Trans-6B-4B-(Pirod 226184)	H	#12ZG - 2.50" - 0.875" conn. (Pirod 208335)
		I	#12ZG - 2.75" - 0.875" conn. (Pirod 208337)
C	P- 5.00" - 0.75" conn.-Trans-20' -C-(Pirod 226200)	J	L2x2x3/16
		K	2 @ 4.79167
D	P- 6.00" - 0.75" conn.-HBD-Trans-20' -C-(Pirod 229377)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

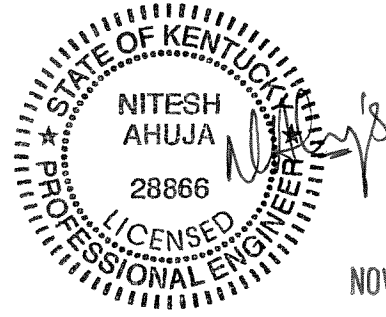
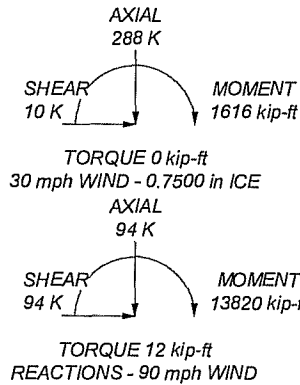
TOWER DESIGN NOTES

1. Tower is located in Pulaski County, Kentucky.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 90 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 30 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.5%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 622 K
 UPLIFT: -554 K
 SHEAR: 61 K

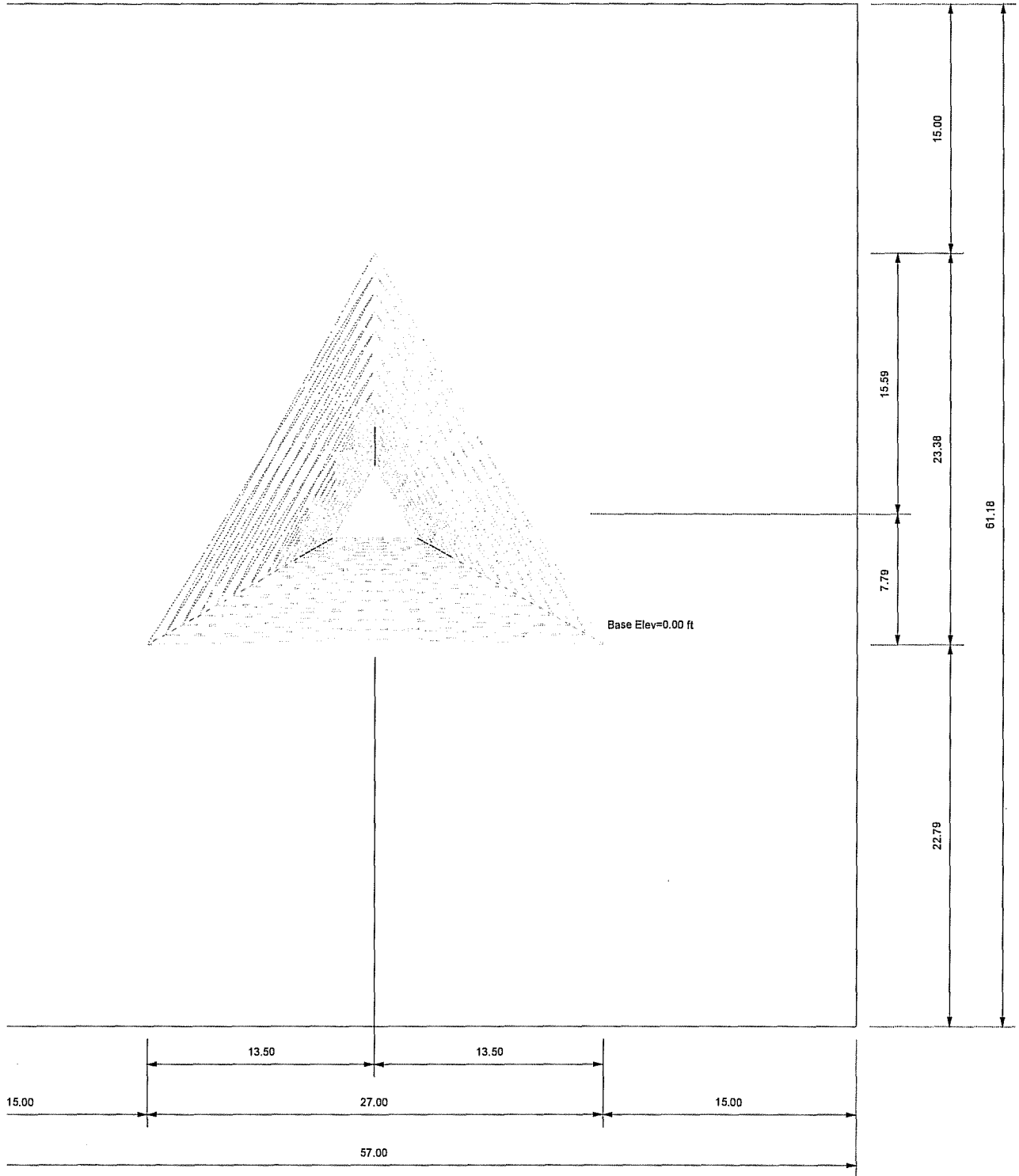



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<p>1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 239126 Project: V-27 x 250' #282083 Ingle, KY
	Client: American Tower Corp. Drawn by: na1 App'd: Code: TIA-222-G Date: 11/11/13 Scale: NTS Path:
	Dwg No. E-1
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11-11-13

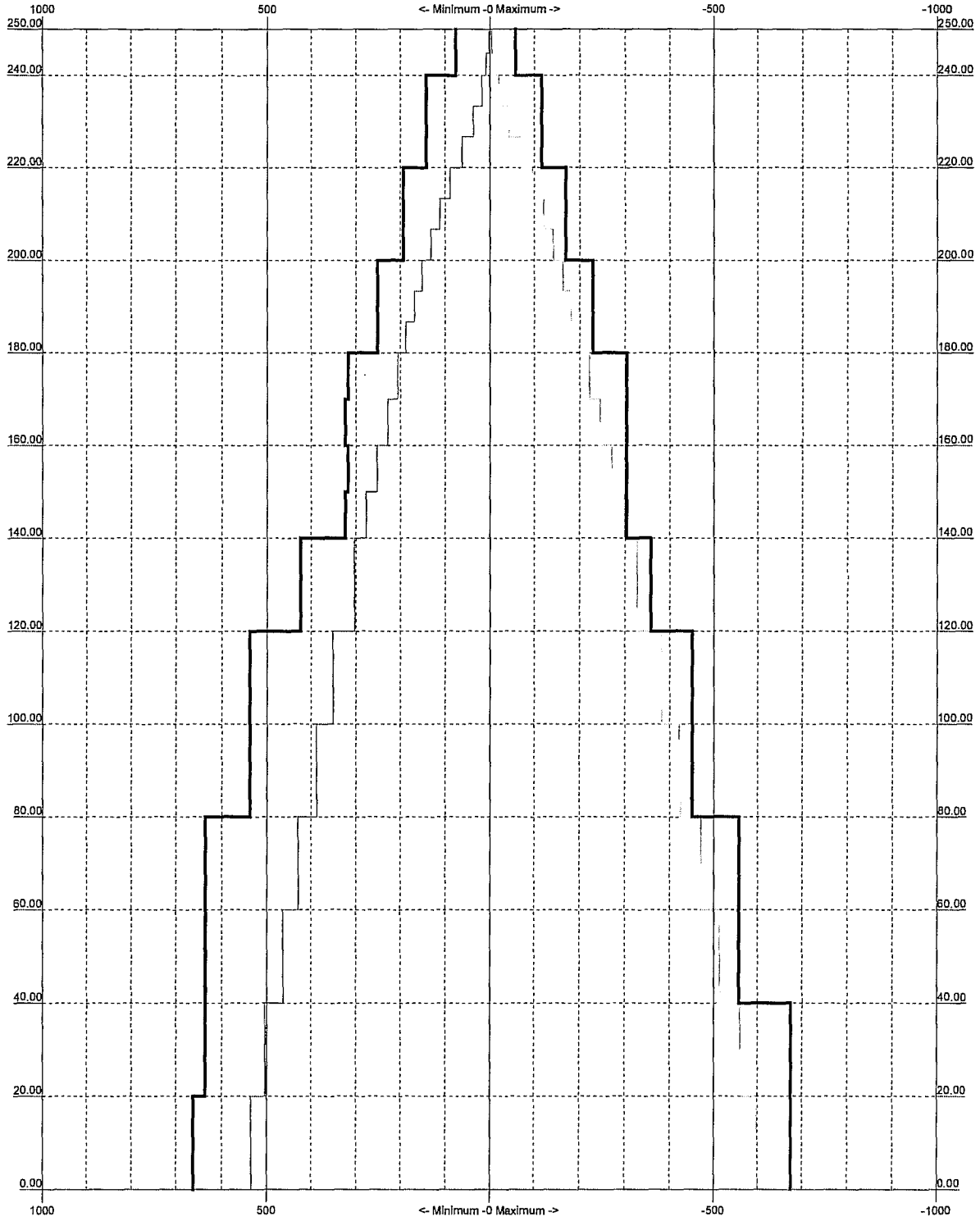
Plot Plan
Total Area - 0.08 Acres




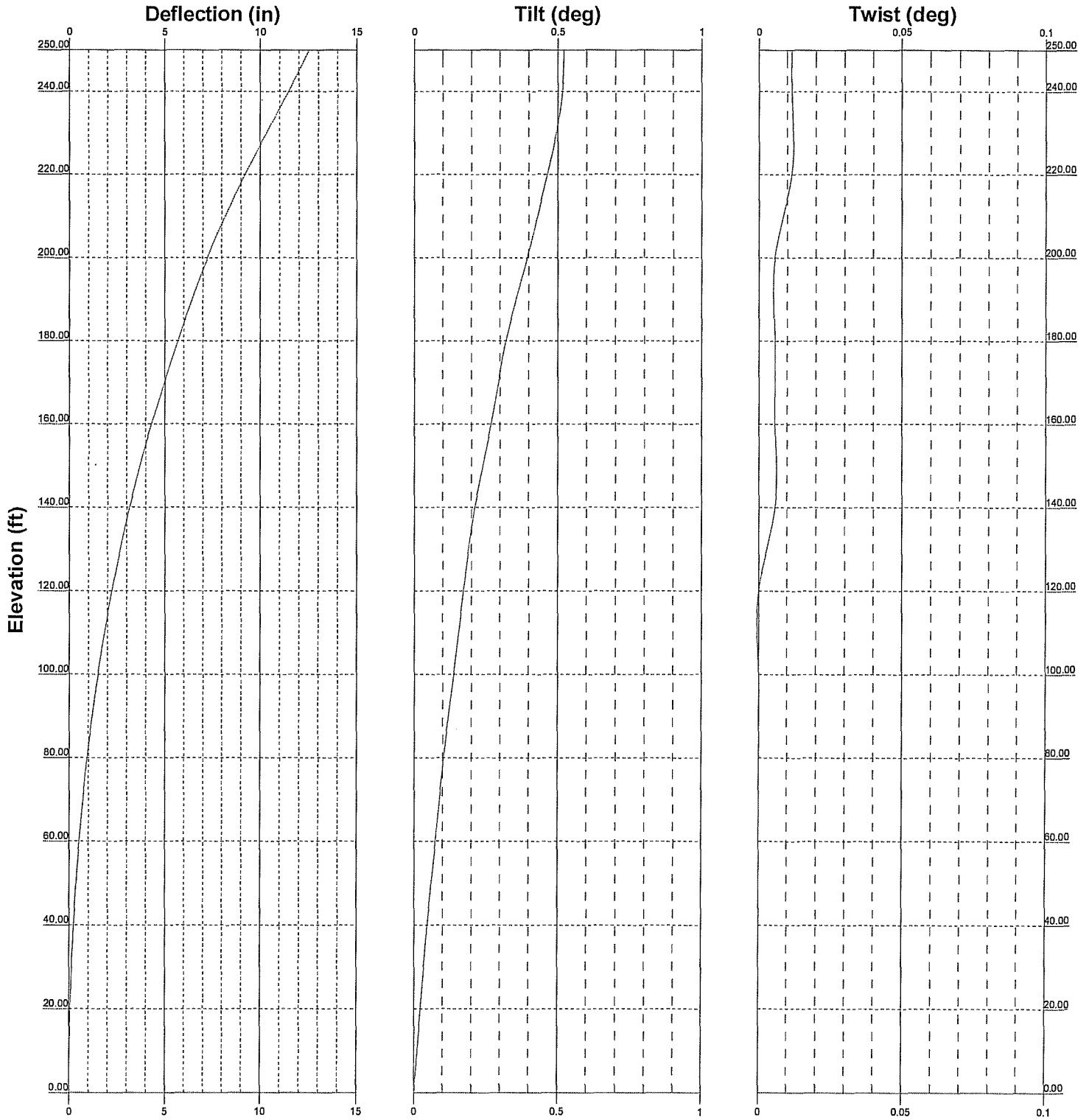
valmont  1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458	Job: 239126		
	Project: V-27 x 250' #282083 Ingle, KY		
	Client: American Tower Corp.	Drawn by: na1	App'd:
	Code: TIA-222-G	Date: 11/11/13	Scale: NTS
Path: \\valmont\file01\fileroom\Documents\239126 ATC-V25-250- Nancy, KY\02 Tower Cales\239126.dwg		Dwg No. E-2	


TIA-222-G - 90 mph/30 mph 0.7500 in Ice Exposure C

Leg Capacity ——— Leg Compression (K)



 <p>1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 239126		
	Project: V-27 x 250' #282083 Ingle, KY		
	Client: American Tower Corp.	Drawn by: na1	App'd:
	Code: TIA-222-G	Date: 11/11/13	Scale: NTS
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		Dwg No. E-3	

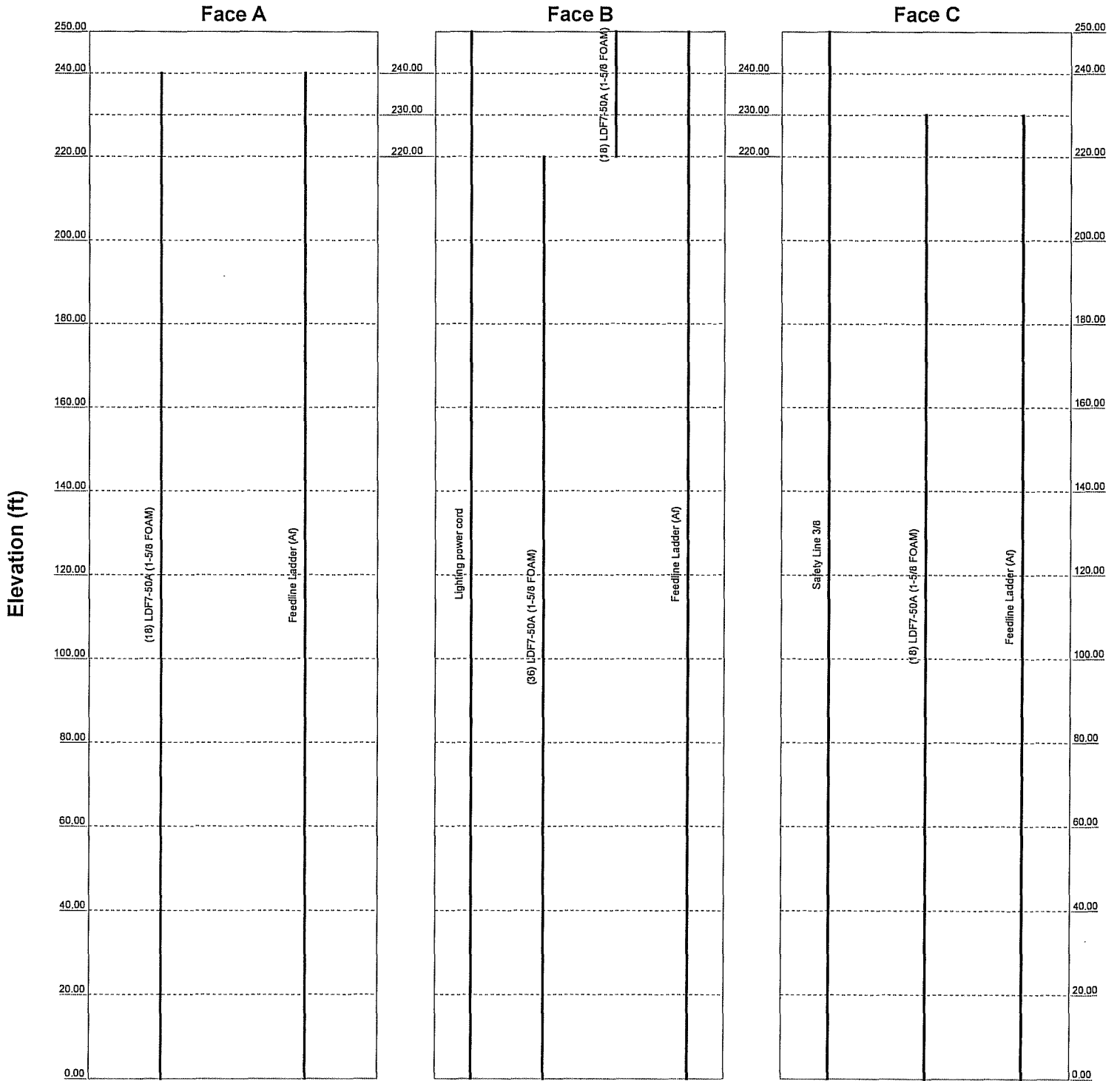


 <p>1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 239126		
	Project: V-27 x 250' #282083 Ingle, KY		
	Client: American Tower Corp.	Drawn by: na1	App'd:
	Code: TIA-222-G	Date: 11/11/13	Scale: NTS
	Path:	Dwg No. E-5	

Feedline Distribution Chart

0' - 250'

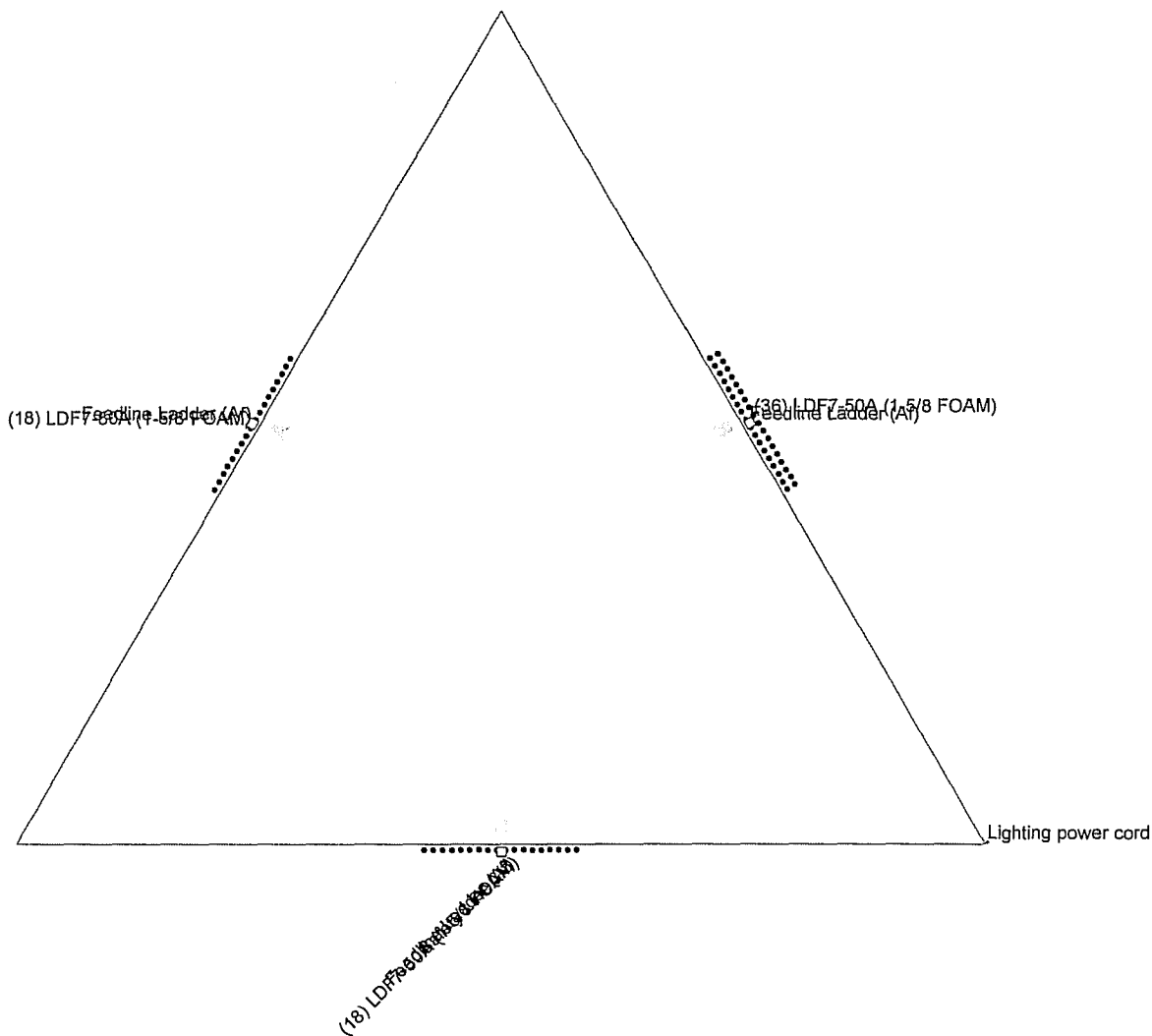
Round
 Flat
 App In Face
 App Out Face
 Truss Leg



<p style="margin: 0;">1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 239126		Project: V-27 x 250' #282083 Ingle, KY	
	Client: American Tower Corp.		Drawn by: na1	App'd:
	Code: TIA-222-G		Date: 11/11/13	Scale: NTS
	Path:		Dwg No. E-7	
	<small>\\valmont\file01\fileroom\Documents\239126\ATC-V28x250-Nancy, KY\02 Tower Calc\239126.dwg</small>			

Feedline Plan

_____ Round _____ Flat _____ App In Face _____ App Out Face _____ Truss-Leg



valmont	1545 Pidco Drive		
	STRUCTURES Plymouth, IN 46563		
	Valmont Industries Inc. - Speciality Structures Group		
	Phone: (574) 936-4221 FAX: (574) 936-6458		
Job:	239126		
Project:	V-27 x 250' #282083 Ingle, KY		
Client:	American Tower Corp.	Drawn by:	na1
Code:	TIA-222-G	Data:	11/11/13
Path:	\\pvtfile01\fileroom\Documents\23923128 ATC-V25x250- Nancy, KY\02 Tower Calc\239126.rvt		Scale: NTS
		Dwg No.	E-7

tnxTower 1543 Piloto Drive Plymouth, IN 46363 Phone: (374) 936-4221 FAX: (374) 936-6438	Job	239126	Page	1 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

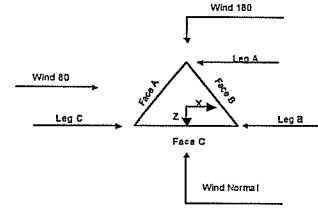
tnxTower 1543 Piloto Drive Plymouth, IN 46363 Phone: (374) 936-4221 FAX: (374) 936-6438	Job	239126	Page	2 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 250.00 ft above the ground line. The base of the tower is set at an elevation of 0.00 ft above the ground line. The face width of the tower is 5.00 ft at the top and 27.00 ft at the base. This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- Tower is located in Pulaski County, Kentucky.
- Basic wind speed of 90 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 30 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.



Triangular Tower

Options

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> Consider Moments - Leg Consider Moments - Horizontals Consider Moments - Diagonals Use Member Magnification Use Code Stress Ratio Use Code Safety Factors - Guys Exclude Ice Always Use Max Ice Use Special Wind Profile Include Belts in Member Capacity Leg Belts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sides) Add IBC 6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Finned Assume Rigid Index Plate Use Clear Span For Wind Area Use Clear Span For K/Ls Retention Guys To Initial Tension Bypass Mast Stability Checks Use Astimath Disk Coefficients Project Wind Area of Support Auxiliary Torque Arm Areas SR Members Have Cut Ends Set Capacity Reports By Component Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Lay Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEAs SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Rigid At Foundation Consider Feedline Torque Include Angle Block Shear Check Peels Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|---|---|--|

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	β			β		β
T1	250.00-240.00		V-Series Leg	5.00	1	10.00
T2	240.00-220.00		V-Series Leg	5.00	1	20.00
T3	220.00-200.00		V-Series Leg	5.00	1	20.00
T4	200.00-180.00		V-Series Leg	7.50	1	20.00
T5	180.00-160.00		PIRod 12BD Truss Leg	9.00	1	20.00
T6	160.00-140.00		PIRod 12BDH Truss Leg	11.00	1	20.00
T7	140.00-120.00		PIRod 12BDH Truss Leg	13.00	1	20.00
T8	120.00-100.00		PIRod 12BDH Truss Leg	15.00	1	20.00
T9	100.00-80.00		PIRod 12BDH Truss Leg	17.00	1	20.00
T10	80.00-60.00		PIRod 12BDH Truss Leg	19.00	1	20.00
T11	60.00-40.00		PIRod 12BDH Truss Leg	21.00	1	20.00
T12	40.00-20.00		PIRod 12BDH Truss Leg	23.00	1	20.00
T13	20.00-0.00		PIRod 12BDH Truss Leg	25.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Braces End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	β	β				in	in
T1	250.00-240.00	4.79	X Brace	No	No	0.0000	0.0000
T2	240.00-220.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1	250.00-240.00	Equal Angle	L5x2x3/16	A36	Solid Round	A36
T2	240.00-220.00			(36 ksi)		(36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adj. Factor A_f	Adj. Factor A_e	Height Mult.	Double Angle Spacing Diagonals	Double Angle Spacing Horizontals
β	β^2	in					in	in
T1	0.00	0.2500	A36	1	1	1.05	36.0000	36.0000
T2	0.00	0.2500	A36	1	1	1.05	36.0000	36.0000
T3	0.00	0.3750	A36	1	1	1.05	36.0000	36.0000
T4	0.00	0.3750	A36	1	1	1.05	36.0000	36.0000
T5	0.00	0.5000	A36	1	1	1.05	36.0000	36.0000
T6	0.00	0.5000	A36	1	1	1.05	36.0000	36.0000
T7	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T8	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T9	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T10	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T11	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T12	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000
T13	0.00	0.6250	A36	1	1	1.05	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Braces
β	Yes	Yes	Y	Y	Y	Y	Y	Y	Y	Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 250.00-240.00	Pipe	P-2.50"-0.75" conn.-10' -C-(PIrod 22672)	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 240.00-220.00	Pipe	P-4.00"-0.75" conn.-20' -C-Trans-4B-(PIrod 226184)	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 220.00-200.00	Pipe	P-5.00"-0.75" conn.-Trans-20' -C-(PIrod 226200)	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 200.00-180.00	Pipe	P-6.00"-0.75" conn.-Trans-20' -C-(PIrod 229377)	A572-50 (50 ksi)	Equal Angle	L2 1/2x3 1/2x3/16	A36 (36 ksi)
T5 180.00-160.00	Truss Leg	#122G-1.75"-1.00" conn.-HBD-Trans (PIrod 229588)	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 160.00-140.00	Truss Leg	#122G-1.75"-1.00" conn.-HBD-Trans (PIrod 229588)	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 140.00-120.00	Truss Leg	#122G-2.00"-0.875" conn.-HBD-Trans (PIrod 208323)	A572-50 (50 ksi)	Double Equal Angle	2L3 x3x3/16	A36 (36 ksi)
T8 120.00-100.00	Truss Leg	#122G-2.25"-0.875" conn. (PIrod 208334)	A572-50 (50 ksi)	Double Equal Angle	2L3 x3x3/16	A36 (36 ksi)
T9 100.00-80.00	Truss Leg	#122G-2.25"-0.875" conn. (PIrod 208334)	A572-50 (50 ksi)	Double Equal Angle	2L3 x3x3/16	A36 (36 ksi)
T10 80.00-60.00	Truss Leg	#122G-2.50"-0.875" conn. (PIrod 208335)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/4	A36 (36 ksi)
T11 60.00-40.00	Truss Leg	#122G-2.50"-0.875" conn. (PIrod 208335)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/4	A36 (36 ksi)
T12 40.00-20.00	Truss Leg	#122G-2.75"-0.875" conn. (PIrod 208337)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/4	A36 (36 ksi)
T13 20.00-0.00	Truss Leg	#122G-2.75"-0.875" conn. (PIrod 208337)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

tnxTower 1545 Pidco Drive Plymouth, IN 46363 Phone: (574) 936-4321 FAX: (574) 936-6438	Job	239126	Page	9 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pidco Drive Plymouth, IN 46363 Phone: (574) 936-4321 FAX: (574) 936-6438	Job	239126	Page	10 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Tower Section	Tower Elevation ft	Face	A _h	A _r	C _{Ai} In Face ft ²	C _{As} Out Face ft ²	Weight K
T12	40.00-28.00	A	0.000	0.000	81.288	8.008	0.46
		B	0.008	0.008	134.280	8.008	8.76
		C	0.008	8.008	82.039	8.008	8.47
T13	20.00-8.08	A	0.008	0.008	81.280	8.008	0.46
		B	0.008	0.008	134.300	8.008	8.76
		C	0.000	8.000	82.030	8.008	8.47

Section	Elevation ft	CP _x	CP _z	CP _z Ice in	CP _z Ice ft
T1	250.88-240.00	3.3597	-1.7738	2.9036	-1.2017
T2	240.08-220.00	0.8336	-0.8085	0.1374	-0.5968
T3	220.08-208.88	1.0027	-0.5163	0.2184	1.1162
T4	208.00-188.00	1.2415	-0.6358	0.2381	1.1605
T5	180.00-160.88	1.4829	-0.7569	0.2738	1.0121
T6	160.00-140.88	1.7342	-0.8838	0.3126	0.2339
T7	148.00-120.00	1.9991	-1.0166	0.3541	0.2768
T8	120.00-180.00	2.2423	-1.1388	0.3983	0.3194
T9	100.88-80.88	2.4944	-1.2646	0.4252	0.3117
T10	88.88-60.00	2.7111	-1.3752	0.4551	0.3832
T11	60.08-40.00	2.9562	-1.4962	0.4829	1.4125
T12	40.08-20.80	3.1735	-1.6032	0.5057	0.4334
T13	20.88-8.00	3.4122	-1.7255	0.5106	0.4231

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _h	A _r	C _{Ai} In Face ft ²	C _{As} Out Face ft ²	Weight K
T1	250.00-240.00	A	1.833	0.000	0.000	0.000	8.800	8.888
		B	0.000	8.800	84.360	0.808	1.42	
		C	0.000	0.008	4.841	0.800	8.83	
T2	248.00-228.08	A	1.821	0.008	0.800	159.339	0.080	2.72
		B	0.008	8.800	168.565	0.000	2.85	
		C	0.000	0.888	87.885	8.800	1.46	
T3	220.08-200.88	A	1.805	0.000	0.000	159.383	0.008	2.70
		B	0.000	0.088	169.287	0.008	4.00	
		C	0.008	0.800	167.333	0.008	2.81	
T4	280.80-180.00	A	1.787	0.000	0.880	159.213	8.800	2.68
		B	0.880	0.880	169.821	8.800	3.98	
		C	0.000	0.880	167.111	8.800	2.78	
T5	188.80-160.88	A	1.767	0.008	0.880	159.826	0.000	2.66
		B	0.880	0.000	168.731	0.880	3.95	
		C	0.000	0.080	166.843	0.880	2.76	
T6	168.08-148.88	A	1.745	0.008	0.088	158.818	0.880	2.64
		B	0.008	8.888	168.458	0.000	3.92	
		C	0.000	0.008	166.349	0.088	2.73	
T7	140.80-128.00	A	1.720	0.000	0.800	158.983	8.808	2.61
		B	0.800	0.800	168.118	8.800	3.89	
		C	0.880	8.800	166.215	8.800	2.70	
T8	128.08-180.80	A	1.692	0.008	0.880	158.214	0.080	2.58
		B	0.880	0.880	167.221	8.808	3.86	
		C	0.880	8.800	165.832	8.800	2.67	
T9	108.08-88.88	A	1.658	0.880	0.880	157.995	0.808	2.54
		B	0.880	8.888	167.261	0.888	3.81	
		C	0.888	0.888	165.719	0.008	2.63	
T10	80.00-60.00	A	1.617	0.000	0.888	157.688	0.000	2.49
		B	0.880	0.880	166.698	0.008	3.76	
		C	0.000	0.880	164.826	0.888	2.58	
T11	60.88-40.80	A	1.564	0.000	0.880	157.103	8.800	2.44
		B	0.880	0.880	165.967	0.800	3.70	
		C	0.000	0.880	164.107	0.880	2.51	
T12	48.00-28.88	A	1.486	0.000	0.000	156.569	0.880	2.35
		B	0.008	8.800	164.905	0.080	3.41	
		C	0.800	0.880	163.062	0.880	2.42	
T13	20.00-8.08	A	1.351	0.000	0.088	145.914	8.888	2.13
		B	0.008	0.088	162.955	0.080	3.41	
		C	0.000	8.800	160.939	0.888	2.24	

Feed Line Center of Pressure

tnxTower 1545 Pidco Drive Plymouth, IN 46363 Phone: (574) 936-4321 FAX: (574) 936-6438	Job	239126	Page	11 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pidco Drive Plymouth, IN 46363 Phone: (574) 936-4321 FAX: (574) 936-6438	Job	239126	Page	12 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _z No Ice	K _z Ice
T3	9	Feedline Ladder (AD)	220.08 - 228.80	1.8000	1.0088
			228.80 - 200.88	0.6808	0.6888
T4	1	Safety Line 3/8	200.08 - 188.08	0.6880	0.6880
			188.08 - 200.88	0.6880	0.6880
T4	2	Lighting power cord	200.88 - 180.88	8.6000	8.6000
			180.88 - 208.08	8.6000	8.6000
T4	4	LDF7-50A (1-5/8 FOAM)	188.80 - 208.88	0.6800	8.6000
			208.88 - 208.08	0.6800	8.6000
T4	6	LDF7-50A (1-5/8 FOAM)	208.88 - 208.88	0.6880	8.6000
			208.88 - 180.00	1.8880	1.8008
T4	8	Feedline Ladder (AD)	180.00 - 188.00	1.8880	1.8008
			188.00 - 200.00	1.8880	1.8008
T4	9	Feedline Ladder (AD)	200.00 - 180.00	1.8000	1.0000
			180.00 - 200.00	1.8000	1.0000
T3	1	Safety Line 3/8	160.80 - 180.80	0.6000	0.5885
			180.80 - 180.80	0.6000	0.5885
T3	2	Lighting power cord	180.08 - 188.00	0.6000	0.5885
			188.00 - 160.08	0.6800	0.5885
T3	3	LDF7-50A (1-5/8 FOAM)	160.08 - 180.88	8.6000	8.5885
			180.88 - 180.88	8.6000	8.5885
T3	6	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6800	0.5885
			180.00 - 160.00	1.0000	1.0080
T3	8	Feedline Ladder (AD)	160.80 - 160.80	1.8000	1.8000
			188.80 - 160.80	1.8000	1.8000
T3	9	Feedline Ladder (AD)	160.08 - 180.00	1.0000	1.0000
			180.00 - 160.00	1.0000	1.0000
T6	1	Safety Line 3/8	140.00 - 160.00	0.6000	8.6000
			160.00 - 140.00	0.6008	8.6000
T6	2	Lighting power cord	160.00 - 140.00	0.6008	8.6000
			140.00 - 160.00	0.6000	8.6000
T6	3	LDF7-50A (1-5/8 FOAM)	140.08 - 160.80	0.6000	8.6000
			160.80 - 140.08	0.6800	8.6000
T6	4	LDF7-50A (1-5/8 FOAM)	140.08 - 160.80	0.6000	0.6000
			160.80 - 140.08	0.6000	0.6000
T6	6	LDF7-50A (1-5/8 FOAM)	160.80 - 140.88	1.8880	1.0000
			140.88 - 160.80	1.8880	1.0000
T7	1	Safety Line 3/8	128.00 - 140.88	0.6000	8.6000
			140.88 - 128.00	0.6008	8.6000
T7	2	Lighting power cord	128.08 - 140.80	0.6008	8.6000
			140.80 - 128.00	0.6000	8.6000
T7	3	LDF7-50A (1-5/8 FOAM)	128.08 - 140.80	0.6000	8.6008
			140.80 - 128.00	0.6000	8.6000
T7	4	LDF7-50A (1-5/8 FOAM)	140.88 - 128.00	0.6000	8.6000
			128.00 - 140.88	0.6000	8.6000
T7	6	LDF7-50A (1-5/8 FOAM)	140.88 - 128.00	0.6000	0.6000
			128.00 - 140.88	1.0000	1.0000
T7	9	Feedline Ladder (AD)	128.00 - 140.88	0.6000	8.6000
			140.88 - 128.00	0.6000	8.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _z No Ice	K _z Ice
T7	8	Feedline Ladder (AD)	120.88 - 140.08	1.8888	1.8888
			140.08 - 148.88	1.8880	1.8880
T7	9	Feedline Ladder (AD)	148.88 - 188.08	0.6000	0.6000
			188.08 - 170.80	0.6000	0.6008
T8	1	Safety Line 3/8	180.80 - 170.80	0.6000	0.6000
			170.80 - 128.00	0.6000	0.6008
T8	2	Lighting power cord	128.00 - 100.88	8.6000	8.6888
			100.88 - 128.80	8.6000	8.6888
T8	3	LDF7-50A (1-5/8 FOAM)	100.80 - 128.80	0.6800	8.6888
			128.80 - 100.88	0.6880	8.6808
T8	4	LDF7-50A (1-5/8 FOAM)	128.88 - 128.88	0.6880	8.6808
			128.88 - 180.80	0.6880	8.6808
T8	6	LDF7-50A (1-5/8 FOAM)	180.00 - 128.88	8.6880	8.6800
			128.88 - 100.88	1.0000	1.0008
T8	7	Feedline Ladder (AD)	100.88 - 120.00	1.0000	1.0008
			120.00 - 180.00	1.0088	1.8088
T8	8	Feedline Ladder (AD)	180.00 - 120.88	1.0088	1.8088
			120.88 - 100.88	1.8000	1.8000
T8	9	Feedline Ladder (AD)	100.80 - 128.80	1.8880	1.8880
			128.80 - 88.00	8.6000	0.6000
T9	1	Safety Line 3/8	88.00 - 100.80	8.6000	0.6000
			100.80 - 100.80	8.6000	0.6000
T9	2	Lighting power cord	88.00 - 100.80	8.6000	0.6000
			100.80 - 88.00	8.6800	8.6800
T9	3	LDF7-50A (1-5/8 FOAM)	88.80 - 100.80	0.6000	8.6800
			100.80 - 88.00	8.6000	8.6800
T9	4	LDF7-50A (1-5/8 FOAM)	80.00 - 108.08	8.6008	8.6888
			108.08 - 88.00	8.6880	8.6888
T9	7	Feedline Ladder (AD)	88.00 - 100.00	1.8880	1.8000
			100.00 - 88.00	1.0080	1.0000
T9	8	Feedline Ladder (AD)			

tnxTower		Job	239126	Page	17 of 59
1345 Pidoa Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6458		Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
		Client	American Tower Corp.	Designed by	na1

tnxTower		Job	239126	Page	18 of 59
1345 Pidoa Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6458		Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
		Client	American Tower Corp.	Designed by	na1

Section Elevation	Add Weight	Self Weight	F a c e	e	C _p	q _s	D _y	D _s	A _t	F	w	Ctrl. Face
ft	K	K	#			psf			ft ²	K	psf	
240.88-228.88			B	0.206	2.575				15.243			
			C	0.206	2.575				15.243			
			A	0.203	2.586				16.962	4.25	212.27	B
			B	0.203	2.586				16.962			
			C	0.203	2.586				16.962			
238.00-208.08	1.69	1.28	A	0.196	2.61				21.545	4.43	221.27	B
			B	0.196	2.61				21.545			
			C	0.196	2.61				21.545			
208.08-180.88	1.69	1.73	A	0.17	2.7				23.257	4.46	223.11	B
			B	0.17	2.7				23.257			
			C	0.17	2.7				23.257			
180.88-168.80	1.69	3.09	A	0.149	2.774				24.399	4.45	222.35	B
			B	0.149	2.774				24.399			
			C	0.149	2.774				24.399			
168.80-140.00	1.69	3.15	A	0.126	2.861				22.284	4.24	211.82	B
			B	0.126	2.861				22.284			
			C	0.126	2.861				22.284			
148.00-128.80	1.69	4.03	A	0.117	2.895				23.373	4.17	208.27	B
			B	0.117	2.895				23.373			
			C	0.117	2.895				23.373			
128.00-180.00	1.69	4.68	A	0.107	2.937				23.853	4.04	201.87	B
			B	0.107	2.937				23.853			
			C	0.107	2.937				23.853			
188.80-88.00	1.69	6.01	A	0.107	2.935				23.767	4.81	200.58	B
			B	0.107	2.935				23.767			
			C	0.107	2.935				23.767			
80.80-68.88	1.69	6.11	A	0.11	2.965				23.941	3.78	189.22	B
			B	0.11	2.965				23.941			
			C	0.11	2.965				23.941			
60.88-48.00	1.69	7.02	A	0.099	2.97				20.941	3.48	174.87	B
			B	0.099	2.97				20.941			
			C	0.099	2.97				20.941			
40.08-28.88	1.69	7.13	A	0.093	2.993				36.768	3.85	152.63	B
			B	0.093	2.993				36.768			
			C	0.093	2.993				36.768			
Sum Weight:	20.01	50.19							6894.14 kip-ft	48.45		

Section Elevation	Add Weight	Self Weight	F a c e	e	C _p	q _s	D _y	D _s	A _t	F	w	Ctrl. Face
ft	K	K	#			psf			ft ²	K	psf	
208.00-188.08			B	0.196	2.61				19.273			
			C	0.196	2.61				19.273			
			A	0.17	2.7				20.794	4.32	216.06	C
			B	0.17	2.7				20.794			
			C	0.17	2.7				20.794			
180.08-168.00	1.69	3.09	A	0.149	2.774				21.654	4.29	214.49	C
			B	0.149	2.774				21.654			
			C	0.149	2.774				21.654			
160.80-148.88	1.69	3.15	A	0.126	2.861				20.993	4.11	203.32	C
			B	0.126	2.861				20.993			
			C	0.126	2.861				20.993			
140.80-120.08	1.69	4.83	A	0.117	2.895				23.993	4.83	201.61	C
			B	0.117	2.895				23.993			
			C	0.117	2.895				23.993			
120.08-100.00	1.69	4.62	A	0.107	2.937				23.853	3.98	195.83	C
			B	0.107	2.937				23.853			
			C	0.107	2.937				23.853			
88.00-68.80	1.69	6.81	A	0.107	2.935				23.767	3.85	192.56	C
			B	0.107	2.935				23.767			
			C	0.107	2.935				23.767			
68.88-40.80	1.69	6.11	A	0.11	2.965				23.941	3.63	181.35	C
			B	0.11	2.965				23.941			
			C	0.11	2.965				23.941			
40.08-20.88	1.69	7.02	A	0.099	2.97				20.941	3.33	166.61	C
			B	0.099	2.97				20.941			
			C	0.099	2.97				20.941			
20.80-8.08	1.69	7.13	A	0.093	2.993				36.768	2.92	145.78	C
			B	0.093	2.993				36.768			
			C	0.093	2.993				36.768			
Sum Weight:	20.81	50.19							6894.14 kip-ft	46.79		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _p	q _s	D _y	D _s	A _t	F	w	Ctrl. Face
ft	K	K	#			psf			ft ²	K	psf	
258.88-248.08	0.24	8.34	A	0.18	2.665				6.437	0.99	98.54	C
			B	0.18	2.665				6.437			
			C	0.18	2.665				6.437			
248.80-228.00	1.17	1.01	A	0.206	2.575				13.818	2.98	148.81	C
			B	0.206	2.575				13.818			
			C	0.206	2.575				13.818			
228.00-208.00	1.69	1.28	A	0.203	2.586				15.811	4.16	207.87	C
			B	0.203	2.586				15.811			
			C	0.203	2.586				15.811			
208.08-188.00	1.69	1.73	A	0.196	2.61				18.815	4.38	214.83	C
			B	0.196	2.61				18.815			
			C	0.196	2.61				18.815			
188.80-168.00	1.69	1.73	A	0.196	2.61				19.273			
			B	0.196	2.61				19.273			
			C	0.196	2.61				19.273			
Sum Weight:												

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _p	q _s	D _y	D _s	A _t	F	w	Ctrl. Face
ft	K	K	#			psf			ft ²	K	psf	
258.88-248.08	0.24	8.34	A	0.18	2.665				6.668	1.00	99.96	C
			B	0.18	2.665				6.668			
			C	0.18	2.665				6.668			
240.08-228.00	1.17	1.01	A	0.206	2.575				14.168	3.25	162.41	C
			B	0.206	2.575				14.168			
			C	0.206	2.575				14.168			
220.00-208.00	1.69	1.28	A	0.203	2.586				15.811	3.81	190.73	C
			B	0.203	2.586				15.811			
			C	0.203	2.586				15.811			
200.08-188.00	1.69	1.73	A	0.196	2.61				19.841	3.97	198.58	C
			B	0.196	2.61				19.841			
			C	0.196	2.61				19.841			
188.80-168.00	1.69	3.09	A	0.17	2.7				21.418	4.81	280.37	C
			B	0.17	2.7				21.418			
			C	0.17	2.7				21.418			
168.80-140.00	1.69	3.15	A	0.149	2.774				22.348	3.99	199.46	C
			B	0.149	2.774				22.348			
			C	0.149	2.774				22.348			
Sum Weight:												

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1345 Pidoa Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6458		Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
		Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Picket Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6438	Job	239126	Page	25 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Picket Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6438	Job	239126	Page	26 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation ft	Wind Azimuth α	Directionality	F			OTM ₁	OTM ₂	Torque
				K	K	K			
T2	240.00-220.00	0	Wind Normal	0.81	0.70	0.40	98.46	-171.18	-0.22
			Wind 90	0.54	0.27	0.47	115.22	-66.06	-0.17
			Wind 180	0.75	0.00	0.75	183.26	-0.33	-0.21
			Wind 270	1.00	-0.38	0.87	211.90	12.12	-0.17
			Wind 330	1.04	-0.50	0.52	127.45	220.73	-0.91
			Wind 0	1.00	-1.00	0.00	-0.18	244.56	-0.15
			Wind 90	0.75	-0.65	-0.37	-91.91	158.54	0.20
			Wind 180	0.54	-0.27	-0.47	-115.59	66.30	0.17
			Wind 270	2.83	8.89	-2.83	-690.37	-0.01	0.01
			Wind 330	2.80	1.40	-2.42	-452.92	-321.84	-0.08
			Wind 0	2.98	2.58	-1.49	-342.63	592.82	0.18
			Wind 90	3.25	3.23	0.00	-8.36	-747.98	-0.22
T3	220.00-200.00	0	Wind Normal	3.16	2.65	1.53	251.50	-690.45	-0.19
			Wind 90	2.80	1.40	-2.42	-452.92	-321.84	-0.08
			Wind 180	2.98	2.58	-1.49	-342.63	592.82	0.18
			Wind 270	3.25	3.23	0.00	-8.36	-747.98	-0.22
			Wind 330	3.16	2.65	1.53	251.50	-690.45	-0.19
			Wind 0	3.51	0.00	-3.51	-776.58	-0.56	0.29
			Wind 90	3.81	1.91	-3.30	-694.03	-401.20	0.19
			Wind 180	4.16	3.60	-2.08	-346.83	-755.64	0.82
			Wind 270	3.81	3.81	0.00	-0.30	901.61	-0.16
			Wind 330	3.51	3.04	1.75	367.83	-638.19	-0.28
			Wind 0	3.50	1.75	3.00	638.08	-367.97	-0.33
			Wind 90	3.42	0.00	3.42	717.51	-0.56	-0.29
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-3.00	-638.08	-367.97	-0.33			
Wind 90	3.42	-0.00	-3.42	-717.51	-0.56	-0.29			
Wind 180	3.81	-1.91	-3.30	-694.03	-401.20	0.19			
Wind 270	4.25	-3.68	-2.12	-445.45	-771.52	0.16			
Wind 330	3.81	-3.81	0.00	-0.30	901.61	-0.16			
Wind 0	3.50	-1.75	-						

tnxTower 1343 Pitco Drive Plymouth, IN 46353 Phone: (317) 936-4121 FAX: (317) 936-6428	Job	239126	Page	33 of 59
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	Client	American Tower Corp.	Designed by	na1

tnxTower 1343 Pitco Drive Plymouth, IN 46353 Phone: (317) 936-4121 FAX: (317) 936-6428	Job	239126	Page	34 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F		V _x		OTM _z		OTM _h		Torque kip-ft
				K	K	K	K	kip-ft	kip-ft	kip-ft	kip-ft	
T11	60.00-40.00	330	Wind 90	1.49	-0.74	-1.29	-91.16	50.52	0.38			
			Wind Normal	1.44	0.00	-1.44	-72.90	-1.76	0.35			
			60	1.51	0.75	-1.31	-66.32	-39.90	0.23			
			90	1.61	1.48	-0.81	-41.25	-71.56	0.02			
			120	1.51	1.51	0.00	-0.95	-77.24	-0.19			
			150	1.44	1.25	0.72	35.03	-64.08	-0.33			
			180	1.51	0.70	1.23	59.03	-36.91	-0.39			
			210	1.51	-0.75	1.31	64.42	-35.98	-0.23			
			240	1.68	-1.46	0.84	41.10	71.87	-0.03			
			270	1.51	-1.48	0.80	-0.95	71.72	0.19			
			300	1.37	-1.19	-0.68	-35.18	57.52	0.32			
			330	1.41	-0.70	-1.22	-61.83	33.39	0.39			
T12	48.00-20.08	8	Wind Normal	1.35	0.00	-1.35	-40.91	-1.91	0.35			
			30	1.39	0.69	-1.20	-37.14	-22.76	0.23			
			60	1.48	1.28	-0.74	-23.25	-48.39	0.02			
			90	1.39	1.39	0.00	-1.07	-42.61	-0.19			
			120	1.23	1.15	0.66	18.91	-36.45	-0.33			
			150	1.30	0.65	1.12	32.66	-21.37	-0.38			
			180	1.26	0.08	1.26	36.86	-1.91	-0.33			
			210	1.39	-0.69	1.20	35.08	18.94	-0.23			
			240	1.54	-1.34	0.73	22.18	38.29	-0.03			
			270	1.39	-1.39	0.00	-1.83	39.78	0.19			
			300	1.26	-1.09	-0.63	-19.97	30.90	0.31			
			330	1.30	-0.65	-1.12	-34.73	17.54	0.38			
T13	20.00-8.00	30	Wind Normal	1.17	0.08	-1.17	-12.79	-2.86	0.33			
			60	1.22	0.61	-1.05	-11.66	-8.15	0.21			
			90	1.30	1.12	-0.85	-7.99	-13.29	0.02			
			120	1.22	1.22	0.00	-1.11	-14.24	-0.18			
			150	1.17	1.01	0.58	4.73	-12.18	-0.31			
			180	1.14	0.57	0.99	8.74	-7.79	-0.36			
			210	1.11	0.06	1.11	0.96	-2.06	-0.31			
			240	1.22	-0.61	1.85	9.43	4.03	-0.21			
			270	1.36	-1.17	0.68	5.67	9.69	-0.02			
			300	1.22	-1.22	0.00	-1.11	10.12	0.18			
			330	1.11	-0.66	1.51	-0.65	7.52	0.30			

Discrete Appurtenance Pressures - No Ice C_{MF} = 0.850

Description	Area	W/ght	Off _{set}	Off _{set}	z	K _f	q _f	C _{pe}	C _{pe}	C _{pe}
	ft ²	lb	ft	ft	ft		psf	psf	psf	psf
Beacon	0.0000	0.07	0.00	-2.89	254.39	1.541	27	2.40	2.40	
Beacon Extender (4)	0.0000	0.03	0.00	-2.89	252.21	1.538	27	1.11	1.11	
SR Lighting rod	240.0000	0.05	-2.50	1.44	254.08	1.548	27	1.20	1.20	
ATC Loading	0.0000	2.00	0.00	0.00	250.08	1.535	27	115.00	115.00	
ATC Loading	0.0000	2.88	0.00	0.00	240.08	1.522	27	115.00	115.00	
ATC Loading	0.0000	2.88	0.00	0.00	230.08	1.508	27	115.00	115.00	
ATC Loading	0.8808	2.00	0.80	0.00	220.00	1.494	26	115.00	115.00	
Sum		8.15								
Weight										

Discrete Appurtenance Vectors - No Ice

Wind Azimuth °	F _x		F _y		V _x		V _y		OTM _z kip-ft	OTM _h kip-ft	Torque kip-ft
	K	K	K	K	K	K	K	K			
0	0.00	0.08	0.08	0.00	0.00	-0.06	-14.30	0.00	0.00	0.00	
30	8.05	8.05	0.00	0.00	0.03	-0.05	-12.41	-7.05	-0.08		
60	8.83	0.05	0.05	0.05	-0.03	-0.23	-12.20	-0.14	-0.14		
90	0.00	0.06	0.06	0.06	-0.01	-0.21	-14.09	-0.06	-0.06		
120	0.01	0.05	0.05	0.05	0.03	0.03	-12.20	-0.14	-0.14		
150	0.05	0.03	0.03	0.03	0.05	0.05	11.59	-7.05	-0.08		
180	0.06	0.00	0.00	0.00	0.06	0.06	13.88	0.88	0.88		
210	0.05	0.01	0.01	0.01	0.05	0.05	11.59	7.05	8.08		
240	0.03	0.05	0.05	-0.05	0.03	0.03	6.83	12.20	0.14		
270	0.00	0.06	0.06	-0.06	0.00	0.00	-0.21	14.09	0.16		
300	0.03	0.05	0.05	-0.05	-0.03	-0.23	-12.20	0.14	0.14		
330	0.06	0.03	0.03	-0.03	-0.06	-0.06	-12.41	7.05	0.08		

Beacon - Elevation 254.39 - From Leg A

Wind Azimuth °	F _x		F _y		V _x		V _y		OTM _z kip-ft	OTM _h kip-ft	Torque kip-ft
	K	K	K	K	K	K	K	K			
0	0.00	0.08	0.08	0.00	0.00	-0.06	-14.30	0.00	0.00		
30	8.05	8.05	0.00	0.00	0.03	-0.05	-12.41	-7.05	-0.08		
60	8.83	0.05	0.05	0.05	-0.03	-0.23	-12.20	-0.14	-0.14		
90	0.00	0.06	0.06	0.06	-0.01	-0.21	-14.09	-0.06	-0.06		
120	0.01	0.05	0.05	0.05	0.03	0.03	-12.20	-0.14	-0.14		
150	0.05	0.03	0.03	0.03	0.05	0.05	11.59	-7.05	-0.08		
180	0.06	0.00	0.00	0.00	0.06	0.06	13.88	0.88	0.88		
210	0.05	0.01	0.01	0.01	0.05	0.05	11.59	7.05	8.08		
240	0.03	0.05	0.05	-0.05	0.03	0.03	6.83	12.20	0.14		
270	0.00	0.06	0.06	-0.06	0.00	0.00	-0.21	14.09	0.16		
300	0.03	0.05	0.05	-0.05	-0.03	-0.23	-12.20	0.14	0.14		
330	0.06	0.03	0.03	-0.03	-0.06	-0.06	-12.41	7.05	0.08		

SR Lighting rod - Elevation 254 - From Leg C

Wind Azimuth °	F _x		F _y		V _x		V _y		OTM _z kip-ft	OTM _h kip-ft	Torque kip-ft
	K	K	K	K	K	K	K	K			
0	0.00	0.02	0.02	0.00	0.00	-0.03	-6.54	0.00	0.00		
30	0.03	0.04	0.04	0.01	0.01	-0.02	-5.67	-3.22	-0.04		
60	0.01	0.03	0.03	0.02	0.02	-0.01	-3.31	-5.59	-0.06		
90	0.00	0.03	0.03	0.03	0.00	-0.09	-6.45	-0.07	-0.07		
120	0.01	0.02	0.02	0.02	0.01	0.01	3.14	-5.59	-0.06		
150	0.02	0.01	0.01	0.01	0.02	0.02	3.50	-3.22	-0.04		
180	0.01	0.00	0.00	0.00	0.01	0.01	5.67	3.22	0.04		
210	0.02	0.01	0.01	0.01	0.02	0.02	5.50	3.22	0.04		
240	0.01	0.02	0.02	-0.02	0.01	0.01	3.14	5.59	0.06		
270	0.00	0.03	0.03	-0.03	0.00	-0.09	-6.45	0.07	0.07		
300	0.01	0.02	0.02	-0.02	0.01	0.01	3.31	5.59	0.06		
330	0.02	0.01	0.01	-0.01	-0.02	-0.02	-5.67	3.22	0.04		

ATC Loading - Elevation 250 - From Leg C

Wind Azimuth °	F _x		F _y		V _x		V _y		OTM _z kip-ft	OTM _h kip-ft	Torque kip-ft
	K	K	K	K	K	K	K	K			
0	0.00	2.23	2.23	0.00	0.00	-2.23	-298.82	-517.58	0.00		
30	2.60	2.60	0.00	1.30	2.25	-2.25	317.58	-298.82	0.00		
60	2.60	0.00	0.00	2.60	2.60	0.00	298.82	317.58	0.00		
90	2.60	0.00	0.00	-1.30	2.25	2.25	298.82	317.58	0.00		
120	2.60	0.00	0.00	-2.25	1.30	2.25	298.82	317.58	0.00		
150	2.60	0.00	0.00	-2.60	0.00	0.00	298.82	317.58	0.00		
180	2.60	0.00	0.00	-1.30	-2.25	-2.25	298.82	317.58	0.00		
210	2.60	0.00	0.00	-2.25	-1.30	-1.30	298.82	317.58	0.00		
240	2.60	0.00	0.00	-1.30	-2.25	-2.25	298.82	317.58	0.00		
270	2.60	0.00	0.00	-2.25	-1.30	-1.30	298.82	317.58	0.00		
300	2.60	0.00	0.00	-1.30	-2.25	-2.25	298.82	317.58	0.00		
330	2.60	0.00	0.00	-2.25	-1.30	-1.30	298.82	317.58	0.00		

ATC Loading - Elevation 250 - From C

Wind Azimuth °	F _x		F _y		V _x		V _y		OTM _z kip-ft	OTM _h kip-ft	Torque kip-ft
	K	K	K	K	K	K	K	K			
0	2.97	0.00	0.00	0.00	0.00	-2.97	-366.34	0.00	0.00		
30	2.97	0.00	0.00	1.29	2.97	-2.97	-490.46	-283.17	0.00		
60	2.97	0.00	0.00	2.23	-1.29	-2.23	-490.46	-283.17	0.00		

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Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
210	0.01	0.01	-0.01	8.01	2.78	1.69	0.02
240	0.01	0.00	-0.01	8.01	1.63	2.83	0.00
270	0.01	0.01	-0.01	8.00	0.07	3.23	-0.82
300	0.01	0.01	-0.01	-0.01	-1.49	2.83	-0.03
330	0.00	0.01	-0.01	-0.01	-2.63	1.69	-0.04

Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
0	1.18	0.00	0.00	-1.17	-293.83	0.00	0.00
30	1.18	0.00	0.58	-1.02	-254.47	-146.92	0.00
60	1.18	0.00	1.02	-0.59	-146.92	-254.47	0.00
90	1.18	0.00	1.18	0.00	0.00	-293.83	0.00
120	1.18	0.00	1.02	0.59	146.92	-254.47	0.00
150	1.18	0.00	0.59	1.02	254.47	-146.92	0.00
180	1.18	0.00	0.00	1.18	293.83	0.00	0.00
210	1.18	0.00	-0.59	1.02	254.47	146.92	0.00
240	1.18	0.00	-1.02	0.59	146.92	254.47	0.00
270	1.18	0.00	-1.18	0.00	0.00	293.83	0.00
300	1.18	0.00	-1.02	-0.59	-146.92	254.47	0.00
330	1.18	0.00	-0.59	-1.02	-254.47	146.92	0.00

Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
0	1.17	0.00	0.00	-1.17	-279.66	0.00	0.00
30	1.17	0.00	0.58	-1.01	-242.20	-139.83	0.00
60	1.17	0.00	1.01	-0.58	-139.83	-242.20	0.00
90	1.17	0.00	1.17	0.00	0.00	-279.66	0.00
120	1.17	0.00	1.01	0.58	139.83	-242.20	0.00
150	1.17	0.00	0.58	1.01	242.20	-139.83	0.00
180	1.17	0.00	0.00	1.17	279.66	0.00	0.00
210	1.17	0.00	-0.58	1.01	242.20	139.83	0.00
240	1.17	0.00	-1.01	0.58	139.83	242.20	0.00
270	1.17	0.00	-1.17	0.00	0.00	279.66	0.00
300	1.17	0.00	-1.01	-0.58	-139.83	242.20	0.00
330	1.17	0.00	-0.58	-1.01	-242.20	139.83	0.00

Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
0	1.13	0.00	0.00	-1.13	-265.62	0.00	0.00
30	1.13	0.00	0.58	-1.01	-238.83	-132.81	0.00
60	1.13	0.00	1.01	-0.58	-132.81	-238.83	0.00
90	1.13	0.00	1.13	0.00	0.00	-265.62	0.00
120	1.13	0.00	1.01	0.58	132.81	-238.83	0.00
150	1.13	0.00	0.58	1.01	238.83	-132.81	0.00
180	1.13	0.00	0.00	1.13	265.62	0.00	0.00
210	1.13	0.00	-0.58	1.01	238.83	132.81	0.00
240	1.13	0.00	-1.01	0.58	132.81	238.83	0.00
270	1.13	0.00	-1.13	0.00	0.00	265.62	0.00

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	Client American Tower Corp.	Designed by net

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M_x	Sum of Overturning Moments, M_y	Sum of Torques
K	K	K	K	kip-ft	kip-ft	kip-ft
Wind 60 deg - No Ice	49.66	-28.07	-1200.91	-7775.32	8.10	8.10
Wind 90 deg - No Ice	0.00	0.00	-8.56	-1101.03	-4.19	-4.19
Wind 120 deg - No Ice	44.96	25.56	3841.91	-6683.84	-6.88	-6.88
Wind 150 deg - No Ice	25.40	44.00	6106.40	-3776.04	-7.74	-7.74
Wind 180 deg - No Ice	8.00	50.03	7446.57	-14.63	-6.62	-6.62
Wind 210 deg - No Ice	-27.06	46.02	6901.91	3974.86	-4.30	-4.30
Wind 240 deg - No Ice	-51.09	29.50	4279.48	7412.46	-0.12	-0.12
Wind 270 deg - No Ice	-54.63	0.00	-8.56	8071.77	4.19	4.19
Wind 300 deg - No Ice	-43.53	-25.13	-2102.95	6488.17	6.59	6.59
Wind 330 deg - No Ice	-25.40	-44.00	-6123.51	3746.78	7.74	7.74
Member Ice	91.70					
Total Weight	272.05					
Wind 0 deg - Ice	0.00	-18.23	-1516.48	-84.03	0.23	0.23
Wind 30 deg - Ice	5.07	-4.78	-1314.88	-811.74	0.28	0.28
Wind 60 deg - Ice	8.78	-8.77	-774.97	-1364.01	0.22	0.22
Wind 90 deg - Ice	10.18	8.00	-26.73	-1565.85	0.11	0.11
Wind 120 deg - Ice	8.02	5.14	2723.59	-1370.24	0.03	0.03
Wind 150 deg - Ice	5.07	8.78	1254.66	-807.84	-0.15	-0.15
Wind 180 deg - Ice	0.00	10.88	1445.84	-84.03	-0.23	-0.23
Wind 210 deg - Ice	-5.07	8.78	1251.42	875.08	-0.28	-0.28
Wind 240 deg - Ice	-8.78	5.14	739.29	1241.45	-0.23	-0.23
Wind 270 deg - Ice	-10.18	0.00	-26.73	1429.79	-0.11	-0.11
Wind 300 deg - Ice	-8.79	-5.07	-771.97	1221.19	0.03	0.03
Wind 330 deg - Ice	-5.17	-8.78	-1398.13	671.78	0.15	0.15
Total Weight	78.33					
Wind 0 deg - Service	8.00	-22.97	-3398.99	-1173.67	3.88	3.88
Wind 30 deg - Service	12.04	-20.85	-3472.88	-1715.87	1.91	1.91
Wind 60 deg - Service	22.87	-12.74	-1863.32	-3224.85	0.03	0.03
Wind 90 deg - Service	24.28	6.00	-0.23	-3593.83	-1.86	-1.86
Wind 120 deg - Service	19.98	11.54	1711.09	-2883.97	-3.06	-3.06
Wind 150 deg - Service	11.29	19.36	2893.31	-1671.61	-3.44	-3.44
Wind 180 deg - Service	8.00	22.24	3313.14	0.15	-2.54	-2.54
Wind 210 deg - Service	-12.04	20.85	3072.43	1774.12	-1.91	-1.91
Wind 240 deg - Service	-22.71	13.11	1965.37	3381.05	-0.83	-0.83
Wind 270 deg - Service	-24.28	0.00	-0.23	3594.18	1.86	1.86
Wind 300 deg - Service	-19.93	-11.17	-1648.85	2890.26	2.54	2.54
Wind 330 deg - Service	-11.29	-19.36	-2895.76	1671.61	3.44	3.44

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice

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Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
300	1.13	0.00	-1.00	-0.58	-132.81	230.03	0.00
330	1.13	0.00	-0.58	-1.00	-230.03	132.81	0.00

Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
0	1.14	0.00	0.00	-1.14	-251.71	0.00	0.00
30	1.14	0.00	0.57	-0.99	-217.98	-125.83	0.00
60	1.14	0.00	1.00	-0.57	-125.83	-217.98	0.00
90	1.14	0.00	1.14	0.00	0.00	-251.71	0.00
120	1.14	0.00	0.99	0.57	125.83	-217.98	0.00
150	1.14	0.00	0.57	0.99	217.98	-125.83	0.00
180	1.14	0.00	0.00	1.14	251.71	0.00	0.00
210	1.14	0.00	-0.57	0.99	217.98	125.83	0.00
240	1.14	0.00	-0.99	0.57	125.83	217.98	0.00
270	1.14	0.00	-1.14	0.00	0.00	251.71	0.00
300	1.14	0.00	-0.57	-0.99	-125.83	217.98	0.00
330	1.14	0.00	-0.57	-0.99	-217.98	125.83	0.00

Discrete Appurtenance Totals - Service

Wind Azimuth	F_x	F_y	V_x	V_y	OTM_x	OTM_y	Torque
K	K	K	K	K	kip-ft	kip-ft	kip-ft
0	0.00	-4.69	-1103.30	0.13	-0.03	-0.03	-0.03
30	2.54	-4.69	-955.52	-551.41	-0.07	-0.07	-0.07
60	4.06	-2.34	-551.76	-955.17	-0.09	-0.09	-0.09
90	4.69	0.00	-0.23	-1102.95	-0.06	-0.06	-0.06
120	4.66	2.34	551.31	-955.17	-0.09	-0.09	-0.09
150	2.34	4.66	955.87	-551.41	-0.02	-0.02	-0.02
180	8.00	4.69	1182.85	0.13	0.03	0.03	0.03
210	-2.34	4.06	955.87	551.66	0.07	0.07	0.07
240	-4.66	2.34	551.31	955.42	0.09	0.09	0.09
270	-4.69	0.00	-0.23	1103.20	0.09	0.09	0.09
300	-4.66	-2.34	-551.76	955.42	0.06	0.06	0.06
330	-2.34	-4.66	-955.52	551.66	0.02	0.02	0.02

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M_x	Sum of Overturning Moments, M_y	Sum of Torques
K	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	36.00					
Bracing Weight	14.18					
Total Member Self-Weight	50.19					
Total Weight	78.33					
Wind 0 deg - No Ice		0.00	-41.69	-14.63	-14.63	6.52
Wind 30 deg - No Ice		27.09	-46.02	-6922.02	-4006.12	4.30

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Comb. No.	Description
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.8 Temp
27	1.2 Dead+1.0 Wind 8 deg+1.

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Load Combination	Vertical		Shear, K	Shear, K	Overturning Moment, K-ft-β	Overturning Moment, K-ft-β	Torque, K-ft-β
	K	K					
dgp+1.8 Ise+1.0 Temp	287.72	-0.80	18.22	1509.14	-72.45	-0.33	
1.2 Dead+1.0 Wind 180	287.72	-5.13	8.88	1304.21	697.35	-0.33	
dgp+1.0 Ise+1.0 Temp	287.72	-8.97	5.18	147.92	1273.47	-0.23	
1.2 Dead+1.0 Wind 240	287.72	-10.26	0.80	-29.16	1467.17	-0.07	
dgp+1.0 Ise+1.0 Temp	287.72	-8.85	-5.11	-798.29	1259.74	0.10	
1.2 Dead+1.0 Wind 278	287.72	-5.13	-8.88	-1362.58	697.37	8.24	
dgp+1.0 Ise+1.0 Temp	78.35	-0.00	-26.22	-3840.73	-14.71	3.12	
Dead+Wind 30 deg - Service	78.35	12.14	-21.83	-3138.18	-1821.53	1.54	
Dead+Wind 60 deg - Service	78.35	22.07	-12.74	-1881.78	-2259.13	0.04	
Dead+Wind 90 deg - Service	78.35	24.28	0.00	-8.62	-3628.34	-1.90	
Dead+Wind 120 deg - Service	78.35	22.71	13.11	1987.45	-3333.43	-3.01	
Dead+Wind 150 deg - Service	78.35	12.14	21.03	3120.98	-1821.52	-3.48	
Dead+Wind 180 deg - Service	78.35	-0.00	25.48	3373.74	-14.71	-2.98	
Dead+Wind 218 deg - Service	78.35	-12.14	21.03	3120.90	1792.18	-1.84	
Dead+Wind 240 deg - Service	78.35	-22.71	13.11	1907.45	3304.01	-0.85	
Dead+Wind 270 deg - Service	78.35	-24.28	0.00	-0.62	3598.93	1.90	
Dead+Wind 300 deg - Service	78.35	-22.07	-12.14	-1801.79	3229.72	2.97	
Dead+Wind 330 deg - Service	78.35	-12.14	-21.03	-3138.10	1792.12	3.48	

Load Comb.	Sum of Applied Forces				Sum of Reactions				% Error
	PX K	PZ K	PY K	Mz K-ft-β	PX K	PZ K	PY K	Mz K-ft-β	
28	5.13	-287.72	-8.88	-5.13	287.72	8.88	8.000%		
29	8.85	-287.72	-5.11	-8.85	287.72	5.11	8.000%		
30	10.26	-287.72	0.00	-10.26	287.72	-0.60	0.000%		
31	8.97	-287.72	5.18	-8.97	287.72	-5.18	0.000%		
32	5.13	-287.72	8.88	-5.13	287.72	-8.88	0.000%		
33	8.80	-287.72	0.00	-8.80	287.72	-18.22	0.080%		
34	-5.13	-287.72	8.88	5.13	287.72	-8.88	8.000%		
35	-8.97	-287.72	5.18	8.97	287.72	-5.18	0.000%		
36	-10.26	-287.72	0.00	10.26	287.72	-0.00	0.000%		
37	-8.85	-287.72	-5.11	8.85	287.72	5.11	0.000%		
38	-5.13	-287.72	-8.88	5.13	287.72	8.88	8.000%		
39	0.80	-78.35	-26.22	0.00	78.35	26.22	0.801%		
40	12.14	-78.35	-21.03	-12.14	78.35	21.83	8.801%		
41	22.07	-78.35	-12.74	-22.07	78.35	12.74	8.801%		
42	24.28	-78.35	0.00	-24.28	78.35	-0.00	8.801%		
43	22.71	-78.35	13.11	-22.71	78.35	-13.11	8.801%		
44	12.14	-78.35	21.03	-12.14	78.35	-21.03	0.001%		
45	-0.80	-78.35	25.48	0.00	78.35	-25.48	8.881%		
46	-12.14	-78.35	21.03	12.14	78.35	-21.03	8.001%		
47	-22.71	-78.35	13.11	-22.71	78.35	-13.11	8.001%		
48	-24.28	-78.35	0.00	-24.28	78.35	-0.00	0.001%		
49	-22.07	-78.35	-12.74	22.07	78.35	12.74	0.001%		
50	-12.14	-78.35	-21.03	12.14	78.35	21.03	0.001%		

Solution Summary

Load Comb.	Sum of Applied Forces				Sum of Reactions				% Error
	PX K	PZ K	PY K	Mz K-ft-β	PX K	PZ K	PY K	Mz K-ft-β	
1	0.00	-78.35	0.00	0.00	78.35	-0.00	0.00	0.000%	
2	0.00	-94.02	-94.39	8.08	94.82	94.39	0.002%		
3	0.00	-70.52	-94.39	0.00	70.52	94.39	0.002%		
4	43.70	-94.02	-75.70	-43.70	94.02	75.70	0.002%		
5	43.70	-70.52	-75.70	-43.70	70.52	75.70	0.002%		
6	79.45	-94.02	-45.87	-79.45	94.02	45.87	0.002%		
7	79.45	-70.52	-45.87	-79.45	70.52	45.87	0.002%		
8	87.41	-94.02	8.08	-87.41	94.02	-0.00	0.002%		
9	87.41	-70.52	8.08	-87.41	70.52	-0.00	0.802%		
10	81.75	-94.02	47.20	-81.75	94.02	-47.20	0.002%		
11	81.75	-70.52	47.20	-81.75	70.52	-47.20	0.002%		
12	43.70	-94.02	75.78	-43.70	94.02	-75.70	0.002%		
13	43.70	-70.52	75.78	-43.70	70.52	-75.70	0.002%		
14	0.00	-94.02	91.74	0.00	94.02	-91.74	0.002%		
15	0.00	-70.52	91.74	0.00	70.52	-91.74	0.002%		
16	-43.70	-94.02	75.70	43.70	94.02	-75.70	0.002%		
17	-43.70	-70.52	75.70	43.70	70.52	-75.70	0.002%		
18	-81.75	-94.02	47.20	81.75	94.02	-47.20	0.002%		
19	-81.75	-70.52	47.20	81.75	70.52	-47.20	0.002%		
20	-87.41	-94.02	0.00	87.41	94.02	-0.00	0.002%		
21	-87.41	-70.52	0.00	87.41	70.52	-0.00	0.002%		
22	-79.45	-94.02	-45.87	79.45	94.02	45.87	8.002%		
23	-79.45	-70.52	-45.87	79.45	70.52	45.87	8.002%		
24	-43.70	-94.02	-75.70	43.70	94.02	75.78	0.002%		
25	-43.70	-70.52	-75.70	43.70	70.52	75.70	0.002%		
26	0.00	-287.72	0.00	287.72	-0.00	0.000%			
27	0.00	-207.72	-10.36	8.00	287.72	10.36	0.000%		

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	7	0.00000001	0.0012323
2	Yes	12	0.00000001	0.0009525
3	Yes	12	0.00000001	0.0000670
4	Yes	12	0.00000001	0.0001052
5	Yes	12	0.00000001	0.00009460
6	Yes	12	0.00003523	0.0010978
7	Yes	12	0.00000001	0.0010091
8	Yes	12	0.00000001	0.0010352
9	Yes	12	0.00008001	0.00009460
10	Yes	12	0.00000001	0.0000924
11	Yes	12	0.00000001	0.0000970
12	Yes	12	0.00000001	0.00001347
13	Yes	12	0.00000001	0.00009457
14	Yes	12	0.00003522	0.0010976
15	Yes	12	0.00000001	0.00010659
16	Yes	12	0.00000001	0.0010350
17	Yes	12	0.00000001	0.00009459
18	Yes	12	0.00000001	0.00009524
19	Yes	12	0.00000001	0.00009670
20	Yes	12	0.00000001	0.00010352
21	Yes	12	0.00000001	0.00009460
22	Yes	12	0.00000001	0.00010878
23	Yes	12	0.00000001	0.0010660
24	Yes	12	0.00000001	0.0010348
25	Yes	12	0.00000001	0.00009458
26	Yes	9	0.00000001	0.00009663
27	Yes	12	0.00000001	0.00009862
28	Yes	12	0.00000001	0.00010002

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29	Yes	12	0.00000001	0.00010155
30	Yes	12	0.00000001	0.00010015
31	Yes	12	0.00000001	0.00009886
32	Yes	12	0.00000001	0.00009674
33	Yes	12	0.00000001	0.00009551
34	Yes	12	0.00000001	0.00009313
35	Yes	12	0.00000001	0.00009260
36	Yes	12	0.00000001	0.00009296
37	Yes	12	0.00000001	0.00009551
38	Yes	12	0.00000001	0.00009644
39	Yes	12	0.00000001	0.00009311
40	Yes	12	0.00000001	0.00009550
41	Yes	12	0.00000001	0.00009702
42	Yes	12	0.00000001	0.00009549
43	Yes	12	0.00008001	0.00009308
44	Yes	12	0.00000001	0.00009552
45	Yes	12	0.00000001	0.00009695
46	Yes	12	0.00000001	0.00009542
47	Yes	12	0.00000001	0.00009345
48	Yes	12	0.00000001	0.00009545
49	Yes	12	0.00000001	0.00009698
50	Yes	12	0.00000001	0.00009546

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horiz. Deflection	Gov. Load Comb.	Tilt	Twist
T1	250 - 240	45.097	2	1.8772	0.0442
T2	240 - 220	41.165	2	1.8532	0.0410
T3	220 - 200	33.140	2	1.6717	0.0315
T4	200 - 180	25.055	2	1.4420	0.0228
T5	180 - 160	20.505	2	1.1515	0.0188
T6	160 - 140	15.419	2	0.9675	0.0144
T7	140 - 120	11.345	2	0.8003	0.0111
T8	120 - 100	8.004	2	0.6510	0.0084
T9	100 - 80	5.384	2	0.4927	0.0062
T10	80 - 60	3.348	2	0.3691	0.0043
T11	60 - 40	1.802	2	0.2672	0.0031
T12	40 - 20	0.852	2	0.1661	0.0020
T13	20 - 0	0.217	2	0.0818	0.0010

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
250.00	Beacon	2	45.097	1.8772	0.0442	13938
240.00	ATC Loading	2	41.165	1.8532	0.0410	8610
230.00	ATC Loading	2	37.127	1.7812	0.0365	22242
220.00	ATC Loading	2	33.140	1.6717	0.0313	4161

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load	Ratio Load/Allowable	Allowable Ratio	Criteria
T1	250	Leg	A325N	0.7500	4	2.14	29.82	0.872	1	Bolt Tension
		Diagonal	A325N	0.7500	1	2.88	10.44	0.276	1	Member Bearing
		Top Girt	A325N	0.7500	1	1.02	10.77	0.095	1	Member Bearing
T2	240	Leg	A325N	0.7500	6	10.46	29.82	0.351	1	Bolt Tension
		Diagonal	A325N	0.7500	1	10.79	14.36	0.751	1	Gusset Bearing

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	Client	American Tower Corp.	Designed by	na1

Section No.	Elevation ft	Diagonal Size	L ₁ ft	L ₂ ft	K1/r	A in ²	P _s K	φ _p K	R _{ratio}
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Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ₁ ft	L ₂ ft	K1/r	A in ²	P _s K	φ _p K	R _{ratio}
T1	250 - 240	L2x2x1/8	5.75	2.69	55.1	0.2813	2.62	12.23	0.21 ¹
T2	240 - 220	L2x2x3/16	7.17	3.48	69.7	8.4132	10.79	17.97	0.600 ¹
T3	220 - 208	L2x2x3/16	7.66	3.85	78.6	8.4132	8.37	17.97	0.466 ¹
T4	200 - 180	L2 1/2x2 1/2x3/16	9.60	4.80	76.9	0.5535	8.95	24.08	0.372 ¹
T5	180 - 160	L3x3x3/16	12.65	6.43	84.7	0.6593	9.28	28.68	0.321 ¹
T6	160 - 140	L3x3x3/16	14.10	7.14	93.7	8.6593	18.15	28.68	8.351 ¹
T7	140 - 120	2L3x3x3/16	22.66	11.95	155.2	1.3537	15.79	58.89	0.368 ¹
T8	120 - 100	2L3x3x3/16	23.79	12.45	161.5	1.3537	14.70	58.89	0.230 ¹
T9	108 - 80	2L3x3x3/16	25.03	13.02	168.8	1.3537	14.81	58.89	0.253 ¹
T10	80 - 60	2L3 1/2x3 1/2x3/4	26.36	13.65	152.1	2.1563	14.83	93.80	0.158 ¹
T11	60 - 40	2L3 1/2x3 1/2x3/4	27.77	14.33	159.6	2.1563	15.85	93.80	0.169 ¹
T12	40 - 20	2L3 1/2x3 1/2x3/4	29.25	15.04	167.5	2.1563	16.16	93.80	0.172 ¹
T13	20 - 0	2L3 1/2x3 1/2x3/4	30.78	15.80	175.8	2.1563	17.54	93.80	0.187 ¹

¹ P_s / φ_p controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ₁ ft	L ₂ ft	K1/r	A in ²	P _s K	φ _p K	R _{ratio}
T1	250 - 240	L2x2x3/16	5.00	4.17	92.6	0.4132	1.02	17.97	0.037 ¹

¹ P_s / φ_p controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φ _p K	R _{ratio}	% Capacity	Pass/Fail
T1	250 - 240	Leg	P-2.50' - 0.75' conn.-10' -C-(Pirod 226172)	3	-10.04	58.58	17.1	Pass	
T2	240 - 220	Leg	P-4.80' - 0.75' conn.-20' -C-Trans-40'-40-(Pirod 226184)	21	-68.87	116.32	59.2	Pass	
T3	220 - 200	Leg	P-5.00' - 0.75' conn.-Trans-28' -C-(Pirod 226200)	42	-142.43	169.37	84.1	Pass	
T4	200 - 180	Leg	P-6.00' - 0.75' conn.-HBD-Trans-20'-C-(Pirod 229377)	63	-201.87	228.83	88.2	Pass	
T5	180 - 160	Leg	#122G -1.75' - 1.00' conn.-HBD-Trans (Pirod 229585)	84	-245.69	303.46	81.0	Pass	
T6	160 - 140	Leg	#122G -1.75' - 1.08' conn.-HBD-Trans (Pirod 229588)	99	-299.04	303.46	98.5	Pass	
T7	140 - 120	Leg	#122G -2.00' - 0.875' conn.-HBD-Trans (Pirod 208322)	114	-327.24	356.29	91.8	Pass	
T8	120 - 108	Leg	#122G -2.25' - 8.875' conn. (Pirod 208334)	123	-382.21	451.15	84.7	Pass	
T9	100 - 80	Leg	#122G -2.25' - 0.875' conn. (Pirod 208334)	132	-424.01	451.15	94.0	Pass	
T10	80 - 60	Leg	#122G -2.50' - 0.875' conn. (Pirod 208335)	141	-472.37	557.27	84.8	Pass	
T11	60 - 40	Leg	#122G -2.50' - 0.875' conn. (Pirod 208335)	150	-514.03	557.27	92.2	Pass	
T12	40 - 20	Leg	#122G -2.75' - 0.875' conn. (Pirod 208337)	159	-561.53	674.68	83.2	Pass	
T13	20 - 0	Leg	#122G -2.75' - 0.875' conn. (Pirod 208337)	168	-598.87	674.68	88.8	Pass	
T1	250 - 240	Diagonal	L2x2x1/8	10	-2.88	9.97	28.9	Pass	
T2	240 - 220	Diagonal	L2x2x3/16	24	-11.12	12.59	88.3	Pass	
T3	220 - 208	Diagonal	L2x2x3/16	45	-8.39	10.32	81.1	Pass	
T4	200 - 180	Diagonal	L2 1/2x2 1/2x3/16	66	-9.04	14.17	63.7	Pass	
T5	180 - 160	Diagonal	L3x3x3/16	87	-18.33	14.54	71.0	Pass	
T6	160 - 140	Diagonal	L3x3x3/16	103	-10.20	11.92	85.6	Pass	
T7	140 - 128	Diagonal	2L3x3x3/16	117	-17.71	21.10	83.9	Pass	
T8	120 - 100	Diagonal	2L3x3x3/16	126	-15.62	19.45	80.3	Pass	
T9	100 - 80	Diagonal	2L3x3x3/16	135	-16.32	17.79	92.9	Pass	
T10	80 - 60	Diagonal	2L3 1/2x3 1/2x3/4	144	-16.15	23.85	47.7	Pass	
T11	60 - 48	Diagonal	2L3 1/2x3 1/2x3/4	153	-17.51	30.72	57.0	Pass	
T12	40 - 20	Diagonal	2L3 1/2x3 1/2x3/4	162	-16.29	27.86	58.5	Pass	
T13	20 - 0	Diagonal	2L3 1/2x3 1/2x3/4	171	-19.52	25.27	77.6	Pass	
T8	250 - 240	Tap Girt	L2x2x3/16	5	-1.16	8.72	13.3	Pass	
Summary									
Leg (T6)								98.5	Pass
Diagonal (T9)								92.9	Pass
Tap Girt (T1)								13.3	Pass
Bolt Checks								87.1	Pass
RATING =								98.5	Pass

tnxTower 1545 Pidge Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6458	Job	239126	Page	59 of 59
	Project	V-27 x 250' #282083 Ingle, KY	Date	09:36:28 11/11/13
	Client	American Tower Corp.	Designed by	na1

Program V:\Engineering\45963011 File:\HWB1\fileroom\Documents\239\239126 ATC-V25x258-Nancy, KY02 Tower Calc...
 Date: 09:36:28 11/11/13
 Designed by: na1

FOUNDATION NOTES

- 1 THE ON-SITE GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE INSITU SOIL STRENGTHS MEET OR EXCEED THOSE PARAMETERS GIVEN IN THE SOIL REPORT.
- 2 PNEUMATIC HAMMERS, RIPPERS, AND/OR BLASTING MAY BE REQUIRED TO REMOVE MATERIAL FROM THE EXCAVATION.
- 3 THE FOUNDATION MUST BEAR ENTIRELY ON COMPETENT BEDROCK. THE FOUNDATION IS NOT TO BEAR ON ANY COMBINATION OF SOIL AND BEDROCK AS THIS MAY CAUSE EXCESSIVE DIFFERENTIAL SETTLEMENT.
- 4 SUBGRADE PREPARATIONS AND BACKFILLING MUST BE COMPLETED PER THE SPECIFICATIONS IN THE REFERENCED GEOTECHNICAL REPORT ABOVE.

UNIT BASE FOUNDATION (Load Case 2)

American Tower Corp.
#282083 Ingle, KY

V- 27.0 250
A- 239126

v.2.0

Reactions	stress ratio	99.0%	mark up:	1.0%
Shear, S:	94.00 kips	x 1.01 =	94.94 kips	
Moment, M:	13820.00 ft-kips	x 1.01 =	13958.20 ft-kips	
Compression / leg, C:	622.00 kips	x 1.01 =	628.22 kips	
Uplift / leg, U:	554.00 kips	x 1.01 =	559.54 kips	
Tower weight, W _t :	94.00 kips	=	94.00 kips	

Soil per: FDH, Dated:09/06/13 (Project#1305551600)

Ultimate bearing: 30.000 ksf
Ultimate Pp: 0.110 kcf

Load Case 2 = 0.9*D + 1.0*Dg + 1.6*Wo

Physical Parameters:

Concrete volume:	$V = T * W^2 + 3 * (d^2 / 4 * \pi) * (D + E - T)$	V =	90.0	cy
Concrete weight:	$W_c = V * \delta$	W _c =	364.7	kips
Soil weight:	$W_s = (D - T) * (W^2 - 3 * (d^2 / 4 * \pi)) * \gamma$	W _s =	609.4	kips
Total weight:	$P = W_c + W_s + W_t$	P =	1068.10	kips

Passive Pressure:

Pp coefficient:	$K_p = \text{TAN}(45 + \phi / 2)^2$	K _p =	1.000	
	$P_{pn} = K_p * \gamma * N + 2 * C_o * \sqrt{K_p}$	P _{pn} =	0.605	ksf
	$P_{pt} = K_p * \gamma * (D - T) + 2 * C_o * \sqrt{K_p}$	P _{pt} =	0.440	ksf
	$P_{pb} = K_p * \gamma * D + 2 * C_o * \sqrt{K_p}$	P _{pb} =	0.605	ksf
	$P_{ptop} = \text{IF}(N < (D - T), P_{pt}, P_{pn})$	P _{ptop} =	0.6	ksf
	$P_p' = (P_{ptop} + P_{pb}) / 2$	P _p ' =	0.605	ksf
Shear area:	$T_{pp} = 0$	T _{pp} =	0.0	ft
	$A_{pp} = T_{pp} * W$	A _{pp} =	0.00	ft ²
Shear Capacity:	$S_{actual} = (P_p' * A_{pp} + \mu * P) * \phi_r$	S _{actual} =	320.431	kips
$\phi_r = 0.75$				

Check	S _{actual} = 320.43 kips	>=	S = 94.94 kips	OK
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Overturning Moment Resistance at Toe:

Wt of soil wedge:	$W_{sw} = D * (D * \text{TAN}(\phi)) / 2 * W * \gamma$	W _{sw} =	0.0	kips
Dist. from leg to edge:	$O = (W - 0.866 * w') / 2$	O =	7.309	ft
Additional offset of Wt:	$O_a = (2 / 3 * 0.866 * w' + O) - W / 2$	O _a =	3.897	ft
Resisting moments:	$M_{rwt} = P * W / 2 - W_t * O_a$	M _{rwt} =	19927.63	ft-kips
	$M_{rp} = P_p' * A_{pp} * (D - N) / 3$	M _{rp} =	0.00	ft-kips
	$M_{rsw} = W_{sw} * (W + D * \text{TAN}(\phi) / 3)$	M _{rsw} =	0.00	ft-kips
Total resisting:	$M_{rt} = (M_{rwt} + M_{rp} + M_{rsw}) * \phi_r$	M _{rt} =	14945.72	ft-kips
$\phi_r = 0.75$				
Total overturning:	$M_o = M + S * (D + E)$	M _o =	14527.84	ft-kips

Check	M _{rt} = 14945.72 ft-kips	>=	M _o = 14527.84 ft-kips	OK
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Bearing Resistance due to Pressure Distribution:

Area of mat:	$area = W^2$	area =	1444.0	ft ²
Section modulus:	$SM = W^3 / 6$	SM =	9145.3	ft ³
Factored total weight:	$P' = W_t + 0.9 * (W_c + W_s)$	P' =	970.7	kips
Pressure exerted:	$P_{pos} = P' / area + M_o / SM$	P _{pos} =	2.261	ksf
	$P_{neg} = P' / area - M_o / SM$	P _{neg} =	-0.916	ksf

Note: The stress resultant is NOT within the kern. Bearing area has been adjusted below.

Load eccentricity:	$e_c = M_o / P'$	e _c =	14.97	ft
	$P_{adj} = 2 * P' / (3 * W * (W / 2 - e_c))$	P _{adj} =	4.2	ksf
Adj. applied pressure:	$q_a = \text{IF}(P_{neg} >= 0, P_{pos}, P_{adj})$	q _a =	4.222	ksf

Check	q _a = 4.222 ksf	<=	B _c * φ _r = 22.500 ksf	OK
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Concrete Shear Strength:

One way beam action at d₁ from tower

Effective depth:	$d_c = T - cc - db_p / 2$	d _c =	14.436	in
Factored intensity:	$q_b = C / area$	q _b =	0.435	ksf
Required shear:	$V_{n1} = q_s * (O - dl / 2 - dc) * W / \phi_s$	V _{n1} =	79.49	kips
$\phi_s = 0.75$ [ACI 9.3.2.3]				
Available shear:	$V_{c1} = 2 * \sqrt{f'_c} * W * dc$	V _{c1} =	832.67	kips
[ACI 12.2.4]				

Check	V _{c1} = 832.67 kips	>=	V _{n1} = 79.49 kips	OK
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Two way beam action at $d_1 / 2$ from tower

Perimeter:	$P_o = (d_i + d_c) * \pi$	$P_o = 19.49$	ft
Required shear: $\phi_s = 0.75$ [ACI 9.3.2.3]	$V_{n2} = q_s / \phi_s * (\text{area} - (d_i + d_c)^2 * \pi / 4)$	$V_{n2} = 820.10$	kips
Available shear: [ACI 12.2.2]	$V_{c2} = 4 * \sqrt{F'_c} * P_o * d_c$	$V_{c2} = 854.02$	kips
	Check $V_{c2} = 854.02$ kips \geq $V_{n2} = 820.10$ kips		OK

Column Compression Capacity:

Compression reaction: $\phi_c = 0.65$ [ACI 9.3.2.2]	$P_c = \phi_c * 0.8 * F'_c * (d_i^2 / 4 * \pi)$	$P_c = 5881.1$	kips
	Check $P_c = 5881.06$ kips \geq $C = 628.22$ kips		OK

Pier Reinforcement:

Cross-sectional area:	$A_g = d_i^2 * \pi / 4$	$A_g = 2827.43$	in ²
Min. area of steel (pier): [ACI 10.9.1] & [ACI 10.8.4]	$A_{st,c} = A_g * 0.005$	$A_{st,c} = 14.14$	in ²
Cage circle:	$d_o = d_i - 2 * c_c$	$d_o = 54.00$	in
Rebar:	$s_c = 7$	$d_{b,c} = 0.875$	in
	$m_c = 29$	$A_{b,c} = 0.6$	in ²
	$A_{s,c} = A_{b,c} * m_c$	$A_{s,c} = 17.40$	in ²
	Check $A_{s,c} = 17.40$ in ² \geq $A_{st,c} = 14.14$ in ²		OK
Actual moment:	$M_{max} = (D - T + E) * S / 2$	$M_{max} = 213.62$	ft-kips
Pier moment capacity:	M_{allow} per Maxmomnt.xls (see attached)	$M_{allow} = 293.69$	ft-kips
	Check $M_{allow} = 293.69$ ft-kips \geq $M_{max} = 213.62$ ft-kips		OK
Bar separation:	$B_{s,c} = (d_o * \pi) / m_c - d_{b,c}$	$B_{s,c} = 4.97$	in
	Check $11.13 \geq B_{s,c} = 4.97$ in ≥ 4.5 "		OK

Vertical Rebar Development Length:

Reinforcement location: [ACI 12.2.4]	$\psi_{t,c} =$ if the space under the rebar > 12 in, use 1.3, else use 1.0	$\psi_{t,c} = 1.3$	
Epoxy coating: [ACI 12.2.4]	$\psi_{e,c} =$ if epoxy-coated bars are not used, use 1.0; but if epoxy-coated bars are used, then if $B_s < 6 * d_b$ or $cc < 3 * d_b$, use 1.5, else 1.2	$\psi_{e,c} = 1.0$	
Max term: [ACI 12.2.4]	$\psi_i \psi_{e,c} =$ the product of ψ_t & ψ_e , need not be taken larger than 1.7	$\psi_i \psi_{e,c} = 1.3$	
Reinforcement size: [ACI 12.2.4]	$\psi_{s,c} =$ if the bar size is 6 or less, then use 0.8, else use 1.0	$\psi_{s,c} = 1$	
Light weight concrete: [ACI 12.2.4]	$\lambda_c =$ if lightweight concrete is used, 1.3, else use 1.0	$\lambda_c = 1.0$	
Spacing/cover: [ACI 12.2.4]	$c_c =$ the smaller of: half the bar spacing or the concrete edge distance	$c_c = 3.36$ in	
Transverse bars: [ACI 12.2.3]	$k_{tr,c} = 0$ (per simplification)	$k_{tr,c} = 0$ in	
Max term: [ACI 12.2.3]	$c_c' = \text{MIN}(2.5, (c_c + k_{tr,c}) / d_{b,c})$	$c_c' = 2.500$	
Excess reinforcement: [ACI 12.2.5]	$R_c = M_{max} / M_{allow}$	$R_c = 0.73$	
Development (tensile): [ACI 12.2.2]	$L_{dt,c} = (3 / 40) * (F_y / \sqrt{F'_c}) * (\psi_t \psi_{e,c} * \psi_{s,c} * \lambda_c * R_c / c_c') * d_{b,c}$	$L_{dt,c} = 23.55$ in	
Minimum length: [ACI 12.2.1]	$L_{d,min} = 12$ inches	$L_{d,min} = 12.0$ in	
Development length:	$L_{dt,c} = \text{MAX}(L_{d,min}, L_{dt,c})$	$L_{dt,c} = 23.55$ in	
Development (comp.): [ACI 12.3.2]	$L_{dc,c} = 0.02 * d_{b,c} * F_y * R_c / \sqrt{F'_c}$	$L_{dc,c} = 12.08$ in	
	$L_{dc,c} = 0.0003 * d_{b,c} * F_y * R_c$	$L_{dc,c} = 11.46$ in	
Development length:	$L_{dc,c} = \text{MAX}(8, L_{dc,c}, L_{dc,c}')$	$L_{dc,c} = 12.08$ in	
Length available in pier:	$L_{vc} = D - T + E - cc$	$L_{vc} = 51.0$ in	
	Check $L_{vc} = 51.0$ in \geq $L_{dt,c} = 23.5$ in		OK
	Check $L_{vc} = 51.0$ in \geq $L_{dc,c} = 12.1$ in		OK
Length available in pad:	$L_{vp} = T - cc$	$L_{vp} = 15.0$ in	
	Check $L_{vp} = 15.0$ in \geq $L_{dt,c} = 23.5$ in		HOOKS
	Check $L_{vp} = 15.0$ in \geq $L_{dc,c} = 12.1$ in		OK

Vertical Rebar Hook Ending:

Bar size & clear cover: [ACI 12.5.3]	α_h if the bar size ≤ 11 and side cc $\geq 2.5"$, use 0.7, else use 1.0	$\psi_{L_h} = 0.7$
Epoxy coating: [ACI 12.5.2]	β_h if epoxy-coated bars are used, use 1.2, else use 1.0	$\psi_{e_h} = 1.0$
Light weight concrete: [ACI 12.5.2]	λ_h if lightweight concrete is used, 1.3, else use 1.0	$\lambda_h = 1.0$
Development (hook): [ACI 12.5.2]	$L_{dh} = 0.02 * \psi_{L_h} * \psi_{e_h} * \lambda_h * F_y / \sqrt{F'_c} * db_c$	$L_{dh} = 11.6$ in
Minimum length: [ACI 12.5.1]	L_{dh_min} the larger of: 8 * db or 6 in	$L_{dh_min} = 7.0$ in
Development length:	$L_{dh} = \text{MAX}(L_{dh_min}, L_{dh})$	$L_{dh} = 11.6$ in
Hook tail length:	$L_{h_tail} = 12 * db$ beyond the bend radius	$L_{h_tail} = 14.0$ in
Length available in pad:	$L_{h_pad} = (W - w - di) / 2$	$L_{h_pad} = 36$ in
	Check $L_{h_pad} = 36.0$ in $\geq L_{h_tail} = 14.0$ in	OK

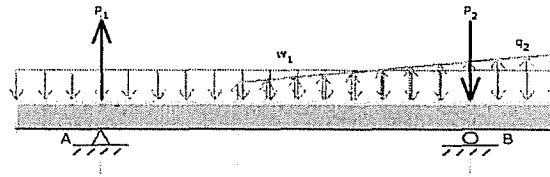
Pier Ties:

Minimum size: [ACI 7.10.5.1]	$s_{t_min} = \text{IF}(s_c \leq 10, 3, 4)$	$s_{t_min} = 3$
z factor:	z = 0.5 if the seismic zone is less than 2, else 1.0	z = 0.5
Tie parameters:	$s_t = 4$ $m_t = 6$	$d_{b_t} = 0.5$ in $A_{b_t} = 0.2$ in ²
Allowable tie spacing:		
per vertical rebar [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s_t_max1} = 8 / z * db_c$	$B_{s_t_max1} = 14$ in
per tie size [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s_t_max2} = 24 / z * db_t$	$B_{s_t_max2} = 24$ in
per pier diameter [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s_t_max3} = di / (4 * z^2)$	$B_{s_t_max3} = 60$ in
per seismic zone [ACI 7.10.5.2] & [ACI 21.3.3.2]	$B_{s_t_max4} = 12"$ in active seismic zones, else 18"	$B_{s_t_max4} = 18$ in
	$B_{s_t_max} = \text{MIN}(B_{s_t_max1}, B_{s_t_max2}, B_{s_t_max3}, B_{s_t_max4})$	$B_{s_t_max} = 14$ in
	$m_{t_min} = (D - T + E) / B_{s_t_max} + 2$	$m_{t_min} = 5.9$
	Check $m_t = 6.0$ $\geq m_{t_min} = 5.9$	OK

Anchor Steel:

AS parameters:	$P_{as} = 103182$ $d_{as} = 1$ in	$L_{as} = 60$ in $E_{as} = 51.50$ in
Development available:	L_{das} per Anchor Bolts (see attached)	$L_{das} = 32.19$ in
Required development:	L_{das_min} per Anchor Bolts (see attached)	$L_{das_min} = 23.55$ in
	Check $L_{das} = 32.19$ in $\geq L_{das_min} = 23.55$ in	OK
To bottom rebar grid:	$E_{as_max} = D + E - cc - 2 * db_p$	$E_{as_max} = 66.744$ in
	Check $E_{as} = 51.50$ in $\leq E_{as_max} = 66.74$ in	OK
To top rebar grid:	rebar @ = D + E - T + cc	rebar @ = 57.00 in
	Check $57 + 6$ in $\geq E_{as} = 51.50$ in or ≤ 57 in	OK
Min. cage dia:	d_{o_min} per ansteel.xls (see attached)	$d_{o_min} = 33.27$ in
	Check $d_o = 54.00$ in $\geq d_{o_min} = 33.27$ in	OK

Pad Reactions:



MDSolids Geometry Input (Option 1)

Total Beam Length:	$B_{L2_1} = W$	$B_{L2_1} =$	38	ft
Location of Left Support:	$S_{L2_1} = 0$	$S_{L2_1} =$	7.309	ft
Location of Right Support:	$S_{R2_1} = W - O$	$S_{R2_1} =$	30.69	ft

MDSolids Geometry Input (Option 2)

Total Beam Length:	$B_{L2_2} = W$	$B_{L2_2} =$	38.0	ft
Location of Left Support:	$S_{L2_2} = (W - w) / 2$	$S_{L2_2} =$	5.50	ft
Location of Right Support:	$S_{R2_2} = S_{L1_2} + W$	$S_{R2_2} =$	32.50	ft

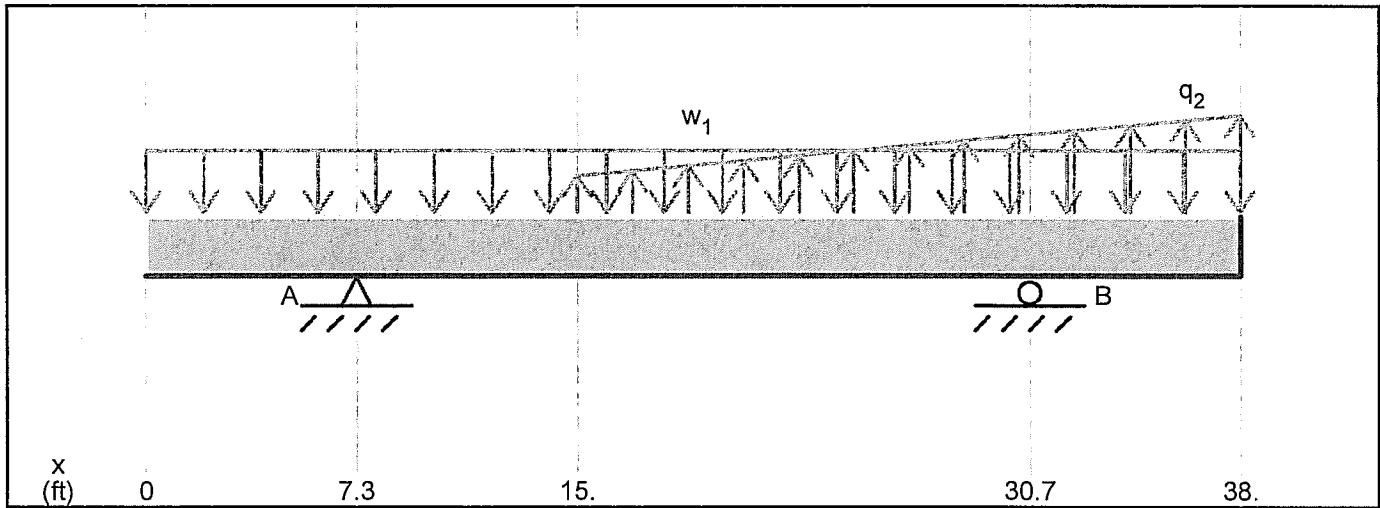
MDSolids Load Input (Option 1 & Option 2)

Uplift:	$P_{2_1} = U$	$P_{2_1} =$	559.5	kips
Compression:	$P_{2_2} = C$	$P_{2_2} =$	628.22	kips
Weight of Overburden: (Distributed)	$w_{2_1} = 0.9 * (W_c + W_s) / W$	$w_{2_1} =$	23.07	kif
		<i>Applied over the beam starting at 0' and ending at W=38ft</i>		
Distributed Soil Pressure: (Linearly Increasing)	$q_{2_2L} = 0$	$q_{2_2L} =$	0.00	kif
	$q_{2_2R} = q_a * W$	$q_{2_2R} =$	160.44	kif
		<i>This linearly increasing load is applied from e=14.97ft to W=38ft</i>		

MDSolids Design Result

Option 1:	$M_{max2_1} = M_{max2_1}$ (Max. Moment calculated from MDSolids for Option 1)	$M_{max2_1} =$	3217.00	ft*kips
Option 2:	$M_{max2_2} = M_{max2_2}$ (Max. Moment calculated from MDSolids for Option 2)	$M_{max2_2} =$	1885.00	ft*kips
Max moment:	$M_{maxp} = \text{Max}(M_{max2_1}, M_{max2_2})$	$M_{maxp} =$	3217.00	ft*kips
Required moment: $\phi_t = 0.9$ [ACI 9.3.2.1]	$M_n = M_{maxp} / \phi_t$	$M_n =$	3574.44	ft*kips

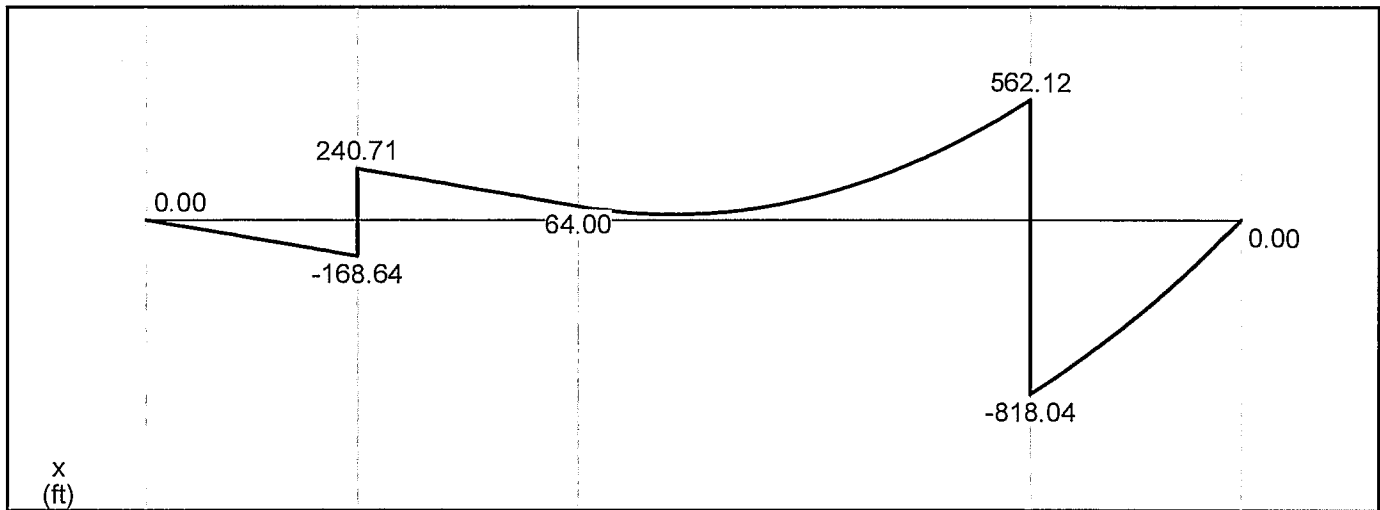
Load Case 2 Option 1



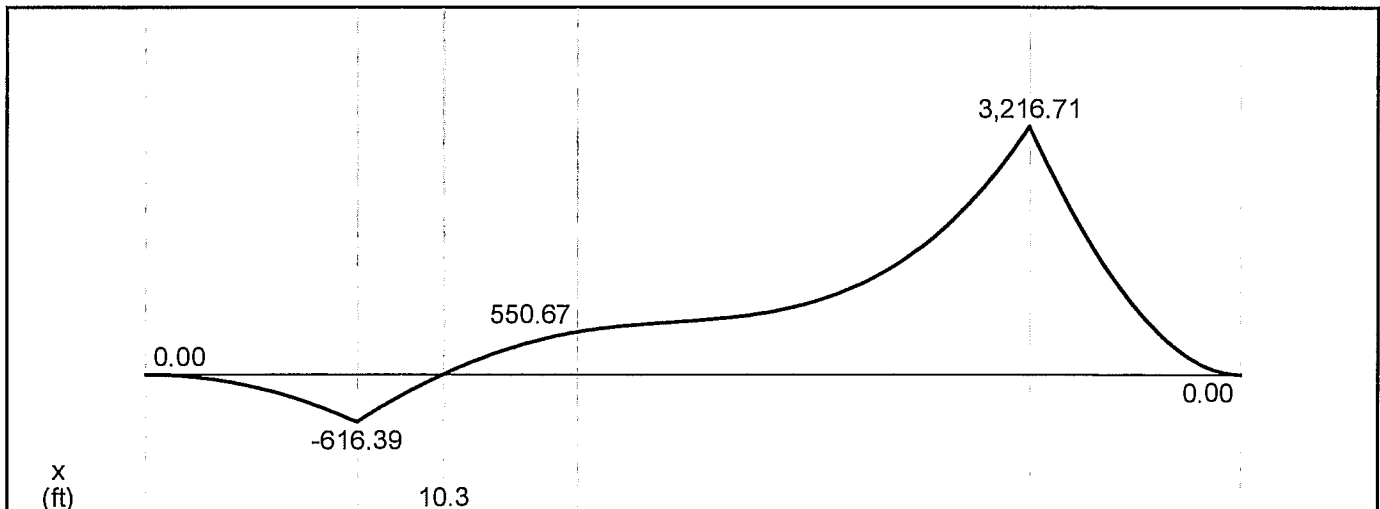
Load Diagram

$w_1 = 23.07$ kip/ft (down)
 $q_2 = 0.0$ to 160.44 kip/ft (up)

$A_y = 409.36$ kip (up)
 $B_y = 1,380.16$ kip (down)

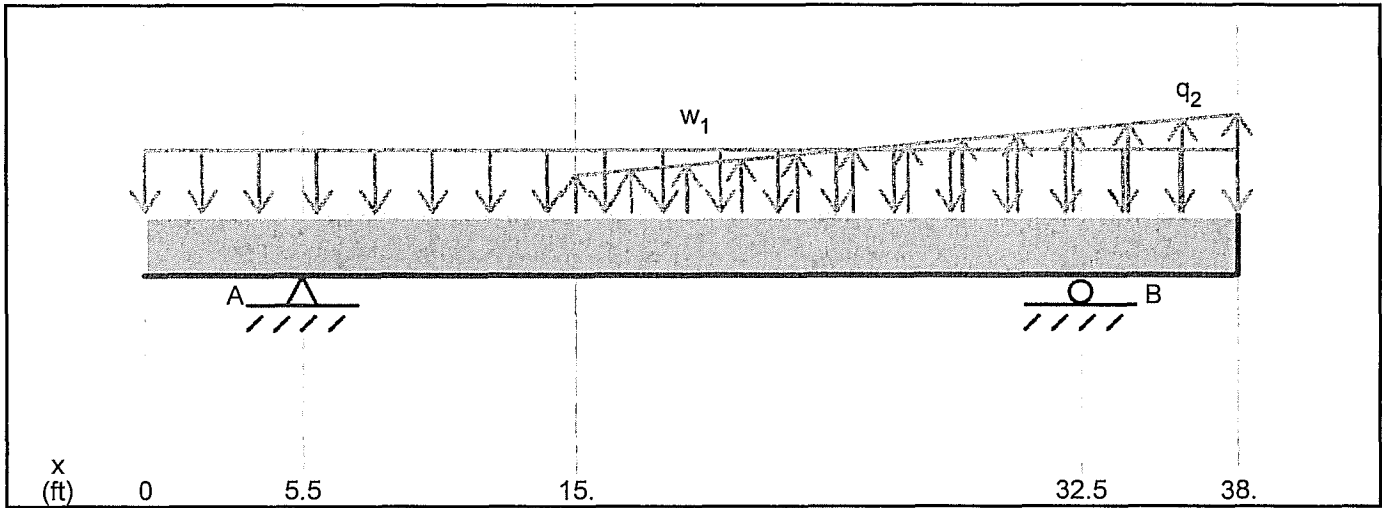


Shear Diagram (kip)



Moment Diagram (kip-ft)

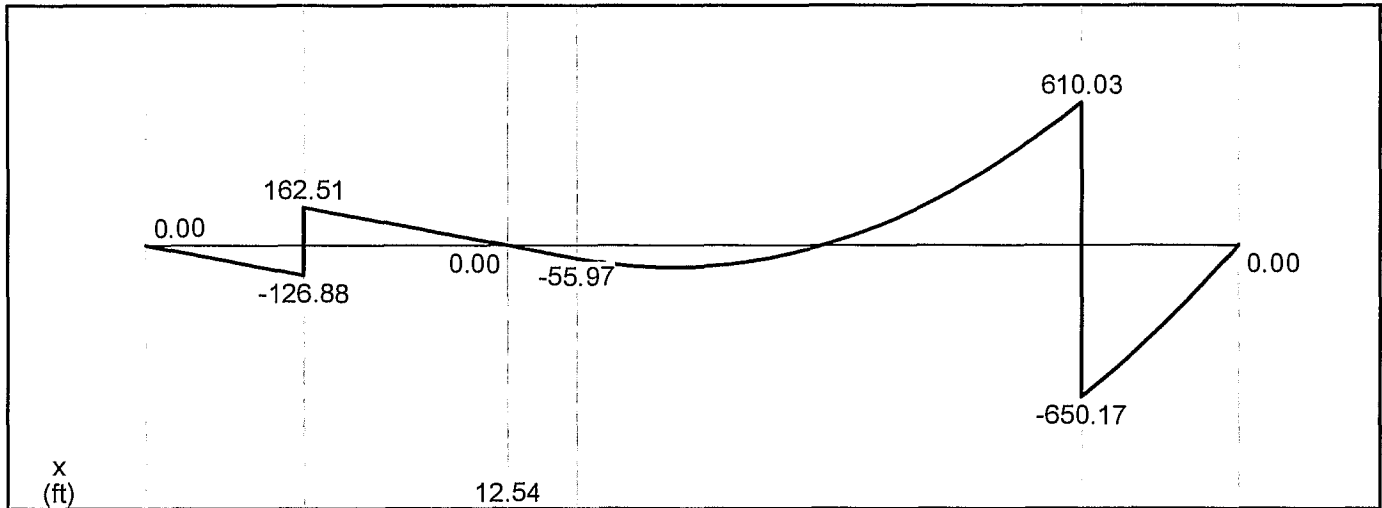
Load Case 2 Option 2



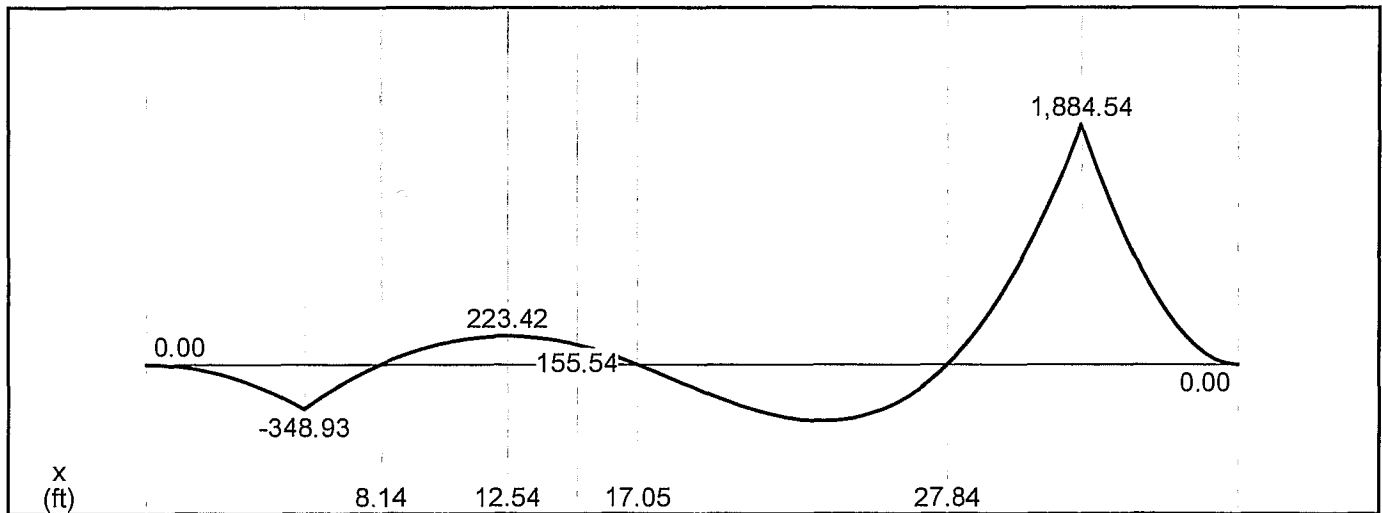
Load Diagram

$w_1 = 23.07$ kip/ft (down)
 $q_2 = 0.0$ to 160.44 kip/ft (up)

$A_y = 289.39$ kip (up)
 $B_y = 1,260.20$ kip (down)



Shear Diagram (kip)



Moment Diagram (kip-ft)

Pad Reinforcement:

	$\beta = \text{IF}(F'c \leq 4000, 0.85, \text{IF}(F'c >= 8000, 0.65, 0.85 - (F'c - 4000) * 0.05))$	$\beta = 0.85$	
Effective width:	$W_e = w' * 0.866 + d_i$	$W_e = 28.382$	ft
	$A_{st_p}' = Mn / (0.9 * F_y * dc)$	$A_{st_p}' = 55.024$	in ²
	$a_p = A_{st_p}' * F_y / (\beta * F'c * W_e)$	$a_p = 2.85$	in
Required steel:	$A_{st_p_st} = Mn / (F_y * (dc - a_p / 2)) * (W / W_e)$	$A_{st_p_st} = 73.567$	in ²
Shrinkage:	$\rho_{sh} = \text{IF}(F_y >= 60000, 0.0018, 0.002)$	$\rho_{sh} = 0.0018$	
	$A_{st_p_sh} = \rho_{sh} * W * T / 2$	$A_{st_p_sh} = 7.387$	in ²
	$A_{st_p} = \text{MAX}(A_{st_p_st}, A_{st_p_sh})$	$A_{st_p} = 73.567$	in ²
Rebar:	$s_p = 9$ Equally spaced, top and bottom, both directions.	$d_{b_p} = 1.128$ in	
	$m_p = 74$	$A_{b_p} = 1$	in ²
	$A_{s_p} = A_{b_p} * m_p$	$A_{s_p} = 74.00$	in ²
	Check $A_{s_p} = 74.00$ in ² \geq $A_{st_p} = 73.57$ in ²		OK
Bar separation:	$B_{s_p} = (W - 2 * cc - db_p) / (m_p - 1) - db_p$	$B_{s_p} = 5.02$	in
	Check $10.87 \geq B_{s_p} = 5.02$ in $\geq 4.5'$		OK

Pad Development Length:

Reinforcement location: [ACI 12.2.4]	$\psi_{i_p} = \text{if the space under the rebar} > 12 \text{ in, use } 1.3, \text{ else use } 1.0$	$\psi_{i_p} = 1$	
Epoxy coating: [ACI 12.2.4]	$\psi_{e_p} = \text{if epoxy-coated bars are not used, use } 1.0; \text{ but if epoxy-coated bars are used, then if } B_s < 6 * db \text{ or } cc < 3 * db, \text{ use } 1.5, \text{ else } 1.2$	$\psi_{e_p} = 1.0$	
Max term: [ACI 12.2.4]	$\psi_i \psi_{e_p} = \text{the product of } \psi_i \text{ \& \psi}_{e_p}, \text{ need not be taken larger than } 1.7$	$\psi_i \psi_{e_p} = 1$	
Reinforcement size: [ACI 12.2.4]	$\psi_{s_p} = \text{if the bar size is } 6 \text{ or less, then use } 0.8, \text{ else use } 1.0$	$\psi_{s_p} = 1$	
Light weight concrete: [ACI 12.2.4]	$\lambda_p = \text{if lightweight concrete is used, } 1.3, \text{ else use } 1.0$	$\lambda_p = 1.0$	
Spacing/cover: [ACI 12.2.4]	$c_p = \text{the smaller of: half the bar spacing or the concrete edge distance}$	$c_p = 3.56$	in
Transverse bars: [ACI 12.2.3]	$k_{tr_p} = 0$ in (per simplification)	$k_{tr_p} = 0$	in
Max term: [ACI 12.2.3]	$c_p' = \text{MIN}(2.5, (c_p + k_{tr_p}) / db_p)$	$c_p' = 2.500$	
Excess reinforcement: [ACI 12.2.5]	$R_p = A_{st_p} / A_{s_p}$	$R_p = 0.99$	
Development (tensile): [ACI 12.2.2]	$L_d = (3 / 40) * (F_y / \sqrt{F'c}) * \psi_t \psi_{e_p} * \psi_{s_p} * \lambda_p * R_p * db_p / c_p'$	$L_{dp}' = 31.9$	in
Minimum length: [ACI 12.2.1]	$L_{d_min} = 12$ inches	$L_{d_min} = 12.0$	in
Development length:	$L_{dp} = \text{MAX}(L_{d_min}, L_{dp}')$	$L_{dp} = 31.9$	in
Length available in pad:	$L_{pad} = (W / 2 - w' / 2) - cc$	$L_{pad} = 63.0$	in
	Check $L_{pad} = 63.00$ in $\geq L_{dp} = 31.92$ in		OK

**THIS SPREADSHEET IS SET UP FOR A MAXIMUM OF 56 BARS.
MAXIMUM FACTORED MOMENT OF A CIRCULAR SECTION**

Loading (negative for compression)	
Axial load =	559.54 kips

Foundation	
<i>Concrete</i>	
Pier diameter =	5.00 ft
Pier area =	2827.4 in ²
<i>Reinforcement</i>	
Clear cover =	3.00 in
Cage diameter =	4.43 ft
Bar size =	7
Bar diameter =	0.875 in
Bar area =	0.601 in ²
Number of bars =	29

Material Strengths	
Concrete compressive strength =	4000 psi
Reinforcement yield strength =	60000 psi
Modulus of elasticity =	29000 ksi
Reinforcement yield strain =	0.00207
Limiting compressive strain =	0.003

(per ACI 10.3.5 - OK)

11/30/07

Seismic	
Seismic Zone =	1
Are hooks required?	no

Minimum Area of Steel

Required area of steel = 14.14 in²
 Actual area of steel = 17.44 in² OK
 Bar spacing = 4.97 in

Axial Loading

Load factor = 1.00
 Reduction factor = 0.65575 (per ACI 9.3.1 & 2)
 Factored axial load = 853.29 kips

Neutral Axis

Distance from extreme edge to neutral axis = 2.93 in
 Equivalent compression zone factor = 0.85 (per ACI 10.2.7.3)
 Distance from extreme edge to
 Equivalent compression zone factor = 2.49 in
 Distance from centroid to neutral axis = 27.07 in

Compression Zone

Area of steel in compression zone = 0.00 in²
 Angle from centroid of pier to intersection of
 equivalent compression zone and edge of pier = 23.51 deg
 Area of concrete in compression = 40.07 in²
 Force in concrete = $0.85 * f_c * Acc$ = 136.24 kips (per ACI 10.3.6.2)
 Total reinforcement forces = -989.52 kips
 Factored axial load = 853.29 kips
 Force in concrete = -136.24 kips

 Sum of the forces in concrete = 0.00 kips OK

Maximum Moment

First moment of the concrete area in compression about the centroid = 1142.37 in³
 Distance between centroid of concrete in compression and centroid of pier = 28.51 in
 Moment of concrete in compression = 3884.04 in-kips
 Total reinforcement moment = 1490.40 in-kips
 Nominal moment strength of column = 5374.45 in-kips
 Factored moment strength of column = 3524.28 in-kips 293.69 ft-kips

Maximum allowable moment of the pier =	293.69 ft-kips
--	----------------

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in ²)	Axial force (kips)	Moment (in-kips)
1	0.00	0.00	-27.07	-27.51	-0.02772	0.00	-36.08	0.00
2	12.41	5.71	-21.36	-21.80	-0.02188	0.00	-36.08	-206.02
3	24.83	11.15	-15.92	-16.36	-0.0163	0.00	-36.08	-402.40
4	37.24	16.07	-11.00	-11.44	-0.01126	0.00	-36.08	-579.97
5	49.66	20.24	-6.83	-7.27	-0.00699	0.00	-36.08	-730.42
6	62.07	23.47	-3.60	-4.04	-0.00369	0.00	-36.08	-846.72
7	74.48	25.59	-1.48	-1.92	-0.00151	0.00	-26.37	-674.83
8	86.90	26.52	-0.55	-0.99	-0.00056	0.00	-9.77	-259.17
9	99.31	26.21	-0.86	-1.30	-0.00088	0.00	-15.32	-401.70
10	111.72	24.68	-2.39	-2.83	-0.00245	0.00	-36.08	-890.29
11	124.14	21.99	-5.09	-5.52	-0.00521	0.00	-36.08	-793.22
12	136.55	18.27	-8.80	-9.24	-0.00902	0.00	-36.08	-659.06
13	148.97	13.69	-13.38	-13.82	-0.0137	0.00	-36.08	-494.08
14	161.38	8.48	-18.59	-19.03	-0.01904	0.00	-36.08	-306.00
15	173.79	2.87	-24.20	-24.64	-0.02478	0.00	-36.08	-103.62
16	186.21	-2.87	-29.94	-30.38	-0.03066	0.00	-36.08	103.62
17	198.62	-8.48	-35.55	-35.99	-0.03641	0.00	-36.08	306.00
18	211.03	-13.69	-40.77	-41.20	-0.04175	0.00	-36.08	494.08
19	223.45	-18.27	-45.34	-45.78	-0.04643	0.00	-36.08	659.06
20	235.86	-21.99	-49.06	-49.50	-0.05024	0.00	-36.08	793.22
21	248.28	-24.68	-51.75	-52.19	-0.053	0.00	-36.08	890.29
22	260.69	-26.21	-53.28	-53.72	-0.05457	0.00	-36.08	945.73
23	273.10	-26.52	-53.59	-54.03	-0.05489	0.00	-36.08	956.95
24	285.52	-25.59	-52.66	-53.10	-0.05394	0.00	-36.08	923.42
25	297.93	-23.47	-50.54	-50.98	-0.05176	0.00	-36.08	846.72
26	310.34	-20.24	-47.32	-47.75	-0.04846	0.00	-36.08	730.42
27	322.76	-16.07	-43.15	-43.59	-0.04419	0.00	-36.08	579.97
28	335.17	-11.15	-38.22	-38.66	-0.03915	0.00	-36.08	402.40
29	347.59	-5.71	-32.78	-33.22	-0.03357	0.00	-36.08	206.02

DEVELOPMENT LENGTH CHECK OF PIER REINFORCEMENT			
Foundation:	Pier diameter = 5.0 ft	Cover between side of pier and cage = 3.00 in.	
	Cage diameter = 4.5 ft	Cover between top of pier and cage = 3.00 in.	
	Rebar size = 9	Compressive strength of concrete = 4000 psi	
	Number of bars = 74	Rebar yield strength = 60000 psi	
	Clear spacing = 5.02 in.		
	Are there hooks? n		
	Check Compression? n		
Anchor Steel:	Part number: 103182 ▼	Actual Bending Moment = 213.62 ft-kips	
	Embedment length = 51.5 in.	Allowable Bending Moment = 293.69 ft-kips	
	Bolt Diameter = 1" ▼	Excess Reinforcement Ratio = 0.727	
Anchor Plate:	Part number: 212008 ▼		
	Plate width = 21.375 in.		
Required development length (compression) = 999.00 in.			
Required development length (tension) = 32.37 in.			
Required development length (tension) = 23.55 in.		(reduced)	
Available development length = 32.188 in.			
OK			
The length available in the pier for the development of the vertical reinforcement exceeds the required length (ACI 318-02, section 12.2).			

CHECK EMBEDMENT PLATE CLEARANCE IN THE PIER			
Foundation:	Pier diameter = 5.0 ft	Cover between side of pier and cage = 3.00 in.	
	Cage diameter = 4.5 ft	Minimum cover between A/S and cage = 3.00 in.	
Anchor Steel:	Part number: 103182	Angle of anchor steel in foundation = 3.3 degrees	
	Embedment length = 51.5 in.		
Anchor Plate:	Part number: 212008		
	Largest plate width = 21.38 in.		
	Bolt Diameter = 1 in.		
Minimum cage diameter = 33.27 in.			
Actual cage diameter = 54 in.			
OK			
The available space exceeds the minimum cage diameter required for anchor steel installed in the pier at an angle.			

From: Cedric Fairbanks
Sent: Monday, November 11, 2013 11:39 AM
To: 'Kaiser, James A.'
Subject: RE: Ingle Question for Mat Foundation

Hi James,

Thanks for the email. The listed net ultimate bearing capacity of 30,000 psf and sliding friction factor of 0.4 can be applied to the 38.0 ft by 38.0 ft..

Thanks,

Cedric

From: Kaiser, James A. [<mailto:james.kaiser@valmont.com>]
Sent: Monday, November 11, 2013 11:00 AM
To: Cedric Fairbanks
Subject: Ingle Question for Mat Foundation

Hello Cedric,

I am now working on the foundation for the Ingle tower (FDH Project Number 1305551600). We would like to design a shallow mat foundation. The mat would be 5.5ft below grade with a 38ft x 38ft pad. Would an Ultimate Bearing Capacity of 30,000psf and Sliding Friction Factor of 0.4 be OK for a mat with these dimensions? If not, could you please give me adjusted parameters for a mat of these dimensions?

Regards,

Jim

Jim Kaiser

Associate Engineer

Valmont Industries, Inc.

Specialty Structures Division

1545 Pidco Drive

Plymouth, IN. 46563

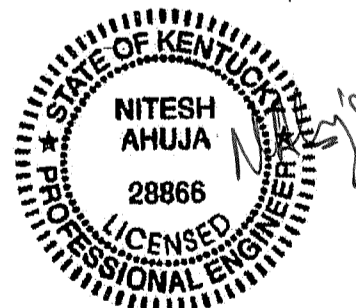
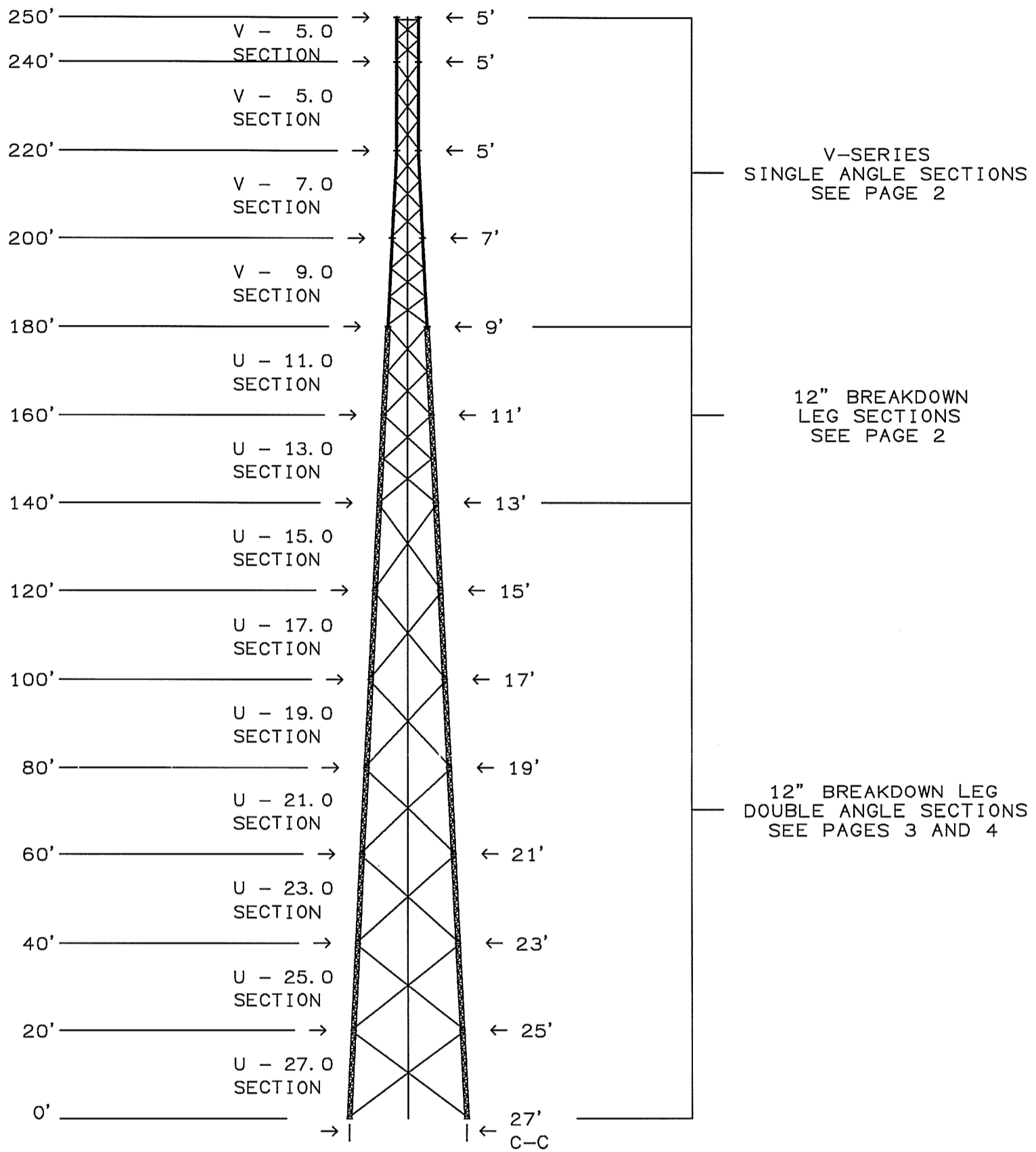
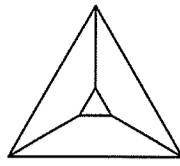
☎ (574) 936-4221 Ext. 5366

james.kaiser@valmont.com

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NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282083 INGLE, KY
V-27.0 X 250'

KENTUCKY C. O. A. 1542

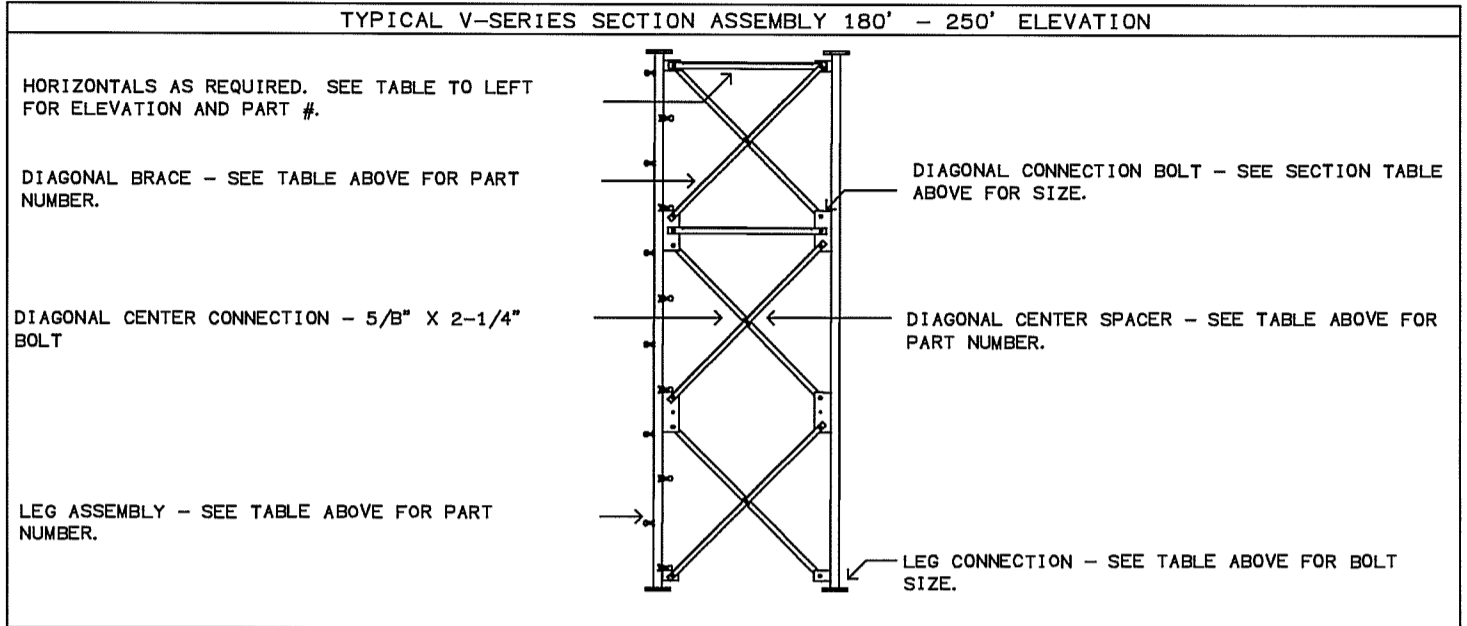
REV	DESCRIPTION OF REVISIONS	INI	DATE	APPROVED/ENG.	M_S	DATE
A	ADDED FOUNDATION	JAK	11/11/2013	APPROVED/ENG.	M_S	11/11/2013
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Printed from 251819_01@A.DWG - 11/11/2013 10:30 @ 11/12/2013 10:28				ARCHIVE	F-1015739	251819
				ENG. FILE NO. A-239126-		PAGE 1 OF 10



V-SERIES LEG SECTION DATA 180' - 250' ELEVATION																				
SECTION			LEG										DIAGONAL BRACE					HOR		
#	LENGTH	* WEIGHT	NOM SIZE	WALL	GRADE	CLIMBING		NON-CLIMB		CONNECT BOLT+		PART NUMBER **			ANGLE		CONNECT BOLT		CENTER SPACER	QTY
						QTY	PART#	QTY	PART#	DIAM	LENGTH	#1	#2	#3	FACE	THICK	DIAM	LENGTH		
V- 5.0	10'	52B#	2-1/2"	0.203	A572-50	1	226172	2	226173	3/4"	3-1/2"	227077	227077		2"	1/8"	3/4"	2-1/4"	116467	1
V- 5.0	20'	12B5#	4"	0.237	A572-50	1	2261B4	2	2261B5	3/4"	3-1/2"	227113	227113	227113	2"	3/16"	3/4"	2-1/4"	116467	
V- 7.0	20'	1609#	5"	0.25B	A572-50	1	226200	2	226201	3/4"	3-1/2"	226190	2261B9	231342	2"	3/16"	3/4"	2-1/4"	116467	
V- 9.0	20'	2293#	6"	0.2B0	A572-50	3	229377			1"	4-3/4"	225035	225034	231345	2-1/2"	3/16"	3/4"	2-1/4"	116467	

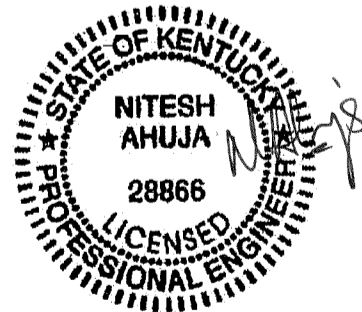
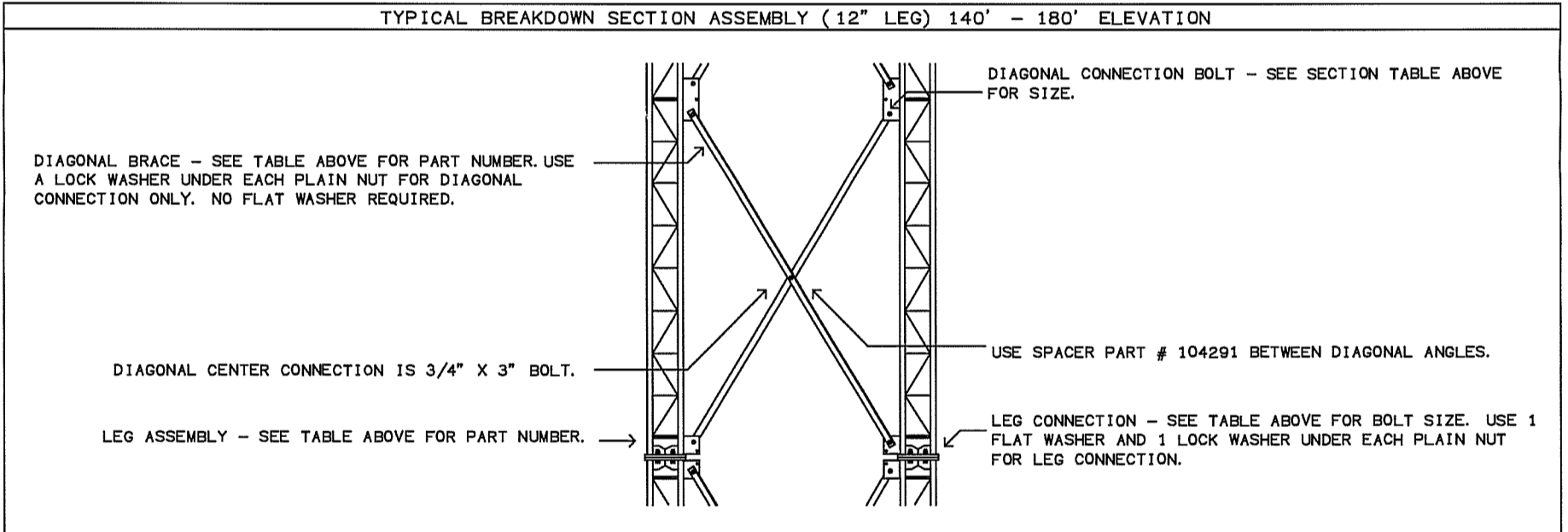
+ AT BOTTOM OF SECTION
* THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.
** PANELS ARE NUMBERED BEGINNING AT THE TOP OF THE SECTION.

HORIZONTAL DATA		
HORIZ HT	IN SEC#	HORIZ PART#
250	V- 5.0	2275B4



BREAKDOWN SECTION DATA (12" LEG) 140' - 180' ELEVATION													
SEC #	SECTION LENGTH	LEG SIZE	LEG PART#	TOP DIAG PART#	BOT DIAG PART#	DIAGONAL FACE	DIAGONAL THICK	SECTION WEIGHT	LEG CONNECT+ DIAM	LEG CONNECT+ LENGTH	DIAG CONNECT DIAM	DIAG CONNECT LENGTH	
U-11.0	20'	1- 3/4"	2295BB	10556B	105571	3"	3/16"	2990#	1"	4-3/4"	1"	2-1/4"	
U-13.0	20'	1- 3/4"	2295BB	105574	105576	3"	3/16"	3056#	1"	4-3/4"	1"	2-1/4"	

* THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.
+ USE 1 FLAT WASHER UNDER EACH LOCK WASHER FOR LEG CONNECTION ONLY.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282083 INGLE, KY
V-27.0 X 250'

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PAGE 2 OF 10

From: F1015739.DFT - 11/11/2013 10:28

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BREAKDOWN SECTION LEG DATA (12" LEG WITH DOUBLE ANGLES) 0' - 140' ELEVATION

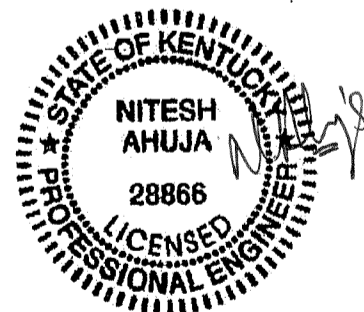
SECTION				LEG		LEG CONNECT @ BOTTOM+		
#	MODEL	LENGTH	WEIGHT*	SIZE	PART #	DIAM	LENGTH	#
7	U-15.0	20'	3953#	2 "	208332	1"	4-3/4"	12
6	U-17.0	20'	4615#	2- 1/4 "	208334	1"	4-3/4"	12
5	U-19.0	20'	4676#	2- 1/4 "	208334	1"	4-3/4"	12
4	U-21.0	20'	6016#	2- 1/2 "	208335	1"	4-3/4"	12
3	U-23.0	20'	6119#	2- 1/2 "	208335	1"	4-3/4"	12
2	U-25.0	20'	7007#	2- 3/4 "	208337	1"	4-3/4"	12
1	U-27.0	20'	7047#	2- 3/4 "	208337			

* THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.
 + QTY IS PER LEG. USE 1 LOCK WASHER AND 1 FLAT WASHER UNDER EACH PLAIN NUT.

BREAKDOWN SECTION DIAGONAL DATA (12" LEG WITH DOUBLE ANGLES) 0' - 140' ELEVATION

SECTION		DIAGONAL PART #			DIAG ANGLE		DIAG END BOLT		DIAG CENTER & SPACER BOLT		CENTER PLATE	SPACER	
#	MODEL	UPPER	LOWER	LONG	FACE	THICK	DIAM	LENGTH	DIAM	LENGTH	PART #	PART #	#*
7	U-15.0	215272	215276	215357	3"	3/16"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	5
6	U-17.0	215280	215284	215361	3"	3/16"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	6
5	U-19.0	215288	215292	215364	3"	3/16"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	7
4	U-21.0	215296	215300	215369	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
3	U-23.0	215304	215308	215373	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
2	U-25.0	215312	215316	215377	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
1	U-27.0	215320	215324	215380	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8

* QUANTITY IS PER PANEL PER FACE. USE 1 LOCK WASHER UNDER EACH PLAIN NUT.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
 #282083 INGLE, KY
 V-27.0 X 250'

KENTUCKY C. O. A. 1542
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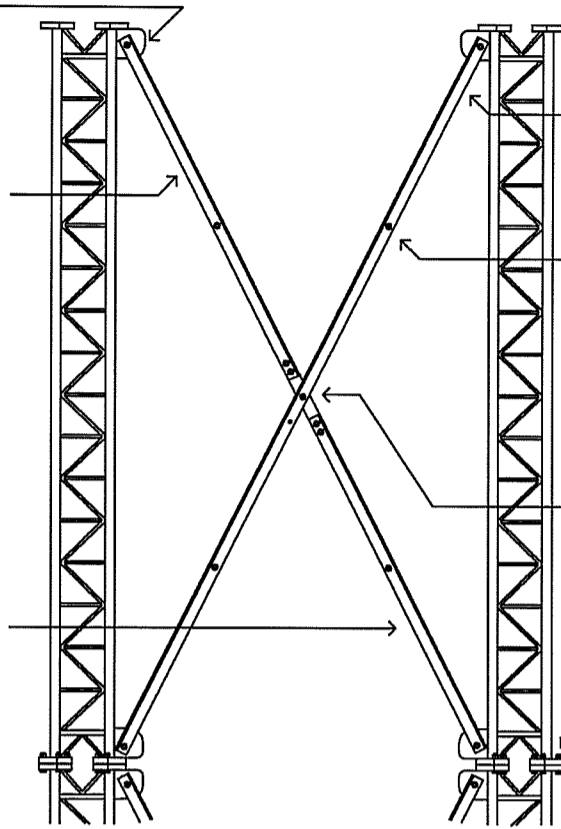
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TYPICAL BREAKDOWN SECTION ASSEMBLY (12" LEG WITH DOUBLE ANGLES) 0' - 140' ELEVATION

DIAGONAL END BOLTS - SEE DIAGONAL TABLE ON PAGE 3 FOR SIZE. NO FLAT WASHER REQUIRED.

"UPPER" DIAGONAL BRACES (BACK TO BACK ANGLES) - SEE TABLE ON PG. 3 FOR PART #.

"LOWER" DIAGONAL BRACES (BACK TO BACK ANGLES) - SEE TABLE ON PG. 3 FOR PART #.



"LONG" DIAGONAL BRACE (BACK TO BACK ANGLES) - SEE TABLE ON PG. 3 FOR PART #.

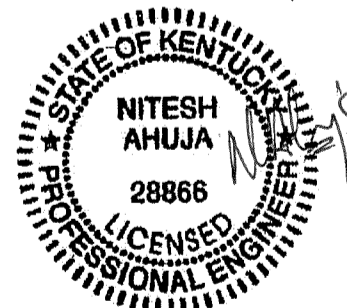
INTERMEDIATE DIAGONAL BOLTS WITH SPACER - SEE TABLE ON PG. 3 FOR SIZE, SPACER PART # AND NUMBER OF LOCATIONS PER PANEL ON EACH FACE. USE 1 SPACER PER BOLT. SEE DRAWING # 214823 FOR DETAILS.

DIAGONAL CENTER PLATE - SEE DIAGONAL TABLE ON PAGE 3 FOR PART # AND BOLT SIZE.

LEG CONNECTION - SEE TABLE ON PAGE 3 FOR BOLT SIZE. USE 1 LOCK WASHER AND 1 FLAT WASHER UNDER EACH PLAIN NUT FOR LEG CONNECTION.

ATTENTION ERECTOR:

- EXTRA CARE MUST BE TAKEN WHEN STANDING BREAKDOWN LEG SECTIONS FROM A FLAT "ASSEMBLY" POSITION ON THE GROUND TO AN UPRIGHT POSITION FOR STACKING. POOR RIGGING AND/OR LIFTING PROCEDURES MAY DAMAGE THE ANGLE BRACES AND/OR BREAKDOWN LEGS. IT IS THE RESPONSIBILITY OF THE TOWER CONTRACTOR TO ENSURE BREAKDOWN LEGS AND ANGLES ARE NOT DAMAGED DURING THE TOWER ASSEMBLY AND ERECTION.
- WHEN LIFTING ("FLYING") SINGLE PANEL TOWER SECTIONS TO PLACE THEM ON PREVIOUSLY ERECTED SECTIONS, A MINIMUM OF TWO (2) FULL SECTIONS (TYPICALLY 40') MUST BE ASSEMBLED TOGETHER TO PROVIDE ADEQUATE STABILITY TO THE TOWER LEGS AND ANGLE BRACES. IT IS THE RESPONSIBILITY OF THE TOWER CONTRACTOR TO ENSURE BREAKDOWN LEGS AND ANGLES ARE NOT DAMAGED DURING THE TOWER ASSEMBLY AND ERECTION.



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Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282083 INGLE, KY
V-27.0 X 250'

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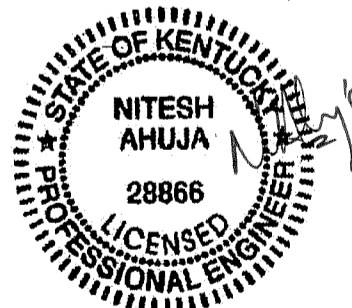
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GENERAL NOTES

1. TOWER DESIGN CONFORMS TO STANDARD TIA-222-G UTILIZING AN 90 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF II, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH NO ICE.
TOWER DESIGN CONFORMS TO STANDARD TIA-222-G UTILIZING AN 30 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF II, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH .75" RADIAL ICE.
TOWER MEETS THE REQUIREMENTS OF THE 2013 KENTUCKY BUILDING CODE UTILIZING AN 115 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF II, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH NO ICE PER ANSI/TIA-222-G.
2. NO TWIST AND SWAY LIMITATIONS SPECIFIED OR USED FOR THIS TOWER.
3. MATERIAL: (A) SOLID RODS TO ASTM A572 GRADE 50. (B) ANGLES TO ASTM A36. (C) PIPE TO ASTM A500 GRADE B. (D) STEEL PLATES TO ASTM A36. (E) CONNECTION BOLTS TO ASTM A325 OR ASTM A449 (Fu=120 KSI AND Fy=92 KSI) AND ANCHOR BOLTS TO ASTM F1554 (Fu=150 KSI AND Fy=105 KSI). (F) TOWER LEG PIPE TO BE ASTM A500 GRADE B/C WITH 50KSI MIN. YIELD STRENGTH
4. BASE REACTIONS PER TIA-222-G FOR 90 MPH BASIC WIND SPEED WITH NO ICE (REACTIONS INCLUDE TIA-222-G LOAD FACTORS): TOTAL WEIGHT = 94.0 KIPS. MAXIMUM COMPRESSION = 622.0 KIPS PER LEG. MOMENT = 13820.0 KIP-FT. MAXIMUM UPLIFT = 554.0 KIPS PER LEG. MAXIMUM SHEAR = 94.0 KIPS TOTAL.
5. BASE REACTIONS PER TIA-222-G FOR 30 MPH BASIC WIND SPEED WITH 0.75" RADIAL ICE (REACTIONS INCLUDE TIA-222-G LOAD FACTORS): TOTAL WEIGHT = 288.0 KIPS. MOMENT = 1616.0 KIP-FT. MAXIMUM SHEAR = 10.0 KIPS TOTAL.
6. FINISH: ALL BOLTS ARE GALVANIZED IN ACCORDANCE WITH ASTM A153 (HOT DIPPED) OR ASTM B695 CLASS 50 (MECHANICAL). ALL OTHER STRUCTURAL MATERIALS ARE GALVANIZED IN ACCORDANCE WITH ASTM 123.
7. ANTENNAS: 250' -135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES
240' -135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES
230' -135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES
220' -135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES
NOTE: (A) ELEVATIONS ARE TO THE BOTTOM OF THE ANTENNAS EXCEPT FOR MICROWAVE DISHES, WHICH ARE TO THE CENTERLINE. (B) ALL TRANSMISSION LINES MUST BE PLACED ON PIROD SUPPLIED LINE BRACKETS.
8. REMOVE FOUNDATION TEMPLATE PRIOR TO ERECTING TOWER. INSTALL BASE SECTION WITH MINIMUM OF 2" CLEARANCE ABOVE CONCRETE. SEE BASE SECTION PLACEMENT PAGE FOR MORE INFORMATION. PACK NON-SHRINK STRUCTURAL GROUT UNDER BASE SECTION AFTER LEVELING TOWER.
9. MIN. WELDS 5/16" UNLESS OTHERWISE SPECIFIED. ALL WELDING TO CONFORM TO AWS D1.1 SPECIFICATIONS .
10. THIS DRAWING DOES NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, SEQUENCES AND PROCEDURES.
11. ALL BOLTS AND NUTS MUST BE IN PLACE BEFORE THE ADJOINING SECTIONS ARE INSTALLED.
12. ALL STRUCTURAL BOLTS ARE TO BE TIGHTENED TO A SNUG TIGHT CONDITION AS DEFINED BY AISC SPECIFICATION UNLESS OTHERWISE NOTED.
13. ATTENTION TOWER ERECTOR: COAT ALL BOLT ASSEMBLIES THAT USE PIN LOCK NUTS WITH ZINC RICH COLD GALVANIZING COMPOUND AFTER FINAL TIGHTENING.
14. TIA-222-G GROUNDING FOR TOWER.
15. TOWER LIGHTING SUPPLIED BY OTHERS.



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Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282083 INGLE, KY
V-27.0 X 250'

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FOUNDATION NOTES

1. SOIL AS PER REPORT BY FDH, DATED: 09/06/13 (PROJECT#1305551600) & EMAIL DATED: 11/11/13
2. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 (2008) BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR NOT PERMITTED.
3. A COLD JOINT IS PERMISSIBLE UPON CONSULTATION WITH PIROD. ALL COLD JOINTS SHALL BE COATED WITH BONDING AGENTS PRIOR TO SECOND POUR.
4. ALL FILL SHOULD BE PLACED IN LOOSE LEVEL LIFTS OF NO MORE THAN 8" THICK. FILL MATERIALS SHOULD BE CLEAN AND FREE OF ORGANIC AND FROZEN MATERIALS OR ANY OTHER DELETERIOUS MATERIALS. COMPACT FILL TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D698.
5. BENDING, STRAIGHTENING OR REALIGNING (HOT OR COLD) OF THE ANCHOR BOLTS BY ANY METHOD IS PROHIBITED.
6. CROWN TOP OF FOUNDATION FOR PROPER DRAINAGE.
7. THE ON-SITE GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE INSITU SOIL STRENGTHS MEET OR EXCEED THOSE PARAMETERS GIVEN IN THE SOIL REPORT.
8. PNEUMATIC HAMMERS, RIPPERS, AND/OR BLASTING MAY BE REQUIRED TO REMOVE MATERIAL FROM THE EXCAVATION.
9. THE FOUNDATION MUST BEAR ENTIRELY ON COMPETENT BEDROCK. THE FOUNDATION IS NOT TO BEAR ON ANY COMBINATION OF SOIL AND BEDROCK AS THIS MAY CAUSE EXCESSIVE DIFFERENTIAL SETTLEMENT.
10. SUBGRADE PREPARATIONS AND BACKFILLING MUST BE COMPLETED PER THE SPECIFICATIONS IN THE REFERENCED GEOTECHNICAL REPORT ABOVE.




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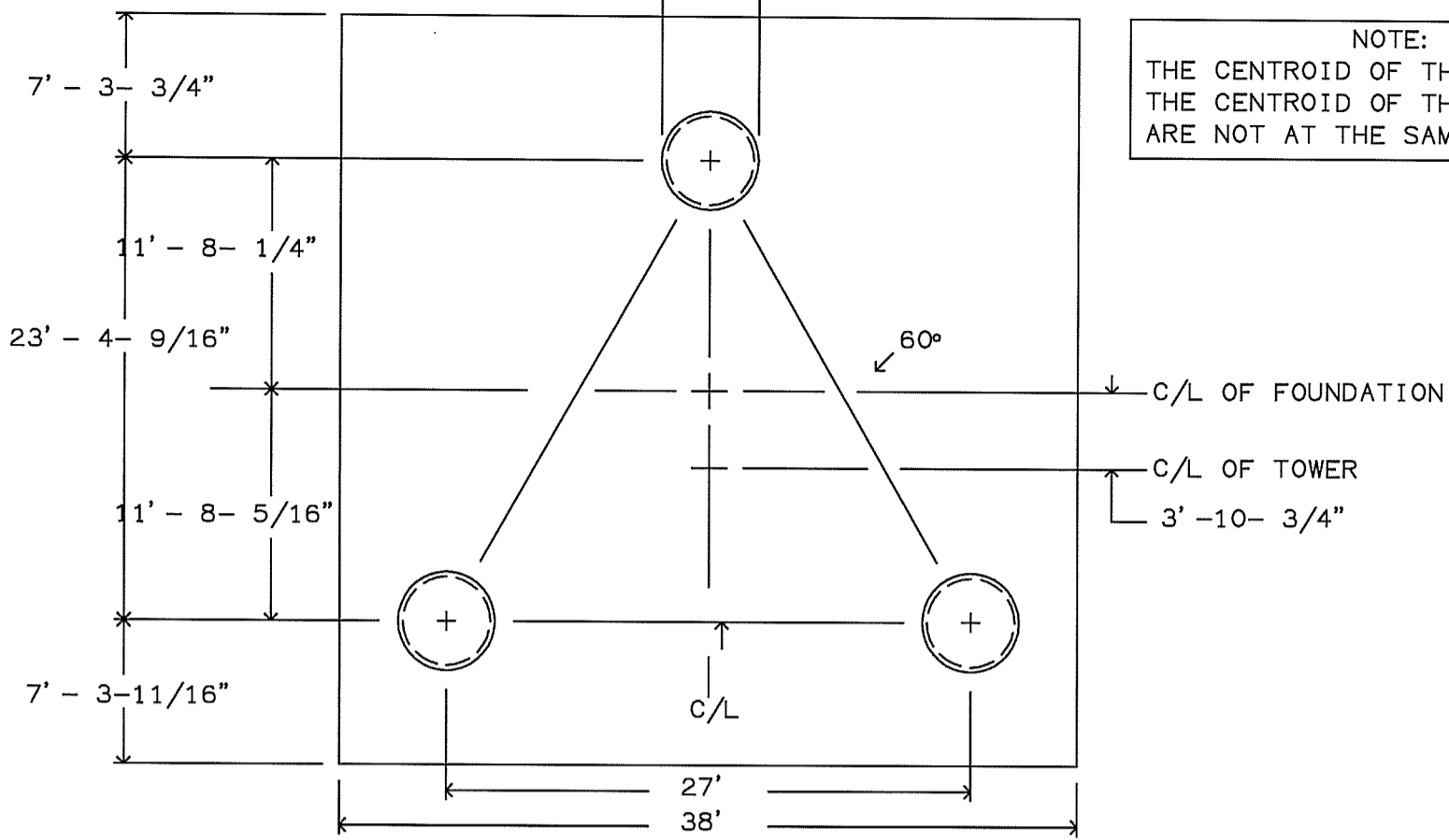
Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282083 INGLE, KY
V-27.0 X 250'

KENTUCKY C. O. A. 1542

A	ADDED FOUNDATION	JAK	11/11/2013	APPROVED/ENG.	M_S	11/11/2013	
REV	DESCRIPTION OF REVISIONS	INI	DATE	APPROVED/FOUND.	M_S	11/11/2013	
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				ARCHIVE		F-1015739	PAGE 6 OF 10

5' ROUND, CENTERED AROUND
THE CIRCULAR REBAR CAGE

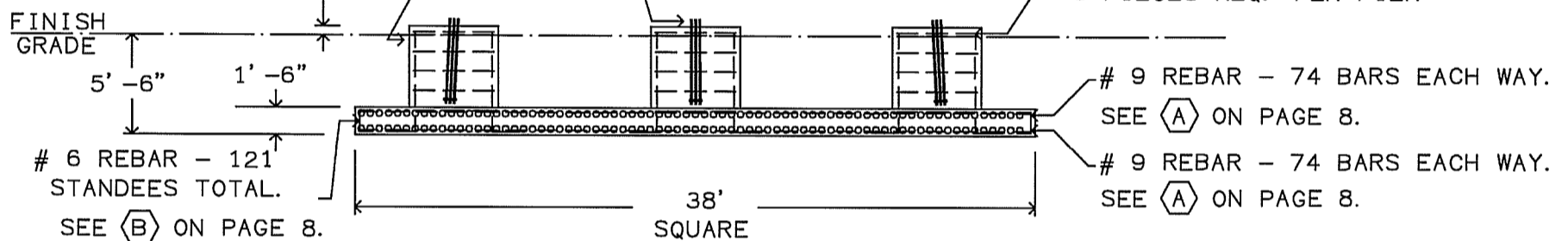


NOTE:
THE CENTROID OF THE TOWER AND
THE CENTROID OF THE FOUNDATION
ARE NOT AT THE SAME POINT!

7 VERTICAL REBAR -
SEE (C) ON PAGE 8.
29 PIECES REQ. PER PIER,
EQUALLY SPACED, TO BE
PLACED INSIDE TIES.

FOR ANCHOR STEEL IDENTIFICATION AND
PLACEMENT INFORMATION, SEE PAGE 9
OF THIS DRAWING. SEE PAGE 10 FOR
BASE SECTION INSTALLATION DETAIL.

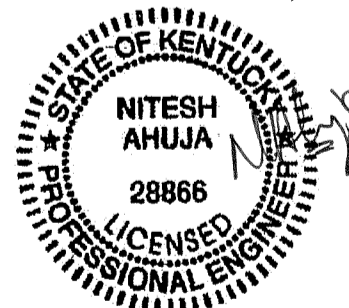
4 TIES - SEE (D) ON PAGE 8.
6 PIECES REQ. PER PIER



NOTE: ALL REBAR REQUIRES
MIN. 3" CONCRETE COVERAGE

TOWER FOUNDATION

90.0 CUBIC YARDS CONCRETE REQUIRED
FOR INSTALLATION SPECIFICATIONS AND
ADDITIONAL INFORMATION, SEE PAGE 6
OF THIS DRAWING.

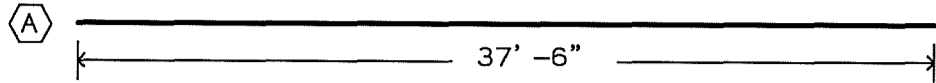


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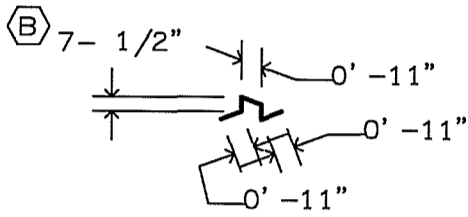
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						ENG. FILE NO. A-239126-		PAGE	
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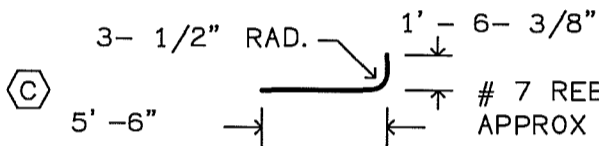


9 REBAR - 296 PIECES REQ. TOTAL
APPROX WT = 127.5# EACH, 37740# TOTAL

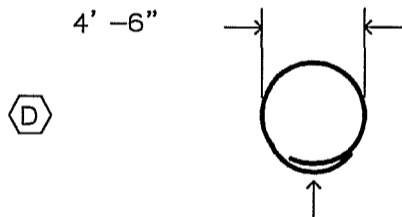
REBAR SUPPORTS MAY CONSIST OF ANY ACCEPTABLE MEANS OF SECURELY SUPPORTING THE TOP REINFORCEMENT GRID ABOVE THE BOTTOM REINFORCEMENT GRID WHILE MAINTAINING A SEPARATION OF 1' (OUTSIDE REBAR TO OUTSIDE REBAR).



6 REBAR - 121 PIECES REQUIRED TOTAL
TYPE 26 STANDEE PLACED BETWEEN REBAR GRIDS ON NOMINAL 4' SPACING THROUGHOUT
APPROX UNBENT LENGTH = 4'-0-1/2"
APPROX WT = 6.1# EACH, 738# TOTAL



7 REBAR - 87 PIECES REQUIRED TOTAL
APPROX UNBENT LENGTH = 6'-10-7/8"
APPROX WT = 14.1# EACH, 1227# TOTAL

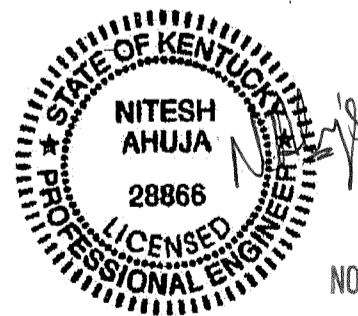


4 REBAR - 18 PIECES REQUIRED TOTAL
APPROX UNBENT LENGTH = 15'-8-1/4"
APPROX WT = 10.5# EACH, 189# TOTAL

LAP DIMENSION: 1'-6-1/2"
PLACE CIRCULAR TIES SO THAT LAPS ON ADJACENT TIES ARE 180 DEGREES APART. PLACE ONE TIE AT TOP OF PAD AND TWO TIES AT TOP OF PIER REBAR. EQUALLY SPACE REMAINING TIES ALONG PIER.

REBAR DETAIL

TOTAL APPROX REBAR WEIGHT = 39894#
REINFORCING BAR TO CONFORM TO
ASTM A615 GRADE 60 SPECIFICATIONS.

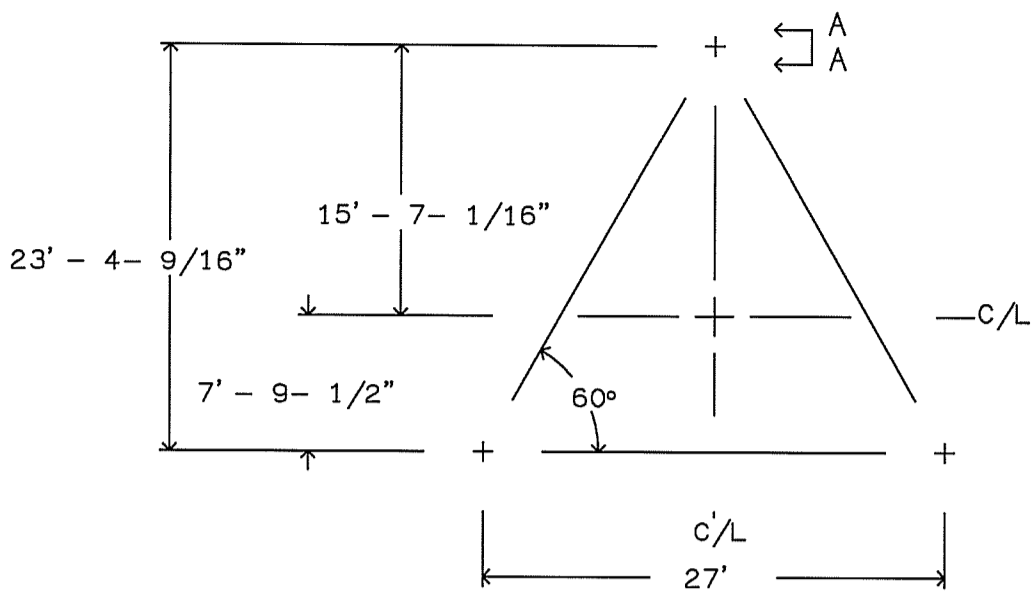


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#282083 INGLE, KY
V-27.0 X 250'

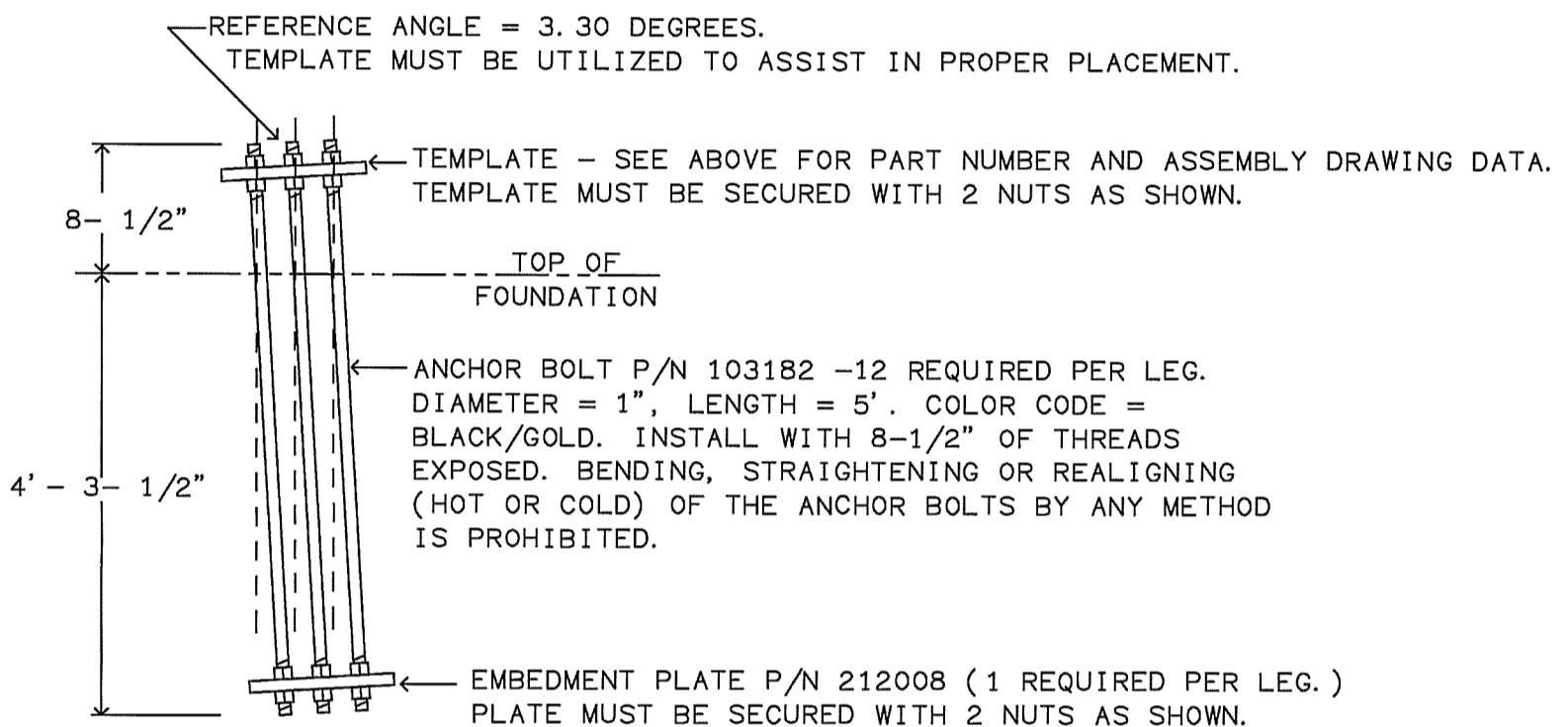
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				ENG. FILE NO. A-239126-		PAGE 8 OF 10



TEMPLATE ASSEMBLY P/N 216152 INCLUDES CORNER PLATE P/N 211902, IS REQUIRED FOR INSTALLATION AND MUST BE PLACED AS SHOWN. SEE DRAWING # 211875 FOR TEMPLATE ASSEMBLY DETAILS. SEE PAGE 7 FOR TOWER C/L LOCATION RELATIVE TO THE FOUNDATION LAYOUT. TEMPLATE PLACEMENT +/- 3". EACH LEG MUST BE CENTERED IN PIER WITHIN +/- 10% OF PIER DIAMETER. TEMPLATE MUST BE LEVEL +/- 1 DEGREE. INSTALL TEMPLATE WITH SUFFICIENT SPACE BENEATH (2" MINIMUM) TO PERMIT FINISHING OF CONCRETE AND TO FACILITATE TEMPLATE REMOVAL PRIOR TO TOWER ERECTION.

SEE PAGE 10 FOR BASE SECTION INSTALLATION DETAIL.

TOWER ANCHOR STEEL PLACEMENT - TOP VIEW



VIEW A - A - ANCHOR BOLT INSTALLATION DETAIL (NOT TO SCALE)

ATTENTION CONTRACTOR INSTALLING THE ANCHOR BOLTS!

1" DIAMETER ANCHOR BOLTS FOR TAPERED TOWER.

VERIFY THE PART NUMBERS AND SIZES FOR ALL COMPONENTS ON THIS PAGE AND PAGE 10.


IF THERE ARE ANY DISCREPANCIES, PLEASE NOTIFY PIROD, INC. PRIOR TO INSTALLATION!!

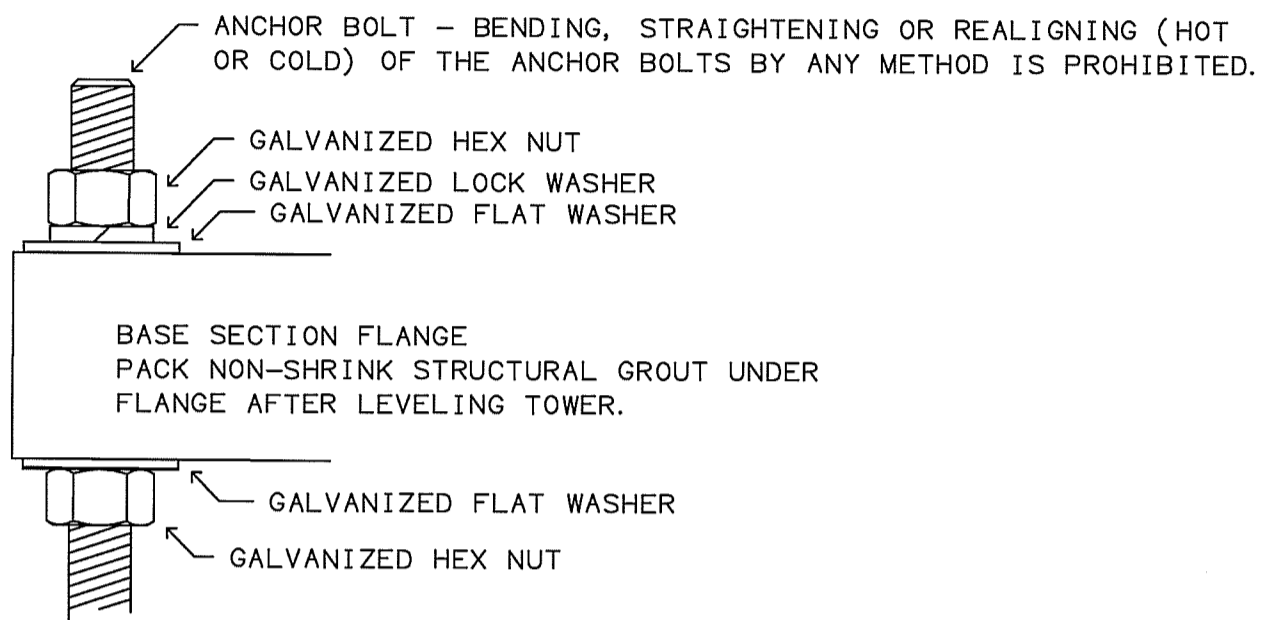


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BASE SECTION INSTALLATION DETAIL



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V-27.0 X 250'


				KENTUCKY C. O. A. 1542			
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EXHIBIT D
COMPETING UTILITIES, CORPORATIONS, OR PERSONS LIST
AND MAP OF LIKE FACILITIES IN VICINITY

License Search

Search Results**Specified Search**

State = **Kentucky**
 County = **PULASKI**
 Radio Service = **CL, CW**
 Status = **Active**

Matches **1- 10** (of **11**)

PA = Pending Application(s)
TP = Termination Pending
L = Lease

	Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date
1	KNKN940	Rural Cellular Corporation	0003715919	CL	Active	10/01/2020
2	KNKN964	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CL	Active	10/01/2020
3	KNKN965	New Cingular Wireless PCS, LLC	0003291192	CL	Active	10/01/2021
4	KNLF252	WIRELESSCO, L.P.	0002316545	CW	Active	06/23/2015
5	KNLH410	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017
6	KNLH411	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017
7	PA KNLH638	Bellevue Wireless, LLC	0018360941	CW	Active	04/28/2017
8	WPOI255	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CW	Active	06/23/2015
9	WPOK659	New Cingular Wireless PCS, LLC	0003291192	CW	Active	09/29/2019
10	WPXT205	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CW	Active	06/23/2015

	Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date
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License Search

Search Results**Specified Search**State = **Kentucky**County = **PULASKI**Radio Service = **CL, CW**Status = **Active**Matches **11- 11** (of **11**)

PA = Pending Application(s)
TP = Termination Pending
L = Lease

Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date
11 WPZX945	Bluegrass Wireless LLC	0010698868	CW	Active	09/29/2019

Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date
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EXHIBIT E
CO-LOCATION REPORT



November 12, 2013

Public Service Commission
211 Sower Boulevard
Frankfort, KY 40602

RE: Alternate Site Analysis Report
Uniform Application for a Communications Facility
Applicant: AT&T Mobility
Site Location: 1867 New Hope Road, Nancy, KY 42544
Site Name: Ingle

Dear Commissioners:

This report is provided to explain the site development process used by the Applicant to identify the site selected for the new wireless communications facility proposed in the accompanying application for a Certificate of Public Convenience and Necessity (CPCN).

AT&T Mobility Site Development Process

Step 1: Problem Identification. AT&T Mobility radio frequency engineers first identified a growing coverage and/or capacity gap in the area along Cumberland Parkway, due west of Somerset, Kentucky.

Step 2: Search Ring. To help guide the site development team's task of identifying a suitable location for a new wireless communications facility site, AT&T Mobility's radio frequency engineers identified the geographic area where the antenna site must be located in order to close the gap and issued a map (called a Search Ring) that identified the general area in which a new site must be located. The search ring map is included as Appendix A to this report.

Step 3: Co-location Review. The site development team first reviewed the area within the Search Ring for a suitable tall structure for co-location. In this case, only one such structure was located (existing Bluegrass Cellular Tower). Jill Vice, with Bluegrass Cellular, was contacted regarding a possible co-location on the tower. The response was that the site is planned for future expansion and they cannot accommodate any new co-locations. A copy of her email communicating this denial for co-location is attached as Appendix B to this report.

Step 4: Review of the Area's Zoning Classification. Once the site development team determined that there are no available existing tall structures which are technically feasible

and suitable for co-location, the team next reviewed local zoning requirements to identify parcels located within the search area that might be suitable from a land use perspective to host an antenna site. In this case, the site acquisition agent was able to view The Pulaski County Property Valuation information on line and the parcels in the search ring were identified. The search ring is located in Pulaski County, and there is no applicable zoning designation.

Step 5: Preliminary Inspection and Assessment of Suitable Parcels. Once suitably zoned parcels are identified, the site development team visits the parcels and performs a preliminary inspection. The purpose of the preliminary inspection is: (1) to confirm the availability of sufficient land space for the proposed facility; (2) to identify a specific location for the facility on the parcel; (3) to identify any recognized environmental conditions that would disqualify the parcel from consideration; (4) to identify any construction issues that would disqualify the candidate; and, (5) to assess the potential impact of the facility on neighboring properties. In this case, once the Bluegrass Cellular tower was ruled out, properties within the search ring were identified that would meet the requirements for the construction of a tower. There were eight such properties. After driving parcels 006-0-0-72, 012-0-1-02, 012-0-1-01, 006-0-0-73, 005-0-2-49, 011-0-2-48, 011-0-2-45 and 011-0-2-46, the site acquisition agent concluded that parcel 011-0-2-46 (the Lyons property) was the best choice for constructability. All other properties were heavily wooded or planted with crops. Also, many of the parcels on the south side of Cumberland Parkway had access issues, meaning they would be difficult to access with construction vehicles. A parcel map is included as Appendix C to this report. An overview of parcel conditions is as follows:

- 006-0-0-72 60 Acre tract: heavily wooded.
- 012-0-1-02 196 Acre tract: Planted crops with difficult access.
- 012-0-1-01 29 Acre tract: heavily wooded.
- 006-0-0-73 100 Acre tract: planted crops with difficult access.

North side of Cumberland Parkway parcel conditions are as follows:

- 005-0-2-49 32 Acre tract: heavily wooded.
- 011-0-2-48 40 Acre tract: portion of property wooded.
- 011-0-2-45 50 Acre tract: planted crops.
- 011-0-2-46 69 Acre tract: mix of pasture and woods. The Lyons property.

Step 6: Candidate Evaluation and Selection. After the preliminary site assessments were performed, the site development team ranked the candidates based on compliance with zoning regulations, the availability of ground space, topography, applicable environmental conditions, construction feasibility and the potential impact of the facility on neighboring properties. In this case, three candidates were submitted to AT&T for review. The A, B and C candidates are on property owned by Larry Lyons (the "Lyons Property"). Larry Lyons was contacted and he was interested in a proposed lease agreement. Mr. Lyons' property is a 69 acre tract that is a mixture of pasture and woods. Mr. Lyons offered three (3) different locations on his property for the proposed site. There is an existing public road to the property and the chosen site was clear of trees. This site has good

elevation and sits just north of the Cumberland Parkway. All three (3) candidates were submitted to AT&T's radio frequency engineers for review, and Candidate A was chosen as the best location to meet service objectives. An aerial search ring map (Appendix A) and a road map (Appendix D) are attached with all three candidates identified thereon.

Step 7: Leasing and Due Diligence. Once a suitable candidate was selected, lease negotiations were commenced and site due diligence steps were performed, as described below.

Leasehold Due Diligence:

- A Title Report was obtained and reviewed to ensure that there are no limitations on the landowner's capacity to lease and to address any title issues.
- A site survey was obtained to identify the location of parcel features, boundaries, easements and other encumbrances revealed by the title search.

Engineering Due Diligence:

- Utility access identified.
- Grounding plan designed.
- Geotechnical soil analysis performed to determine foundation requirements.
- Foundations designed to meet the Kentucky Building Code lateral and subjacent support requirements.
- Site plan developed.

Environmental Due Diligence:

A Phase I Environmental Site Assessment ("ESA") investigation was performed to establish the pre-existing types and amounts of contamination at a site, and to establish that the leaseholder is innocent of liability for the costs of performing environmental cleanup work that might arise from pollution or contamination of the site caused by a third party.

In addition to performing a Phase 1 ESA, the site was also evaluated for potential impacts under the *National Environmental Policy Act* (NEPA), submitted to the State Historic Preservation Office for review of potential impacts to historic structures or districts, and submitted to the registered Tribal Historic Preservation Office so that registered Native American nations had the opportunity to review potential impacts on native religious, ceremonial, or cultural resources.

Federal Regulatory Approvals

- Federal Aviation Administration ("FAA") compliance.
- Federal Communication Commission ("FCC") compliance.

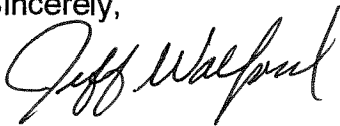
In this case, only two property owners were contacted. Bluegrass Cellular denied AT&T's request for co-location on their tower. The Lyons Property was chosen by AT&T's radio frequency engineers and a lease was agreed upon by the parties.

Step 8: Application. Once a lease was obtained and all site due diligence was completed, AT&T Mobility prepared and filed the accompanying request for a CPCN to construct, maintain and operate a communications facility.

Conclusion

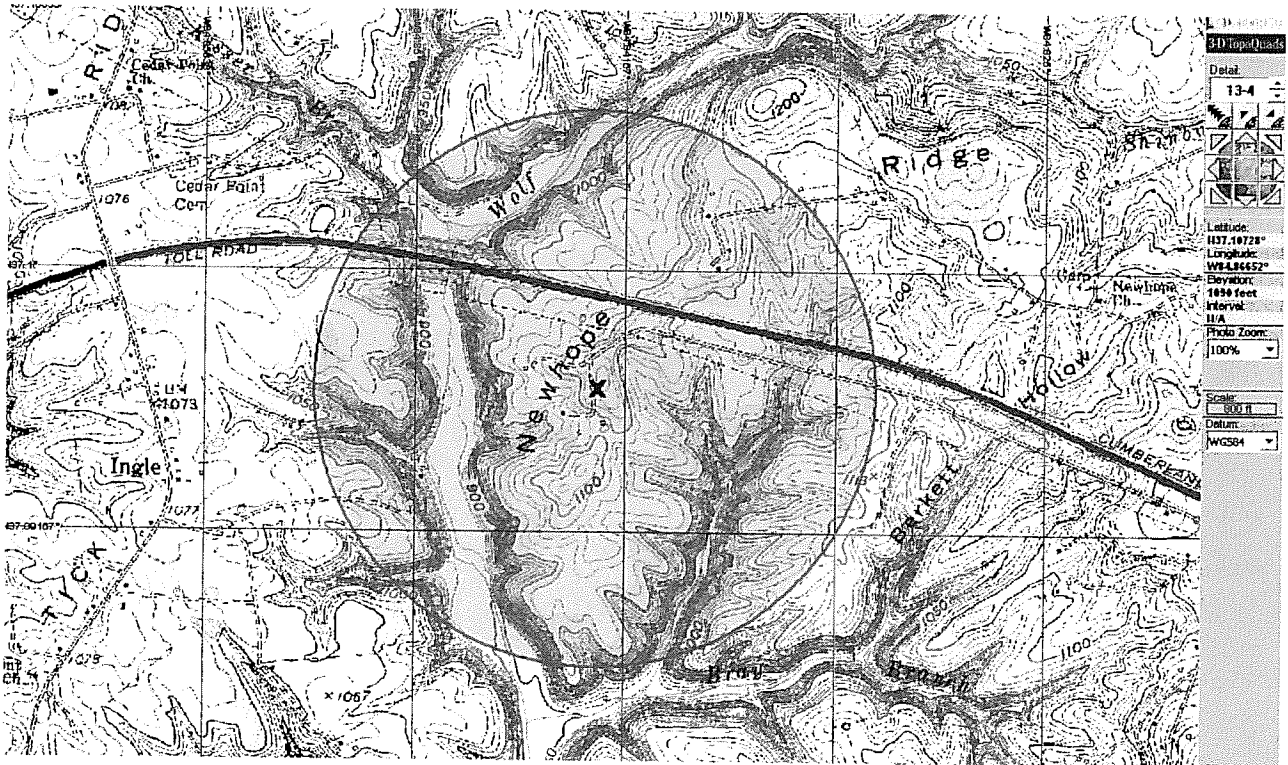
Applicant's site identification and selection process aims to identify the least intrusive of all the technically feasible parcels in a service need area. In this case, AT&T's radio frequency engineers considered all three candidates and chose the candidate that would provide optimum coverage for their wireless service. Based on the elevation and position of the chosen site, we believe that a 250' self support tower at this location would meet the coverage objective.

Sincerely,



Jeff Wolford
Site Acquisition Specialist
FMHC
6924 Peppermill Lane
Louisville, KY 40228
502-639-8967

APPENDIX A—SEARCH RING AERIAL MAP



Ingle 37.09623 -84.84276

APPENDIX B—BLUEGRASS CELLULAR DENIAL OF REQUEST FOR CO-LOCATION

From: Jill Vice [<mailto:jvice@bluegrasscellular.com>]
Sent: Thursday, April 25, 2013 1:40 PM
To: Jennifer Sturgeon
Cc: Heather Vagasky
Subject: FW: INGLE - LOADING

Jennifer -

I'm so sorry, I just realized that AT&T already requested this site, unfortunately here was my response when asked:

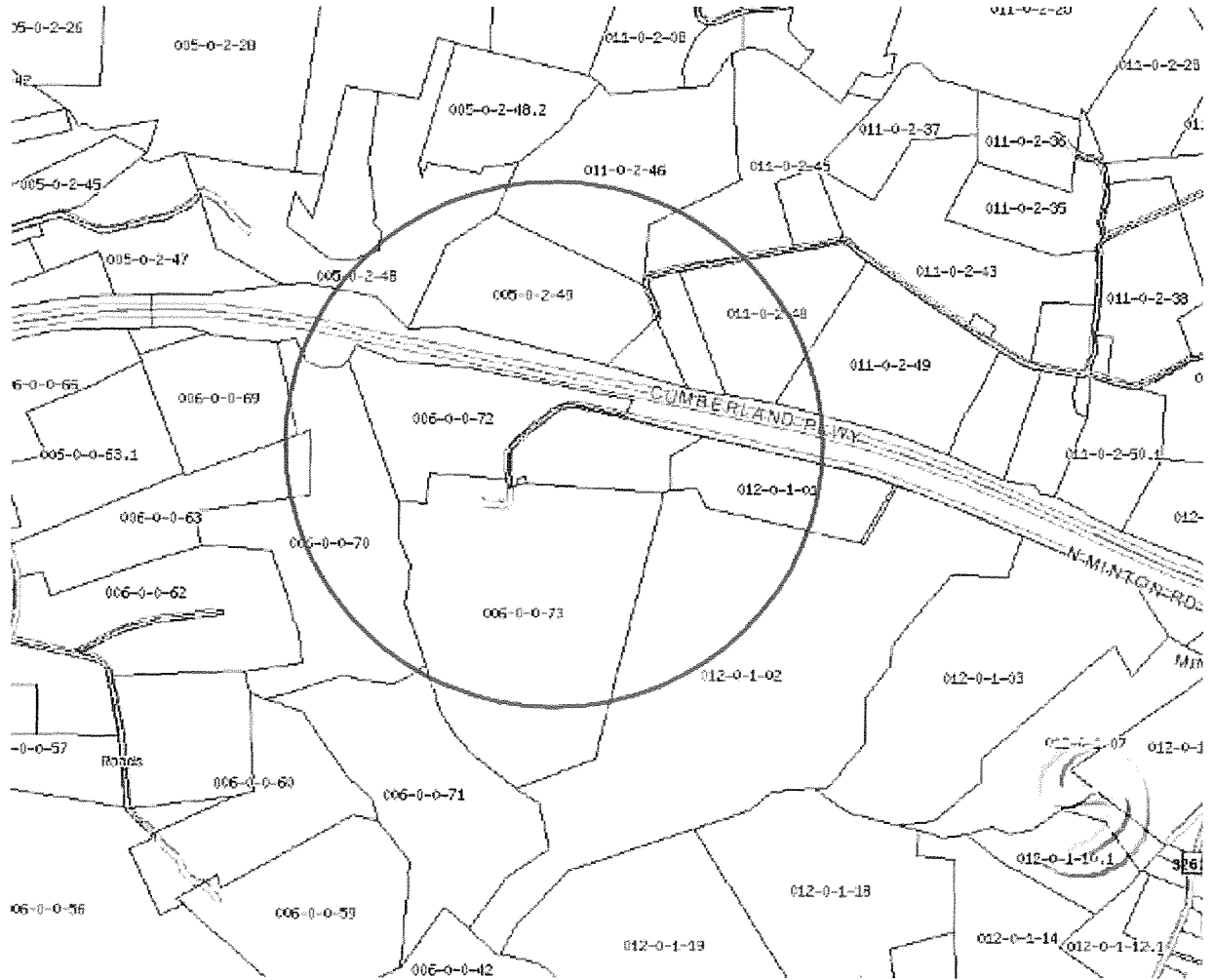
Pulaski West - This is a HUB site with future builds coming. No ETA

Jill Vice | Senior Lease & Co-location Administrator
Bluegrass Cellular Inc. | 2902 Ring Rd | Elizabethtown, KY 42701

Email: jvice@bluegrasscellular.com
Office: 270.765.6361 x3015 | Fax: 270.737.0580
Cell:



APPENDIX C—PARCEL MAP



APPENDIX D—ROAD MAP

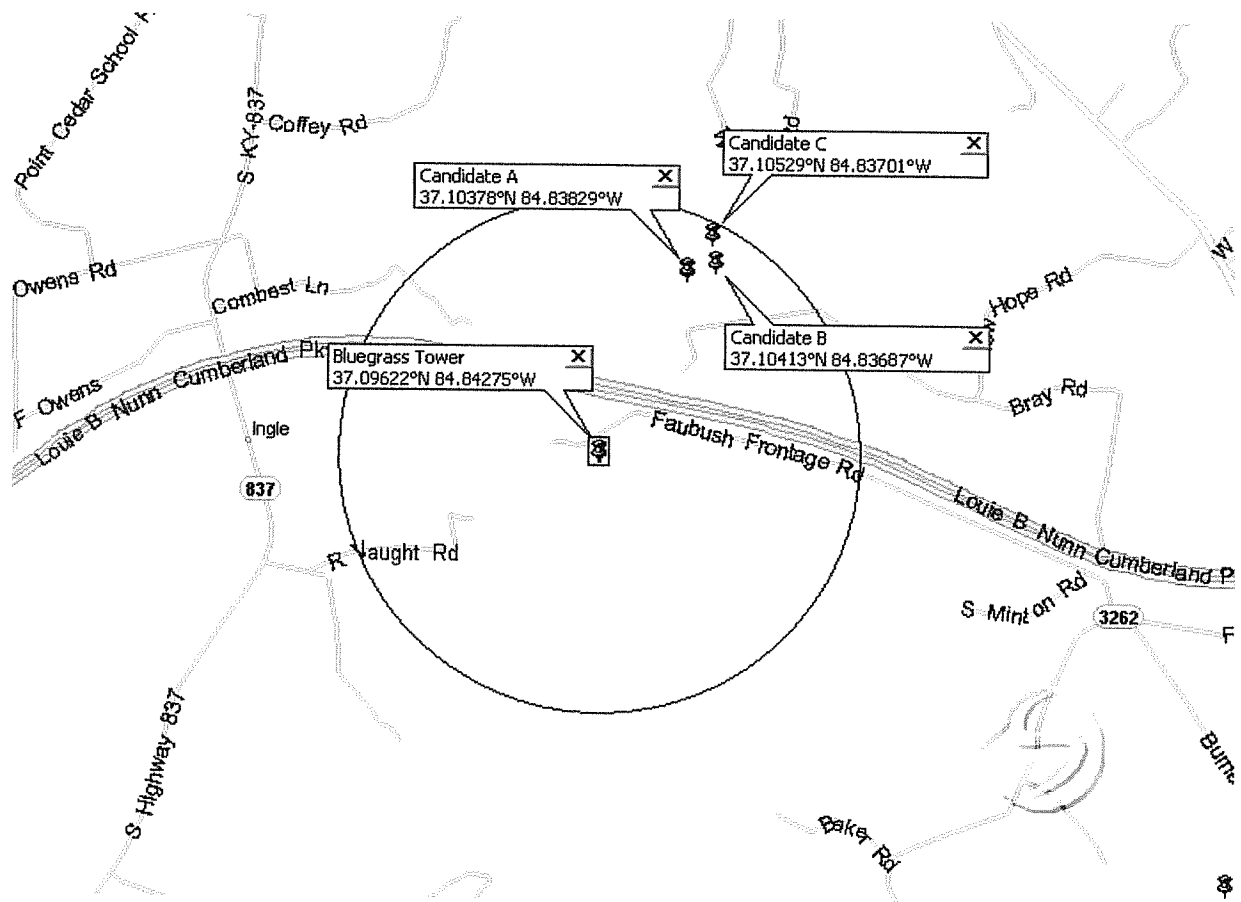




EXHIBIT F
FAA



Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 2601 Meacham Boulevard
 Fort Worth, TX 76137

Aeronautical Study No.
 2013-ASO-8010-OE

Issued Date: 11/14/2013

John Monday
 AT&T Mobility LLC
 2200 W. Greenville Ave.
 1W
 Richardson, TX 75082

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Antenna Tower Ingle
 Location: Nancy, KY
 Latitude: 37-06-13.87N NAD 83
 Longitude: 84-50-17.67W
 Heights: 1138 feet site elevation (SE)
 260 feet above ground level (AGL)
 1398 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)
- Within 5 days after the construction reaches its greatest height (7460-2, Part II)

This determination expires on 05/14/2015 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates , heights, frequency(ies) and power . Any changes in coordinates , heights, and frequencies or use of greater power will void this determination. Any future construction or alteration , including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (847) 294-8084. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2013-ASO-8010-OE.

Signature Control No: 197602627-201773128

(DNE)

Carole Bernacchi
Technician

Attachment(s)
Frequency Data

cc: FCC

Frequency Data for ASN 2013-ASO-8010-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W



EXHIBIT G
KENTUCKY AIRPORT ZONING COMMISSION



KENTUCKY AIRPORT ZONING COMMISSION

STEVEN BESHEAR
Governor

90 Airport Road, Bldg 400
Frankfort, KY 40601
www.transportation.ky.gov/aviation
502 564-4480

CONDITIONAL APPROVAL

October 24, 2013

A T & T
AT&T
402 Franklin Rd|RM 03D092
Brentwood, TN 37027

SUBJECT: AS-100-SME-2013-161

STRUCTURE: Antenna Tower
LOCATION: Nancy, KY
COORDINATES: 37° 6' 13.87" N / 84° 50' 17.67" W
HEIGHT: 260' AGL/1398' AMSL

Your application for a permit to construct or alter the above structure was reviewed at the Thursday, October 10, 2013 regular meeting of the Kentucky Airport Zoning Commission. This letter is to advise you that your permit has been tentatively approved by the Commission pending the FAA Determination. Upon receipt of notification of No Hazard, No IFR/VFR Effects from the FAA and FAA recommended lighting, final approval of your application will be granted and copies forwarded to you.

If you have any questions or would like to check on the status of your permit, please feel free to call me at 502 564-4480.

Sincerely,

A handwritten signature in black ink, appearing to read "John Houlihan".

John Houlihan
Administrator



An Equal Opportunity Employer M/F/D



**EXHIBIT H
GEOTECHNICAL REPORT**



Geotechnical Evaluation of Subsurface Conditions

Self Support Tower

Report Prepared for
FMHC Corporation

Site Name: Ingle
Site ID: 141960-A

1867 New Hope Road - New Hope, KY 42544
Lat: 37.103844
Lon: -84.838303

FDH Project Number 1305551600

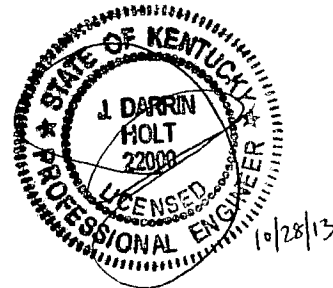
Prepared by:

Cedric D. Fairbanks, PhD, P.E.
Senior Geotechnical Engineer

J. Darrin Holt, PhD, P.E.
Managing Principal

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919)755-1012
info@fdh-inc.com

09/06/2013





EXECUTIVE SUMMARY

Project Location: 1867 New Hope Road – New Hope, KY 42544
Structure Type: Self-Support
Site ID/Number: 141960-A
Number of Borings: One (1)
Depth of Borings: B-1 to 3.0 ft

INTRODUCTION

FDH Engineering, Inc. understands that a self-support telecommunication tower with a proposed height of 250-ft tall will be erected at the aforementioned project site. The authorized subsurface investigation has been completed to evaluate the existing subsurface conditions and their effect on the proposed construction and site development. Boring B-1 was terminated at a depth of 3.0 ft due to auger refusal. Two additional offset borings were performed to verify refusal.

SITE INVESTIGATIONS

The project site is slightly sloping to the east and exhibits a topographic variation of less than 15.0 ft. Currently, the footprint area of the proposed self-support tower is vacant and covered with grass and sparse bushes. The site drainage is surface runoff.

Subsurface conditions were evaluated by obtaining one test boring near the tower's foundation elements base as shown on Figure 1. The boring was sampled at selected intervals using standard penetration test procedures designated in ASTM D-1586. The soil samples were transported to our soil lab and classified according to ASTM D-2487. Additionally, unconfined compressive strength tests according to ASTM D-2166 were conducted on selected cohesive soil samples.

The soil samples will be retained in our laboratory for a period of forty-five (45) days, after which, they will be discarded unless other instructions are received as to their disposition.

SUBSURFACE CONDITIONS

Based on the field boring record and laboratory test results, the subsurface conditions on site can be generalized using the following strata descriptions:

Strata #	Approx. Depth (ft)	General Description
I	0.0 – 1.5	CL - Stiff Lean Clay with sand
II	1.5 – 3.0	PWR – Very Dense Partially Weathered Rock with clay (Probable Sandstone)



GROUNDWATER

Groundwater was not encountered in the soil boring B-1 during the time of drilling. However, regional groundwater levels will fluctuate with seasonal and climatic changes and may be different at other times. We recommend that FDH be immediately notified if a noticeable change in groundwater occurs from the depths mentioned in this report.

FOUNDATION RECOMMENDATIONS

The following recommendations are made based on our review of the attached test boring data and laboratory results, along with our past experience with similar projects and subsurface conditions. Ultimate soil strength design parameters are presented on the attached Table 1. The values in this table can be used to evaluate the lateral capacity of the soil supporting this foundation. Based on the TIA Standard (TIA-222-G), dated August 2005, the recommended design frost penetration depth to be used for Pulaski County, KY is 30-inches (2.5 ft).

FDH was not provided with the required foundation capacities at the time of this report. For self-support towers, we anticipate the planned tower foundation will be subjected to relatively high axial loads. Based on our past experience with similar projects and subsurface conditions, we recommend that Drilled Shaft (Caisson) and Pad & Pier type foundation be used as the tower foundation. For these foundations, general soil strength design recommendations are given in this report that can be used by the Engineer of Record to determine the foundation sizes once the required foundation capacities are known.

Drilled Shaft (Caisson) Foundation

Should caisson foundations be used, we recommend the caissons be reinforced with steel to resist and transfer lateral and axial loads. The caissons will achieve compressive (downward) and uplift (vertical) resistance through skin friction along the side of the shafts. In addition to skin friction, additional compressive capacity can be gained from the bearing resistance at the caissons' tip. For uplift, the weight of the concrete in the shafts can be added to their skin friction resistance. For these cases, we recommend the following values be used:

- **Ultimate Compressive SKIN FRICTION vs. DEPTH** = shown in Figure 2. This figure display ultimate values and an appropriate factor of safety should be used.
- **Ultimate Uplift SKIN FRICTION vs. DEPTH** = shown in Figure 3. This figure display ultimate values and an appropriate factor of safety should be used.
- **Net Ultimate Bearing Capacity vs. DEPTH** = shown in Figure 4. This figure display ultimate values and an appropriate factor of safety should be used.

Based on the subsurface soil conditions, excavation for the caisson should be possible using a large, truck-mounted, hydraulic-advanced drill rig. All debris, loose or disturbed soil should be removed from the excavation prior to placing reinforced steel and/or concrete. Reinforcing steel and/or concrete should be placed immediately upon completion of the excavation.



Drilling fluid or casing could be used to assist in keeping the drilled hole open. If casing is used, we recommend it be removed from the excavation as concrete is being placed. Continuous vibration or other approved methods should be used during casing withdrawal to reduce the potential for void-space formation within the concrete. If water is present during concrete placement and/or drilling fluids are used to maintain hole stability, concrete should be pumped or otherwise discharged to the bottom of the hole via a hose or tremie pipe. The end of the hose or tremie pipe must remain below the top surface of any water, drilling fluid and the in-place concrete at all times. Additionally, concrete should be consolidated using vibration methods over the entire length and width of the caisson and the consolidation should be performed only after these fluids are removed and to the extent possible.

Pad & Pier Foundation

Should three (3) pad & pier foundations be used, we recommend the pad & pier be reinforced with steel to resist and transfer lateral and axial loads, as well as prevent cracking and shrinkage due to temperature and moisture variations. Based on the subgrade conditions and frost penetration depth of the project site, we recommend the bottom of the pad foundation bears at a depth deeper than 2.5 ft. The tower's foundation capacity can be determined using the soil's bearing capacity, passive pressure resistance, and a sliding friction factor. For these calculations we recommend the following:

- **Net Ultimate Bearing Capacity for PAD & PIER Foundation:**

Pad Dimensions (ft)	Pad Bearing Depth (ft)	Net Ultimate Bearing Capacity (psf)	Sliding Friction Factor
4.0 × 4.0	3.0	30,000	0.40
	4.0		
	5.0		
6.0 × 6.0	3.0	30,000	0.40
	4.0		
	5.0		
8.0 × 8.0	3.0	30,000	0.40
	4.0		
	5.0		

These values are ultimate values and an appropriate factor of safety should be used.

- **Ultimate Passive Pressure vs. Depth:** Shown in Figure 5. This figure contains ultimate values and an appropriate factor of safety should be used. These values have been reduced for frost penetration to a depth of 2.5 ft.

The pad should bear on natural soils or on controlled structural fill placed on acceptable natural soils. The site should be stripped to suitable depths to remove any existing grass, bushes, top soil and miscellaneous fill material. Select fill used to elevate the grade and backfill the excavation should consist of clean soils without deleterious inclusions and with maximum 3.0-inch particle size. On-site soils identified as sandy lean clay are acceptable for use as structural fill if the soils are maintained normally at optimum moisture content. Some of these soils may require aeration and drying prior to re-use as structural fill. The select



fill material should be placed in maximum of 8.0 inches loose lifts and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D-698. The moisture content should be within -2 to +2 % of optimum moisture.

The pad & pier foundation should be protected from freezing if built during the winter or subject to freezing temperatures after construction. Groundwater was not encountered within the recommended bearing depth at the project site. However, positive drainage should be provided to prevent rainwater water collection in foundation excavations or on subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward a corner to facilitate removal of any collected rainwater or surface runoff.

Construction Inspection

We recommend that the foundation excavation and fill placement process be monitored by a geotechnical engineer or representative thereof. Geological material variances may occur at project site. Therefore, the soil excavations should be inspected under the supervision of a geotechnical engineer or representative thereof to confirm that the bearing soils are similar to those encountered in our field exploration and that the subgrade has been properly prepared. The geotechnical engineer should be immediately notified should any subsoil conditions be uncovered that will alter the conclusions and recommendations contained in this report. Further investigation and supplemental recommendations may be required if such a condition is encountered.

Samples of the subgrade soil and structural fill material should be obtained prior to compaction operations for laboratory moisture/density testing (Proctor Tests). The tests will then provide a basis for evaluating the in-place density requirements during compaction operations. A qualified soil technician should perform sufficient in-place density tests during the filling operations to verify that proper levels of compaction are being attained.

Prior to placement of concrete, the foundation excavation should be inspected to verify that the excavation is to the proper depth and reinforcing steel is placed as recommended. Concrete cylinders should be made for 7-day and 28-day breaks and the concrete compressive strength should reach the required strengths after curing for designated days.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.



Table 1
ULTIMATE SOIL STRENGTH PARAMETERS

Ingle
Site ID: 141960-A

Boring #	Depth (ft)	Unified Soil Classification	Moist Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
B-1	0.0 – 1.5	CL	115	0	2000
	1.5 – 3.0	PWR	135	45	0



FIGURE 1: Site Plan – 1867 New Hope Road - New Hope, KY 42544

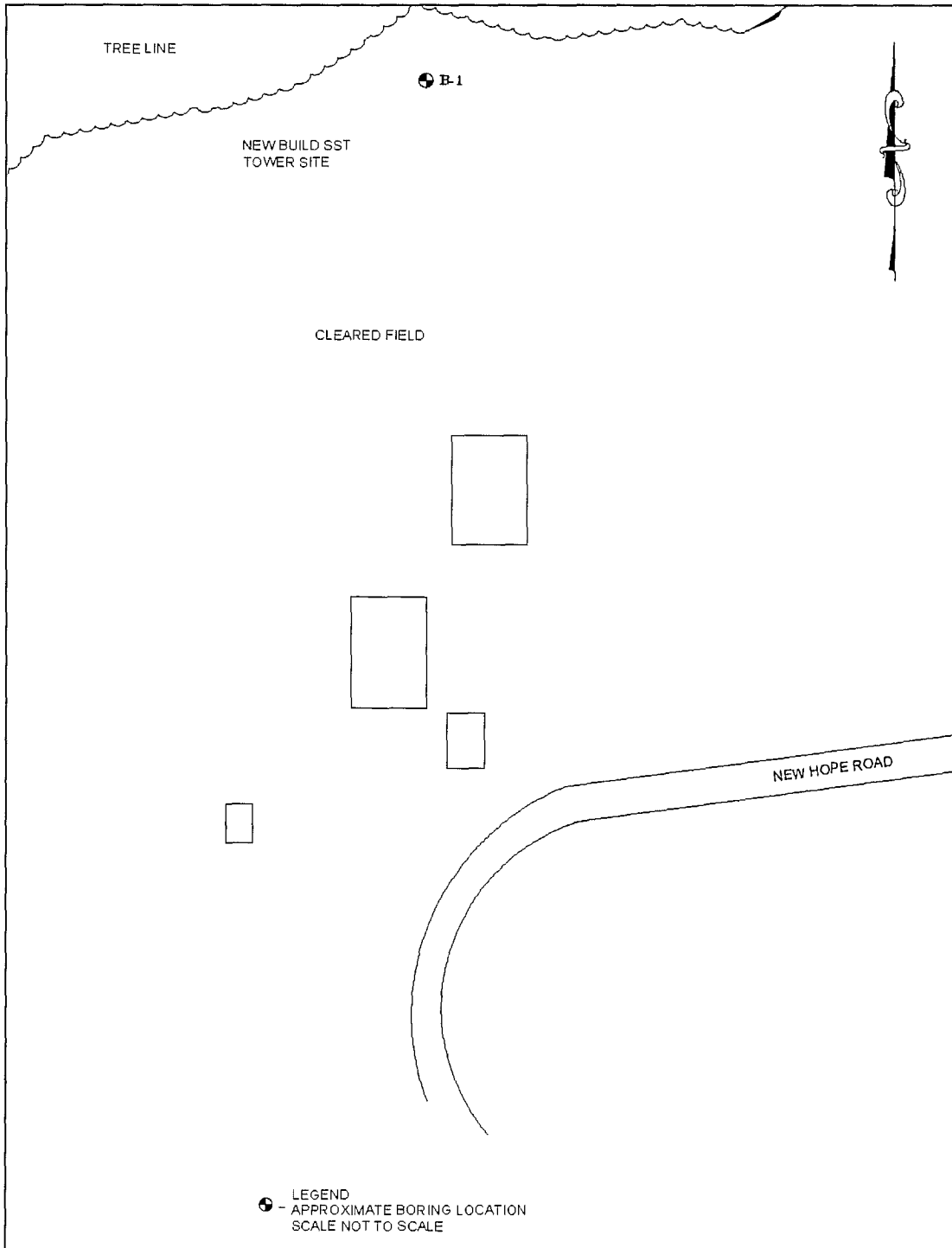




FIGURE 2: Ultimate Skin Friction vs. Depth
Soil Boring B-1, 3.0 ft to 5.0 ft Diameter Caissons

Ignore the top 4.0 ft for skin friction
An appropriate factor of safety should be used with this figure

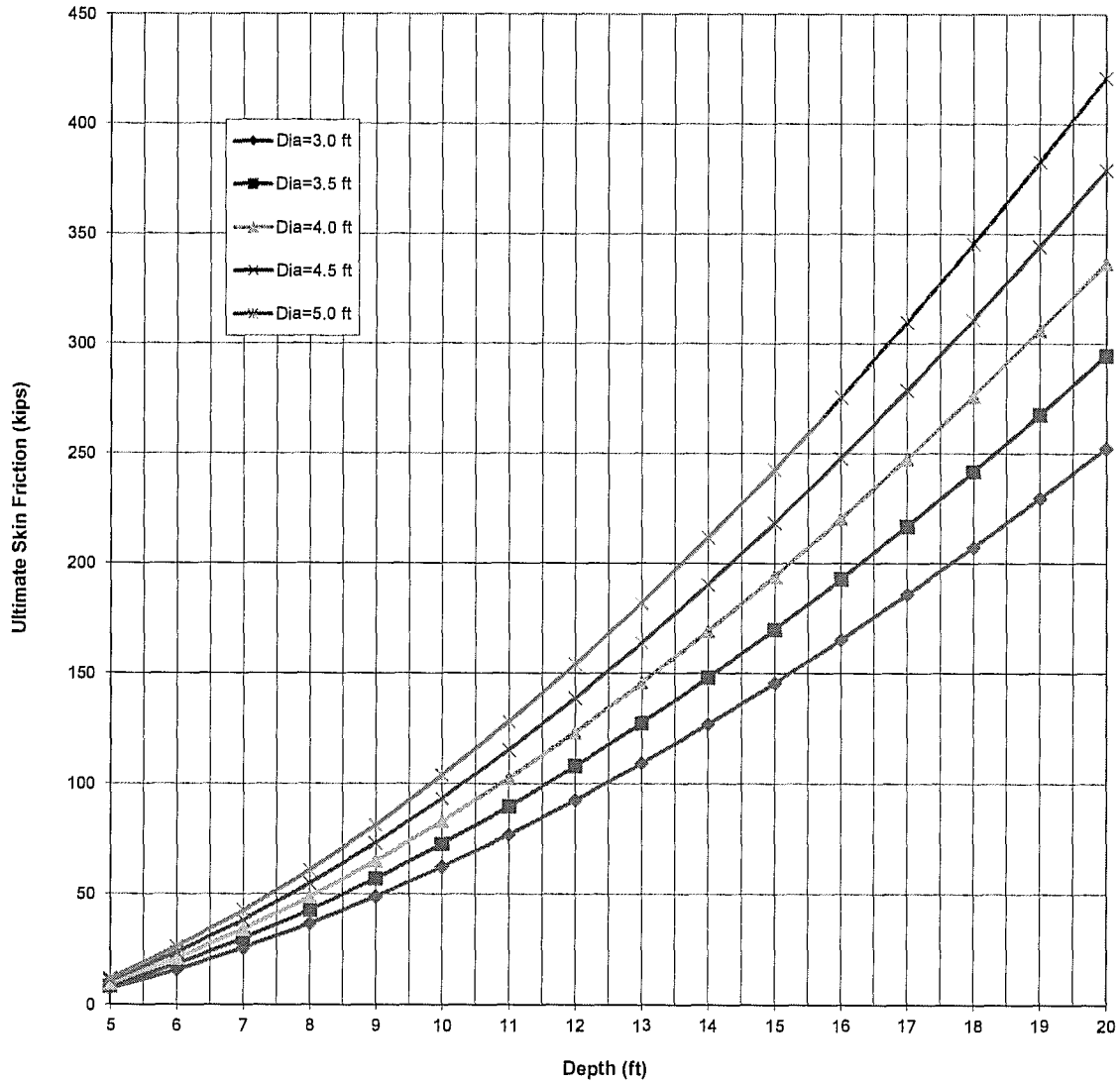
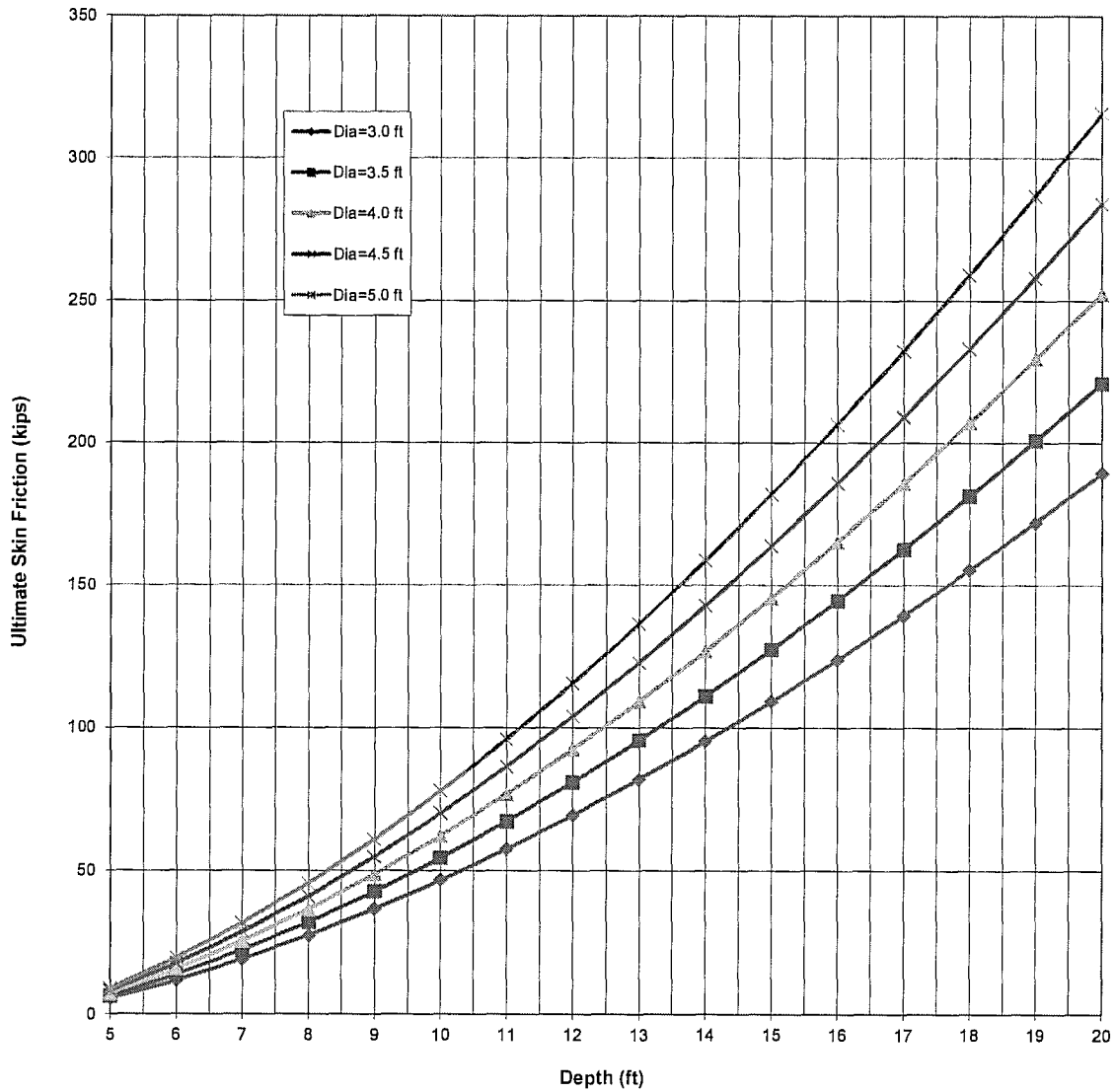




FIGURE 3: Ultimate Uplift Skin Friction vs. Depth
Soil Boring B-1, 3.0 ft to 5.0 ft Diameter Caissons

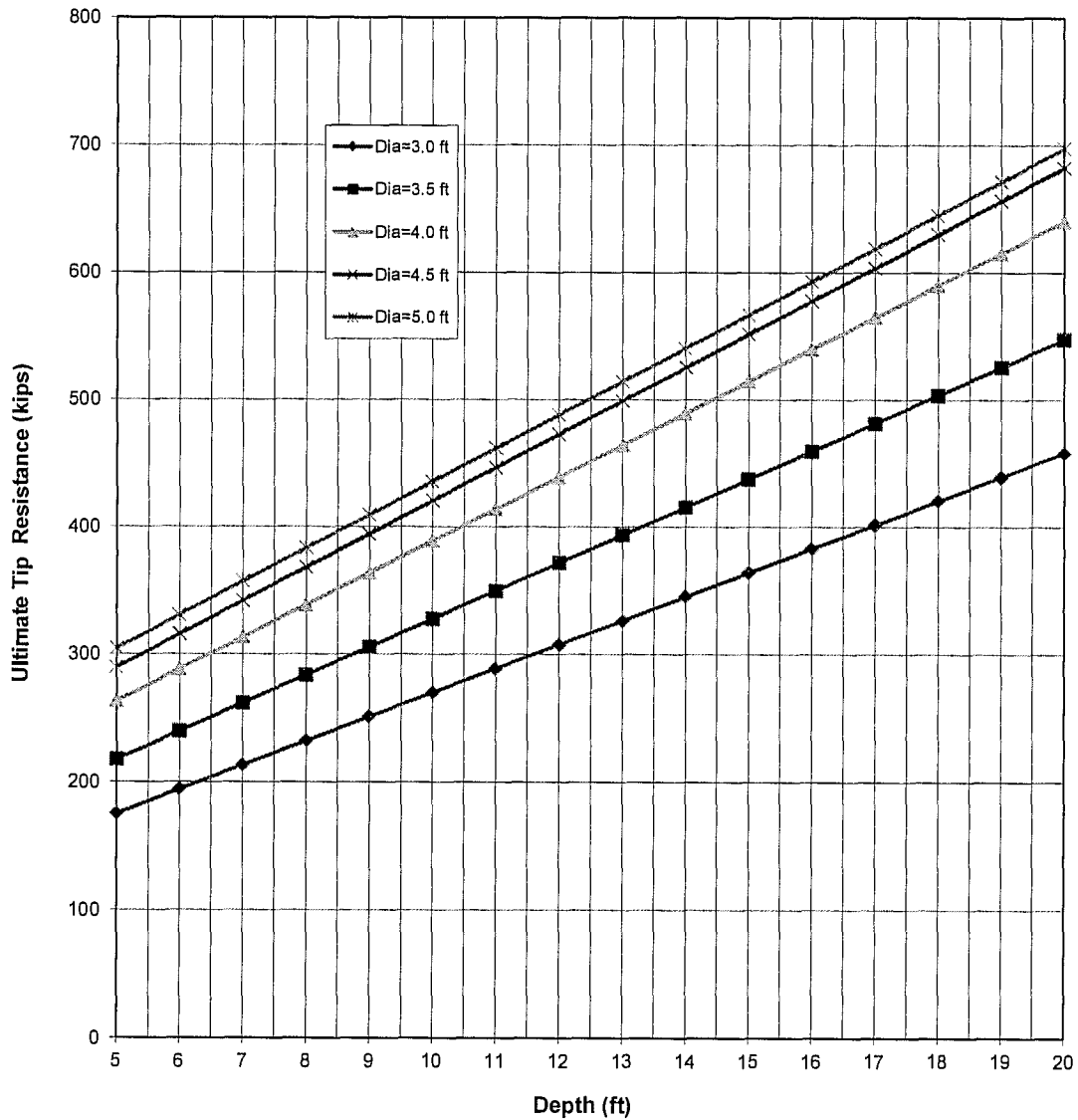
Ignore the top 4.0 ft for skin friction
An appropriate factor of safety should be used with this figure





**FIGURE 4: Ultimate Tip Resistance vs. Depth
Soil Boring B-1, 3.0 ft to 5.0 ft Diameter Caissons**

An appropriate factor of safety should be used with this figure





**FIGURE 5: Ultimate Passive Resistance vs. Depth
Soil Boring B-1**

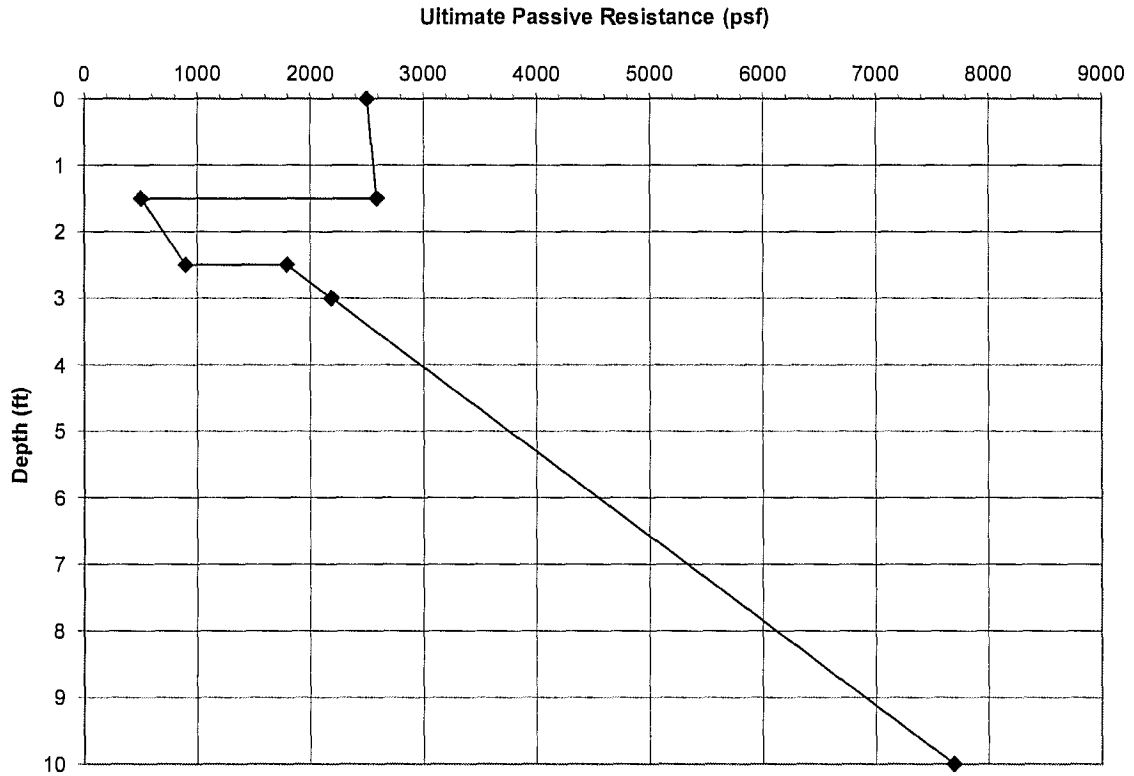




EXHIBIT I
DIRECTIONS TO WCF SITE

Driving Directions to Proposed Tower Site:

1. Beginning at the Pulaski County seat located at 100 N. Main St., Somerset, KY 42501
2. Head northeast on KY-1247 toward S. Vine St. for 1.0 miles
3. Turn left onto KY-80 W for 3.1 miles
4. Turn right onto KY-914 W/Southeastern Bypass for 0.4 miles
5. Turn slight left to take the ramp toward Bowling Green/Cumberland Parkway for 0.6 miles
6. Merge onto Louie B. Nunn Cumberland Parkway for 7.7 miles
7. Take the KY-80 Exit (78) toward Nancy for 0.4 miles
8. Turn right onto KY-80 W for 1.0 miles
9. Turn left onto New Hope Road
10. Destination is on N side of New Hope Road (see map below)
11. site coordinates are
 - a. 37 deg 06 min 13.87 sec N
 - b. 84 deg 50 min 17.67 sec W



Prepared by:
Robert W. Grant
Pike Legal Group PLLC
1578 Highway 44 East, Suite 6
PO Box 369
Shepherdsville, KY 40165-0369
Telephone: 502-955-4400 or 800-516-4293



EXHIBIT J
COPY OF REAL ESTATE AGREEMENT

357554

MEMORANDUM OF LEASE

Prepared by: Jeff Wolford
EMHC Corporation
1700 Sherwin Avenue
Des Plaines, IL 60018

2

Return to:
12555 Cingular Way, Suite 1300
Alpharetta, GA 30004

Re: Cell Site #KYALU5160; Cell Site Name: Ingle
Fixed Asset #10589938
State: Kentucky
County: Pulaski

2013 NOV 13 AM 10:11
RALPH TROYTELL
PULASKI COUNTY CLERK

MEMORANDUM
OF
LEASE

This Memorandum of Lease is entered into on this 1st day of August, 2013, by and between Larry R. Lyons and Glenda K. Lyons, having a mailing address of 1867 New Hope Road, Nancy, KY 42544 (hereinafter referred to as "Landlord") and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 12555 Cingular Way, Suite 1300, Alpharetta, GA 30004 (hereinafter referred to as "Tenant").

1. Landlord and Tenant entered into a certain Option and Lease Agreement ("Agreement") on the 1st day of August, 2013, for the purpose of installing, operating and maintaining a communications facility and other improvements. All of the foregoing is set forth in the Agreement.
2. The initial lease term will be five (5) years commencing on the effective date of written notification by Tenant to Landlord of Tenant's exercise of its option, with four (4) successive five (5) year options to renew.
3. The portion of the land being leased to Tenant and associated easements are described in Exhibit 1 annexed hereto.
4. This Memorandum of Lease is not intended to amend or modify, and shall not be deemed or construed as amending or modifying, any of the terms, conditions or provisions of the Agreement, all of which are hereby ratified and affirmed. In the event of a conflict between the provisions of this Memorandum of Lease and the provisions of the Agreement, the provisions of the Agreement shall control. The Agreement shall be binding upon and inure to the benefit of the parties and their respective heirs, successors, and assigns, subject to the provisions of the Agreement.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Lease as of the day and year first above written.

"LANDLORD"

Larry R. Lyons and Glenda K. Lyons

By: Larry Lyons

Print Name: Larry R. Lyons

Its: OWNER

Date: 6-3-13

By: Glenda Lyons

Print Name: Glenda K. Lyons

Its: Owner

Date: 6-3-13

"TENANT"

New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation

Its: Manager

By: Daniel Toth

Print Name: Daniel Toth

Its: Manager Real Estate and Construction

Date: 8/1/13

[ACKNOWLEDGMENTS APPEAR ON THE NEXT PAGE]

TENANT ACKNOWLEDGMENT

STATE OF TENNESSEE)

) ss:

COUNTY OF WILLIAMSON)

On the 1st day of August, 2013, before me personally appeared Daniel Toth, and acknowledged under oath that he is the Manager Real Estate and Construction of AT&T Mobility Corporation, the Manager of New Cingular Wireless PCS, LLC, the Tenant named in the attached instrument, and ~~that he~~ was authorized to execute this instrument on behalf of the Tenant.



Erin Woodard
Notary Public: Erin Woodard
My Commission Expires: May 4, 2015

LANDLORD ACKNOWLEDGMENT

STATE OF KENTUCKY)

) ss:

COUNTY OF Pulaski)

On the 3rd day of June, 2013 before me, personally appeared Larry R. Lyons, who acknowledged under oath, that he is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act, and deed of Landlord for the purposes therein contained.

Andrea K. Ebell
Notary Public: Andrea K. Ebell
My Commission Expires: July 16, 2016

LANDLORD ACKNOWLEDGMENT

STATE OF KENTUCKY)

) ss:

COUNTY OF Pulaski)

On the 3rd day of June, 2013 before me, personally appeared Glenda K. Lyons, who acknowledged under oath, that she is the person/officer named in the within instrument, and that he/she executed the same in his/her stated capacity as the voluntary act and deed of Landlord for the purposes therein contained.

Andrea K. Ebell
Notary Public: Andrea K. Ebell
My Commission Expires: July 16, 2016

EXHIBIT 1

DESCRIPTION OF PREMISES

Page 1 of 3

to the Memorandum of Lease dated August 1, 2013, by and between Larry R. Lyons and Glenda K. Lyons, as Landlord, and New Cingular Wireless PCS, LLC, a Delaware limited liability company, as Tenant.

The Property is legally described as follows:

BOOK 0503 PAGE 343

BEGINNING at a rock in County Road being an old property corner; thence leaving County Road with old fence line of Winifred Compton, N 07 deg. 00' 09" E 622.73 feet to a post; thence still with Compton's line fence N 64 deg. 22' 02" E 785.90 feet to a rock; thence still with Compton's line fence N 15 deg. 56' 09" W 569.44 feet to a rock; thence still with Compton's line fence N 72 deg. 06' 28" E 400.48 feet to a post; thence still with Compton's line fence S 86 deg. 39' 32" E 172.04 feet to a post; thence still with Compton's line N 62 deg. 02' 15" E 345.56 feet; thence still with Compton's line N 52 deg. 23' 18" E 250.50 feet to 3 sycamores on South side of Wolf Creek; thence leaving Compton's line with South side of Wolf Creek as follows: N 24 deg. 39' 52" W 117.27 feet; thence N 52 deg. 51' 40" W 200.27 feet; thence N 55 deg. 51' 26" W 173.21 feet; thence N 75 deg. 20' 31" W 224.08 feet; thence N 86 deg. 20' 28" W 93.98 feet; thence S 87 deg. 39' 16" W 199.86 feet; thence S 40 deg. 52' 38" W 99.03 feet; thence S 43 deg. 09' 31" W 307.30 feet; thence S 89 deg. 09' 27" W 439.81 feet to a 17" sycamore, and being a corner of Ertis Roy; thence leaving Wolf Creek with Ertis Roy's line S 25 deg. 02' 49" W 398.94 feet to a 20" Black Oak on top of bluff; thence with meanders of the bluff and Ertis Roy's line S 68 deg. 08' 18" N 299.59 feet; thence S 68 deg. 08' 06" W 117.90 feet; thence S 54 deg. 36' 58" W 99.91 feet; thence S 41 deg. 05' 14" W 229.46 feet; thence S 57 deg. 37' 18" W 299.46 feet; thence S 36' 49' 38" W 99.76 feet; thence S 40 deg. 50' 12" W 99.77 feet; thence S 05 deg. 59' 41" W 146.59 feet to the West side of an old hard road; thence with West side of old road S 13 deg. 48' 32" E 223.42 feet to a 20" White Oak; thence leaving old road S 51 deg. 52' 44" N 157.74 feet to a Pine stump; thence S 36 deg. 36' 45" E 100.8 feet to a 100' E to a 10" Maple at old fence corner; thence with old fence S 48 deg. 53' 00" E 514.21 feet to a post; thence S 58 deg. 23' 45" E 857.54 feet to a post; thence S 75 deg. 39' 30" E 112.95 feet to a post on West side of County Road; thence leaving Ertis Roy's line with County Road N 03 deg. 30' 44" E 14.12 feet; thence N 18 deg. 35' 46" W 324.41 feet to the point of Beginning. Containing 69.2910 acres, more or less.

Being the same property conveyed to First Parties, Lewis N. Johnson, et al, by Deed of Conveyance from Ricky Wayne Bray, et al, dated June 11, 1982, of record in Deed Book #16, Page 477, Pulaski County Court, Clark's Office, Kentucky.

BOOK 0055 PAGE 012

The Premises are described and/or depicted as follows:

See Attached Sheet, Next Page.



**EXHIBIT K
NOTIFICATION LISTING**

Ingle Landowner Notice Listing

Larry & Glenda Kay Lyons
1867 New Hope Rd.
Nancy, KY 42544-9453

Pamela Tucker
PO Box 87
Nancy, KY 42544-0087

William K. & Saadia Sue Daniels
1062 Coffey Rd.
Nancy, KY 42544

Kristine Butto-Brownlee
9436 Whitall Ln.
Grosse Ile, MI 48138

Linda M. Seber &
Dorothey F. Morgan
544 W. Farm Rd.
Nancy, KY 42544

John R. Dierolf
1044 Bainbridge Dr.
Naperville, IL 60563

Eugene Rogers
308 Ash St.
Somerset, KY 42503

Roy Ertis Family Irrevocable Trust
3889 S. Highway 837
Ingle, KY 42544

Norman Halcomb
4919 S. Highway 837
Nancy, KY 42544

William K. & Saadia Sue Daniels
1964 New Hope Road
Nancy, KY 42544

Roy Ertis Family Irrevocable Trust
3889 S. Highway 837
Nancy, KY 42544



EXHIBIT L
COPY OF PROPERTY OWNER NOTIFICATION



1578 Highway 44 East, Suite 6
P.O. Box 369
Shepherdsville, KY 40165-0369
Phone (502) 955-4400 or (800) 516-4293
Fax (502) 543-4410 or (800) 541-4410

**Notice of Proposed Construction of
Wireless Communications Facility
Site Name: Ingle**

Dear Landowner:

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility has filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 1867 New Hope Raod, Nancy, KY 42320 (37°06'13.87" North latitude, 84°50'17.67" West longitude). The proposed facility will include a 250-foot tall antenna tower, plus a 15-foot lightning arrester and related ground facilities. This facility is needed to provide improved coverage for wireless communications in the area.

This notice is being sent to you because the Pulaski County Property Valuation Administrator's records indicate that you may own property that is within a 500' radius of the proposed tower site or contiguous to the property on which the tower is to be constructed. You have a right to submit testimony to the Kentucky Public Service Commission ("PSC"), either in writing or to request intervention in the PSC's proceedings on the application. You may contact the PSC for additional information concerning this matter at: Kentucky Public Service Commission, Executive Director, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602. Please refer to docket number 2013-00397 in any correspondence sent in connection with this matter.

We have attached a map showing the site location for the proposed tower. AT&T Mobility's radio frequency engineers assisted in selecting the proposed site for the facility, and they have determined it is the proper location and elevation needed to provide quality service to wireless customers in the area. Please feel free to contact us toll free at (800) 516-4293 if you have any comments or questions about this proposal.

Sincerely,
David A. Pike
Attorney for AT&T Mobility

enclosure



EXHIBIT M
COPY OF COUNTY JUDGE/EXECUTIVE NOTICE



1578 Highway 44 East, Suite 6
P.O. Box 369
Shepherdsville, KY 40165-0369
Phone (502) 955-4400 or (800) 516-4293
Fax (502) 543-4410 or (800) 541-4410

VIA CERTIFIED MAIL

Hon. Barty Bullock
Pulaski County Judge Executive
Pulaski County Courthouse
100 North Main Street
Somerset, KY 42502

RE: Notice of Proposal to Construct Wireless Communications Facility
Kentucky Public Service Commission Docket No. 2013-00397
Site Name: Ingle

Dear Judge Bullock:

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility has filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 1867 New Hope Road, Nancy, KY 42544 (37°06'13.87" North latitude, 84°50'17.67" West longitude). The proposed facility will include a 250-foot tall antenna tower, plus a 15-foot lightning arrester and related ground facilities. This facility is needed to provide improved coverage for wireless communications in the area.

You have a right to submit comments to the PSC or to request intervention in the PSC's proceedings on the application. You may contact the PSC at: Executive Director, Public Service Commission, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602. Please refer to docket number 2013-00397 in any correspondence sent in connection with this matter.

We have attached a map showing the site location for the proposed tower. AT&T Mobility's radio frequency engineers assisted in selecting the proposed site for the facility, and they have determined it is the proper location and elevation needed to provide quality service to wireless customers in the area. Please feel free to contact us with any comments or questions you may have.

Sincerely,

David A. Pike
Attorney for AT&T Mobility
enclosure



EXHIBIT N
COPY OF POSTED NOTICES

SITE NAME: INGLE
NOTICE SIGNS

The signs are at least (2) feet by four (4) feet in size, of durable material, with the text printed in black letters at least one (1) inch in height against a white background, except for the word "**tower**," which is at least four (4) inches in height.

New Cingular Wireless PCS, LLC d/b/a AT&T Mobility proposes to construct a telecommunications **tower** on this site. If you have questions, please contact Pike Legal Group, PLLC, P.O. Box 369, Shepherdsville, KY 40165 (800) 516-4293, or the Executive Director, Public Service Commission, 211 Sower Boulevard, PO Box 615, Frankfort, Kentucky 40602. Please refer to docket number Case No. 2013-00397 in your correspondence.

New Cingular Wireless PCS, LLC d/b/a AT&T Mobility proposes to construct a telecommunications **tower** near this site. If you have questions, please contact Pike Legal Group, PLLC, P.O. Box 369, Shepherdsville, KY 40165 (800) 516-4293, or the Executive Director, Public Service Commission, 211 Sower Boulevard, PO Box 615, Frankfort, Kentucky 40602. Please refer to docket number Case No. 2013-00397 in your correspondence.



1578 Highway 44 East, Suite 6
P.O. Box 369
Shepherdsville, KY 40165-0369
Phone (502) 955-4400 or (800) 516-4293
Fax (502) 543-4410 or (800) 541-4410

VIA TELEFAX: 606-451-4905

Commonwealth Journal
Attn: Debra Gossett
Classified Advertising Director
110-112 East Mt. Vernon Street
Somerset, KY 42501

RE: Legal Notice Advertisement
Site Name: Ingle

Dear Ms. Gossett:

Please publish the following legal notice advertisement in the next edition of *The Commonwealth Journal*:

NOTICE

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility has filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 1867 New Hope Road, Nancy, KY 42320 (37°06'13.87" North latitude, 84°50'17.67" West longitude). You may contact the PSC for additional information concerning this matter at: Kentucky Public Service Commission, Executive Director, 211 Sower Boulevard, P.O. Box 615, Frankfort, Kentucky 40602. Please refer to docket number 2013-00397 in any correspondence sent in connection with this matter.

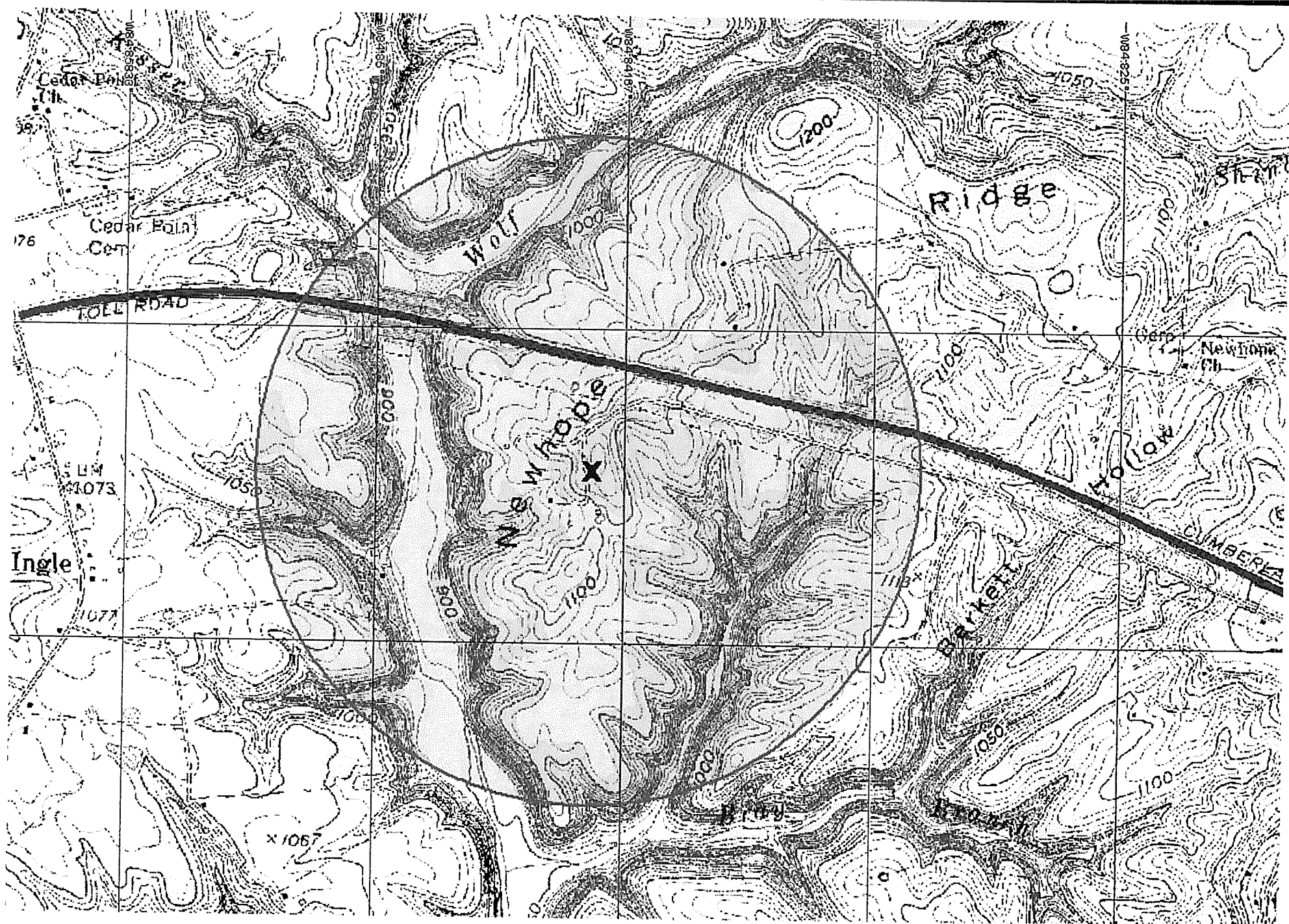
After this advertisement have been published, please forward a tearsheet copy, affidavit of publication, and invoice to Pike Legal Group, PLLC, P. O. Box 369, Shepherdsville, KY 40165. Please call me at (800) 516-4293 if you have any questions. Thank you for your assistance.

Sincerely,

Robert W. Grant
Pike Legal Group, PLLC



EXHIBIT O
COPY OF RADIO FREQUENCY DESIGN SEARCH AREA



37.09623 -84.84276