

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION **RECEIVED**

NOV 22 2013

In the Matter of:

THE APPLICATION OF)
NEW CINGULAR WIRELESS PCS, LLC)
FOR ISSUANCE OF A CERTIFICATE OF PUBLIC) CASE NO.: 2013-00396
CONVENIENCE AND NECESSITY TO CONSTRUCT)
A WIRELESS COMMUNICATIONS FACILITY)
IN THE COMMONWEALTH OF KENTUCKY)
IN THE COUNTY OF PERRY)

PUBLIC SERVICE
COMMISSION

SITE NAME: COUCHTOWN

* * * * *

**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 1023 Snatch Creek Road, Busy, KY 41723 (37°16'01.83" North latitude, 83°15'58.95" 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 Betty J. Wooton pursuant to a Deed recorded at Deed Book 136, Page 159 in the office of the Perry 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. The Application for Determination of No Hazard to Air Navigation has been approved with the Federal Aviation Administration ("FAA") as described in **Exhibit F**.

12. A copy of the 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. An 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.

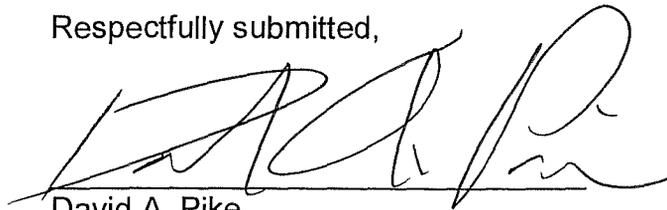
26. All responses and requests associated with this Application may be directed to:

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,

A handwritten signature in black ink, appearing to read 'D. A. Pike', written over a horizontal line.

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 - KNKN841 - NEW CINGULAR WIRELESS PCS, LLC

Call Sign	KNKN841	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA452 - Kentucky 10 - Powell	Channel Block	A
Submarket	0	Phase	2

Dates

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

Five Year Buildout Date

02/05/1997

Control Points

1 1650 Lyndon Farms Court, LOUISVILLE, KY
P: (502)329-4700

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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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		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
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Notification Dates

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

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

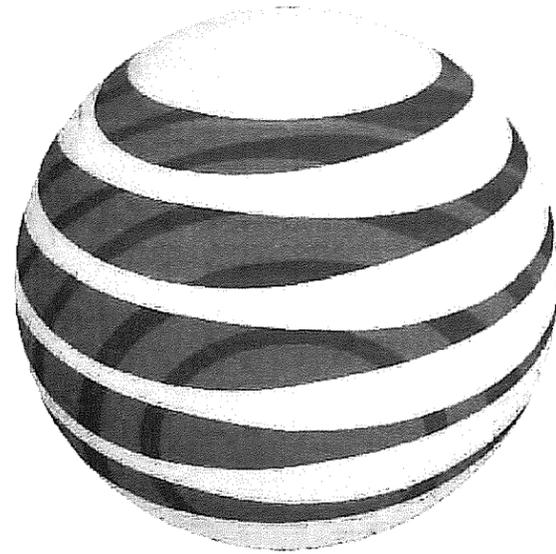
Ethnicity

Gender

EXHIBIT B

SITE DEVELOPMENT PLAN:

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



at&t

SITE NAME:

COUCHTOWN

SITE NUMBER

KYALU6155

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

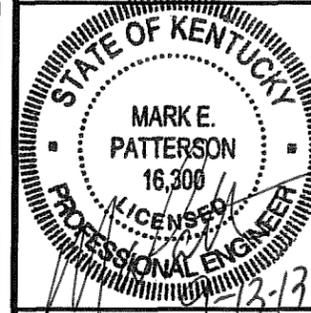
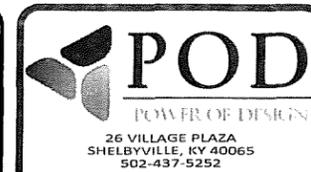


Know what's below.
Call before you dig.

SHEET INDEX	
T-1	TITLE SHEET
SURVEY:	
B-1	SITE SURVEY
B-2	500' RADIUS & ABUTTER'S MAP
CIVIL:	
C-1	OVERALL SITE LAYOUT
C-2	OVERALL SITE LAYOUT - CONT'D
C-3	ENLARGED COMPOUND LAYOUT
C-4	TOWER ELEVATION

CONTACT INFORMATION	
FIRE DEPARTMENT	AVAWAM VOLUNTEER FIRE DEPARTMENT PHONE: (606) 436-8859
POLICE DEPARTMENT	HAZARD POLICE DEPARTMENT PHONE: (606) 436-2222
ELECTRIC COMPANY	AEP PHONE: (614) 716-3162
TELEPHONE COMPANY	WINDSTREAM KENTUCKY EAST PHONE: (501) 748-7000

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.	



ZONING DRAWINGS

REV.	DATE	DESCRIPTION
1	08.28.13	500' RADIUS MAP

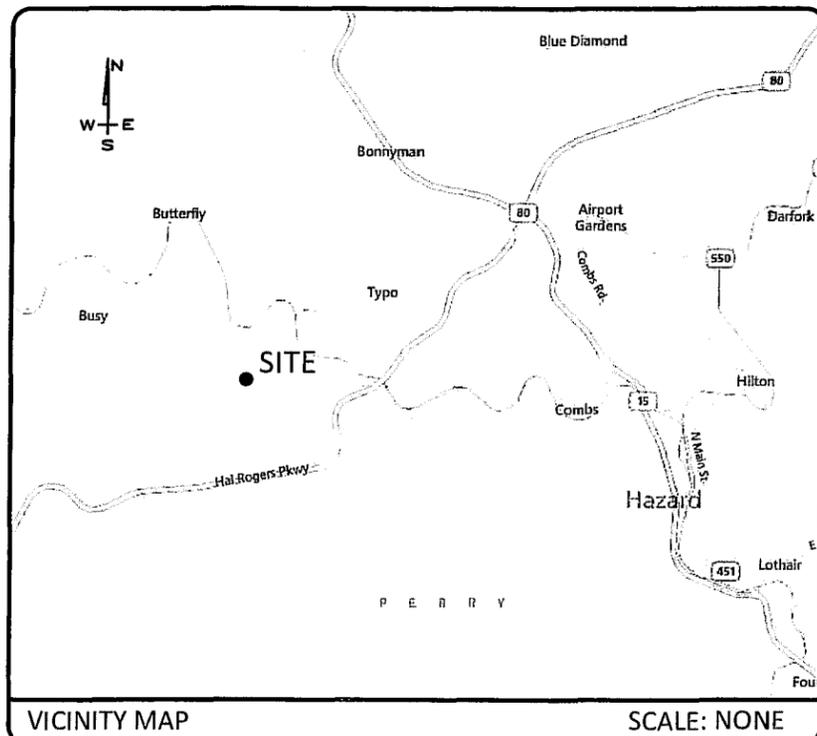
SITE INFORMATION:
COUCHTOWN
1023 SNATCH CREEK ROAD
BUSY, KY 41723

SITE NUMBER:
KYALU6155

POD NUMBER: 13-0729
DRAWN BY: CMD
CHECKED BY: MEP
DATE: 08.22.13

TITLE SHEET AND PROJECT INFORMATION

SHEET NUMBER:
T-1



DRIVE DIRECTIONS	
FROM THE PERRY COUNTY CLERKS OFFICE, 14B CHESTER ST, HAZARD, KY 41701:	
DEPART CHESTER ST TOWARD VERMILLION ST	195 FEET
TURN BACK ON KY-15 BRANCH / KY-451 / E MAIN ST	253 FEET
KEEP RIGHT ONTO KY-15 BRANCH / S KENTUCKY 15 BUSINESS	280 FEET
KEEP STRAIGHT ONTO KY-15 BRANCH / S KENTUCKY 15 BUSINESS	0.2 MILES
TURN RIGHT ONTO KY-15	2.5 MILES
TAKE RAMP RIGHT FOR KY-80 EAST / KY-550 TOWARD JOHN C. COMBS ARENA	0.1 MILES
TURN RIGHT ONTO KY-80 / KY-550 / COMBS RD	0.1 MILES
KEEP LEFT TO STAY ON KY-80 / KY-550	174 FEET
KEEP STRAIGHT ONTO KY-80	3.3 MILES
KEEP STRAIGHT ONTO KY-80 / KY-451	0.2 MILES
BEAR RIGHT ONTO KY-451	2.7 MILES
TURN RIGHT ONTO SNATCH CREEK RD	1.0 MILES
ARRIVE AT THE SITE, 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:	PERRY
SITE ADDRESS:	1023 SNATCH CREEK ROAD BUSY, KY 41723
APPLICANT:	AT&T 601 WEST CHESTNUT STREET LOUISVILLE, KY 40203
LATITUDE:	37° 16' 01.83"
LONGITUDE:	-83° 15' 58.95"

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

LEGAL DESCRIPTIONS

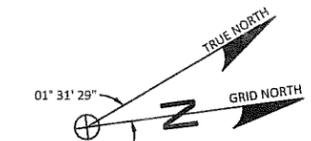
THE FOLLOWING IS A DESCRIPTION OF AN AREA TO BE LEASED FROM THE PROPERTY OF CLIFFORD WOOTON AND BETTY JEAN WOOTON, WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

PROPOSED LEASE AREA

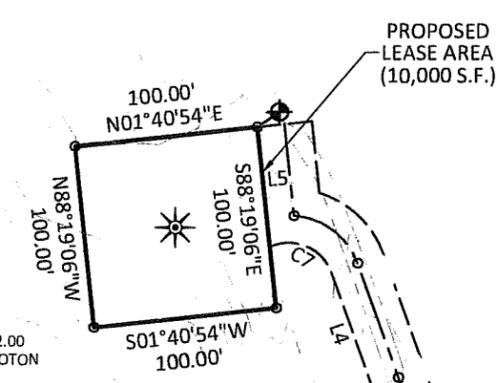
BEGINNING AT A SET PK NAIL AT THE INTERSECTION OF THE CENTERLINE OF SNATCH CREEK ROAD AND THE NORTH PROPERTY LINE OF THE PROPERTY CONVEYED TO CLIFFORD WOOTON AND BETTY JEAN WOOTON AS RECORDED IN DEED BOOK 136, PAGE 159 IN THE OFFICE OF THE CLERK OF PERRY COUNTY, KENTUCKY WITH THE KENTUCKY STATE PLANE COORDINATES OF N: 3631532.61 E:5643764.22; THENCE WITH THE CENTER OF SNATCH CREEK ROAD S18°24'44"E - 110.85' TO A SET PK NAIL; THENCE WITH SAID ROAD S31°14'26"E - 105.59' TO A SET PK NAIL; THENCE WITH AN EXISTING GRAVEL ROAD THE FOLLOWING CALLS: S52°25'16"E - 156.12' TO A SET 5/8" REBAR; S48°10'24"E - 182.04' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF S51°31'12"E - 35.61' TO A SET 5/8" REBAR; THENCE S54°52'00"E - 122.29' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 300.00' AND A CHORD OF S49°14'44"E - 57.79' TO A SET 5/8" REBAR; THENCE S43°37'28"E - 97.61' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 50.00' AND A CHORD OF S19°08'06"E - 41.45' TO A SET 5/8" REBAR; THENCE S05°21'16"W - 61.74' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 75.00' AND A CHORD OF S25°44'05"E - 52.24' TO A SET 5/8" REBAR; THENCE S46°06'54"W - 193.94' GRAVEL ROAD ENDS AND DIRT PATH BEGINS ALONG THIS CALL; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS 150' AND A CHORD OF S68°03'27"W - 112.10' TO A SET 5/8" REBAR; THENCE N90°00'00"W - 43.64' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF S84°03'55"W - 62.04' TO A SET 5/8" REBAR; THENCE S78°07'50"W - 66.89' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 40.00' AND A CHORD OF S45°05'26"W - 43.62' TO A SET 5/8" REBAR; THENCE S88°19'06" - 50.65' TO A SET 5/8" REBAR THENCE S°140'54"W - 15.00' TO A SET 5/8" REBAR AND THE TRUE POINT OF BEGINNING OF THE PROPOSED LEASE AREA; THENCE S 88°19'06" W - 100.00' TO A SET 5/8" REBAR; THENCE S 01°40'54" W - 100.00' TO A SET 5/8" REBAR, BEING N88°19'06"W - 100.00' TO A SET 5/8" REBAR; THENCE N 01°40'54" W - 100.00' TO THE TRUE POINT OF BEGINNING CONTAINING 10,000 SQ. FT. AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED AUGUST 6, 2013.

CENTERLINE PROPOSED 30' ACCESS & UTILITY EASEMENT

BEGINNING AT A SET PK NAIL AT THE INTERSECTION OF THE CENTERLINE OF SNATCH CREEK ROAD AND THE NORTH PROPERTY LINE OF THE PROPERTY CONVEYED TO CLIFFORD WOOTON AND BETTY JEAN WOOTON AS RECORDED IN DEED BOOK 136, PAGE 159 IN THE OFFICE OF THE CLERK OF PERRY COUNTY, KENTUCKY WITH THE KENTUCKY STATE PLANE COORDINATES OF N: 3631532.61 E:5643764.22; THENCE WITH THE CENTER OF SNATCH CREEK ROAD S18°24'44"E - 110.85' TO A SET PK NAIL; THENCE WITH SAID ROAD S31°14'26"E - 105.59' TO A SET PK NAIL; THENCE WITH AN EXISTING GRAVEL ROAD THE FOLLOWING CALLS: S52°25'16"E - 156.12' TO A SET 5/8" REBAR; S48°10'24"E - 182.04' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF S51°31'12"E - 35.61' TO A SET 5/8" REBAR; THENCE S54°52'00"E - 122.29' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 300.00' AND A CHORD OF S49°14'44"E - 57.79' TO A SET 5/8" REBAR; THENCE S43°37'28"E - 97.61' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 50.00' AND A CHORD OF S19°08'06"E - 41.45' TO A SET 5/8" REBAR; THENCE S05°21'16"W - 61.74' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 75.00' AND A CHORD OF S25°44'05"E - 52.24' TO A SET 5/8" REBAR; THENCE S46°06'54"W - 193.94' GRAVEL ROAD ENDS AND DIRT PATH BEGINS ALONG THIS CALL; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS 150' AND A CHORD OF S68°03'27"W - 112.10' TO A SET 5/8" REBAR; THENCE N90°00'00"W - 43.64' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF S84°03'55"W - 62.04' TO A SET 5/8" REBAR; THENCE S78°07'50"W - 66.89' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 40.00' AND A CHORD OF S45°05'26"W - 43.62' TO A SET 5/8" REBAR; THENCE S88°19'06" - 50.65' TO A SET 5/8" REBAR AND THE END OF SAID EASEMENT AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED AUGUST 6, 2013.



BASED ON KENTUCKY STATE PLANE SINGLE ZONE AND DETERMINED BY GPS OBSERVATIONS COMPLETED ON JULY 10, 2013

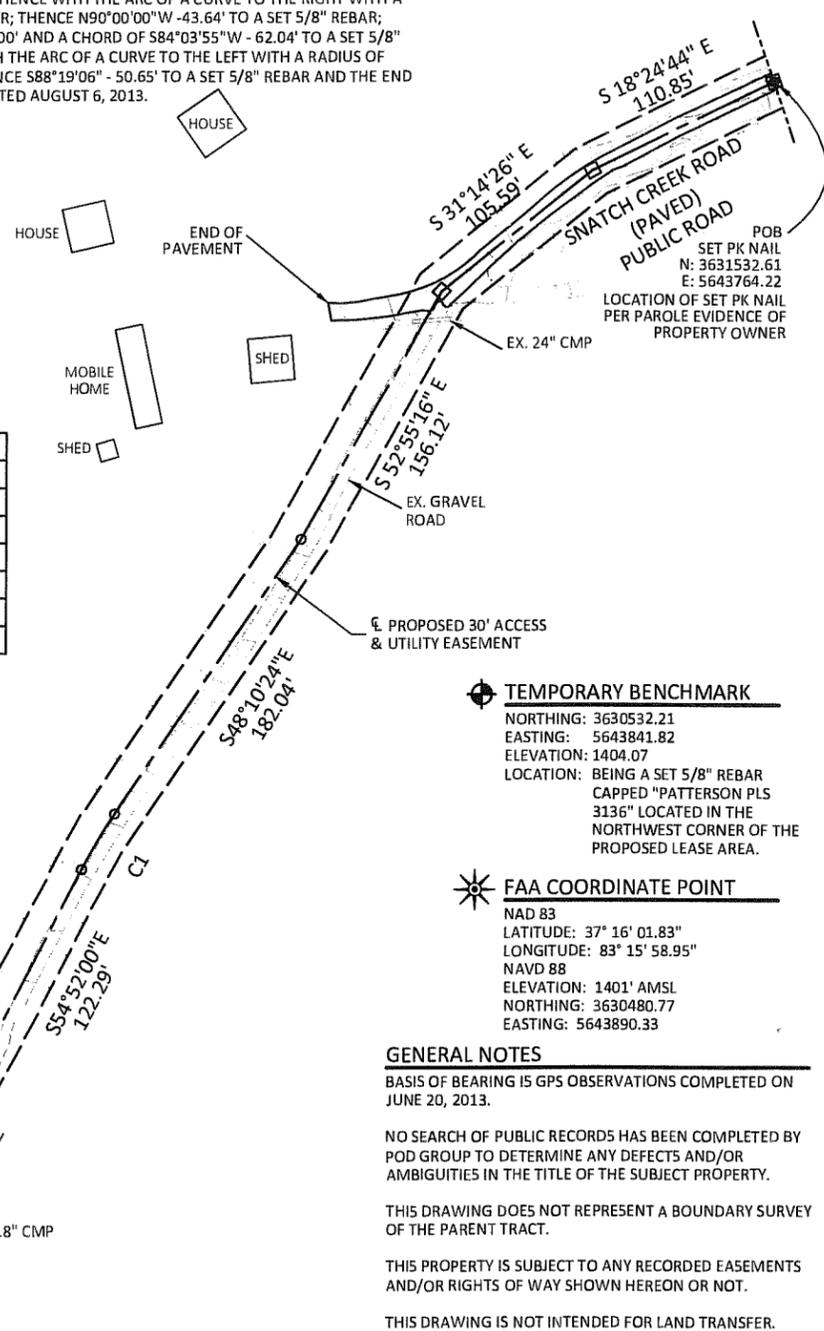


TAX MAP # 063-00 00 012.00
CLIFFORD AND BETTY J WOOTON
DB 136 PG 159

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	S51°31'12"E	35.61'	300.00'	35.63'
C2	S49°14'44"E	57.79'	300.00'	57.88'
C3	S19°08'06"E	41.45'	50.00'	42.74'
C4	S25°44'05"W	52.24'	75.00'	53.36'
C5	S68°03'27"W	112.10'	150.00'	114.89'
C6	S84°03'55"W	62.04'	300.00'	62.15'
C7	S45°05'26"W	43.62'	40.00'	46.13'

LINE	BEARING	DISTANCE
L1	S43°37'28"E	97.61'
L2	S05°21'16"W	61.74'
L3	N90°00'00"W	43.64'
L4	S78°07'50"W	66.89'
L5	S88°19'06"W	50.65'

TAX MAP # 063-00 00 012.00
CLIFFORD AND BETTY J WOOTON
DB 136 PG 159



TEMPORARY BENCHMARK
NORTHING: 3630532.21
EASTING: 5643841.82
ELEVATION: 1404.07
LOCATION: BEING A SET 5/8" REBAR CAPPED "PATTERSON PLS 3136" LOCATED IN THE NORTHWEST CORNER OF THE PROPOSED LEASE AREA.

FAA COORDINATE POINT
NAD 83
LATITUDE: 37° 16' 01.83"
LONGITUDE: 83° 15' 58.95"
NAVD 88
ELEVATION: 1401' AMSL
NORTHING: 3630480.77
EASTING: 5643890.33

GENERAL NOTES
BASIS OF BEARING IS GPS OBSERVATIONS COMPLETED ON JUNE 20, 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 18.750 AND IN EFFECT ON THE DATE OF THIS SURVEY.

Mark E. Patterson 9-13-13
MARK PATTERSON, LPLS #3136 DATE



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 2119C0175D, DATED AUGUST 2, 2006. THE PROPOSED LEASE AREA IS LOCATED IN ZONE X.

SITE INFORMATION

TAX PARCEL NUMBER: 063-00 00 012.00

PROPERTY OWNER: BETTY J WOOTON
1004 SNATCH CREEK ROAD
BUSY, KY 41723

SOURCE OF TITLE:
DB 136 PG 159

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
	EX. OVERHEAD ELECTRIC		EX. OVERHEAD ELECTRIC & TELEPHONE
	EX. UNDERGROUND TELEPHONE		EX. FENCE LINE
	EX. DITCH		SET PK NAIL
	SET 5/8" REBAR 18" LONG (UNLESS OTHERWISE NOTED)		FOUND MONUMENT AS NOTED

POD
POWER OF DESIGN
26 VILLAGE PLAZA
SHELBYVILLE, KY 40065
502-437-5252

fmhc
at&t

SURVEY

REV.	DATE	DESCRIPTION

SITE INFORMATION:

COUCHTOWN

1023 SNATCH CREEK ROAD
BUSY, KY 41723

SITE NUMBER:
KYALU6155

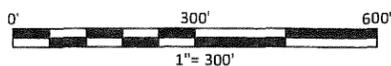
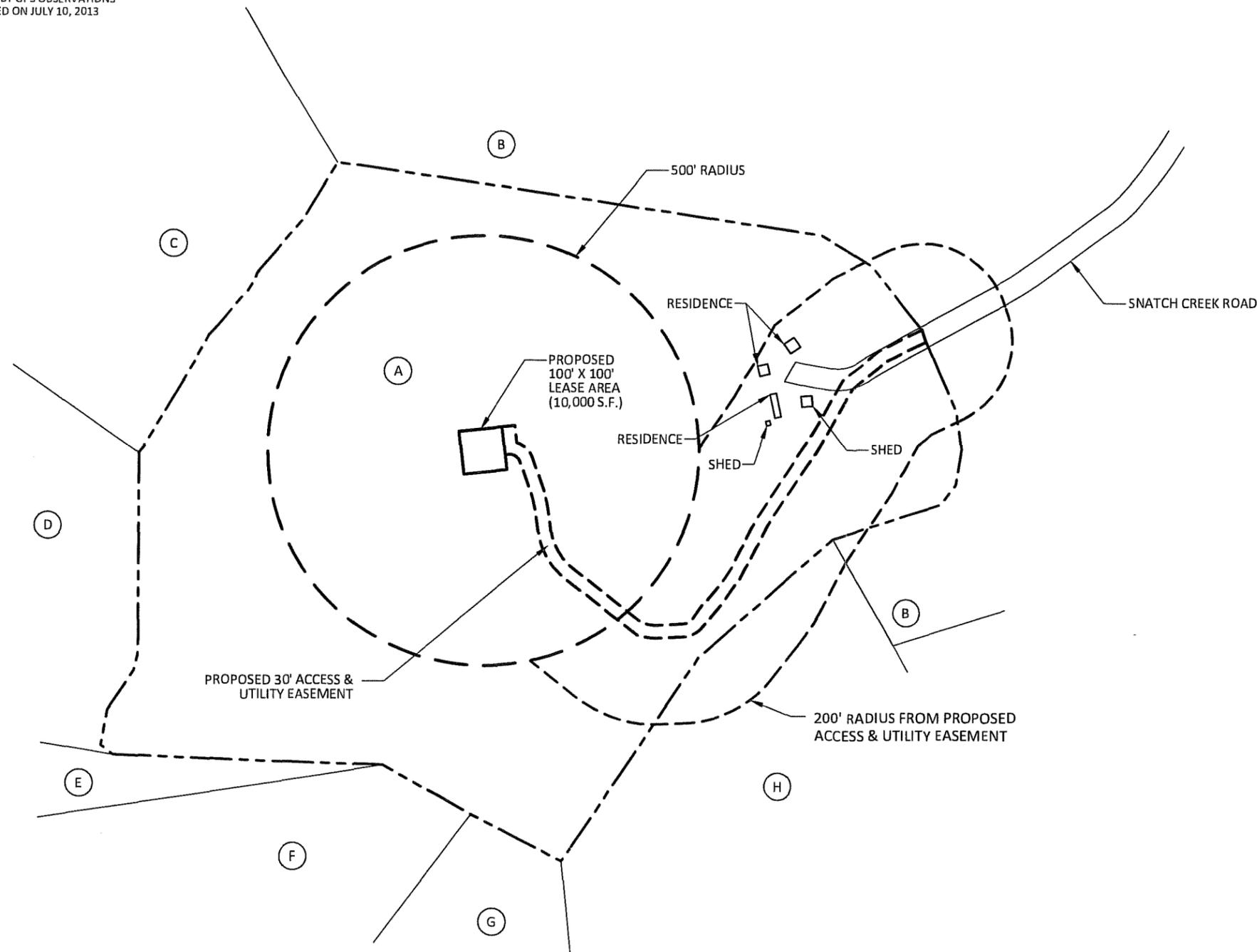
POD NUMBER: 13-0727

DRAWN BY: DSR
CHECKED BY: MEP
DATE: 07.23.13

SHEET TITLE:
SITE SURVEY

SHEET NUMBER:
B-1

01° 31' 29" TRUE NORTH
 GRID NORTH
 BASED ON KENTUCKY STATE
 PLANE SINGLE ZONE AND
 DETERMINED BY GPS OBSERVATIONS
 COMPLETED ON JULY 10, 2013



(A) PARCEL # 063-00_00_012.00
 CLIFFORD AND BETTY J WOOTON
 1004 SNATCH CREEK ROAD
 BUSY, KY 41723
 D.B. 166, PG. 727
 NO ZONING

(B) PARCEL # 063-00_00_009.00
 RON DEATON
 PO BOX 222
 CHAVIES, KY 41727
 D.B. 197, PG. 748
 NO ZONING

(C) PARCEL # 063-00_00_013.00
 JESSIE THOMAS
 6279 KY HWY 451
 HAZARD, KY 41701
 D.B. 278, PG. 372
 NO ZONING

(D) PARCEL # 063-00_00_017.00
 DOUGLAS CRAWFORD
 PO BOX 581
 HAZARD, KY 41701
 D.B. 229, PG. 280
 NO ZONING

(E) PARCEL # 063-00_00_026.00
 MARY FIELDS AND MARTHA GREER
 79 JESS FIELDS LANE
 HAZARD, KY 41701
 D.B. 177, PG. 101
 NO ZONING

(F) PARCEL # 063-00_00_027.00
 BOBBY JEAN HOWARD
 137 CAMPBELL LANE
 KRYPTON, KY 41754
 D.B. 146, PG. 435
 NO ZONING

(G) PARCEL # 063-00_00_028.00
 EUGENE FIELDS
 PO BOX 95
 HAZARD, KY 41702
 D.B. 245, PG. 510
 NO ZONING

(H) PARCEL # 063-00_00_029.00
 ODELL AND REBECCA COUCH
 109 FIELDS LANE
 BUSY, KY 41723
 D.B. 132, PG. 327
 NO ZONING

GENERAL NOTE:

1. ALL INFORMATION SHOWN HEREON WAS OBTAINED FROM THE RECORDS OF THE PERRY COUNTY KENTUCKY PROPERTY VALUATION ADMINISTRATION OFFICE ON 7.10.13, AND VERIFIED VIA ONLINE PVA RECORDS ON 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



SURVEY

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

SITE INFORMATION:

COUCHTOWN

1023 SNATCH CREEK ROAD
 BUSY, KY 41723

COUNTY: PERRY

SITE NUMBER:

KYALU6155

POD NUMBER: 13-0728

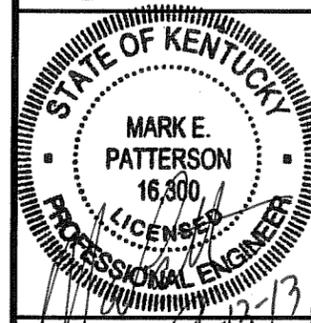
DRAWN BY: CSA
 CHECKED BY: MEP
 DATE: 08.21.13

SHEET TITLE:

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

SHEET NUMBER:

B-2



ZONING DRAWINGS

REV.	DATE	DESCRIPTION
1	08.28.13	500' RADIUS MAP

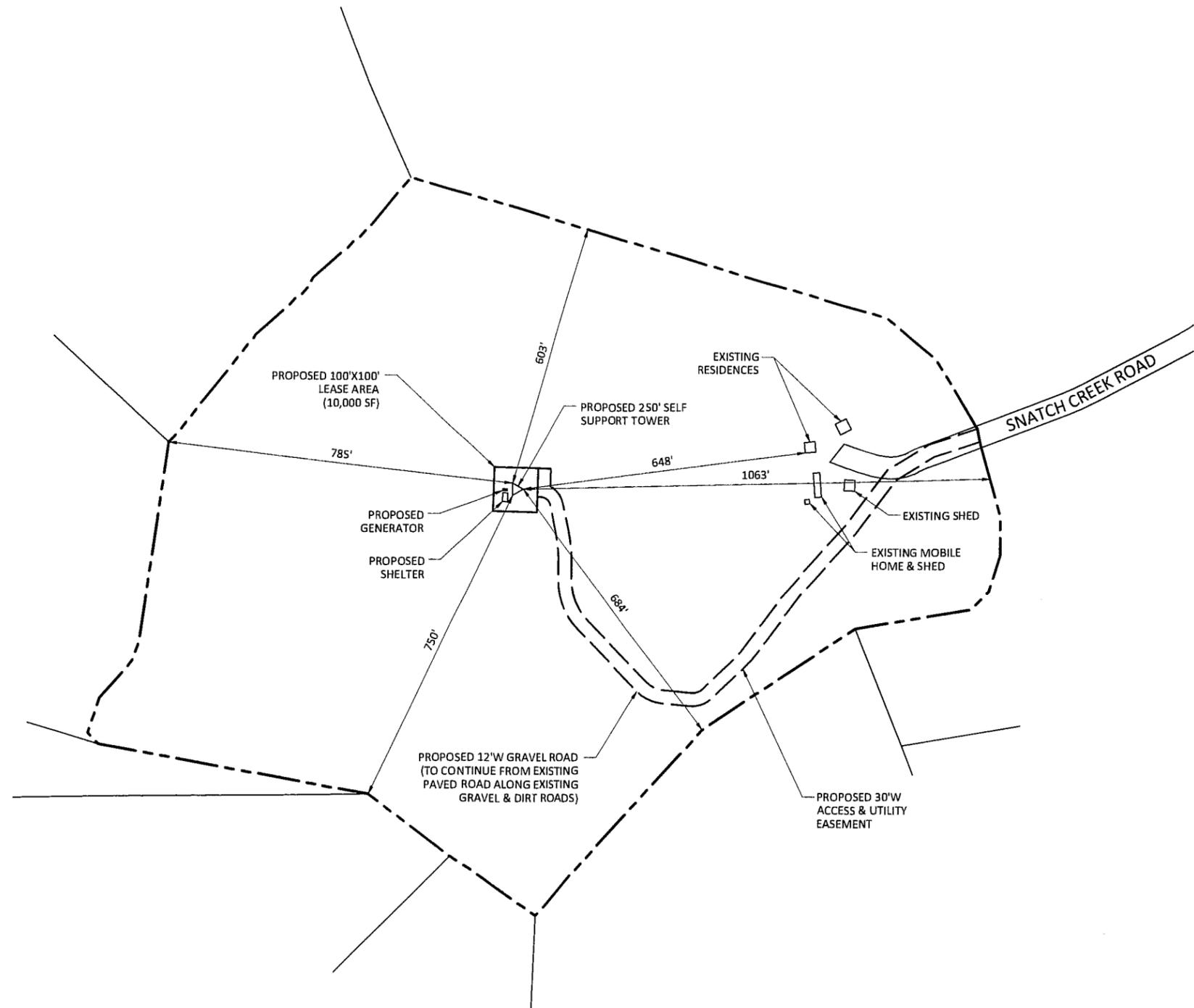
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COUCHTOWN
1023 SNATCH CREEK ROAD
BUSY, KY 41723

SITE NUMBER:
KYALU6155

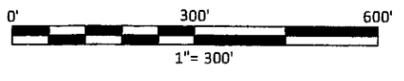
POD NUMBER: 13-0729
DRAWN BY: CMD
CHECKED BY: MEP
DATE: 08.22.13

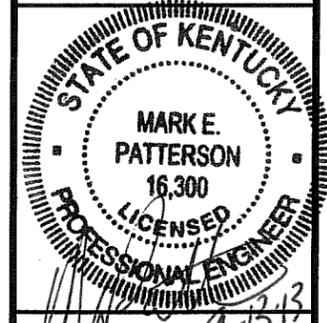
SHEET TITLE:
OVERALL SITE LAYOUT

SHEET NUMBER:
C-1



- (P) LEASE LINE
- (P) ELECTRIC
- (P) TELEPHONE
- (P) FENCE
- (E) PROPERTY LINE
- (E) EDGE OF PAVEMENT
- (E) RIGHT OF WAY
- (E) FENCE
- (E) OVERHEAD ELECTRIC
- (E) LOT LINES





ZONING DRAWINGS

REV.	DATE	DESCRIPTION
1	08.28.13	500' RADIUS MAP

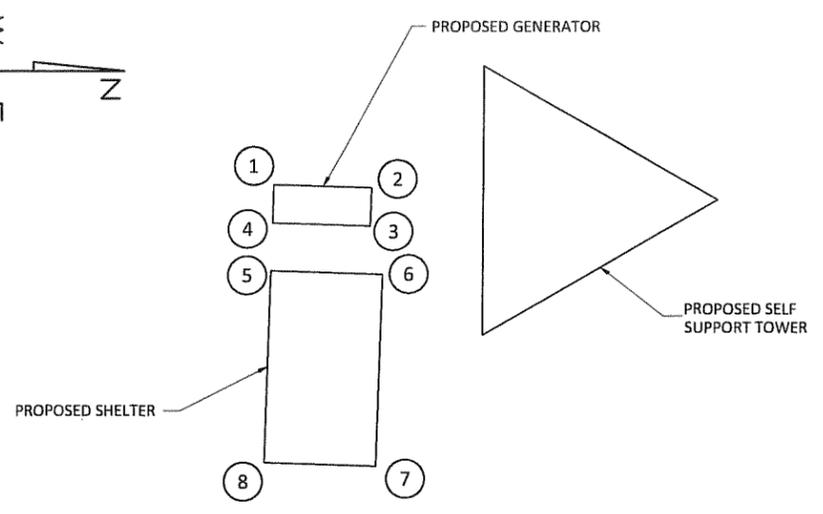
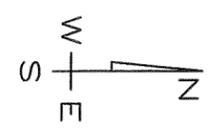
SITE INFORMATION:
COUCHTOWN
1023 SNATCH CREEK ROAD
BUSY, KY 41723

SITE NUMBER:
KYALU6155

POD NUMBER: 13-0729
DRAWN BY: CMD
CHECKED BY: MEP
DATE: 08.22.13

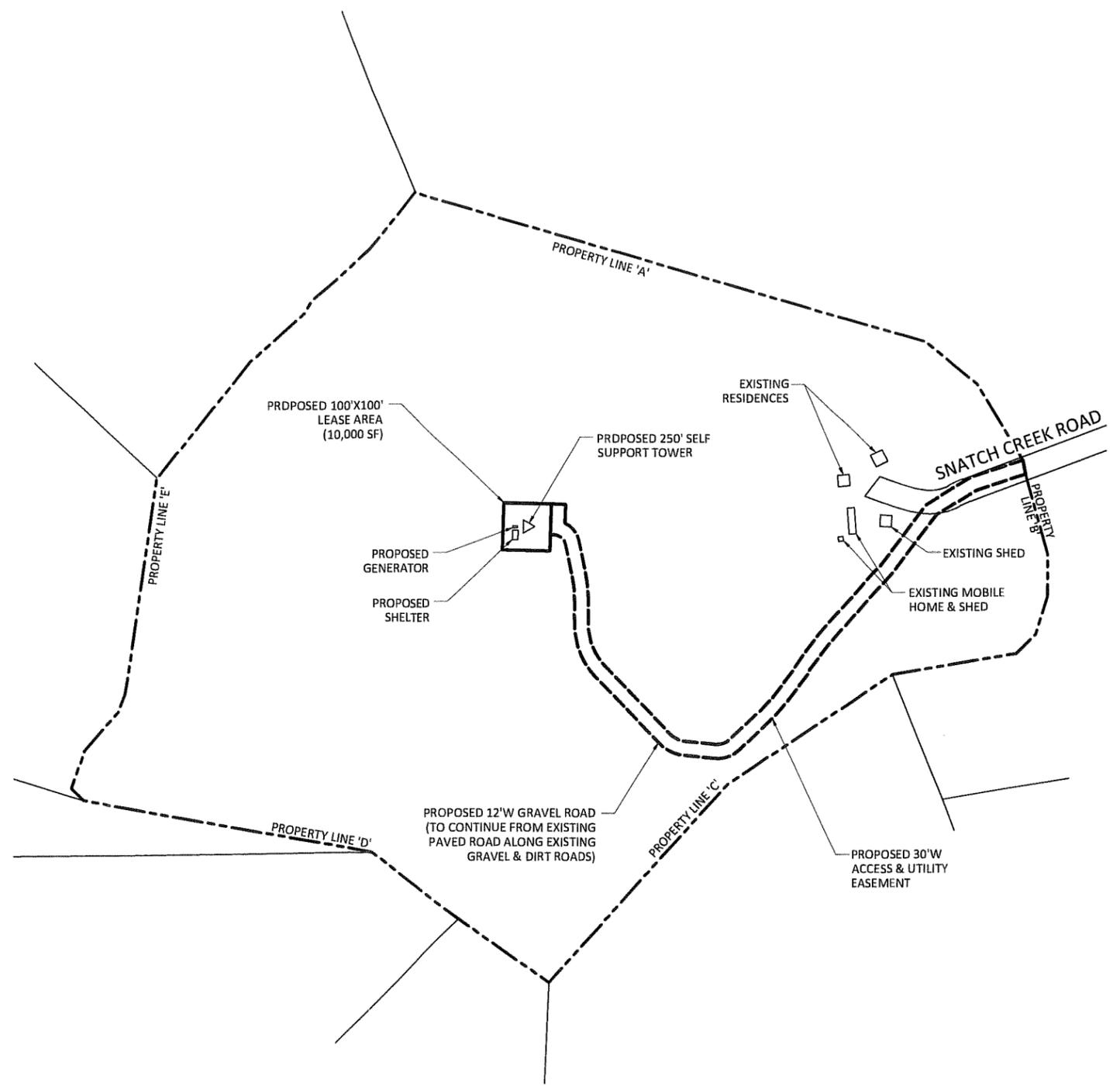
SHEET TITLE:
**OVERALL
SITE
LAYOUT-
CONT'D**

SHEET NUMBER:
C-2

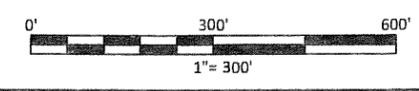


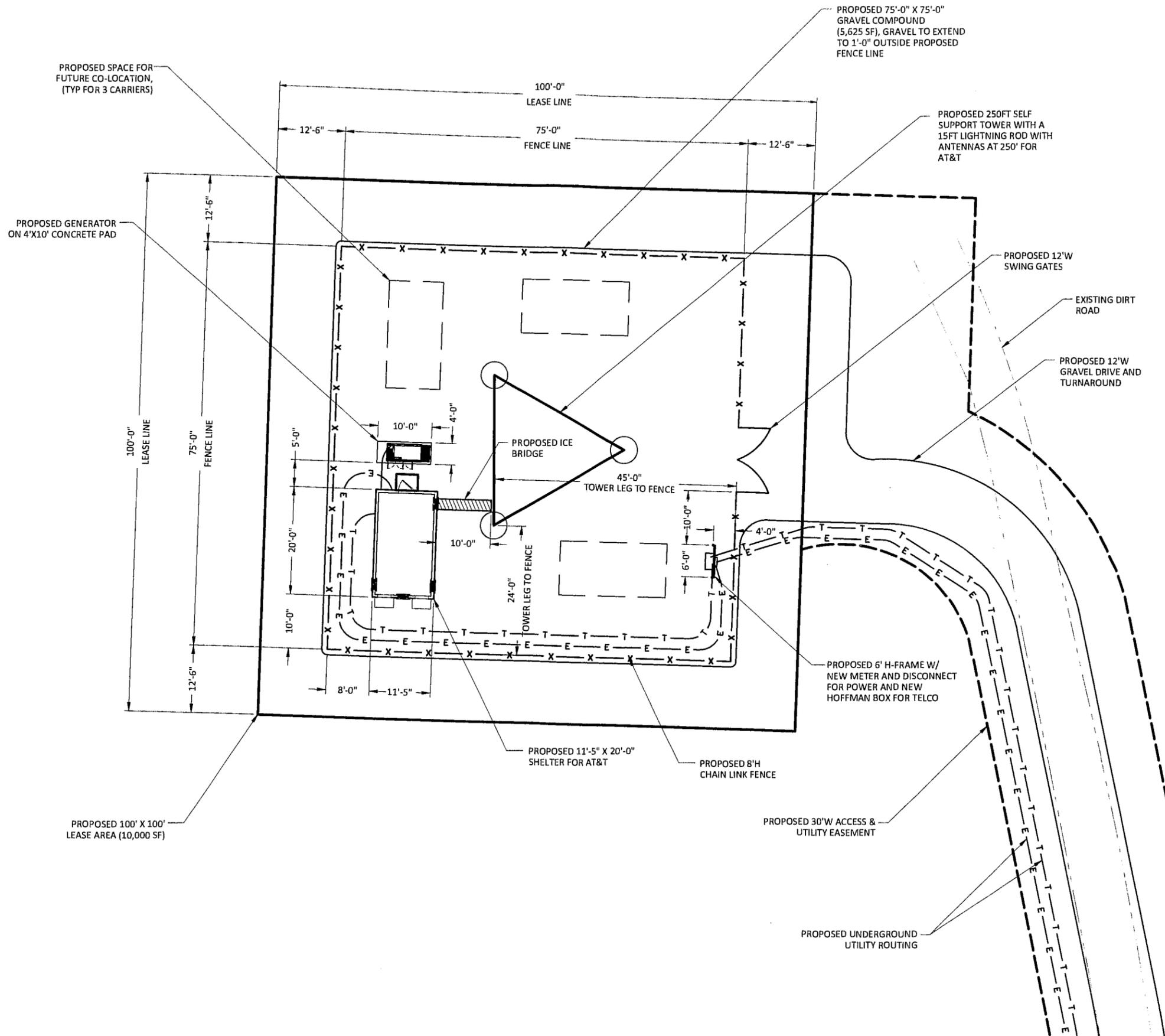
EQUIPMENT ENLARGEMENT
NTS

PROPERTY LINE	EQUIPMENT	DISTANCE
A	2	618'
B	2	1098'
C	3	704'
D	4	751'
E	1	765'
A	6	626'
B	6	1097'
C	7	685'
D	8	728'
E	5	766'

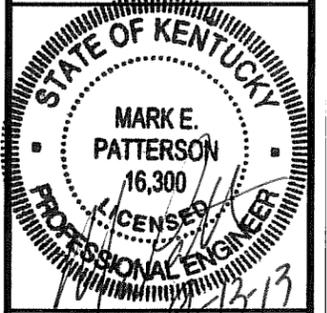
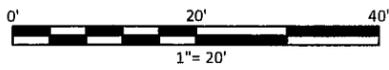


- (P) LEASE LINE
- (P) ELECTRIC
- (P) TELEPHONE
- (P) FENCE
- (E) PROPERTY LINE
- (E) EDGE OF PAVEMENT
- (E) RIGHT OF WAY
- (E) FENCE
- (E) OVERHEAD ELECTRIC
- (E) LOT LINES





- (E) UTILITY POLE
- (S) SANITARY MANHOLE
- LINE LEGEND:**
- (P) LEASE LINE
- (P) ELECTRIC
- (P) TELEPHONE
- (P) FENCE
- (E) PROPERTY LINE
- (E) EDGE OF PAVEMENT
- (E) RIGHT OF WAY
- (E) FENCE
- (E) OVERHEAD ELECTRIC
- (E) LOT LINES
- (E) GRAVEL
- (E) CONTOURS - MAJOR
- (E) CONTOURS - MINOR



ZONING DRAWINGS

REV.	DATE	DESCRIPTION
1	08.28.13	500' RADIUS MAP

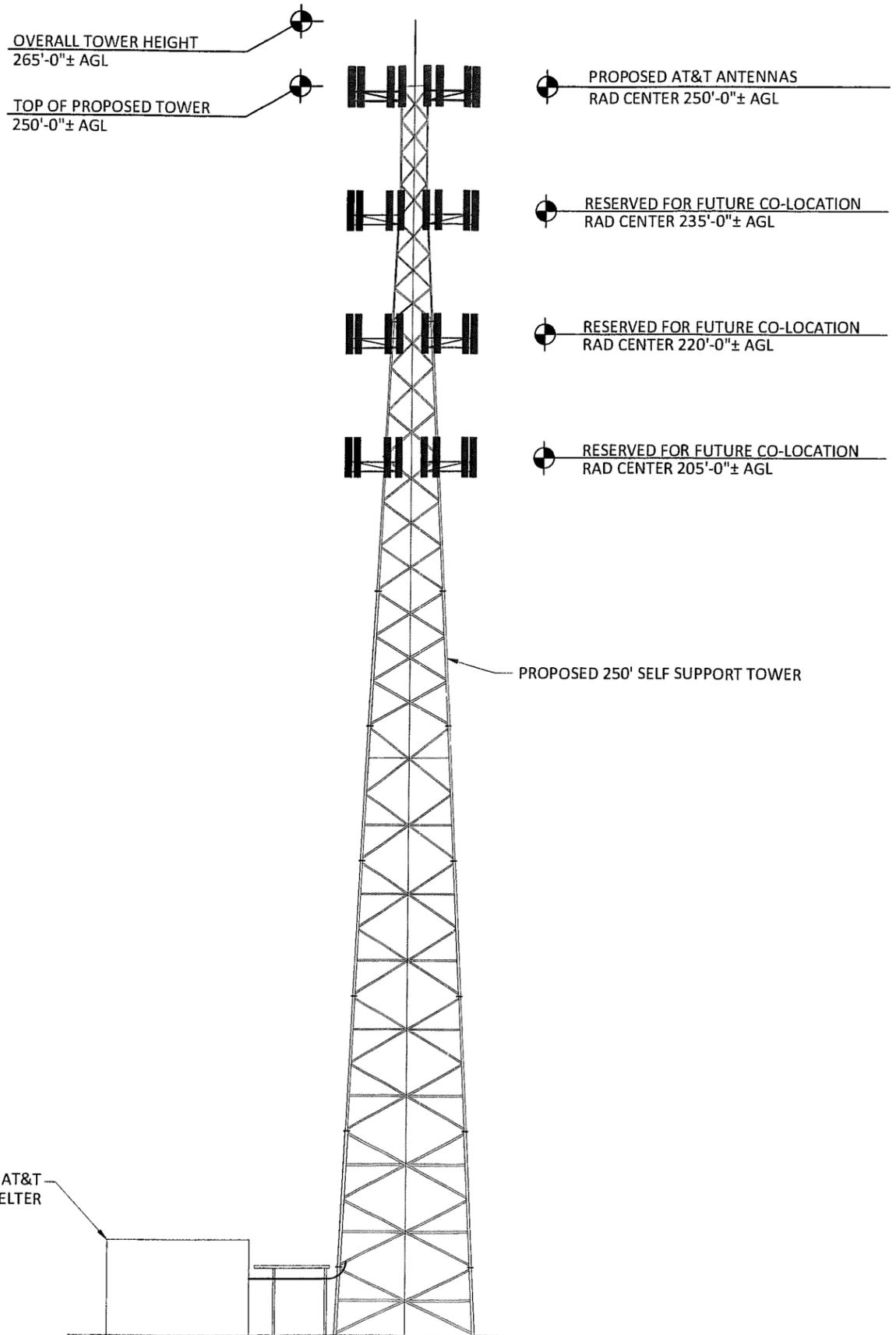
SITE INFORMATION:
COUCHTOWN
 1023 SNATCH CREEK ROAD
 BUSY, KY 41723

SITE NUMBER:
KYALU6155

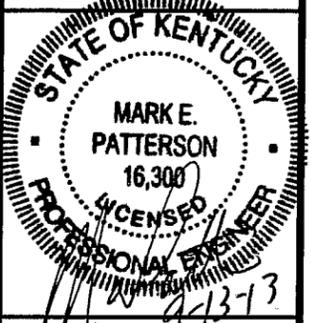
POD NUMBER: 13-0729
 DRAWN BY: CMD
 CHECKED BY: MEP
 DATE: 08.22.13

SHEET TITLE:
ENLARGED COMPOUND LAYOUT

SHEET NUMBER:
C-3



1 TOWER ELEVATION
NOT TO SCALE



ZONING DRAWINGS

REV.	DATE	DESCRIPTION
1	08.28.13	500' RADIUS MAP

SITE INFORMATION:
COUCHTOWN
1023 SNATCH CREEK ROAD
BUSY, KY 41723

SITE NUMBER:
KYALU6155

POD NUMBER: 13-0729
DRAWN BY: CMD
CHECKED BY: MEP
DATE: 08.22.13

SHEET TITLE:
TOWER ELEVATION

SHEET NUMBER:
C-4

EXHIBIT C
TOWER AND FOUNDATION DESIGN

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. Tony Lucas
American Tower Corp.

Reference: Valmont #238614 V-27.0 x 250' Self-Supporting Tower
Site Name: #282079 Couchtown Site – Busy, KY - Perry County

Dear Mr. Lucas:

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



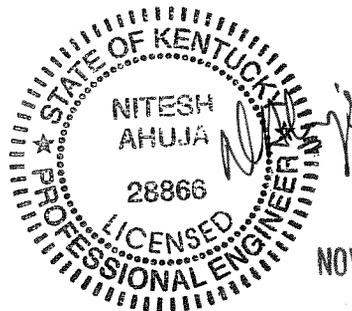
While failure is extremely rare in any kind of tower, it is especially so for monopoles and self-supporting towers. In fact, only if a self-supporting tower were subjected to a direct hit from a tornado or the severest of hurricanes would failure be predicted. We are aware of very few instances of self-supporting 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.

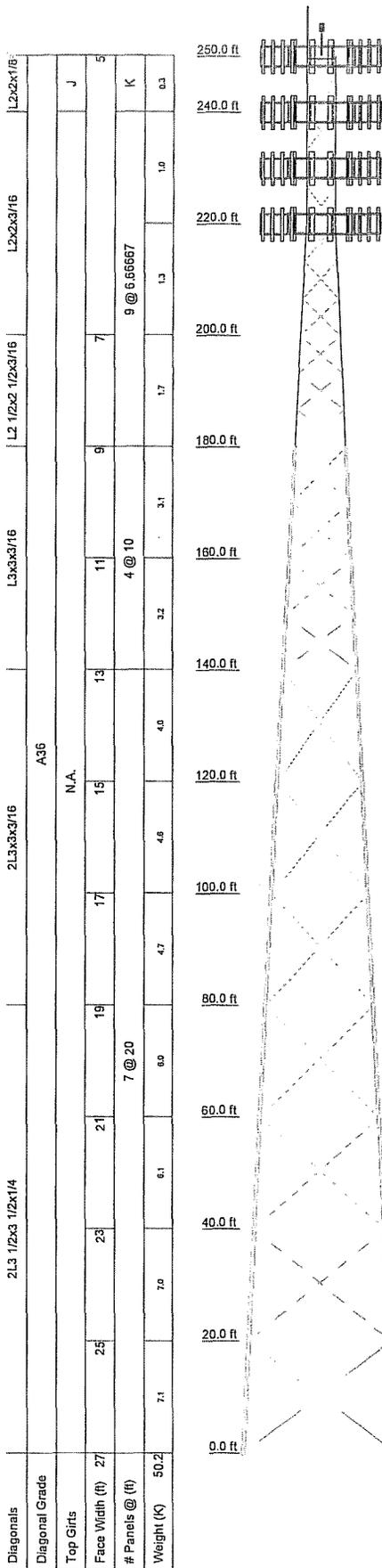
We trust the above and the attached will be helpful to you. If you should need anything else, please let us know at your convenience.

Sincerely,

Nitesh Ahuja
Senior Project Engineer
Extension #5257



NOV 12 2013



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Beacon	250	ATC Loading	240
Beacon Extender (4) 803062	250	ATC Loading	230
8ft 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)
C	P- 5.00" - 0.75" conn.-Trans-20' -C-(Pirod 226200)	I	#12ZG - 2.75" - 0.875" conn. (Pirod 208337)
D	P- 6.00" - 0.75" conn.-HBD-Trans-20' -C-(Pirod 229377)	J	L2x2x3/16
		K	2 @ 4.79167

MATERIAL STRENGTH

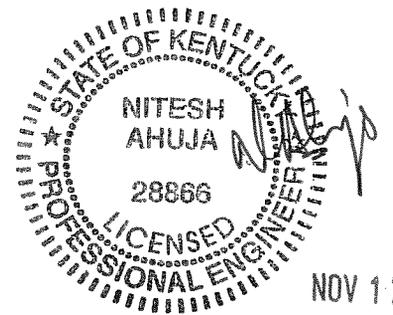
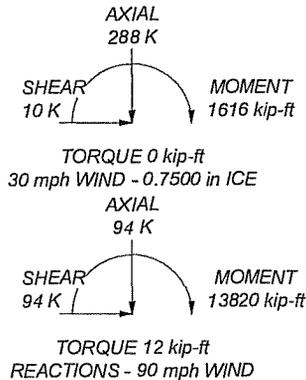
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Perry 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

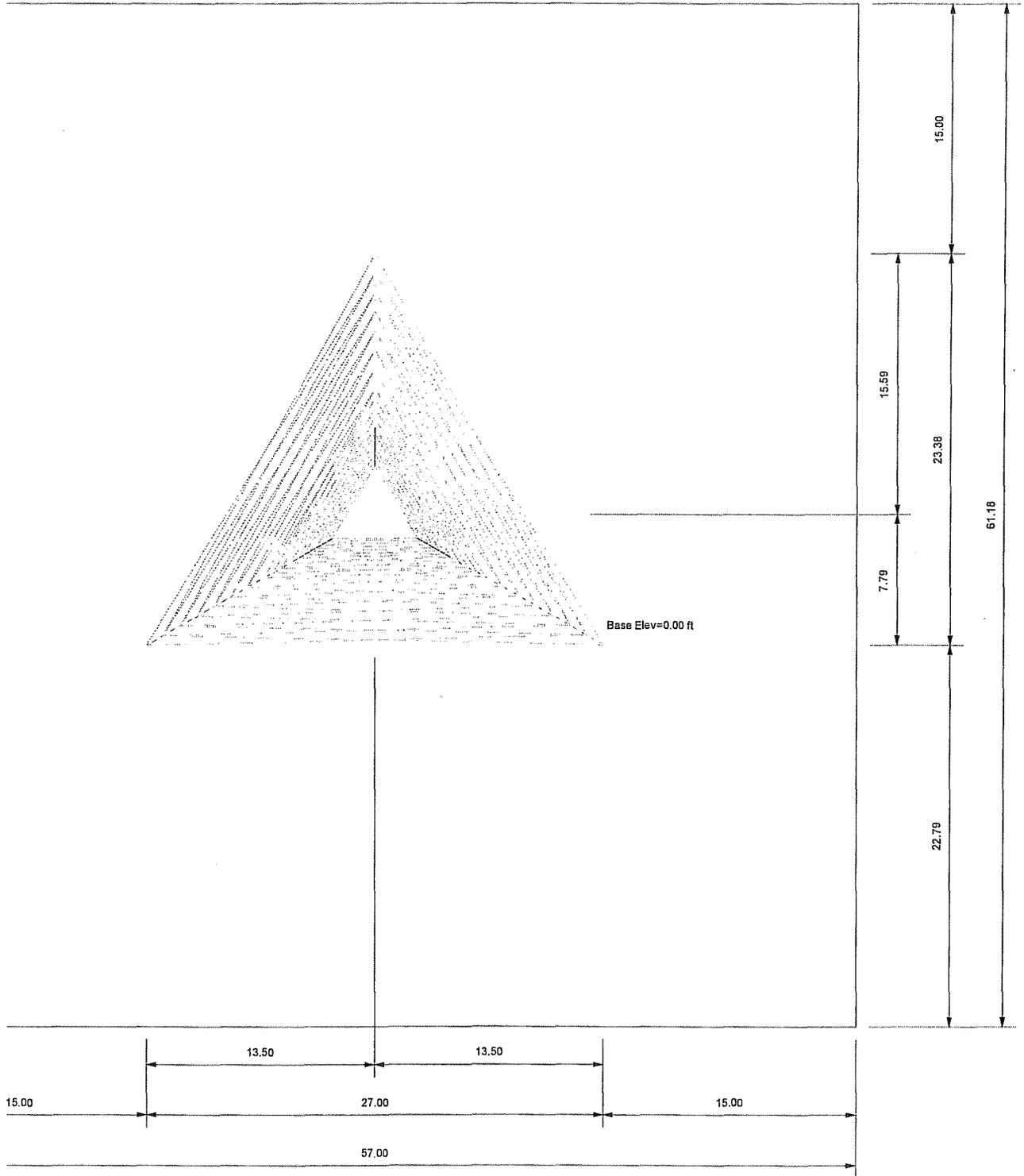
MAX. CORNER REACTIONS AT BASE:
 DOWN: 622 K
 UPLIFT: -554 K
 SHEAR: 61 K



NOV 12 2013

<p>valmont STRUCTURES Valmont Industries Inc. - Speciality Structures Group</p>	1545 Pidco Drive Plymouth, IN 46563 Phone: (574) 936-4221 FAX: (574) 936-6458	Job: 238614	Project: V-27 x 250' #282079 Couchtown, 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
	<small>\\vs05s01\wps\eng\2013\238614_V-27x250-Couchtown-KY02_Line.dwg 11/11/13 11:42:42 AM</small>		

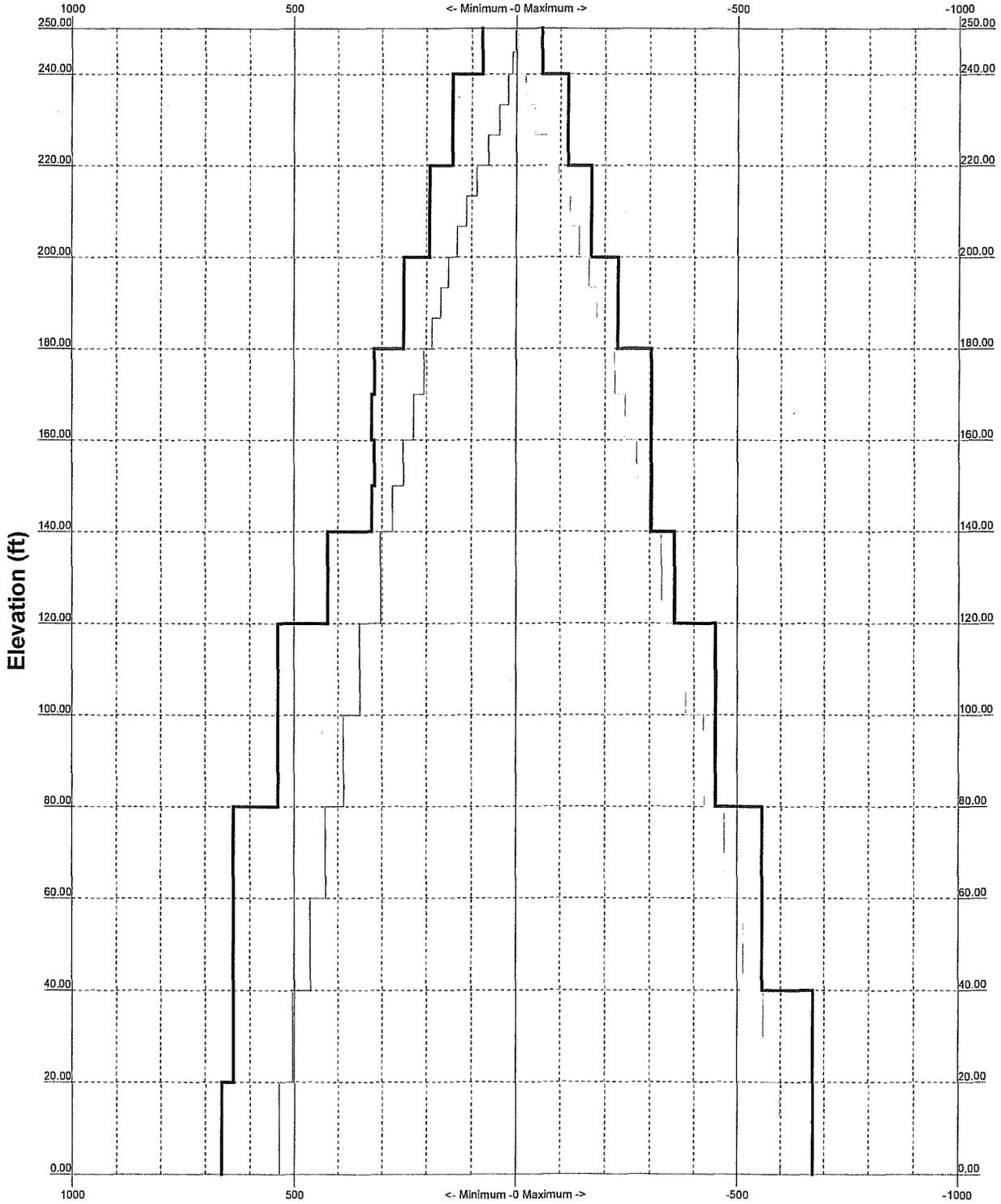
Plot Plan
Total Area - 0.08 Acres



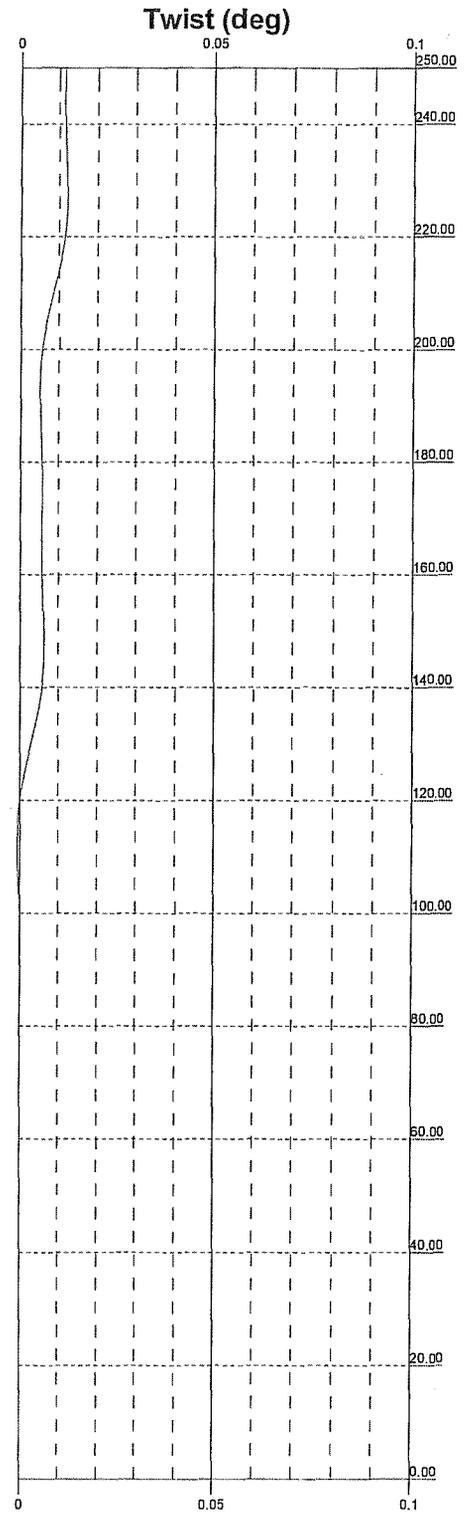
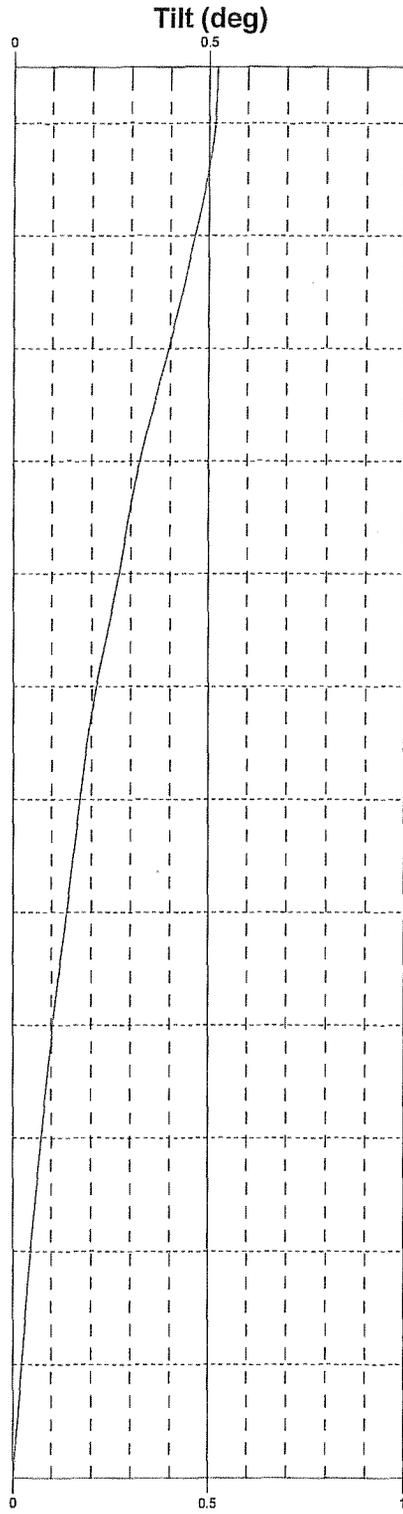
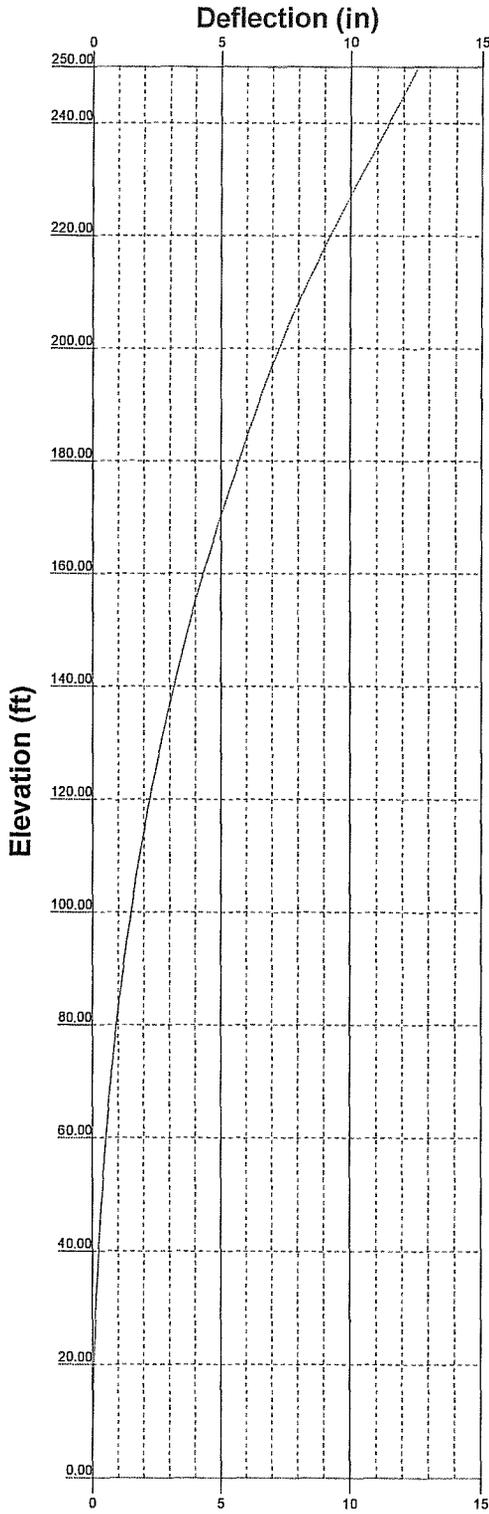
 <p>1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 238614		
	Project: V-27 x 250' #282079 Couchtown, KY		
	Client: American Tower Corp.	Drawn by: na1	App'd:
	Code: TIA-222-G	Date: 11/11/13	Scale: NTS
	Path:	Dwg No. E-2	

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

Leg Capacity ——— Leg Compression (K)



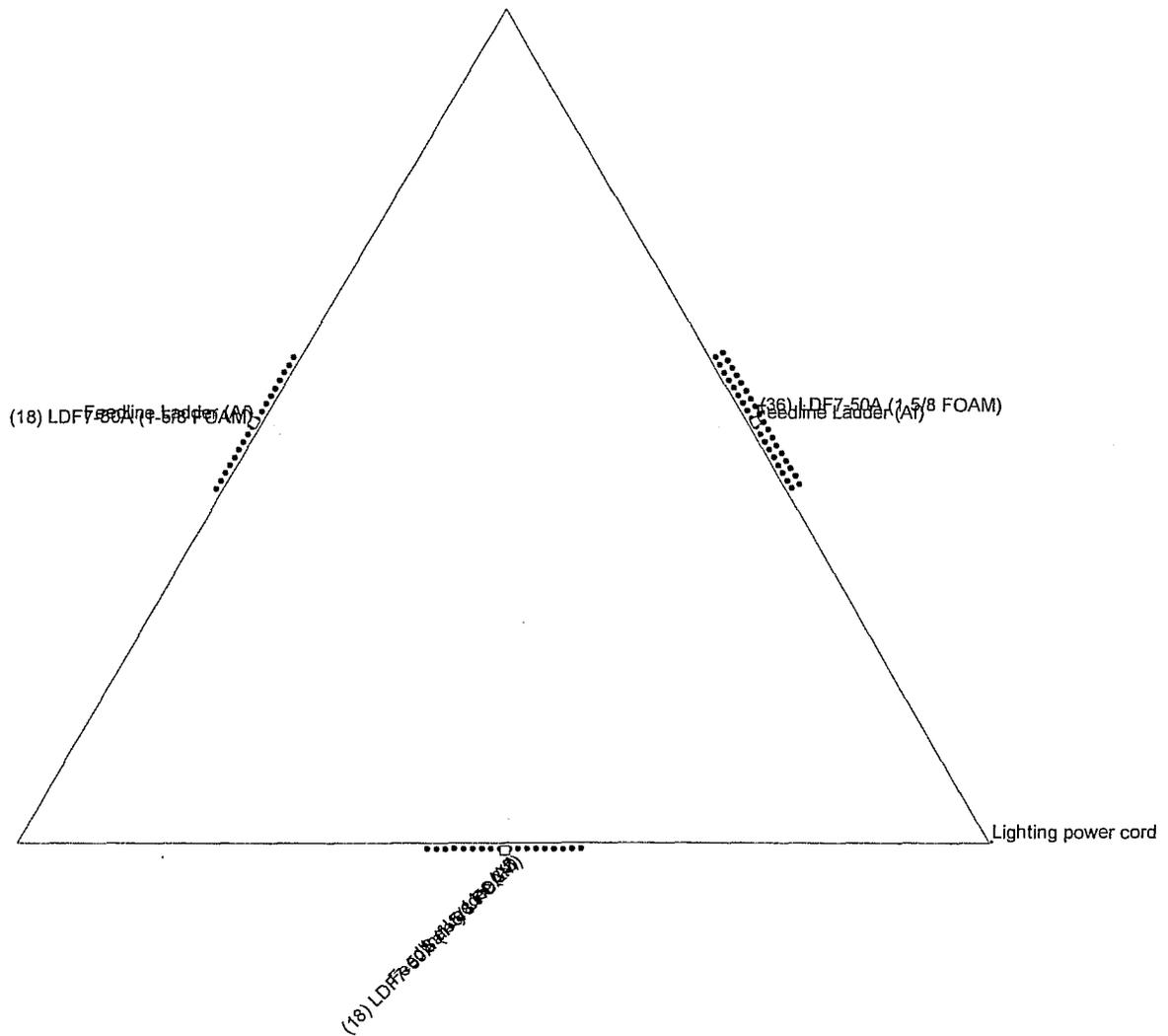
 1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458	Job: 238614	Project: V-27 x 250' #282079 Couchtown, KY	
	Client: American Tower Corp.	Drawn by: na1	App'd:
	Code: TIA-222-G	Date: 11/11/13	Scale: NTS
	Path:	Dwg No. E-3	
	<small>Path: \\p01521\file\work\Drawings\10230\11414 ATC V27\250_Couchtown KY\27 Tower E-3\11414 V27 E-3.dwg</small>		



 <p>1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Specialty Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 238614		
	Project: V-27 x 250' #282079 Couchtown, 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 Plan

Round Flat App In Face App Out Face Truss-Leg

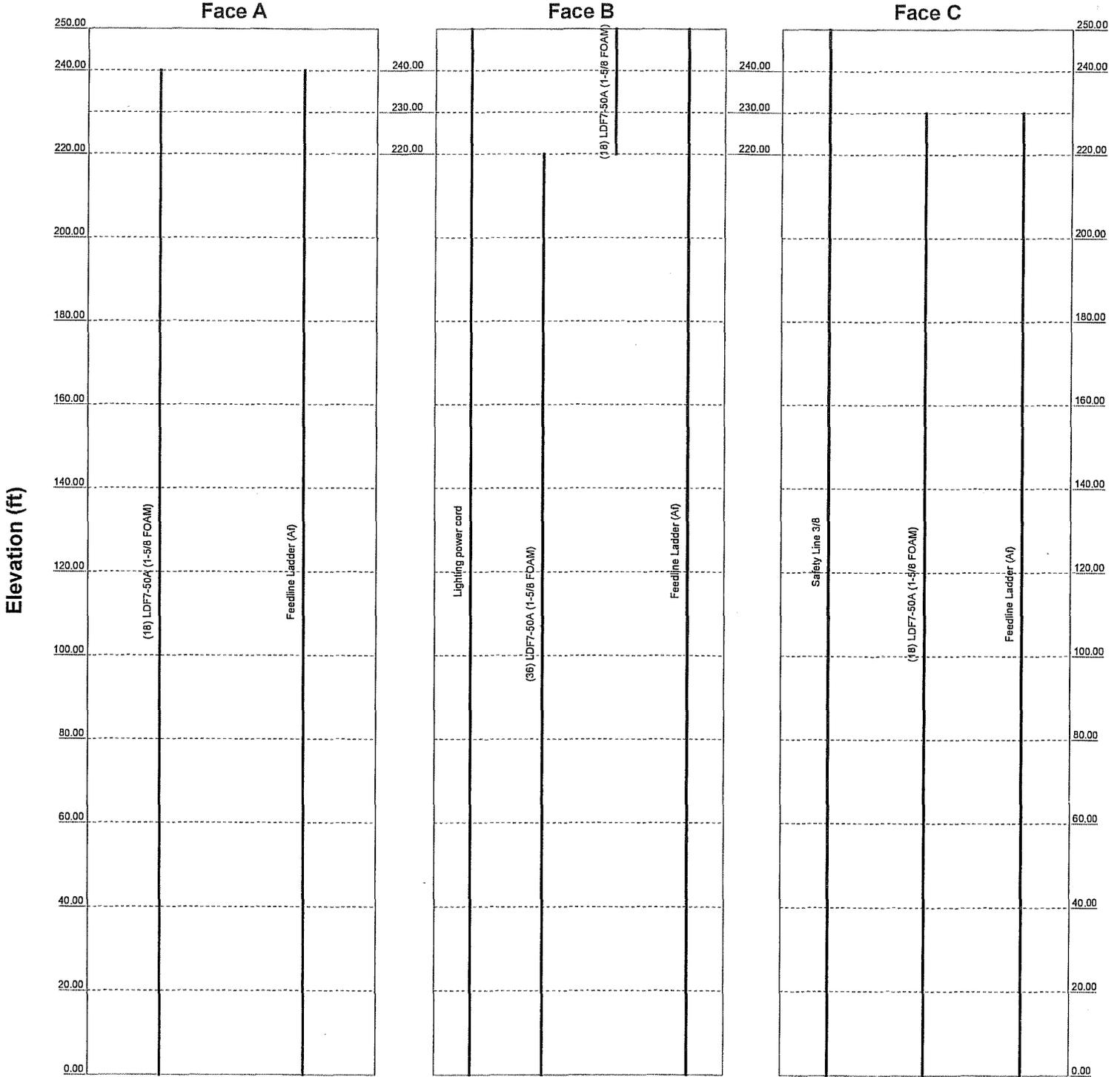


 valmont	1545 Pidco Drive		Job: 238614		
	STRUCTURES Plymouth, IN 46563		Project: V-27 x 250' #282079 Couchtown, KY		
	Valmont Industries Inc. - Specialty Structures Group		Client: American Tower Corp.	Drawn by: na1	App'd:
	Phone: (574) 936-4221	Code: TIA-222-G	Date: 11/11/13	Scale: NTS	
	FAX: (574) 936-6458	Path:		Dwg No. E-7	

Feedline Distribution Chart

0' - 250'

Round
Flat
App In Face
App Out Face
Truss Leg



<p style="margin-top: 5px;">1545 Pidco Drive STRUCTURES Plymouth, IN 46563 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p>	Job: 238614	Project: V-27 x 250' #282079 Couchtown, 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
	T:\valmont\Drawings\238614\ATC\27250_Couchtown_P27_Tower_Cad\238614_V27_250.dwg			

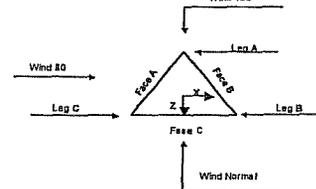
tnxTower 1343 Pidco Drive Plymouth, IN 46363 Phone: (317) 936-4321 FAX: (317) 936-6438	Job	238614	Page	1 of 59
	Project	V-27 x 250' #282079 Coughtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

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	Project	V-27 x 250' #282079 Coughtown, KY	Date	09:16:09 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 Perry County, Kentucky.
- Basic Wind speed of 90 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category I.
- 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 - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios Use Code Safety Factors - Guys Estimate Ice Always Use Max Kz Use Special Wind Profile Include Bolt In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IRC 60xW Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Flanged Assume Rigid End Plate Use Clear Spans For Wind Area Use Clear Spans For KLR Retention Guys To Initial Tension Bypass Mast Stability Checks Use Azimuth Dih Coefficient Project Wind Area of Appar. Assume Torque Area Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Bolts Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Some Allowable Offset Clrt At Foundation Consider Feedline Torque Include Angle Block Shear Check 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
	<i>f</i>			<i>f</i>		<i>f</i>
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	7.00	1	20.00
T5	180.00-160.00		PIRad 12BD Truss Leg	9.00	1	20.00
T6	160.00-140.00		PIRad 12BD Truss Leg	11.00	1	20.00
T7	140.00-120.00		PIRad 12BDH Truss Leg	13.00	1	20.00
T8	120.00-100.00		PIRad 12BDH Truss Leg	15.00	1	20.00
T9	100.00-80.00		PIRad 12BDH Truss Leg	17.00	1	20.00
T10	80.00-60.00		PIRad 12BDH Truss Leg	19.00	1	20.00
T11	60.00-40.00		PIRad 12BDH Truss Leg	21.00	1	20.00
T12	40.00-20.00		PIRad 12BDH Truss Leg	23.00	1	20.00
T13	20.00-0.00		PIRad 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 Clrt Offset	Bottom Clrt Offset
	<i>f</i>	<i>f</i>		Y/N	Y/N	<i>in</i>	<i>in</i>
T1	250.00-240.00	4.79	X Brace	No	No	5.0000	0.0000
T2	240.00-220.00	6.67	X Brace	No	No	0.8000	0.0880

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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Braces End Panels	Has Horizontals	Top Clrt Offset	Bottom Clrt Offset
	<i>f</i>	<i>f</i>		Y/N	Y/N	<i>in</i>	<i>in</i>
T3	220.00-200.00	6.67	X Brace	No	No	8.0000	0.0000
T4	200.00-180.00	6.67	X Brace	No	No	0.0000	0.0000
T5	180.00-160.00	10.00	X Brace	No	No	8.0000	0.0000
T6	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T7	140.00-120.00	20.00	X Brace	No	No	0.0000	8.8800
T8	120.00-100.00	20.00	X Brace	No	No	0.0000	0.0000
T9	100.00-80.00	20.00	X Brace	No	No	0.0000	8.0000
T10	80.00-60.00	20.00	X Brace	No	No	0.8000	0.0000
T11	60.00-40.00	20.00	X Brace	No	No	0.0000	0.0000
T12	40.00-20.00	20.00	X Brace	No	No	0.0000	8.0000
T13	20.00-0.00	20.00	X Brace	No	No	0.0000	8.8000

Tower Elevation	Top Clrt Type	Top Clrt Size	Top Clrt Grade	Bottom Clrt Type	Bottom Clrt Size	Bottom Clrt Grade
T1	250.00-240.00	Equal Angle		A36	Solid Round	
T2	240.00-220.00		1/2x3/16	A36	(36 ksi)	A36 (36 ksi)

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-2.58" x 0.75" conn.-10"	A372-50 (50 ksi)	Equal Angle	1.2x2x1/8	A36 (36 ksi)
T2 240.00-220.00	Pipe	P-4.08" x 1.75" conn.-20"	A372-50 (50 ksi)	Equal Angle	1.2x2x3/16	A36 (36 ksi)
T3 220.00-200.00	Pipe	P-5.00" x 2.125" conn.-20"	A372-50 (50 ksi)	Equal Angle	1.2x2x3/16	A36 (36 ksi)
T4 200.00-180.00	Pipe	P-6.00" x 2.75" conn.-HDD-Truss-20"	A372-50 (50 ksi)	Equal Angle	1.2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 180.00-160.00	Truss Leg	#122G-1.75" x 1.80" conn.-HDD-Truss (PIrad 22911)	A512-50 (50 ksi)	Equal Angle	1.3x3x1/16	A36 (36 ksi)
T6 160.00-140.00	Truss Leg	#122G-1.75" x 1.80" conn.-HDD-Truss (PIrad 22911)	A512-50 (50 ksi)	Equal Angle	1.3x3x1/16	A36 (36 ksi)
T7 140.00-120.00	Truss Leg	#122G-2.00" x 0.875" conn.-HDD-Truss (PIrad 20832)	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16	A36 (36 ksi)
T8 120.00-100.00	Truss Leg	#122G-2.25" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16	A36 (36 ksi)
T9 100.00-80.00	Truss Leg	#122G-2.25" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16	A36 (36 ksi)
T10 80.00-60.00	Truss Leg	#122G-2.50" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T11 60.00-40.00	Truss Leg	#122G-2.75" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 40.00-20.00	Truss Leg	#122G-2.75" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 20.00-0.00	Truss Leg	#122G-2.75" x 0.875" conn. (PIrad 20833)	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _t	Height Adj.	Double Angle Spacing Diagonals	Double Angle Spacing Horizontals
<i>f</i>	<i>f</i> ²	<i>t</i>					<i>in</i>	<i>in</i>
T1	8.08	0.2388	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T2	8.00	0.2508	A36 (36 ksi)	1	1	1.85	36.0008	36.0000
T3	0.00	0.3758	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T4	8.00	0.3758	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5	0.00	0.3888	A36 (36 ksi)	1	1	1.05	36.0008	36.8880
T6	0.00	0.5000	A36 (36 ksi)	1	1	1.85	36.0008	36.8000
T7	0.80	0.6238	A36 (36 ksi)	1	1	1.85	36.0000	36.0008
T8	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.8880	36.0000
T9	0.00	0.6250	A36 (36 ksi)	1	1	1.85	36.0008	36.0000
T10	0.80	0.6250	A36 (36 ksi)	1	1	1.05	36.0008	36.8000
T11	0.00	0.6250	A36 (36 ksi)	1	1	1.05	36.0000	36.0008
T12	8.00	0.6250	A36 (36 ksi)	1	1	1.05	36.8000	36.0000
T13	20.00-0.00	0.80	0.6250	1	1	1.05	36.0000	36.0008

Tower Section Geometry (cont'd)

Tower Elevation	Calc E	Calc F	Legs	K Factor							
				X Braces Diags	X Braces Horiz	Single Diags	Horiz.	Sec. Horiz.	Inner Brace		
<i>f</i>	Y	Y		X	X	X	X	X	X	X	
250.00-240.00	Yes	Yes	1	1	1	1	1	1	1	1	
T2	Yes	Yes	1	1	1	1	1	1	1	1	
240.00-220.00	Yes	Yes	1	1	1	1	1	1	1	1	
220.00-200.00	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)

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Tower Elevation ft	Cale K Single Angles	Cale K Solid Rounds	Legs	K Factors											
				X Brace Diags X	Y Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Inner Brace X	Inner Brace Y		
200.00-180.00	T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
180.00-160.00	T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
160.00-140.00	T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
140.00-120.00	T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
120.00-100.00	T9	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
100.00-80.00	T10	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00	T11	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
60.00-40.00	T12	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00	T13	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1
20.00-0.00	T14	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Panels	Truss-Legs Used As Leg Members		Truss-Legs Used As Inner Members			
		X Diagonals	Z Diagonals	X Diagonals	Z Diagonals		
180.00-160.00	T6	1	0.5	0.7	1	0.5	0.7
160.00-140.00	T7	1	0.5	0.7	1	0.5	0.7
140.00-120.00	T8	1	0.5	0.7	1	0.5	0.7
120.00-100.00	T9	1	0.5	0.7	1	0.5	0.7
100.00-80.00	T10	1	0.5	0.7	1	0.5	0.7
80.00-60.00	T11	1	0.5	0.7	1	0.5	0.7
60.00-40.00	T12	1	0.5	0.7	1	0.5	0.7
40.00-20.00	T13	1	0.5	0.7	1	0.5	0.7
20.00-0.00	T14	1	0.5	0.7	1	0.5	0.7

Tower Section Geometry (cont'd)

Tower Elevation ft	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
258.00-240.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
240.00-220.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
220.00-200.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
200.00-180.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
180.00-160.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
160.00-140.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
140.00-120.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
120.00-100.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
100.00-80.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
80.00-60.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
60.00-40.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
40.00-20.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
20.00-0.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg	Diagonal		Top Girt	Bottom Girt	Mid Girt	Long Horizontal	Short Horizontal	
			Bolt Size in	No.						Bolt Size in
258.00-240.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
240.00-220.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
220.00-200.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
200.00-180.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
180.00-160.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
160.00-140.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
140.00-120.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
120.00-100.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
100.00-80.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
80.00-60.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
60.00-40.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
40.00-20.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0
20.00-0.00	Flange	A325N	8.7500	1	1.0000	0	1.0000	0	1.0000	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Tower Elevation ft	Leg	Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal		
		Net Width Deduct in	U											
T1	0.0000	1	0.0006	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Cable/Offset				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
258.00-240.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
240.00-220.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
220.00-200.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
200.00-180.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
180.00-160.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
160.00-140.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
140.00-120.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
120.00-100.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
100.00-80.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
80.00-60.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
60.00-40.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
40.00-20.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008
20.00-0.00	5.0000	5.8000	5.0880	5.8008	0.0000	0.8000	0.0000	0.8008

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Description	Face Shield	Allow No	Component Type	Placement ft	Face Offset ft	Lateral Offset (Per F17)	# Per Row	# Clear Spacing in	Width Diameter in	Perimeter in	Weight plf
Safety Line	C	No	Ar (CxA)	258.00 - 0.00	3.8000	0	1	0.3750	0.3750	0.22	0.22
Lighting	B	No	Ar (CxA)	258.88 - 0.00	0.5000	0.5	1	8.2000	8.2000	0.15	0.15
LD7F-50A	C	No	Ar (CxA)	238.00 - 0.80	1.8000	8	18	1.0258	1.9800	0.52	0.52
LD7F-50A	B	No	Ar (CxA)	228.00 - 0.00	1.0000	8	36	1.0258	1.9800	0.52	0.52
LD7F-50A	A	No	Ar (CxA)	258.86 - 220.00	1.0000	0	18	1.0258	1.9888	0.52	0.52
LD7F-58A	A	No	Ar (CxA)	240.88 - 0.08	1.0000	0	18	1.0000	1.9800	0.52	0.52
Feedline Leader (AD)	B	No	Ar (CxA)	258.00 - 0.00	1.0000	8	1	3.0000	3.0000	8.48	8.48
Feedline Leader (AD)	A	No	Ar (CxA)	240.00 - 0.00	1.0000	0	1	3.8000	3.0880	8.40	8.40
Feedline Leader (AD)	C	No	Ar (CxA)	238.00 - 0.00	1.0880	0	1	3.0000	3.0880	8.40	8.40

Feed Line/Linear Appurtenances Section Areas

Tower Elevation ft	Face	Ar	Ar	Cx1 In Face	Cx1 Out Face	Weight K
T1	A	0.000	0.000	0.000	0.000	0.00
T1	B	0.000	0.000	0.000	0.000	0.23
T1	C	0.000	0.000	0.375	0.000	0.08

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Tower Section	Tower Elevation ft	Face	A _s ft ²	A _r ft ²	C _s A _s In Face ft ²	C _r A _s Out Face ft ²	H _g ft	K
T12	40.00-20.00	A	0.000	0.000	81.280	0.000	0.46	
		B	0.000	0.000	154.300	0.000	0.76	
		C	0.008	0.000	82.030	0.000	0.47	
T13	20.88-0.00	A	0.000	0.000	81.288	0.000	0.46	
		B	0.000	0.000	154.308	0.000	0.76	
		C	0.008	0.000	82.030	0.000	0.47	

Section	Elevation ft	CP _r In	CP _r In	CP _s In	CP _s In
T1	250.00-240.00	3.3597	-1.7738	2.9036	-1.2017
T2	240.00-230.00	0.8335	-0.8083	0.1374	-0.3968
T3	220.08-200.00	1.0027	-0.8163	0.2104	0.1162
T4	200.88-180.88	1.2415	-0.6358	0.2381	0.1605
T5	180.80-160.00	1.4829	-0.7569	0.2738	0.1921
T6	160.08-140.08	1.7342	-0.8938	0.3155	0.2239
T7	140.00-120.00	1.9991	-1.0160	0.3541	0.2768
T8	120.00-100.00	2.2423	-1.1388	0.3903	0.3151
T9	100.00-80.00	2.4944	-1.2646	0.4232	0.3317
T10	80.88-60.88	2.7111	-1.3732	0.4531	0.3432
T11	60.00-40.88	2.9562	-1.4962	0.4839	0.4123
T12	40.00-20.08	3.1735	-1.6082	0.5057	0.4334
T13	20.00-0.00	3.4132	-1.7253	0.5106	0.4331

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Lag	Ice Thickness in	A _s ft ²	A _r ft ²	C _s A _s In Face ft ²	C _r A _s Out Face ft ²	H _g ft	K
T1	250.00-240.00	A	1.833	0.000	8.000	0.000	0.000	0.00	
		B	0.000	0.000	84.360	0.000	1.43		
		C	0.008	0.008	8.008	4.041	8.000	0.03	
T2	240.80-220.00	A	1.821	0.000	0.890	159.939	0.389	2.72	
		B	0.890	0.890	168.565	0.000	2.85		
		C	0.008	0.890	87.885	0.000	1.46		
T3	220.80-200.08	A	1.805	0.000	0.890	159.383	0.380	2.70	
		B	0.890	0.890	169.267	0.000	4.80		
		C	0.008	0.000	167.333	0.000	2.81		
T4	200.00-180.80	A	1.787	0.008	0.890	159.213	0.380	2.68	
		B	0.890	0.890	169.031	0.330	3.98		
		C	0.008	0.000	167.111	0.000	2.78		
T5	180.00-168.00	A	1.767	0.000	0.890	159.826	0.380	2.66	
		B	0.890	0.890	168.731	0.380	3.93		
		C	0.000	0.890	166.845	0.380	2.76		
T6	160.08-148.00	A	1.745	0.000	0.890	158.818	0.380	2.64	
		B	0.890	0.890	168.450	0.380	3.92		
		C	0.000	0.890	166.529	0.381	2.73		
T7	148.80-120.80	A	1.720	0.000	0.890	158.383	0.380	2.61	
		B	0.890	0.890	168.118	0.380	3.89		
		C	0.008	0.890	166.215	0.380	2.70		
T8	120.00-100.80	A	1.692	0.000	0.890	158.314	0.380	2.58	
		B	0.890	0.890	167.721	0.000	3.86		
		C	0.000	0.890	165.832	0.388	2.67		
T9	100.00-80.00	A	1.658	0.000	0.890	157.996	0.380	2.54	
		B	0.890	0.890	167.261	0.380	3.81		
		C	0.000	0.890	165.379	0.000	2.63		
T10	80.00-60.00	A	1.617	0.000	0.890	157.698	0.380	2.49	
		B	0.890	0.890	166.698	0.380	3.76		
		C	0.000	0.890	164.826	0.000	2.58		
T11	60.00-48.80	A	1.564	0.008	0.890	157.103	0.380	2.44	
		B	0.890	0.890	165.967	0.000	3.70		
		C	0.000	0.890	164.107	0.000	2.51		
T12	40.00-20.00	A	1.486	0.000	0.890	156.369	0.380	2.35	
		B	0.000	0.000	164.903	0.000	3.60		
		C	0.000	0.000	163.052	0.000	2.42		
T13	20.08-0.00	A	1.331	0.008	0.008	154.914	0.000	2.18	
		B	0.000	0.000	162.793	0.000	3.41		
		C	0.000	0.000	160.989	0.000	2.24		

Feed Line Center of Pressure

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _c No Ice	K _s Ice
T1	1	Safety Line 3/8"	240.00 - 238.80	0.6000	0.5671
			238.80 - 237.60	0.6000	0.5671
T1	2	Lighting power cord	240.88 - 238.00	0.6000	0.5671
			238.00 - 235.00	0.6000	0.5671
T1	5	LDF7-50A (1-5/8 FOAM)	240.88 - 238.00	0.6000	0.5671
			238.00 - 235.00	0.6000	0.5671
T1	7	Feedline Ladder (AD)	240.88 - 238.00	1.0000	1.0000
			238.00 - 235.00	0.6000	0.5829
T2	1	Safety Line 3/8"	220.00 - 218.80	0.6000	0.5829
			218.80 - 217.60	0.6000	0.5829
T2	2	Lighting power cord	220.00 - 218.00	0.6000	0.5829
			218.00 - 215.00	0.6000	0.5829
T2	3	LDF7-50A (1-5/8 FOAM)	220.00 - 218.00	0.6000	0.5829
			218.00 - 215.00	0.6000	0.5829
T2	5	LDF7-50A (1-5/8 FOAM)	220.88 - 218.00	0.6000	0.5829
			218.00 - 215.00	0.6000	0.5829
T2	6	LDF7-50A (1-5/8 FOAM)	220.00 - 218.00	0.6000	0.5829
			218.00 - 215.00	0.6000	0.5829
T2	7	Feedline Ladder (AD)	220.88 - 218.00	1.8000	1.8000
			218.00 - 215.00	1.8000	1.8000
T2	8	Feedline Ladder (AD)	220.00 - 218.00	1.8000	1.8000
			218.00 - 215.00	1.8000	1.8000
T2	9	Feedline Ladder (AD)	220.00 - 218.00	1.0800	1.0800
			218.00 - 215.00	0.6000	0.6000
T3	1	Safety Line 3/8"	200.00 - 198.80	0.6000	0.6000
			198.80 - 197.60	0.6000	0.6000
T3	2	Lighting power cord	200.00 - 198.00	0.6000	0.6000
			198.00 - 195.00	0.6000	0.6000
T3	3	LDF7-50A (1-5/8 FOAM)	200.88 - 198.00	0.6000	0.6000
			198.00 - 195.00	0.6000	0.6000
T3	4	LDF7-50A (1-5/8 FOAM)	200.00 - 198.00	0.6000	0.6000
			198.00 - 195.00	0.6000	0.6000
T3	6	LDF7-50A (1-5/8 FOAM)	200.00 - 198.00	0.6000	0.6000
			198.00 - 195.00	0.6000	0.6000
T3	7	Feedline Ladder (AD)	200.00 - 198.00	1.0000	1.0000
			198.00 - 195.00	0.6000	0.6000
T3	8	Feedline Ladder (AD)	200.00 - 198.00	1.0000	1.0000
			198.00 - 195.00	0.6000	0.6000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _c No Ice	K _s Ice
T3	9	Feedline Ladder (AD)	238.00 - 200.00	1.0800	1.0800
			200.00 - 180.80	0.6000	0.6000
T4	1	Safety Line 3/8"	200.00 - 180.80	0.6000	0.6000
			180.80 - 170.00	0.6000	0.6000
T4	2	Lighting power cord	180.00 - 170.00	0.6000	0.6000
			170.00 - 160.80	0.6000	0.6000
T4	3	LDF7-50A (1-5/8 FOAM)	180.00 - 170.00	0.6000	0.6000
			170.00 - 160.80	0.6000	0.6000
T4	4	LDF7-50A (1-5/8 FOAM)	180.00 - 170.00	0.6000	0.6000
			170.00 - 160.80	0.6000	0.6000
T4	6	LDF7-50A (1-5/8 FOAM)	180.00 - 170.00	0.6000	0.6000
			170.00 - 160.80	0.6000	0.6000
T4	7	Feedline Ladder (AD)	180.00 - 170.00	1.0000	1.0000
			170.00 - 160.80	1.0000	1.0000
T4	8	Feedline Ladder (AD)	180.00 - 170.00	1.0000	1.0000
			170.00 - 160.80	1.0000	1.0000
T4	9	Feedline Ladder (AD)	180.00 - 170.00	1.0000	1.0000
			170.00 - 160.80	1.0000	1.0000
T5	1	Safety Line 3/8"	160.00 - 150.00	0.6000	0.5883
			150.00 - 140.00	0.6000	0.5883
T5	2	Lighting power cord	160.00 - 150.00	0.6000	0.5883
			150.00 - 140.00	0.6000	0.5883
T5	3	LDF7-50A (1-5/8 FOAM)	160.00 - 150.00	0.6000	0.5883
			150.00 - 140.00	0.6000	0.5883
T5	4	LDF7-50A (1-5/8 FOAM)	160.00 - 150.00	0.6000	0.5883
			150.00 - 140.00	0.6000	0.5883
T5	6	LDF7-50A (1-5/8 FOAM)	160.00 - 150.00	0.6000	0.5883
			150.00 - 140.00	0.6000	0.5883
T5	7	Feedline Ladder (AD)	160.00 - 150.00	1.0000	1.0000
			150.00 - 140.00	1.0000	1.0000
T5	8	Feedline Ladder (AD)	160.00 - 150.00	1.0000	1.0000
			150.00 - 140.00	1.0000	1.0000
T5	9	Feedline Ladder (AD)	160.00 - 150.00	1.0000	1.0000
			150.00 - 140.00	1.0000	1.0000
T6	1	Safety Line 3/8"	140.00 - 130.00	0.6000	0.6008
			130.00 - 120.00	0.6000	0.6008
T6	2	Lighting power cord	140.00 - 130.00	0.6000	0.6000
			130.00 - 120		

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offset: Horiz Lateral	Offset: Vert	Adjustment	Placement	C _{As} Front	C _{As} Side	Weight
			ft	ft		ft	ft ²	ft ²	K
Beacon	A	From Leg	0.30	0.0080		250.00	No Ice 2.40	2.40	0.07
			0.60			1/2" Ice 2.67	2.67	0.10	
			4.39			1" Ice 2.96	2.96	0.12	
Beacon Extender (4) 803062	A	From Leg	0.00	0.0000		250.80	No Ice 1.11	1.11	0.03
			0.00			1/2" Ice 1.32	1.32	0.04	
			2.21			1" Ice 1.54	1.54	0.05	
8ft lightning rod	C	From Leg	0.00	0.0000		250.00	No Ice 1.20	1.20	0.05
			0.90			1/2" Ice 2.00	2.00	0.36	
			4.00			1" Ice 2.80	2.80	0.98	
ATC Loading	C	None	0.0000			256.00	No Ice 115.00	115.00	2.00
						1/2" Ice 135.00	135.00	3.00	
						1" Ice 155.00	155.00	4.00	
ATC Loading	C	None	0.0000			240.00	No Ice 115.00	115.00	2.00
						1/2" Ice 135.00	135.00	3.00	
						1" Ice 155.00	155.00	4.00	
ATC Loading	C	None	0.0000			220.00	No Ice 115.00	115.00	2.00
						1/2" Ice 135.00	135.00	3.00	
						1" Ice 155.00	155.00	4.00	

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Ice	Leg Area
	in ²	in ²	K	K	in	in	in ²
#122G-1.75"-1.80" com.-HBD-Trans (Piled 229588)	2209.6087	5808.4093	0.84	2.27	7.6410	20.1681	7,2158
#122G-1.75"-1.80" com.-HBD-Trans (Piled 229588)	2209.6087	5796.0500	0.84	2.26	7.6410	20.1252	7,2158
#122G-2.00"-0.875" com.-HBD-Trans (Piled 208332)	2321.4820	5854.1285	0.99	2.29	8.0607	20.3268	9,4248
#122G-2.25"-0.875" com.-HBD-Trans (Piled 208332)	2457.0620	5910.1026	1.17	2.31	8.5315	20.5212	11,9282
#122G-2.25"-0.875" com.-HBD-Trans (Piled 208334)	2457.0620	5891.2118	1.17	2.30	8.5315	20.4556	11,9282

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Ice	Leg Area
	in ²	in ²	K	K	in	in	in ²
0.875" con. (Piled 28334)							
#122G-2.50"-0.875" con. (Piled 28335)	2597.2622	5940.0828	1.37	2.31	9.0183	20.6253	14,7262
#122G-2.50"-0.875" con. (Piled 28335)	2597.2622	5910.0109	1.37	2.28	9.0183	20.5209	14,7262
#122G-2.75"-0.875" con. (Piled 28337)	2816.7341	5938.2486	1.63	2.28	9.7883	20.6189	17,8187
#122G-2.75"-0.875" con. (Piled 28337)	2816.7341	5851.3735	1.63	2.10	9.7803	20.3173	17,8187

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation	z	K _t	q _s	A _o	F _a	F _r	A _s	A _u	Leg %	C _{As} In	C _{As} Out
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²	%	Face	Face
250.00-240.00	T1	245.00	1.528	27	52.396	A	4.623	4.792	4.792	50.89	0.000
						B	4.623	4.792		50.89	41.319
						C	4.623	4.792		50.89	0.000
240.00-220.00	T2	230.00	1.508	27	187.500	A	7.169	15.000	15.000	67.66	81.280
						B	7.169	15.000		67.66	83.020
						C	7.169	15.000		67.66	41.300
220.00-200.00	T3	210.00	1.48	26	129.283	A	7.669	18.574	18.574	78.78	154.308
						B	7.669	18.574		78.78	82.030
						C	7.669	18.574		78.78	81.280
200.00-180.00	T4	190.00	1.449	26	171.053	A	11.361	22.120	22.120	66.07	154.300
						B	11.361	22.120		66.07	82.030
						C	11.361	22.120		66.07	81.280
180.00-160.00	T5	170.00	1.415	25	222.945	A	12.313	25.512	25.512	67.45	81.280
						B	12.313	25.512		67.45	154.300
						C	12.313	25.512		67.45	82.030
160.00-140.00	T6	150.00	1.378	24	262.945	A	13.727	25.512	25.512	65.02	81.280
						B	13.727	25.512		65.02	154.300
						C	13.727	25.512		65.02	82.030
140.00-120.00	T7	130.00	1.337	24	308.362	A	11.332	26.914	26.914	70.37	81.280
						B	11.332	26.914		70.37	154.300
						C	11.332	26.914		70.37	81.280
120.00-100.00	T8	110.00	1.291	23	343.780	A	11.896	28.486	28.486	70.54	154.300
						B	11.896	28.486		70.54	82.030
						C	11.896	28.486		70.54	81.280
100.00-80.00	T9	90.00	1.238	22	383.780	A	12.514	28.486	28.486	69.48	154.300
						B	12.514	28.486		69.48	82.030
						C	12.514	28.486		69.48	81.280
80.00-60.00	T10	70.00	1.174	21	424.197	A	15.375	30.111	30.111	66.20	154.300
						B	15.375	30.111		66.20	82.030
						C	15.375	30.111		66.20	81.280
60.00-40.00	T11	50.00	1.094	19	464.197	A	16.198	30.111	30.111	65.02	81.280
						B	16.198	30.111		65.02	154.300
						C	16.198	30.111		65.02	82.030

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	Client	American Tower Corp.	Designed by	na1

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	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section Elevation	z	K _t	q _s	A _o	F _a	F _r	A _s	A _u	Leg %	C _{As} In	C _{As} Out
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²	%	Face	Face
40.00-20.00	T12	30.00	0.982	17	504.614	A	17.060	32.653	32.653	65.68	81.280
						B	17.060	32.653		65.68	154.300
						C	17.060	32.653		65.68	82.030
20.00-0.00	T13	10.00	0.85	13	544.614	A	17.958	32.653	32.653	64.52	81.280
						B	17.958	32.653		64.52	154.300
						C	17.958	32.653		64.52	82.030

Tower Pressure - Service

$G_H = 0.850$

Section Elevation	z	K _t	q _s	A _o	F _a	F _r	A _s	A _u	Leg %	C _{As} In	C _{As} Out
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²	%	Face	Face
250.00-240.00	T1	245.00	1.528	12	52.396	A	4.623	4.792	4.792	50.89	0.000
						B	4.623	4.792		50.89	41.319
						C	4.623	4.792		50.89	0.000
240.00-220.00	T2	230.00	1.508	12	107.500	A	7.169	15.000	15.000	67.66	81.280
						B	7.169	15.000		67.66	83.020
						C	7.169	15.000		67.66	41.300
220.00-200.00	T3	210.00	1.48	12	129.283	A	7.669	18.574	18.574	78.78	154.308
						B	7.669	18.574		78.78	82.030
						C	7.669	18.574		78.78	81.280
200.00-180.00	T4	190.00	1.449	11	171.053	A	11.361	22.120	22.120	66.07	154.300
						B	11.361	22.120		66.07	82.030
						C	11.361	22.120		66.07	81.280
180.00-160.00	T5	170.00	1.415	11	222.945	A	12.313	25.512	25.512	67.45	81.280
						B	12.313	25.512		67.45	154.300
						C	12.313	25.512		67.45	82.030
160.00-140.00	T6	150.00	1.378	11	262.945	A	13.727	25.512	25.512	65.02	81.280
						B	13.727	25.512		65.02	154.300
						C	13.727	25.512		65.02	82.030
140.00-120.00	T7	130.00	1.337	10	308.362	A	11.332	26.914	26.914	70.37	81.280
						B	11.332	26.914		70.37	154.300
						C	11.332	26.914		70.37	81.280
120.00-100.00	T8	110.00									

tnxTower 1345 Picket Drive Plymouth, IN 46563 Phone: (317) 936-4321 FAX: (317) 936-6438	Job	238614	Page	17 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1345 Picket Drive Plymouth, IN 46563 Phone: (317) 936-4321 FAX: (317) 936-6438	Job	238614	Page	18 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
240.00-220.00			B	0.206	2.573				15.243			
T3	1.69	1.28	C	0.206	2.573				15.243	4.25	212.27	B
220.00-200.00			A	0.203	2.586	26	1	1	16.962			
T4	1.69	1.73	B	0.203	2.586				16.962			
200.00-180.00			C	0.203	2.586				16.962			
T5	1.69	3.09	A	0.196	2.61	26	1	1	21.545	4.43	221.37	B
180.00-160.00			B	0.196	2.61				21.545			
T6	1.69	3.11	C	0.196	2.61				21.545			
160.00-140.00			A	0.17	2.7	25	1	1	23.257	4.48	223.11	B
140.00-120.00			B	0.17	2.7				23.257			
T7	1.69	4.03	C	0.17	2.7				23.257			
120.00-100.00			A	0.149	2.774	24	1	1	24.399	4.45	222.35	B
100.00-80.00			B	0.149	2.774				24.399			
T8	1.69	4.62	C	0.126	2.861	23	1	1	22.284	4.24	211.82	B
80.00-60.00			A	0.126	2.861				22.284			
T9	1.69	4.62	B	0.117	2.895	23	1	1	23.373	4.17	208.27	B
60.00-40.00			C	0.117	2.895				23.373			
T10	1.69	4.68	A	0.107	2.935	22	1	1	23.853	4.84	201.87	B
40.00-20.00			B	0.107	2.935				23.853			
T11	1.69	6.11	C	0.107	2.935				23.853			
20.00-0.00			A	0.099	2.97	17	1	1	29.941	3.48	174.87	B
Sum Weight:	28.81	58.19							6094.14 kip-ft	48.45		

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
208.00-180.00			B	0.196	2.61				19.273			
T5	1.69	3.09	A	0.17	2.7	25	0.8	1	19.273	4.32	216.06	C
180.00-160.00			B	0.17	2.7				19.273			
T6	1.69	3.15	C	0.17	2.7				19.273			
160.00-140.00			A	0.149	2.774	24	0.8	1	21.545	4.29	214.19	C
140.00-120.00			B	0.149	2.774				21.545			
T7	1.69	4.83	C	0.149	2.774				21.545			
120.00-100.00			A	0.126	2.861	24	0.8	1	20.818	4.11	203.32	C
100.00-80.00			B	0.126	2.861				20.818			
T8	1.69	4.62	C	0.117	2.895	23	0.8	1	20.818	4.03	201.61	C
80.00-60.00			A	0.117	2.895				20.818			
T9	1.69	4.68	B	0.107	2.935	22	0.8	1	20.818	3.90	195.83	C
60.00-40.00			C	0.107	2.935				20.818			
T10	1.69	6.01	A	0.107	2.935	21	0.8	1	24.922	3.85	192.36	C
40.00-20.00			B	0.099	2.97	17	0.8	1	24.922			
T11	1.69	7.82	C	0.099	2.97				24.922			
20.00-0.00			A	0.099	2.97	15	0.8	1	27.168	2.92	145.78	C
Sum Weight:	28.81	50.19							5922.08 kip-ft	46.79		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
250.00-240.00			A	0.18	2.665	27	0.8	1	6.437	0.59	98.54	C
T1	0.24	0.34	B	0.18	2.665				6.437			
240.00-220.00			C	0.18	2.665				6.437			
T2	1.17	1.01	A	0.206	2.575	27	0.8	1	13.810	2.98	148.81	C
220.00-200.00			B	0.206	2.575				13.810			
T3	1.69	1.28	C	0.206	2.575				13.810			
200.00-180.00			A	0.203	2.586	26	0.8	1	15.428	4.18	287.87	C
180.00-160.00			B	0.203	2.586				15.428			
T4	1.69	1.73	C	0.196	2.61	26	0.8	1	19.273	4.30	214.83	C

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
238.00-210.00			A	0.18	2.665	27	0.85	1	6.668	1.00	99.06	C
T1	0.24	0.34	B	0.18	2.665				6.668			
210.00-190.00			C	0.18	2.665				6.668			
T2	1.17	1.01	A	0.206	2.575	27	0.85	1	14.168	3.25	162.41	C
190.00-170.00			B	0.206	2.575				14.168			
T3	1.69	1.28	C	0.206	2.575				14.168			
170.00-150.00			A	0.203	2.586	26	0.85	1	15.811	3.81	190.73	C
150.00-130.00			B	0.203	2.586				15.811			
T4	1.69	1.73	C	0.203	2.586				15.811			
130.00-110.00			A	0.196	2.61	26	0.85	1	19.841	3.97	198.58	C
110.00-90.00			B	0.196	2.61				19.841			
T5	1.69	3.09	C	0.196	2.61				19.841			
90.00-70.00			A	0.17	2.7	25	0.85	1	21.418	4.01	200.37	C
70.00-50.00			B	0.17	2.7				21.418			
T6	1.69	3.15	C	0.17	2.7				21.418			

tnxTower 1345 Picket Drive Plymouth, IN 46563 Phone: (317) 936-4321 FAX: (317) 936-6438	Job	238614	Page	19 of 59
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	Client	American Tower Corp.	Designed by	na1

tnxTower 1345 Picket Drive Plymouth, IN 46563 Phone: (317) 936-4321 FAX: (317) 936-6438	Job	238614	Page	20 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
160.00-140.00			B	0.149	2.774				22.348			
T7	1.69	4.83	C	0.149	2.774				22.348			
140.00-120.00			A	0.126	2.861	24	0.85	1	20.395	3.81	190.46	C
120.00-100.00			B	0.126	2.861				20.395			
T8	1.69	4.62	C	0.126	2.861				20.395			
100.00-80.00			A	0.117	2.895	23	0.85	1	21.518	3.75	187.35	C
80.00-60.00			B	0.117	2.895				21.518			
T9	1.69	4.68	C	0.107	2.935	22	0.85	1	21.976	3.63	181.49	C
60.00-40.00			A	0.107	2.935				21.976			
T10	1.69	6.01	B	0.107	2.935	21	0.85	1	25.061	3.60	180.07	C
40.00-20.00			C	0.107	2.935				25.061			
T11	1.69	6.11	A	0.1	2.965	19	0.85	1	25.661	3.40	169.83	C
20.00-0.00			B	0.1	2.965				25.661			
T12	1.69	7.02	C	0.099	2.97	17	0.85	1	27.382	3.13	156.37	C
Sum Weight:	28.01	50.19							5601.48 kip-ft	44.08		

Section Elevation	Add Weight	Self Weight	F a c #	#	C _r	g _s	D _r	D _s	A _e	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
120.00-100.00			B	0.269	2.383				60.219			
T9	0.98	13.90	C	0.269	2.383				60.219			
100.00-80.00			A	0.243	2.458	2	1	1	60.425	0.72	35.78	C
80.00-60.00			B	0.243	2.458				60.425			
T10	0.83	15.65	C	0.229	2.501	2	1	1	63.573	0.70	34.83	C
60.00-40.00			A	0.211	2.559	2	1	1	64.04			

tnxTower 1545 Fideo Drive Plymouth, IN 46363 Phone: (317) 936-4211 FAX: (317) 936-6438	Job	238614	Page	21 of 59
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	Client	American Tower Corp.	Designed by	na1

Section Elevation	Add Weight	Self Weight	F _a	e	C _p	g _s	D _r	D _x	A _t	F	w	Ctrl Face
ft	K	K	ft	ft		psf			ft ²	K	plf	
80.00-60.00			B	0.229	2.501		0.8		60.498			
			C	0.229	2.501		0.8		60.498	0.64	32.01	B
			A	0.211	2.559		0.8		60.806			
T11	8.64	15.70	B	0.211	2.559		0.8		60.806			
			C	0.211	2.559		0.8		60.806			
			A	0.197	2.606		0.8		61.476	0.58	28.94	B
T12	8.37	16.56	B	0.197	2.606		0.8		61.476			
			C	0.197	2.606		0.8		61.476			
			A	0.181	2.666		0.8		60.936	0.50	25.11	B
T13	7.83	16.22	B	0.181	2.666		0.8		60.936			
			C	0.181	2.666		0.8		60.936			
			A	0.181	2.666		0.8		60.936	0.50	25.11	B
Sum Weight:	107.11	141.98						OTM	1053.56	8.30		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F _a	e	C _p	g _s	D _r	D _x	A _t	F	w	Ctrl Face
ft	K	K	ft	ft		psf			ft ²	K	plf	
T1	1.48	1.33	A	0.433	2.803		3	0.85	16.548	0.20	19.71	C
			B	0.433	2.803		0.85		16.548			
			C	0.433	2.803		0.85		16.548	0.60	29.94	C
T2	7.03	3.19	A	0.417	2.831		3	0.85	16.548			
			B	0.417	2.831		0.85		16.548			
			C	0.417	2.831		0.85		16.548			
T3	9.51	3.66	A	0.385	2.894		3	0.85	16.548	0.68	34.04	B
			B	0.385	2.894		0.85		16.548			
			C	0.385	2.894		0.85		16.548			
T4	9.45	4.73	A	0.348	2.175		3	0.85	16.548	0.70	35.20	B
			B	0.348	2.175		0.85		16.548			
			C	0.348	2.175		0.85		16.548			
T5	9.37	11.83	A	0.411	2.042		3	0.85	16.548	0.77	38.71	B
			B	0.411	2.042		0.85		16.548			
			C	0.411	2.042		0.85		16.548			
T6	9.29	12.85	A	0.361	1.147		3	0.85	16.548	0.78	38.80	B
			B	0.361	1.147		0.85		16.548			
			C	0.361	1.147		0.85		16.548			
T7	9.21	13.12	A	0.298	2.301		3	0.85	16.548	0.75	37.31	B
			B	0.298	2.301		0.85		16.548			
			C	0.298	2.301		0.85		16.548			
T8	9.10	13.84	A	0.269	2.383		3	0.85	16.548	0.73	36.55	B
			B	0.269	2.383		0.85		16.548			
			C	0.269	2.383		0.85		16.548			
T9	8.98	13.90	A	0.243	2.458		2	0.85	16.548	0.71	35.42	B
			B	0.243	2.458		0.85		16.548			
			C	0.243	2.458		0.85		16.548			
T10	8.83	15.65	A	0.229	2.501		2	0.85	16.548	0.69	34.39	B
			B	0.229	2.501		0.85		16.548			
			C	0.229	2.501		0.85		16.548			
T11	8.64	15.70	A	0.211	2.559		2	0.85	16.548	0.63	32.30	B
			B	0.211	2.559		0.85		16.548			
			C	0.211	2.559		0.85		16.548			
T12	8.37	16.56	A	0.197	2.606		2	0.85	16.548	0.58	29.21	B

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F _a	e	C _p	g _s	D _r	D _x	A _t	F	w	Ctrl Face
ft	K	K	ft	ft		psf			ft ²	K	plf	
T1	0.24	0.34	A	0.18	2.665		12	0.8	6.437	0.44	43.80	C
			B	0.18	2.665		0.8		6.437			
			C	0.18	2.665		0.8		6.437			
T2	1.17	1.01	A	0.206	2.575		12	0.8	13.810	1.32	66.14	C
			B	0.206	2.575		0.8		13.810			
			C	0.206	2.575		0.8		13.810			
T3	1.69	1.28	A	0.203	2.586		12	0.8	15.428	1.85	92.39	C
			B	0.203	2.586		0.8		15.428			
			C	0.203	2.586		0.8		15.428			
T4	1.69	1.73	A	0.196	2.61		11	0.8	19.273	1.91	95.48	C
			B	0.196	2.61		0.8		19.273			
			C	0.196	2.61		0.8		19.273			
T5	1.69	3.09	A	0.17	2.7		11	0.8	20.794	1.92	96.83	C
			B	0.17	2.7		0.8		20.794			
			C	0.17	2.7		0.8		20.794			
T6	1.69	3.15	A	0.149	2.774		11	0.8	21.654	1.91	93.33	C
			B	0.149	2.774		0.8		21.654			
			C	0.149	2.774		0.8		21.654			
T7	1.69	4.03	A	0.126	2.861		18	0.8	20.019	1.83	91.26	C
			B	0.126	2.861		0.8		20.019			
			C	0.126	2.861		0.8		20.019			
T8	1.69	4.62	A	0.117	2.893		10	0.8	20.993	1.79	89.60	C
			B	0.117	2.893		0.8		20.993			
			C	0.117	2.893		0.8		20.993			
T9	1.69	4.68	A	0.107	2.937		10	0.8	21.350	1.73	86.69	C
			B	0.107	2.937		0.8		21.350			
			C	0.107	2.937		0.8		21.350			
T10	1.69	6.01	A	0.107	2.937		9	0.8	21.350	1.71	85.58	C
			B	0.107	2.937		0.8		21.350			
			C	0.107	2.937		0.8		21.350			
T11	1.69	6.11	A	0.1	2.965		9	0.8	21.851	1.61	80.60	C
			B	0.1	2.965		0.8		21.851			
			C	0.1	2.965		0.8		21.851			
T12	1.69	7.82	A	0.099	2.97		8	0.8	26.729	1.48	74.05	C
			B	0.099	2.97		0.8		26.729			
			C	0.099	2.97		0.8		26.729			
T13	1.69	7.13	A	0.093	2.993		7	0.8	27.168	1.30	64.79	C
			B	0.093	2.993		0.8		27.168			
			C	0.093	2.993		0.8		27.168			
Sum Weight:	28.01	50.19						OTM	2623.11	20.00		

tnxTower 1545 Fideo Drive Plymouth, IN 46363 Phone: (317) 936-4211 FAX: (317) 936-6438	Job	238614	Page	22 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section Elevation	Add Weight	Self Weight	F _a	e	C _p	g _s	D _r	D _x	A _t	F	w	Ctrl Face
ft	K	K	ft	ft		psf			ft ²	K	plf	
40.00-20.00			B	0.197	2.606				62.329			
			C	0.197	2.606				62.329	0.50	25.11	B
			A	0.181	2.666				61.834			
T13	7.83	16.22	B	0.181	2.666				61.834			
			C	0.181	2.666				61.834			
			A	0.181	2.666				61.834			
Sum Weight:	107.11	141.98						OTM	1053.56	8.30		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F _a	e	C _p	g _s	D _r	D _x	A _t	F	w	Ctrl Face
ft	K	K	ft	ft		psf			ft ²	K	plf	
T1	0.24	0.34	A	0.18	2.665		12	1	7.362	0.46	46.31	B
			B	0.18	2.665		12	1	7.362			
			C	0.18	2.665		12	1	7.362			
T2	1.17	1.01	A	0.206	2.575		12	1	15.243	1.36	67.99	B

tnxTower 1343 Picka Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6458	Job	238614	Page	25 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1343 Picka Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6458	Job	238614	Page	26 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F	V _x	V _y	OTM _x	OTM _y	Torque
				K	K	K	kip-ft	kip-ft	kip-ft
T2	248.88-320.00	120	Wind Normal	0.81	0.70	0.40	98.46	-171.18	-0.22
		150	Wind 60	0.58	0.27	0.17	115.21	-66.58	-0.17
		180	Wind 90	0.75	0.00	0.75	183.26	-0.33	-8.21
		210	Wind Normal	1.00	-0.50	0.87	211.90	122.12	-8.17
		240	Wind Normal	1.84	-1.84	0.50	127.45	220.73	-0.81
		270	Wind 90	1.80	-1.80	0.88	-5.18	214.56	0.15
		300	Wind 60	0.75	-0.63	-0.37	-91.91	138.51	0.20
		330	Wind 90	0.94	-0.27	-0.47	-113.39	66.30	0.17
		0	Wind Normal	2.83	2.83	0.00	-650.33	-0.01	0.81
		30	Wind 90	2.80	1.40	-2.42	-557.79	-321.84	-8.88
		60	Wind 60	2.98	2.98	-1.49	-342.63	-892.83	-0.17
		90	Wind 90	3.25	3.25	0.00	-0.36	-777.08	-0.22
		120	Wind Normal	3.06	2.63	1.53	351.50	609.15	-8.19
		150	Wind 90	2.80	1.48	-2.42	-552.06	-321.84	-8.11
		180	Wind 60	2.74	0.05	2.74	610.46	-0.01	-0.01
		210	Wind Normal	2.80	-1.09	2.42	-457.06	721.82	0.20
		240	Wind Normal	3.06	-2.63	1.53	351.50	609.15	0.22
		270	Wind 90	3.25	-2.25	8.88	-31.50	747.07	0.17
		300	Wind 60	2.98	-2.98	-1.49	-342.63	892.83	0.19
		330	Wind 90	2.90	-1.40	-2.42	-557.79	-321.84	8.11
		0	Wind Normal	3.51	0.08	-3.51	-736.58	-8.56	2.28
		30	Wind 90	3.81	1.91	-3.20	-694.83	-401.88	0.19
		60	Wind 60	4.16	3.68	-2.08	-436.83	-746.64	0.21
		90	Wind 90	3.81	3.81	0.00	-801.61	-8.16	0.21
		120	Wind Normal	3.51	3.04	1.75	367.83	-638.19	-0.28
		150	Wind 90	3.50	1.75	3.03	636.08	-367.97	-8.29
		180	Wind 60	3.42	0.00	3.42	717.51	-0.16	-0.16
		210	Wind Normal	3.81	-1.91	3.38	693.42	399.97	-0.19
		240	Wind Normal	4.25	-3.68	2.12	445.48	717.52	-0.02
		270	Wind 90	3.81	-3.81	0.00	-0.38	800.49	0.16
		300	Wind 60	3.42	-2.96	-1.71	-359.21	621.08	0.27
		330	Wind 90	3.50	-1.75	-3.83	-626.69	366.86	0.33
		0	Wind Normal	3.70	0.88	-3.70	-780.69	-0.71	0.38
		30	Wind 90	3.97	1.99	-3.44	-658.90	-378.01	0.25
		60	Wind 60	4.30	3.72	-2.15	-488.57	-707.71	8.83
		90	Wind 90	3.97	3.97	0.00	-0.38	-755.32	-0.21
		120	Wind Normal	3.70	3.21	1.85	381.27	-659.79	-0.36
		150	Wind 90	3.66	1.83	3.17	692.33	-348.68	-0.43
		180	Wind 60	3.57	0.00	3.57	678.46	-0.71	-0.37
		210	Wind 90	3.97	-1.99	3.44	633.13	376.60	-0.25
		240	Wind Normal	4.43	-3.86	2.21	477.47	747.47	0.25
		270	Wind 90	3.97	-3.97	8.89	-8.38	753.90	0.21
		300	Wind 60	3.57	-3.09	-1.79	-339.81	597.19	0.35
		330	Wind 90	3.68	-3.17	-8.83	-317.27	-377.27	0.43
		0	Wind Normal	3.76	0.88	-3.76	-628.83	-0.86	0.46
		30	Wind 90	4.01	2.80	-3.47	-590.46	-741.49	0.10
		60	Wind 60	4.32	3.74	-2.16	-367.77	-637.84	0.03
		90	Wind 90	4.81	4.81	0.00	-0.82	-132.13	0.10
		120	Wind Normal	3.76	3.25	1.88	381.72	-553.70	-0.44
		150	Wind 90	3.71	1.85	3.21	545.13	-315.86	-0.31
		180	Wind 60	3.65	0.00	3.65	613.93	-0.86	-0.45
		210	Wind Normal	4.01	-2.06	3.47	-699.33	319.78	-0.30
		240	Wind Normal	4.46	-3.86	2.23	378.82	626.08	-0.23
		270	Wind 90	4.01	-4.01	0.00	-0.46	600.41	-0.63
		300	Wind 60	3.61	-3.13	-1.85	-307.87	562.83	-0.42
		330	Wind 90	3.71	-1.85	-3.21	-546.06	314.14	0.51
		0	Wind Normal	3.76	0.00	-3.76	-564.38	-1.81	0.34
		30	Wind 90	3.99	1.99	-3.49	-518.76	-300.20	0.35
		60	Wind 60	4.28	3.78	-2.14	-322.88	-518.27	0.84
		90	Wind 90	3.99	3.99	0.00	-1.25	-599.39	-0.20
		120	Wind Normal	3.76	3.25	1.88	381.33	-519.23	-0.51

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F	V _x	V _y	OTM _x	OTM _y	Torque
				K	K	K	kip-ft	kip-ft	kip-ft
T7	140.88-180.80	180	Wind 90	3.70	1.85	3.20	479.30	-276.17	-8.60
		210	Wind 60	3.60	0.00	3.60	539.61	-1.01	-0.21
		240	Wind Normal	3.99	-1.99	3.45	517.66	298.18	-0.31
		270	Wind Normal	4.45	-3.81	2.22	332.98	576.68	-0.01
		300	Wind 90	3.99	-3.99	0.80	-0.35	397.37	0.29
		330	Wind 60	3.60	-3.12	-1.88	-378.63	465.78	0.49
		0	Wind Normal	3.70	-1.83	-3.20	-488.60	-276.15	8.60
		30	Wind Normal	3.57	0.08	-3.57	-464.49	-1.16	8.39
		60	Wind 60	3.81	1.90	-3.20	-614.74	-248.78	0.36
		90	Wind 90	4.11	3.56	-2.57	-267.55	-468.10	8.04
		120	Wind Normal	3.81	3.81	0.00	-0.63	-496.35	-0.32
		150	Wind Normal	3.97	3.00	1.70	231.31	-482.88	-0.56
		180	Wind 90	3.42	1.76	3.81	198.13	-232.23	-8.66
		210	Wind 60	3.44	0.08	3.44	446.34	-1.16	-0.37
		240	Wind Normal	3.81	-1.98	3.38	428.32	246.44	-8.59
		270	Wind Normal	4.25	-3.68	2.12	212.12	475.79	-0.24
		300	Wind 90	3.81	-3.81	0.00	-0.63	491.93	0.32
		330	Wind 60	3.44	-2.98	-1.72	-224.11	383.93	0.54
		0	Wind Normal	3.92	-1.76	-3.83	-397.39	227.91	8.66
		30	Wind 90	3.92	0.98	-3.32	-387.93	-1.21	8.66
		60	Wind 60	3.75	1.87	-3.25	-357.66	-207.40	8.43
		90	Wind 90	4.03	3.49	-2.82	-322.17	-385.42	0.03
		120	Wind Normal	3.75	3.75	0.00	-0.71	-415.48	-8.36
		150	Wind Normal	3.52	3.03	1.76	192.90	-326.63	-0.62
		180	Wind 90	3.47	1.74	3.01	338.83	-192.26	-0.73
		210	Wind 60	3.39	0.00	3.39	371.86	-1.31	-0.63
		240	Wind Normal	3.71	-1.87	3.24	-219.24	204.77	-0.41
		270	Wind Normal	4.17	-3.61	2.00	228.30	395.49	-8.03
		300	Wind 90	3.75	-3.75	0.00	-0.71	418.86	0.36
		330	Wind 60	3.39	-2.93	-1.69	-186.99	321.34	0.55
		0	Wind Normal	3.47	-1.74	-3.01	-331.44	-189.64	0.73
		30	Wind Normal	3.42	0.00	-3.42	-308.49	-1.46	0.71
		60	Wind 60	3.63	1.81	-3.14	-283.71	-164.81	8.46
		90	Wind 90	3.90	3.18	-3.19	-219.24	-305.52	8.36
		120	Wind 90	3.63	1.63	0.00	-0.79	-328.15	-8.38
		150	Wind Normal	3.42	2.96	1.71	133.06	-267.94	-0.67
		180	Wind 90	3.37	1.68	2.92	261.57	-152.94	-8.78
		210	Wind Normal	3.28	0.00	3.28	294.61	-1.46	-0.68
		240	Wind Normal	3.63	-1.81	3.14	282.13	161.88	-0.46
		270	Wind Normal	4.04	-3.40	2.02	180.89	313.22	-0.05
		300	Wind 90	3.63	0.00	3.63	403.67	-0.21	-0.38
		330	Wind 60	3.28	-2.84	-1.64	-148.58	254.39	0.64
		0	Wind Normal	3.37	-1.68	-2.92	-263.15	-158.81	8.78
		30	Wind Normal	3.42	0.08	-3.42	-340.31	-1.61	8.77
		60	Wind 60	3.60	1.88	-3.19	-219.24	-305.52	8.36
		90	Wind 90	3.85	3.34	-3.93	-135.66	-235.00	0.04
		120	Wind 90	3.60	3.60	0.00	-0.87	-253.71	-8.41
		150	Wind Normal	3.60	3.18	1.71	118.86	-209.15	-0.73
		180	Wind 60	3.33	1.68	2.90	202.29	-118.94	-8.81
		210	Wind 90	3.26	0.08	3.26	227.66	-1.61	-0.74
		240	Wind Normal	3.60	-1.80	3.12	217.46	124.47	-8.38
		270	Wind Normal	4.01	-3.47	2.01	138.84	241.48	-0.66
		300	Wind 90	3.60	-3.60	0.00	-0.87	236.49	8.41
		330	Wind 60	3.26	-2.83	-1.63	-115.13	196.30	8.69
		0	Wind Normal	3.42	-1.68	-2.98	-204.03	-115.68	8.85
		30	Wind Normal	3.47	0.08	-3.47	-314.21	-1.76	8.85
		60	Wind 60	3.40	1.70	-2.94	-148.83	-86.08	8.51
		90	Wind 90	3.63	3.14	-3.81	-91.62	-158.81	8.86
		120	Wind Normal	3.60	3.00	1.80	340.31	-171.50	-0.43
		150	Wind Normal	3.24	2.88	1.62	80.00	-141.97	-8.75
		180	Wind 90	3.16	1.58	2.74	136.03	-88.85	-8.87

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	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1343 Picka Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6458	Job	238614	Page	28 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F	V _x	V _y	OTM _x	OTM _y	Torque
				K					

tnxTower		Job	238614	Page	29 of 59
1545 Piddo Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

tnxTower		Job	238614	Page	30 of 59
1545 Piddo Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F _K	V _{1/2} K	V _{1/4} K	V _{1/8} K	OTM _L kip-ft	OTM _T kip-ft	Torque kip-ft
T7	140.00-120.00	30	Wind 90	0.77	0.38	-0.67	-101.40	-62.37	0.02	
		60	Wind 60	0.76	0.38	-0.38	-58.77	-103.78	0.02	
		90	Wind 30	0.77	0.37	0.00	-1.39	-119.99	0.01	
		120	Wind Normal	0.78	0.68	0.39	53.11	-105.65	0.01	
		150	Wind 60	0.78	0.39	0.67	99.21	-62.95	0.01	
		180	Wind 30	0.77	0.00	0.77	113.91	-4.75	-0.02	
		210	Wind 90	0.77	-0.38	0.67	98.21	55.87	-0.02	
		240	Wind Normal	0.78	-0.67	0.39	-46.60	96.04	-0.02	
		270	Wind 30	0.77	-0.77	0.00	-1.59	118.50	-0.01	
		300	Wind 60	0.77	-0.67	-0.39	-19.35	93.28	-0.00	
		330	Wind 90	0.78	-0.39	-0.67	-102.40	-51.45	0.02	
		360	Wind Normal	0.78	0.00	-0.25	-59.64	-4.42	0.02	
		30	Wind 90	0.74	0.37	-0.64	-45.00	-51.44	8.03	
		60	Wind 60	0.73	0.64	-0.37	-49.30	-87.99	0.03	
		90	Wind 30	0.74	0.00	-1.83	-101.46	60.02	0.02	
		120	Wind Normal	0.75	0.63	0.98	47.08	-90.13	0.00	
		150	Wind 60	0.73	0.37	0.65	82.18	-53.93	0.00	
		180	Wind 30	0.74	0.00	0.74	94.48	-5.82	-0.02	
210	Wind 90	0.74	-0.37	0.64	81.24	43.60	-0.03			
240	Wind Normal	0.74	-0.65	0.37	46.59	78.43	-0.02			
270	Wind 30	0.74	-0.74	0.00	-1.83	90.61	-0.03			
300	Wind 60	0.74	-0.64	-0.37	-49.98	71.98	-0.08			
330	Wind 90	0.75	-0.37	-0.65	-85.84	-43.08	8.01			
360	Wind Normal	0.74	0.00	-0.74	-83.23	-6.80	8.82			
30	Wind 90	0.72	0.36	-0.63	-71.03	-45.90	0.02			
60	Wind 60	0.72	0.62	-0.36	-41.58	-74.52	0.03			
90	Wind 30	0.72	0.00	-2.07	-83.71	8.82	8.81			
120	Wind Normal	0.74	0.64	0.37	38.51	-76.37	8.00			
150	Wind 60	0.73	0.37	0.63	67.57	-62.30	-0.31			
180	Wind 30	0.80	0.00	-51.37	-77.75	-6.89	-8.82			
210	Wind 90	0.72	-0.36	0.63	66.89	33.72	-8.83			
240	Wind Normal	0.73	-0.63	0.37	37.11	63.51	-8.83			
270	Wind 30	0.73	-0.73	0.00	-2.87	72.54	-8.82			
300	Wind 60	0.73	-0.63	-0.36	-41.98	63.04	-8.88			
330	Wind 90	0.73	-0.37	-0.63	-71.71	34.12	8.01			
360	Wind Normal	0.72	0.00	-0.72	-66.73	-4.74	8.83			
30	Wind 90	0.70	0.35	-0.64	-57.08	-38.31	8.83			
60	Wind 60	0.68	0.68	-0.35	-33.64	-68.99	8.83			
90	Wind 30	0.70	0.70	0.00	-2.32	-69.88	8.82			
120	Wind Normal	0.72	0.62	0.36	29.88	-62.52	0.81			
150	Wind 60	0.71	0.35	0.61	52.90	-38.62	-8.81			
180	Wind 30	0.78	0.00	0.70	60.95	-6.74	-0.02			
210	Wind 90	0.70	-0.35	0.61	52.36	24.83	-8.83			
240	Wind Normal	0.71	-0.61	0.35	29.57	48.50	-8.03			
270	Wind 30	0.70	-0.78	0.00	-2.32	56.48	-8.82			
300	Wind 60	0.78	-0.41	-0.35	-33.96	-48.03	-0.81			
330	Wind 90	0.71	-0.35	-0.61	-51.54	23.14	0.81			
360	Wind Normal	0.68	0.00	-0.78	-41.37	-7.37	0.83			
30	Wind 90	0.68	0.34	-0.59	-43.89	-31.22	8.83			
60	Wind 60	0.68	0.58	-0.34	-26.22	-49.32	0.02			
90	Wind 30	0.68	0.00	-2.59	-80.49	54.09	-8.87			
120	Wind Normal	0.76	0.68	0.35	21.81	-49.62	0.01			
150	Wind 60	0.69	0.34	0.68	39.11	-31.45	-0.01			
180	Wind 30	0.68	0.00	0.68	45.13	-7.37	-8.03			
210	Wind 90	0.68	-0.34	0.59	38.72	18.47	-8.03			
240	Wind Normal	0.69	-0.68	0.35	21.58	34.48	-8.03			
270	Wind 30	0.68	-0.68	0.00	-2.59	40.32	-8.82			
300	Wind 60	0.68	-0.59	-0.34	-25.45	-33.97	-0.01			
330	Wind 90	0.69	-0.34	-0.68	-44.29	16.70	0.81			
360	Wind Normal	0.66	0.00	-0.66	-33.63	-7.98	0.83			
30	Wind 90	0.64	0.32	-0.55	-30.58	-23.98	0.02			

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F _K	V _{1/2} K	V _{1/4} K	V _{1/8} K	OTM _L kip-ft	OTM _T kip-ft	Torque kip-ft
T12	40.00-20.00	60	Wind 60	0.63	0.35	-0.32	-18.72	-33.44	0.02	
		90	Wind 30	0.64	0.64	0.08	-2.87	-39.98	0.02	
		120	Wind Normal	0.66	0.57	0.33	13.51	-36.36	0.01	
		150	Wind 60	0.63	0.00	0.56	24.10	-24.11	-0.01	
		180	Wind 30	0.64	0.00	0.64	29.14	-7.98	-0.03	
		210	Wind 90	0.64	-0.32	0.55	24.84	8.02	-0.03	
		240	Wind Normal	0.65	-0.56	0.32	13.26	26.13	-0.03	
		270	Wind 30	0.64	-0.64	0.08	-2.87	21.02	-0.02	
		300	Wind 60	0.64	-0.55	-0.32	-18.87	19.74	-0.01	
		330	Wind 90	0.65	-0.32	-0.56	-30.84	8.17	8.01	
		360	Wind Normal	0.65	0.00	-0.59	-20.09	-8.54	0.03	
		30	Wind 90	0.58	0.29	-0.58	-18.22	-17.22	0.03	
		60	Wind 60	0.57	0.50	-0.29	-11.79	-23.43	0.83	
		90	Wind 30	0.58	0.58	0.08	-3.19	-25.90	0.02	
		120	Wind Normal	0.59	0.29	0.30	5.77	-32.95	0.01	
		150	Wind 60	0.58	0.00	0.51	12.00	-17.38	0.01	
		180	Wind 30	0.58	0.00	0.58	14.18	-8.54	-0.02	
		210	Wind 90	0.58	-0.29	0.50	11.83	8.14	-0.03	
240	Wind Normal	0.59	-0.51	0.29	5.63	6.74	-0.03			
270	Wind 30	0.58	-0.58	0.00	-3.19	8.83	-0.02			
300	Wind 60	0.58	-0.50	-0.29	-11.87	6.50	8.01			
330	Wind 90	0.58	-0.29	-0.51	-18.37	0.23	8.01			
360	Wind Normal	0.51	0.00	-0.51	-8.70	-8.96	8.82			
30	Wind 90	0.58	0.25	-0.43	-7.90	-11.45	0.03			
60	Wind 60	0.58	0.43	-0.25	-4.85	-12.53	8.03			
90	Wind 30	0.50	0.58	0.00	-1.59	-13.94	8.82			
120	Wind Normal	0.51	0.44	0.26	-1.83	-13.39	8.81			
150	Wind 60	0.50	0.25	0.42	8.76	-11.47	-8.81			
180	Wind 30	0.50	0.00	0.50	12.73	-21.50	0.00			
210	Wind 90	0.50	-0.25	0.43	8.72	-6.47	-8.03			
240	Wind Normal	0.51	-0.44	0.23	-1.86	-4.88	-8.83			
270	Wind 30	0.50	-0.50	0.00	-3.59	-3.59	-0.02			
300	Wind 60	0.50	-0.43	-0.23	-6.03	-4.66	-8.00			
330	Wind 90	0.50	-0.25	-0.43	-7.94	-6.35	8.81			

Mast Totals - With Ice

Wind Azimuth °	V _{1/2} K	V _{1/4} K	V _{1/8} K	OTM _L kip-ft	OTM _T kip-ft	Torque kip-ft
0	8.80	-8.31	-1064.00	-68.35	8.23	
30	4.11	-7.11	-92.96	-58.86	8.31	
60	7.12	-4.11	-348.49	-92.18	0.26	
90	8.26	0.00	-26.26	-114.17	0.13	
120	7.25	4.19	499.86	-979.61	-8.02	
150	4.11	7.12	863.69	-382.16	-0.16	
180	8.80	8.16	1064.00	68.35	8.23	
210	4.11	7.11	870.45	449.36	-8.31	
240	-7.25	4.18	503.76	849.67	-0.26	
270	-8.26	0.00	-26.26	977.47	-8.15	
300	-7.13	-4.12	-344.59	828.44	8.02	
330	-4.11	-7.12	-916.21	445.46	8.16	

tnxTower		Job	238614	Page	31 of 59
1545 Piddo Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

tnxTower		Job	238614	Page	32 of 59
1545 Piddo Drive Plymouth, IN 46363 Phone: (317) 936-4221 FAX: (317) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

Mast Vectors - Service

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F _K	V _{1/2} K	V _{1/4} K	V _{1/8} K	OTM _L kip-ft	OTM _T kip-ft	Torque kip-ft
T1	250.00-240.80	8	Wind Normal	0.36	0.00	-0.36	-47.86	-4.33	0.10	
		144	Wind 60	0.44	0.22	-0.18	-94.44	-54.75	0.07	
		60	Wind 30	0.44	0.38	-0.22	-53.83	-93.26	8.01	
		90	Wind 90	0.44	0.44	8.00	-8.18	-109.17	-0.07	
		120	Wind Normal	0.36	0.11	0.18	43.66	-76.26	-0.10	
		150	Wind 60	0.24	0.12	0.21	51.11	-29.94	-8.83	
		180	Wind 30	0.43	0.00	0.33	81.35	-0.33	-0.99	
		210	Wind 90	0.44	-0.22	0.38	94.08	54.09	-8.87	
		240	Wind Normal	0.46	-0.40	0.23	38.54	97.92	-0.23	
		270	Wind 30	0.44	-0.44	0.08	-0.18	108.51	0.87	
		300	Wind 60	0.33	-0.29	-0.17	-40.95	76.29	0.99	
		330	Wind 90	0.24	-0.12	-0.21	-51.47	29.28	0.99	
		360	Wind Normal	0.26	0.00	-1.26	-289.26	-0.01	0.01	
		30	Wind 90	1.24	0.62	-1.88	-218.11	-143.04	-8.04	
		60	Wind 60	1.32	1.15	-8.66	-132.48	-263.49	-8.87	
		90	Wind 30	1.44	1.44	0.08	-8.36	-132.84	-8.83	
		120	Wind Normal	1.36	1.18	0.68	156.02	-270.87	-8.08	
		150	Wind 60	1.24	0.62	1.08	247.38	-143.04	-8.05	
180	Wind 30	1.22	0.00	1.22	268.80	-0.81	-8.01			
210	Wind 90	1.24	-0.62	1.08	247.38	143.83	8.04			
240	Wind Normal	1.36	-1.18	0.68	156.02	270.86	8.88			
270	Wind 30	1.44	-1.44	0.00	-8.36	332.83	0.18			
300	Wind 60	1.32	-1.15	-0.66	-152.48	263.47	8.88			
330	Wind 90	1.24	-0.62	-1.88	-248.11	143.03	8.05			
360	Wind Normal	1.56	0.00	-1.56	-327.54	-0.56	0.13			
30	Wind 90	1.78	0.83	-1.47	-305.63	-178.57	0.89			
60	Wind 60	1.85	1.63	-1.01	-191.31	-336.60	0.01			
90	Wind 30	1.70	1.70	0.00	-0.30	-356.58	-8.87			
120	Wind Normal	1.56	1.35	0.78	313.					

inxTower		Job	238614	Page	33 of 59
1545 Picket Drive Plymouth, IN 46163 Phone: (574) 936-4221 FAX: (574) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

inxTower		Job	238614	Page	34 of 59
1545 Picket Drive Plymouth, IN 46163 Phone: (574) 936-4221 FAX: (574) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

Section No.	Section Elevation	Wind Azimuth	Directionality	F _K	F _V	F _V	OTM _L	OTM _R	Torque
	β	°		K	K	K	ktp-ft	ktp-ft	ktp-ft
T11	60.00-10.80	330	Wind 98	1.49	-0.74	-1.29	-91.16	50.52	0.38
		8	Wind Normal	1.44	1.44	-1.44	-72.98	-1.76	0.55
		38	Wind 90	1.51	0.75	-1.31	-66.32	-39.58	0.23
		68	Wind 60	1.61	1.40	-0.81	-41.25	-71.56	0.02
		90	Wind 30	1.51	1.51	0.00	-0.95	-77.24	-0.19
		120	Wind Normal	1.44	1.23	0.72	35.83	-64.08	-0.33
		150	Wind 90	1.41	0.70	1.22	59.93	-36.91	-0.39
		180	Wind 60	1.37	0.00	1.37	67.58	-1.76	-0.34
		210	Wind 30	1.24	1.24	1.24	64.42	35.98	-0.23
		248	Wind Normal	1.68	-1.46	0.84	41.10	71.87	-0.03
		270	Wind 90	1.21	-1.51	0.80	-0.95	73.72	8.19
		300	Wind 60	1.37	-1.15	-0.89	-33.18	57.32	8.32
		338	Wind 30	1.41	-0.78	-1.22	-64.83	35.39	0.39
T12	40.00-20.00	8	Wind Normal	1.33	0.08	-1.33	-48.91	-1.91	0.35
		38	Wind 98	1.39	0.69	-1.20	-37.14	-22.76	0.23
		60	Wind 68	1.48	1.28	-0.74	-23.25	-48.39	0.02
		90	Wind 98	1.39	1.39	0.00	-1.00	-43.61	-8.19
		120	Wind Normal	1.33	1.15	0.66	18.91	-36.45	-8.25
		158	Wind 90	1.38	0.63	1.12	32.66	-21.37	-0.39
		188	Wind 60	1.26	0.00	1.26	36.86	-1.91	-0.33
		218	Wind 30	1.39	-0.69	1.28	35.88	18.94	-0.23
		240	Wind Normal	1.35	-1.34	0.77	22.18	38.29	-0.85
		278	Wind 98	1.39	-1.39	0.88	-1.00	39.78	8.19
		308	Wind 60	1.26	-0.69	-0.63	-19.97	38.98	0.31
		338	Wind 30	1.30	-0.63	-1.12	-34.73	17.54	0.38
T13	20.80-8.88	8	Wind Normal	1.17	0.00	-1.17	-12.79	-2.06	0.33
		38	Wind 98	1.22	0.61	-1.03	-11.66	-8.15	0.21
		60	Wind 68	1.30	1.17	-0.65	-7.49	-13.20	0.82
		98	Wind 98	1.22	1.22	0.88	-1.11	-4.24	-0.19
		128	Wind Normal	1.17	1.01	0.58	4.33	-12.18	-0.31
		158	Wind 90	1.14	0.57	0.99	8.74	-7.75	-0.16
		188	Wind 60	1.11	0.00	1.11	9.96	-2.86	-0.31
		218	Wind 30	1.22	-0.61	1.03	9.43	4.00	-0.21
		240	Wind Normal	1.16	-1.17	0.63	5.67	9.69	-0.82
		278	Wind 98	1.22	-1.22	0.80	-1.11	10.12	-0.18
		308	Wind 68	1.11	-0.56	-0.51	-6.63	7.52	0.30
		338	Wind 38	1.12	-0.37	-0.59	-10.26	3.23	0.36

Discrete Appurtenance Pressures - No Ice $G_H = 0.850$

Description	Area Actual	Weight	Off _{Wind}	Off _{Ice}	z	K _t	g _f	C _s	C _e	C _g
	K	lb	ft	ft	ft			psf	psf	in
Beacon	0.0000	8.87	0.08	-2.89	254.39	1.341	27	2.40	2.40	2.40
Beacon Extender (4')	0.8008	0.03	0.00	-2.89	252.21	1.358	27	1.11	1.11	1.11
#03062										
88 Hipling rod	240.0080	8.85	-2.58	1.44	254.80	1.500	27	1.20	1.20	1.20
ATC Loading	0.0008	2.08	0.08	0.00	250.08	1.533	27	115.80	115.00	115.00
ATC Loading	0.8008	2.08	0.88	0.08	218.00	1.533	27	115.80	115.00	115.00
ATC Loading	0.8008	2.89	0.80	0.08	220.08	1.494	26	115.00	115.00	115.00
ATC Loading	0.8008	2.89	0.80	0.08	220.08	1.494	26	115.00	115.00	115.00
Sum										
Weight:		8.15								

Discrete Appurtenance Vectors - No Ice

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
0	0.00	0.00	0.00	0.00	-0.06	-14.38	0.00
38	0.03	0.83	0.83	-0.03	-12.41	-7.85	-0.39
60	0.03	0.03	0.83	-0.83	-7.26	-12.20	-0.14
98	0.08	0.08	0.86	0.86	-8.21	-14.89	-0.16
120	0.03	0.83	0.83	0.03	6.83	-12.20	-0.14
158	0.05	0.83	0.83	0.05	11.99	-7.85	-0.39
180	0.06	0.06	0.80	0.80	13.88	0.00	0.88
210	0.03	0.83	0.83	-0.03	8.85	11.99	7.85
248	0.05	0.83	0.83	0.05	6.83	6.83	8.14
278	0.08	0.86	0.86	-0.08	-8.21	14.89	0.16
308	0.03	0.83	0.83	-0.03	-7.26	12.20	0.14
338	0.03	0.03	-0.83	-0.83	-12.41	7.85	0.80

Mast Totals - Service

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
8	8.00	-18.38	-2304.02	-11.76	3.11		
38	9.78	-16.79	-1212.69	-12.79	1.98		
68	18.81	-10.48	-1319.89	-2286.44	0.14		
90	19.59	8.89	-4.33	-2385.64	-1.78		
128	15.21	9.19	1181.45	-3.88	0.00		
150	8.05	15.38	1931.91	-1134.96	-3.43		
188	0.08	17.55	2201.96	-14.76	-2.97		
218	-9.70	16.79	1207.70	-1.98			
248	-18.45	18.77	2330.84	-8.14			
270	-19.59	0.88	-8.33	2476.12	1.78		
308	-15.29	-8.83	-1123.41	1920.89	2.87		
338	-8.05	-15.38	-1183.41	1183.41	3.43		

Beacon Extender (4') #03062 - Elevation 252.31 - From Leg A

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
8	0.03	0.00	0.00	0.00	-0.03	-6.51	0.00
38	0.82	0.81	0.81	-0.82	-8.23	-3.22	-0.81
60	0.81	0.02	0.02	-8.81	-3.31	-5.59	-0.06
90	0.88	0.03	0.03	8.88	-0.89	-6.45	-0.07
120	0.81	0.81	0.81	0.81	3.14	-5.59	-0.88
158	0.83	0.81	0.81	0.82	5.58	-3.22	-0.81
188	0.83	0.00	0.80	0.83	6.36	0.00	0.83
210	0.82	0.81	-8.81	8.82	5.30	3.22	8.04
248	0.81	0.02	-8.81	8.81	3.14	5.59	0.81
278	0.88	0.03	-0.83	8.88	-3.31	6.45	0.07
308	0.81	0.81	-0.82	-8.81	-3.31	5.59	0.06
338	0.82	0.82	-0.81	-0.82	-5.67	3.22	8.04

88 Hipling rod - Elevation 254 - From Leg C

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
8	8.00	-18.38	-2304.02	-11.76	3.11		
38	9.78	-16.79	-1212.69	-12.79	1.98		
68	18.81	-10.48	-1319.89	-2286.44	0.14		
90	19.59	8.89	-4.33	-2385.64	-1.78		
128	15.21	9.19	1181.45	-3.88	0.00		
150	8.05	15.38	1931.91	-1134.96	-3.43		
188	0.08	17.55	2201.96	-14.76	-2.97		
218	-9.70	16.79	1207.70	-1.98			
248	-18.45	18.77	2330.84	-8.14			
270	-19.59	0.88	-8.33	2476.12	1.78		
308	-15.29	-8.83	-1123.41	1920.89	2.87		
338	-8.05	-15.38	-1183.41	1183.41	3.43		

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		Client	American Tower Corp.	Designed by	na1

inxTower		Job	238614	Page	36 of 59
1545 Picket Drive Plymouth, IN 46163 Phone: (574) 936-4221 FAX: (574) 936-6438		Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
		Client	American Tower Corp.	Designed by	na1

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
8	8.81	0.02	0.80	-0.03	-6.56	0.13	-0.07
38	8.82	0.81	0.81	-0.02	-6.02	-3.39	-0.04
60	8.83	0.08	0.82	-0.01	-3.44	-5.97	0.80
90	0.02	8.03	0.80	0.87	-6.94	0.84	0.87
120	0.01	8.02	8.82	0.81	3.59	-5.97	0.87
158	8.88	0.03	8.81	8.82	6.16	-3.39	8.88
188	8.81	0.02	0.08	0.83	7.19	8.13	8.07
218	8.81	-0.81	8.02	6.16	3.64	8.04	0.87
248	0.03	0.08	-0.02	0.01	3.59	6.22	8.00
270	0.82	0.81	-0.03	0.80	8.07	7.16	-0.04
308	0.01	8.82	-0.03	-8.81	-3.44	6.22	-0.07
338	0.88	0.83	-0.81	-0.02	-6.02	5.64	-8.98

Wind Azimuth	F _x	F _y	V _x	V _y	OTM _L	OTM _R	Torque
°	K	K	K	K	ktp-ft	ktp-ft	ktp-ft
128	2.60	0.00	2.25	2.25	298.82	-317.58	8.08
158	2.60	8.88	1.30	2.25	517.58	-298.82	8.80
188	2.60	8.88	8.00	2.68	597.65	0.80	8.88
218	2.60	8.88	0.87	2.25	517.58	298.82	8.08
240	2.68	0.88	-2.23	1.98	298.82	517.58	0.88
278	2.60	8.00	-2.60	0.88	8.88	597.65	0.88
308	2.68	0.00	-2.23	-1.39	-298.82	517.58	8.88
338	2.68	0.00	-1.39	-2.23	-317.58	298.82	8.08

Wind Azimuth	F _x
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tnxTower 1545 Pizzo Drive Plymouth, IN 46363 Phone: (774) 936-4221 FAX: (774) 936-6418	Job	238614	Page	37 of 59
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	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pizzo Drive Plymouth, IN 46363 Phone: (774) 936-4221 FAX: (774) 936-6418	Job	238614	Page	38 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Description	Aiming Azimuth	Weight	Offset _x	Offset _y	z	K _x	φ	C _x C _z Front	C _x C _z Side	I _x
	K		ft	ft	ft		psf	ft ²	ft ²	in
Beacon Extender (4')	0.0080	0.07	0.00	-2.89	252.21	1.538	3	1.83	1.83	1.8367
803062										
BH lightning rod	248.0000	8.13	-2.50	1.44	254.00	1.540	3	4.14	4.14	4.8567
ATC Loading	0.0000	1.67	0.00	0.00	248.00	1.535	3	184.47	184.47	1.8367
ATC Loading	8.8000	5.66	0.00	0.00	240.00	1.522	3	188.17	188.17	1.8292
ATC Loading	0.0003	5.64	0.08	0.08	230.00	1.508	3	187.86	187.86	1.8214
ATC Loading	8.9000	5.63	0.08	0.00	220.80	1.494	3	187.53	187.53	1.8134
Sum		22.96								
Weight:										

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
128	0.01	0.01	0.01	0.01	0.01	0.81	0.81	1.53	-2.02	0.03	0.03
150	0.80	0.01	0.01	0.01	0.81	0.81	2.52	-1.03	0.03	0.03	
180	0.01	0.01	0.01	0.88	0.01	0.88	2.88	-0.28	0.03	0.03	
210	0.01	0.01	0.01	-0.01	0.81	0.81	2.52	1.67	0.03	0.03	
240	8.81	0.00	-0.01	0.01	0.01	1.53	2.65	0.00	0.00	0.00	
270	0.01	0.01	-0.01	0.00	0.00	0.18	3.01	-0.02	-0.03	-0.03	
300	0.01	0.01	0.01	-0.01	-0.01	-1.16	2.65	0.00	0.00	0.00	
330	0.80	0.01	-0.01	-0.01	-0.01	-2.15	1.67	0.03	-0.03	-0.03	

Discrete Appurtenance Vectors - With Ice

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
0	0.01	0.00	0.00	0.00	-0.81	-2.68	0.00	0.00	0.00	0.00	0.00
30	0.01	0.00	0.00	-0.81	-2.34	-1.11	-1.92	-0.02	-0.01	-0.01	
60	0.01	0.01	0.01	-0.08	-1.57	-0.82	-1.92	-0.02	-0.01	-0.01	
90	8.01	0.01	0.01	0.00	-0.47	-2.21	-0.05	-0.02	-0.01	-0.01	
120	0.00	0.01	0.01	0.80	0.64	-1.92	-0.82	-0.01	-0.01	-0.01	
150	0.01	0.00	0.88	0.01	1.45	-1.11	-0.01	-0.01	-0.01	-0.01	
180	0.01	0.00	0.00	8.01	1.75	0.80	0.88	0.00	0.00	0.00	
210	0.01	0.00	-0.08	8.01	1.45	1.11	0.81	0.00	0.00	0.00	
240	0.00	0.01	-0.01	0.00	0.64	1.92	0.02	0.01	0.01	0.01	
270	8.01	0.00	-0.01	0.00	-0.47	2.21	0.03	0.01	0.01	0.01	
300	0.01	0.00	-0.01	-0.01	-1.57	1.92	0.02	0.01	0.01	0.01	
330	0.01	0.00	-0.00	-0.01	-2.34	1.11	0.01	0.01	0.01	0.01	

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
0	0.48	0.00	0.00	0.00	-0.48	-120.39	0.00	0.00	0.00	0.00	
30	0.48	0.00	0.24	-0.24	-0.42	-104.26	-60.19	-60.19	0.00	0.00	
60	0.48	0.88	0.42	-0.42	-0.48	-60.19	-104.26	-60.19	0.00	0.00	
90	0.48	0.00	0.48	0.00	0.00	-120.39	0.00	-120.39	0.00	0.00	
120	0.48	0.80	0.42	0.24	0.42	-60.19	-104.26	-60.19	0.00	0.00	
150	0.48	0.00	0.24	0.42	0.42	-60.19	-104.26	-60.19	0.00	0.00	
180	0.48	0.00	0.00	0.48	0.48	-120.39	0.00	-120.39	0.00	0.00	
210	0.48	0.00	-0.24	0.24	0.42	-60.19	-104.26	-60.19	0.00	0.00	
240	0.48	0.00	-0.42	0.24	0.42	-60.19	-104.26	-60.19	0.00	0.00	
270	0.48	0.00	-0.48	0.00	0.00	-120.39	0.00	-120.39	0.00	0.00	
300	0.48	0.00	-0.24	-0.42	-0.42	-60.19	-104.26	-60.19	0.00	0.00	
330	0.48	0.00	-0.24	-0.42	-0.42	-60.19	-104.26	-60.19	0.00	0.00	

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
0	0.48	0.00	0.00	0.00	-0.48	-114.40	0.00	0.00	0.00	0.00	
30	0.48	0.00	0.24	-0.24	-0.41	-99.07	-57.20	-57.20	0.00	0.00	
60	0.48	0.80	0.41	-0.41	-0.41	-57.20	-99.07	-57.20	0.00	0.00	
90	0.48	0.00	0.41	0.24	0.41	-57.20	-99.07	-57.20	0.00	0.00	
120	0.48	0.00	0.24	0.41	0.41	-57.20	-99.07	-57.20	0.00	0.00	
150	0.48	0.00	0.24	0.41	0.41	-57.20	-99.07	-57.20	0.00	0.00	
180	0.48	0.00	0.00	0.48	0.48	-114.40	0.00	-114.40	0.00	0.00	
210	0.48	0.00	-0.24	0.24	0.41	-99.07	-57.20	-57.20	0.00	0.00	
240	0.48	0.00	-0.41	0.24	0.41	-99.07	-57.20	-57.20	0.00	0.00	
270	0.48	0.00	-0.48	0.00	0.00	-114.40	0.00	-114.40	0.00	0.00	
300	0.48	0.00	-0.41	-0.24	-0.41	-99.07	-57.20	-57.20	0.00	0.00	
330	0.48	0.00	-0.24	-0.41	-0.41	-99.07	-57.20	-57.20	0.00	0.00	

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
0	0.47	0.00	0.00	0.00	-0.47	-108.48	0.00	0.00	0.00	0.00	
30	0.47	0.00	0.24	-0.24	-0.41	-93.94	-54.24	-54.24	0.00	0.00	
60	0.47	0.80	0.41	-0.41	-0.41	-54.24	-93.94	-54.24	0.00	0.00	
90	0.47	0.00	0.41	0.24	0.41	-54.24	-93.94	-54.24	0.00	0.00	
120	0.47	0.00	0.24	0.41	0.41	-54.24	-93.94	-54.24	0.00	0.00	
150	0.47	0.00	0.24	0.41	0.41	-54.24	-93.94	-54.24	0.00	0.00	
180	0.47	0.00	0.00	0.47	0.47	-108.48	0.00	-108.48	0.00	0.00	

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	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pizzo Drive Plymouth, IN 46363 Phone: (774) 936-4221 FAX: (774) 936-6418	Job	238614	Page	40 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
210	0.47	0.00	-0.24	0.41	93.94	54.24	0.00	0.00	0.00	0.00	
240	0.47	0.00	-0.41	0.24	54.24	93.94	0.00	0.00	0.00	0.00	
270	0.47	0.00	-0.47	0.00	108.48	0.00	0.00	0.00	0.00	0.00	
300	0.47	0.00	-0.41	-0.24	54.24	93.94	0.00	0.00	0.00	0.00	
330	0.47	0.00	-0.24	-0.41	93.94	54.24	0.00	0.00	0.00	0.00	

Description	Aiming Azimuth	Weight	Offset _x	Offset _y	z	K _x	φ	C _x C _z Front	C _x C _z Side	I _x
	K		ft	ft	ft		psf	ft ²	ft ²	in
ATC Loading	0.0000	2.00	0.00	0.00	250.00	1.535	12	115.00	115.00	115.00
ATC Loading	0.0800	2.00	0.00	0.00	240.00	1.522	12	115.00	115.80	115.80
ATC Loading	0.0000	2.00	0.00	0.00	230.80	1.488	12	115.00	115.80	115.80
ATC Loading	0.0000	2.00	0.00	0.00	220.00	1.494	12	115.00	115.00	115.00
Sum		8.15								
Weight:										

Wind Azimuth	F _x		F _y		V _x		V _y		OTM _x	OTM _y	Torque
	K	kip-ft	K	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft	kip-ft
0	0.47	0.00	0.00	0.00	-0.47	-102.62	0.00	0.00	0.00	0.00	
30	0.47	0.00	0.23	-0.46	-0.46	-88.87	-51.31	-51.31	0.00	0.00	
60	0.47	0.00	0.40	-0.23	-0.40	-88.87	-51.31	-51.31	0.00	0.00	
90	0.47	0.00	0.47	0.00	0.00	-102.62	0.00	-102.62	0.00	0.00	
120	0.47	0.00	0.23	0.40	0.40	-88.87	-51.31	-51.31	0.00	0.00	
150	0.47	0.00	0.23	0.40	0.40	-88.87	-51.31	-51.31	0.		

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	Project	V-27 x 250' #282079 Coughtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

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	0.01	2.78	1.09	0.03
240	0.01	0.00	-0.01	0.01	1.63	2.83	0.00
270	0.01	0.01	-0.01	0.00	0.07	3.25	-0.02
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
300	1.13	0.00	-1.00	-0.38	-132.81	230.03	0.00
330	1.13	0.00	-0.38	-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	1.18	0.00	0.00	-1.18	-293.83	0.00	0.00
30	1.18	0.00	0.59	-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	1.14	0.00	0.00	-1.14	-211.71	0.00	0.00
30	1.14	0.00	0.57	-0.99	-181.98	-125.85	0.00
60	1.14	0.00	0.99	-0.57	-125.85	-181.98	0.00
90	1.14	0.00	1.14	0.00	0.00	-211.71	0.00
120	1.14	0.00	0.99	0.57	125.85	-181.98	0.00
150	1.14	0.00	0.57	0.99	181.98	-125.85	0.00
180	1.14	0.00	0.00	1.14	211.71	0.00	0.00
210	1.14	0.00	-0.57	0.99	181.98	125.85	0.00
240	1.14	0.00	-0.99	0.57	125.85	181.98	0.00
270	1.14	0.00	-1.14	0.00	0.00	211.71	0.00
300	1.14	0.00	-0.99	-0.57	-125.85	181.98	0.00
330	1.14	0.00	-0.57	-0.99	-181.98	125.85	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	0.00	-4.69	-1103.30	0.13	-0.03	-0.07	0.00
30	0.00	-4.66	-955.23	-511.41	-0.02	-0.02	0.00
60	4.69	-2.34	-551.76	-955.17	-0.02	-0.02	0.00
90	4.69	0.00	-0.23	-1102.93	-0.02	-0.02	0.00
120	4.66	2.34	551.31	-955.17	-0.02	-0.02	0.00
150	2.34	4.66	955.07	-551.41	-0.02	-0.02	0.00
180	0.00	4.69	1102.85	0.13	0.03	0.07	0.00
210	-2.34	4.66	955.07	551.66	0.02	0.02	0.00
240	-4.66	2.34	551.31	955.42	0.02	0.02	0.00
270	-4.69	0.00	-0.23	1103.20	0.02	0.02	0.00
300	-4.66	-2.34	-551.76	955.42	0.02	0.02	0.00
330	-2.34	-4.66	-955.23	551.66	0.02	0.02	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	-263.62	0.00	0.00
30	1.13	0.00	0.58	-1.00	-230.03	-132.81	0.00
60	1.13	0.00	1.00	-0.58	-132.81	-230.03	0.00
90	1.13	0.00	1.13	0.00	0.00	-263.62	0.00
120	1.13	0.00	1.00	0.58	132.81	-230.03	0.00
150	1.13	0.00	0.58	1.00	230.03	-132.81	0.00
180	1.13	0.00	0.00	1.13	263.62	0.00	0.00
210	1.13	0.00	-0.58	1.00	230.03	132.81	0.00
240	1.13	0.00	-1.00	0.58	132.81	230.03	0.00
270	1.13	0.00	-1.13	0.00	0.00	263.62	0.00

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Y	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
Lag Weight	36.00					
Bearing Weight	14.18					
Total Member Self-Weight	50.19			-1.56	-14.63	
Total Weight	76.33			-1.56	-14.63	
Wind 0 deg - No Ice		0.00	-51.60	-7855.78	-14.63	6.92
Wind 30 deg - No Ice		27.09	-46.92	-6923.02	-4006.12	4.30

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	Client	American Tower Corp.	Designed by	na1

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Y	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	-28.67	-4200.51	-7475.32	0.00
Wind 90 deg - No Ice		54.63	0.00	-8.56	-8181.03	-4.19
Wind 120 deg - No Ice		44.96	28.96	3641.91	-6692.84	-6.83
Wind 150 deg - No Ice		23.60	44.00	6506.00	-3774.04	-7.31
Wind 180 deg - No Ice		0.00	50.03	7446.52	-14.63	-6.62
Wind 210 deg - No Ice		-27.09	46.92	6904.91	3976.86	-4.10
Wind 240 deg - No Ice		-51.09	35.50	4279.48	7412.46	-0.12
Wind 270 deg - No Ice		-54.63	0.00	8.56	8071.77	4.19
Wind 300 deg - No Ice		-43.33	-23.13	-3762.93	6488.17	6.39
Wind 330 deg - No Ice		-23.40	-41.00	-4523.21	2746.78	7.71
Member Ice				91.79	-68.03	
Total Weight Ice	272.03			-26.70		
Wind 0 deg - Ice	0.00	-10.23	-1316.44	-68.03	0.23	
Wind 30 deg - Ice	3.07	-8.78	-1311.89	-611.74	0.28	
Wind 60 deg - Ice	8.78	-2.07	-774.97	-1361.81	0.23	
Wind 90 deg - Ice	10.18	0.00	-26.73	-1565.83	0.11	
Wind 120 deg - Ice	6.92	3.13	725.29	-1370.74	-0.03	
Wind 150 deg - Ice	3.07	4.78	1254.66	-807.84	-0.19	
Wind 180 deg - Ice	0.00	10.18	1443.84	-488.03	-0.25	
Wind 210 deg - Ice	-5.07	8.78	1261.42	675.08	-0.28	
Wind 240 deg - Ice	-8.91	3.14	729.29	1241.43	-0.23	
Wind 270 deg - Ice	-10.18	0.00	-26.73	1420.79	-0.11	
Wind 300 deg - Ice	-8.79	-5.07	-171.07	1221.19	0.03	
Wind 330 deg - Ice	-5.07	-8.78	-430.13	671.78	0.13	
Total Weight	78.33			-4.56	-44.63	
Wind 0 deg - Service		12.64	-29.83	-3398.99	0.15	3.08
Wind 30 deg - Service		22.07	-12.74	-1863.22	-3226.85	0.03
Wind 60 deg - Service		29.28	0.00	-0.23	-3593.83	-1.86
Wind 90 deg - Service		19.28	11.54	1711.29	-2923.87	-3.06
Wind 120 deg - Service		11.29	19.26	2852.51	-1671.61	-3.41
Wind 150 deg - Service		0.00	22.24	3313.14	0.13	-2.94
Wind 180 deg - Service		-12.83	20.72	3072.23	1774.72	-4.91
Wind 210 deg - Service		-22.71	13.11	1903.37	3301.04	-0.03
Wind 240 deg - Service		-24.28	0.00	-0.23	3594.08	1.86
Wind 270 deg - Service		-19.33	-11.17	-1668.83	2890.26	2.93
Wind 300 deg - Service		-11.29	-19.36	-2892.76	1671.61	3.41

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 240 deg - No Ice
18	1.2 Dead+1.6 Wind 270 deg - No Ice
19	0.9 Dead+1.6 Wind 300 deg - No Ice
20	1.2 Dead+1.6 Wind 330 deg - No Ice
21	0.9 Dead+1.6 Wind 0 deg - No Ice
22	1.2 Dead+1.6 Wind 30 deg - No Ice
23	0.9 Dead+1.6 Wind 60 deg - No Ice
24	1.2 Dead+1.6 Wind 90 deg - No Ice
25	0.9 Dead+1.6 Wind 120 deg - No Ice
26	1.2 Dead+1.6 Wind 150 deg - No Ice
27	1.2 Dead+1.6 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.6 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.6 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.6 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.6 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.6 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.6 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.6 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.6 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.6 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.6 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.6 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Comb. No.

tnxTower 1545 Pidco Drive Plymouth, IN 46353 Phone: (574) 936-4221 FAX: (574) 936-6458	Jobs	238614	Page	45 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pidco Drive Plymouth, IN 46353 Phone: (574) 936-4221 FAX: (574) 936-6458	Job	238614	Page	46 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	240 - 220	Leg	Max. Vx	10	0.00	0.00	0.00
			Max Tension	7	92.73	8.14	-0.09
			Max. Compression	2	-68.87	8.02	1.30
			Max. Mx	8	-32.44	-2.54	0.26
			Max. My	14	37.23	-0.08	-2.45
			Max. Vy	8	-1.23	0.65	-8.84
	Diagonal	Max. Vx	2	1.20	0.11	-0.71	
		Max Tension	24	18.79	8.05	0.68	
		Max. Compression	12	-11.12	0.80	0.68	
		Max. Mx	5	-3.85	-0.85	0.80	
		Max. My	29	-10.80	-2.58	0.82	
		Max. Vy	27	-8.82	0.03	0.68	
T3	220 - 200	Leg	Max. Vx	10	-8.00	0.00	8.80
			Max Tension	7	112.20	0.12	-0.81
			Max. Compression	2	-142.43	2.48	-0.81
			Max. Mx	18	-96.18	3.61	-0.01
			Max. My	8	-4.58	-0.02	2.38
			Max. Vy	14	0.96	-2.58	0.02
	Diagonal	Max. Vx	16	0.90	0.08	-1.43	
		Max Tension	12	8.37	0.00	0.00	
		Max. Compression	12	-8.70	0.00	0.80	
		Max. Mx	4	-4.43	-0.06	-0.00	
		Max. My	24	-8.70	-0.04	-0.02	
		Max. Vy	27	-0.03	0.03	0.08	
T4	208 - 180	Leg	Max. Vx	24	0.00	0.00	0.00
			Max Tension	7	187.85	-3.27	-0.00
			Max. Compression	2	-201.87	-4.31	-0.02
			Max. Mx	2	-201.87	-4.31	-0.82
			Max. My	8	-6.10	0.05	2.40
			Max. Vy	2	1.24	3.54	-0.01
	Diagonal	Max. Vx	4	-8.47	8.06	-1.16	
		Max Tension	12	9.25	0.00	0.00	
		Max. Compression	12	-9.04	0.08	8.08	
		Max. Mx	4	3.76	0.10	-0.80	
		Max. My	24	-8.96	-0.06	-0.03	
		Max. Vy	27	-0.94	0.05	-0.00	
T3	180 - 160	Leg	Max. Vx	24	0.01	8.00	0.08
			Max Tension	7	228.89	-5.06	-0.01
			Max. Compression	2	-245.09	11.07	-8.05
			Max. Mx	2	-221.84	16.33	-8.85
			Max. My	8	-8.87	-0.29	11.41
			Max. Vy	18	-2.61	16.32	-0.02
	Diagonal	Max. Vx	8	-1.52	8.17	10.00	
		Max Tension	12	9.28	0.80	0.08	
		Max. Compression	12	-10.33	0.00	0.08	
		Max. Mx	2	6.18	0.12	-0.08	
		Max. My	31	0.29	0.07	-0.15	
		Max. Vy	27	-0.05	8.09	0.01	
T6	160 - 148	Leg	Max. Vx	31	-8.08	0.00	0.08
			Max Tension	7	235.01	-8.85	-0.01
			Max. Compression	2	-298.04	8.09	-0.12
			Max. Mx	2	-271.29	15.63	-0.84
			Max. My	8	-11.06	-8.41	11.68
			Max. Vy	18	-1.60	0.05	-0.00
	Diagonal	Max. Vx	8	-1.11	-0.41	11.60	
		Max Tension	18	10.15	8.80	0.00	
		Max. Compression	18	-10.31	0.80	0.00	
		Max. Mx	6	7.30	-0.14	0.00	
		Max. My	24	-9.74	-0.06	-0.84	
		Max. Vy	29	8.86	0.88	-0.81	
T11	20 - 0	Leg	Max. Vx	24	0.81	0.00	0.08
			Max Tension	7	228.89	-5.06	-0.01
			Max. Compression	2	-245.09	11.07	-8.05
			Max. Mx	2	-221.84	16.33	-8.85
			Max. My	8	-8.87	-0.29	11.41
			Max. Vy	18	-2.61	16.32	-0.02
	Diagonal	Max. Vx	8	-1.52	8.17	10.00	
		Max Tension	12	9.28	0.80	0.08	
		Max. Compression	12	-10.33	0.00	0.08	
		Max. Mx	2	6.18	0.12	-0.08	
		Max. My	31	0.29	0.07	-0.15	
		Max. Vy	27	-0.05	8.09	0.01	
T12	40 - 28	Leg	Max. Vx	31	-8.08	0.00	0.08
			Max Tension	7	235.01	-8.85	-0.01
			Max. Compression	2	-298.04	8.09	-0.12
			Max. Mx	2	-271.29	15.63	-0.84
			Max. My	8	-11.06	-8.41	11.68
			Max. Vy	18	-1.60	0.05	-0.00
	Diagonal	Max. Vx	8	-1.11	-0.41	11.60	
		Max Tension	18	10.15	8.80	0.00	
		Max. Compression	18	-10.31	0.80	0.00	
		Max. Mx	6	7.30	-0.14	0.00	
		Max. My	24	-9.74	-0.06	-0.84	
		Max. Vy	29	8.86	0.88	-0.81	

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T7	140 - 120	Leg	Max Tension	7	303.87	4.17	-0.01
			Max. Compression	2	-327.24	21.76	-0.18
			Max. Mx	18	-326.41	21.79	-0.04
			Max. My	8	-12.53	0.27	12.55
			Max. Vy	18	-1.53	21.79	-0.01
			Max. Vx	16	-0.75	0.27	12.52
	Diagonal	Max Tension	23	15.79	0.88	0.08	
		Max. Compression	10	-4.71	0.88	0.88	
		Max. Mx	6	15.34	-0.27	-0.01	
		Max. My	24	-15.72	0.66	0.07	
		Max. Vy	29	-0.10	-0.05	-0.05	
		Max. Vx	29	8.61	0.08	0.08	
T8	120 - 100	Leg	Max Tension	7	332.24	8.87	-0.01
			Max. Compression	2	-382.21	20.85	-0.18
			Max. Mx	19	-375.56	20.09	-0.01
			Max. My	8	-15.97	-0.30	11.19
			Max. Vy	18	-1.68	20.08	-0.01
			Max. Vx	10	-0.48	-10.12	10.25
	Diagonal	Max Tension	10	14.70	0.88	0.00	
		Max. Compression	12	-15.62	0.88	0.88	
		Max. Mx	29	1.51	-0.38	-0.85	
		Max. My	38	0.84	-0.38	0.05	
		Max. Vy	29	-8.12	-0.38	-8.05	
		Max. Vx	38	0.01	0.80	0.08	
T9	108 - 80	Leg	Max Tension	7	338.54	0.82	-0.01
			Max. Compression	2	-424.01	20.06	-0.20
			Max. Mx	18	-422.99	20.08	-0.08
			Max. My	8	-17.69	0.42	10.15
			Max. Vy	19	-1.30	19.97	-0.08
			Max. Vx	16	-0.67	0.42	10.14
	Diagonal	Max Tension	23	14.81	0.00	0.00	
		Max. Compression	10	-16.52	0.80	0.00	
		Max. Mx	29	1.04	-0.34	-0.06	
		Max. My	28	1.32	-0.31	0.06	
		Max. Vy	29	-0.13	-0.34	-0.06	
		Max. Vx	32	-0.81	0.00	0.80	
T10	80 - 68	Leg	Max Tension	7	430.07	3.63	-8.01
			Max. Compression	2	-472.37	16.02	-0.15
			Max. Mx	22	-424.00	-16.32	-0.16
			Max. My	4	-21.20	-0.54	-13.74
			Max. Vy	22	1.24	-16.32	-0.16
			Max. Vx	16	-0.68	-0.54	13.72
	Diagonal	Max Tension	12	14.83	0.00	0.00	
		Max. Compression	12	-16.15	0.00	0.00	
		Max. Mx	28	8.82	-0.52	0.08	
		Max. My	27	-0.68	-0.51	0.08	
		Max. Vy	29	-0.19	-0.52	-0.08	
		Max. Vx	27	0.81	0.00	8.00	
T11	68 - 48	Leg	Max Tension	7	465.06	0.99	-0.00
			Max. Compression	2	-514.83	18.88	-0.15
			Max. Mx	18	-512.84	18.82	0.00
			Max. My	24	-21.13	-0.78	6.57
			Max. Vy	18	-1.26	18.82	8.08
			Max. Vx	4	-0.36	-0.78	-6.58
	Diagonal	Max Tension	23	15.85	0.08	0.00	
		Max. Compression	18	-17.51	0.00	0.00	
		Max. Mx	29	1.77	-0.56	-8.89	
		Max. My	28	1.86	-0.56	0.09	
		Max. Vy	29	-0.20	-0.56	-8.09	
		Max. Vx	29	0.81	0.00	0.00	
T12	40 - 28	Leg	Max Tension	7	504.62	0.78	-0.08
			Max. Compression	2	-554.62	18.88	-0.15
			Max. Mx	18	-552.84	18.82	0.00
			Max. My	24	-21.13	-0.78	6.57
			Max. Vy	18	-1.26	18.82	8.08
			Max. Vx	4	-0.36	-0.78	-6.58
	Diagonal	Max Tension	23	15.85	0.08	0.00	
		Max. Compression	18	-17.51	0.00	0.00	
		Max. Mx	29	1.77	-0.56	-8.89	
		Max. My	28	1.86	-0.56	0.09	
		Max. Vy	29	-0.20	-0.56	-8.09	
		Max. Vx	29	0.81	0.00	0.00	

tnxTower 1545 Pidco Drive Plymouth, IN 46353 Phone: (574) 936-4221 FAX: (574) 936-6458	Job	238614	Page	47 of 59
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	Client	American Tower Corp.	Designed by	na1

tnxTower 1545 Pidco Drive Plymouth, IN 46353 Phone: (574) 936-4221 FAX: (574) 936-6458	Job	238614	Page	48 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T13	20 - 0	Leg	Max. Compression	2	-561.53	13.16	-8.12
			Max. Mx	22	496.43	-14.11	-0.15
			Max. My	4	-27.88	-8.74	-18.29
			Max. Vy	22	1.21	-0.11	-0.15
			Max. Vx	4	1.13	-0.74	-18.29
			Max Tension	10	16.16	0.88	0.88
			Max. Compression	12	-15.29	0.00	8.08
			Max. Mx	29	-0.85	-0.68	8.10
			Max. My	22	-16.07	-0.24	0.10
			Max. Vy	29	-0.22	-8.68	8.10
			Max. Vx	29	0.81	8.88	0.00
			Max Tension	7	535.26	-1.14	-8.08
		Max. Compression	2	-598.87	9.19	-8.09	
		Max. Mx	18	-597.51	9.20	-1.00	
		Max. My	24	-7.74	-1.05	11.82	
		Max. Vy	18	-0.64	9.20	-8.00	
		Max. Vx	4	-8.72	-1.04	-11.78	
		Max Tension	15	17.54	0.00	8.00	
		Max. Compression	10	-19.62	0.00	0.88	
		Max. Mx	38	2.53	-0.65	-8.10	
		Max. My	31	2.81	-0.63	-10.10	
		Max. Vy	38	-8.22	-0.65	-0.18	
		Max. Vx	31	-8.81	0.00	0.88	

Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead Dry	78.35	-0.00	8.00	-8.51	-14.57	-0.88
1.2 Dead+1.6 Wind 0 deg - No Ice	94.02	-8.00	-84.39	-13819.92	-17.75	11.24
0.9 Dead+1.6 Wind 0 deg - No Ice	70.52	-				

tnxTower 1543 Pickett Drive Plymouth, NJ 08563 Phone: (774) 936-4321 FAX: (774) 936-6438	Job	238614	Page	49 of 59
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	Client	American Tower Corp.	Designed by	na1

tnxTower 1543 Pickett Drive Plymouth, NJ 08563 Phone: (774) 936-4321 FAX: (774) 936-6438	Job	238614	Page	50 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

Load Combination	Vertical		Shear		Overturning Moment, k-ft		Torsion	
	K	K	K	K	k-ft	k-ft	k-ft	k-ft
degr1.0 Inst+1.0 Temp	287.72	-8.08	10.22	1589.14	-72.45	-0.33		
1.2 Dead+1.0 Wind 100								
degr1.0 Inst+1.0 Temp	287.72	-5.13	8.88	1384.21	697.35	-0.33		
1.2 Dead+1.0 Wind 210								
degr1.0 Inst+1.0 Temp	287.72	-8.97	5.18	747.92	1273.47	-0.23		
1.3 Dead+1.0 Wind 240								
degr1.0 Inst+1.0 Temp	287.72	-10.26	0.00	-29.16	1467.17	-0.87		
1.2 Dead+1.0 Wind 278								
degr1.0 Inst+1.0 Temp	287.72	-8.85	-5.11	-798.29	1259.74	0.18		
1.2 Dead+1.0 Wind 300								
degr1.0 Inst+1.0 Temp	287.72	-5.13	-8.88	-1362.50	697.37	0.24		
1.2 Dead+1.0 Wind 330								
degr1.0 Inst+1.0 Temp	78.35	-0.08	-26.22	-3040.73	-14.71	3.12		
Dead+Wind 0 deg - Service	78.35	12.14	-21.03	-3138.10	-1821.23	1.94		
Dead+Wind 30 deg - Service	78.35	12.27	-21.03	-1881.78	-3259.13	0.84		
Dead+Wind 60 deg - Service	78.35	24.28	0.00	-8.62	-3628.34	-1.50		
Dead+Wind 90 deg - Service	78.35	22.71	13.11	1907.45	-3333.43	-3.10		
Dead+Wind 120 deg - Service	78.35	12.14	21.03	3120.99	-1821.52	-3.48		
Dead+Wind 150 deg - Service	78.35	-24.28	0.00	-4.62	3598.93	1.90		
Dead+Wind 180 deg - Service	78.35	-12.14	21.03	3120.99	1792.10	-1.94		
Dead+Wind 210 deg - Service	78.35	-22.71	13.11	1907.45	3343.01	-0.05		
Dead+Wind 240 deg - Service	78.35	-22.87	-12.74	-1881.79	3229.72	2.97		
Dead+Wind 270 deg - Service	78.35	-12.14	-21.03	-3138.10	1792.12	3.48		
Dead+Wind 300 deg - Service								

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PZ K	M K-ft	PX K	PZ K	M K-ft	
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	-0.00	8.000%
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	0.00	-287.72	18.22	0.00	287.72	-18.22	0.000%
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	8.000%
36	-10.26	-287.72	8.88	10.26	287.72	-8.88	0.000%
37	-8.85	-287.72	-5.11	8.85	287.72	5.11	8.000%
38	-5.13	-287.72	-8.88	5.13	287.72	8.88	0.000%
39	0.00	-287.72	-26.22	0.00	287.72	26.22	0.001%
40	12.14	-287.72	-21.03	-12.14	287.72	21.03	0.001%
41	22.07	-287.72	-12.74	-22.07	287.72	12.74	0.001%
42	24.28	-287.72	0.00	-24.28	287.72	-0.00	0.001%
43	22.71	-287.72	13.11	-22.71	287.72	-13.11	0.001%
44	12.14	-287.72	21.03	-12.14	287.72	-21.03	0.001%
45	-0.00	-287.72	25.48	0.00	287.72	-25.48	0.001%
46	-12.14	-287.72	21.03	12.14	287.72	-21.03	0.001%
47	-22.71	-287.72	13.11	-22.71	287.72	13.11	0.001%
48	-24.28	-287.72	0.00	24.28	287.72	-0.00	0.001%
49	-22.87	-287.72	-12.74	22.87	287.72	12.74	0.001%
50	-12.14	-287.72	-21.03	12.14	287.72	21.03	0.001%

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PZ K	M K-ft	PX K	PZ K	M K-ft	
1	0.00	-78.35	0.00	0.00	78.35	-0.00	0.000%
2	0.00	-94.02	-94.39	0.00	94.02	94.39	0.002%
3	0.00	-78.35	-94.39	0.00	78.35	94.39	0.002%
4	43.70	-94.02	-75.70	-43.70	94.02	75.70	0.002%
5	43.70	-78.32	-75.70	-43.70	78.32	75.70	8.822%
6	79.45	-94.02	-45.87	-79.45	94.02	45.87	0.002%
7	79.45	-78.32	-45.87	-79.45	78.32	45.87	0.002%
8	87.41	-94.02	0.00	-87.41	94.02	-0.00	0.002%
9	87.41	-78.32	0.00	-87.41	78.32	-0.00	0.002%
10	81.75	-94.02	-47.20	-81.75	94.02	-47.20	0.002%
11	81.75	-78.32	-47.20	-81.75	78.32	-47.20	0.002%
12	43.70	-94.02	75.70	43.70	94.02	75.70	8.002%
13	43.70	-78.32	75.70	43.70	78.32	75.70	8.002%
14	0.88	-94.02	91.74	0.88	94.02	-91.74	0.002%
15	0.88	-78.32	91.74	0.88	78.32	-91.74	0.002%
16	-43.70	-94.02	75.70	43.70	94.02	-75.70	0.002%
17	-43.70	-78.32	75.70	43.70	78.32	-75.70	0.002%
18	-81.75	-94.02	47.20	81.75	94.02	-47.20	8.002%
19	-81.75	-78.32	47.20	81.75	78.32	-47.20	8.002%
20	-87.41	-94.02	8.80	87.41	94.02	-8.80	0.002%
21	-87.41	-78.32	8.80	87.41	78.32	-8.80	0.002%
22	-79.45	-94.02	-45.87	79.45	94.02	45.87	0.002%
23	-79.45	-78.32	-45.87	79.45	78.32	45.87	0.002%
24	-43.70	-94.02	-75.70	43.70	94.02	75.70	8.002%
25	-43.70	-78.32	-75.70	43.70	78.32	75.70	8.002%
26	0.00	-287.72	0.00	0.00	287.72	-0.00	0.000%
27	0.88	-287.72	-10.26	0.88	287.72	10.26	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	7	0.00000001	0.00012523
2	Yes	12	0.00000001	0.00009525
3	Yes	12	0.00000001	0.00008670
4	Yes	12	0.00000001	0.00010352
5	Yes	12	0.00000001	0.00009468
6	Yes	12	0.00003523	0.00109978
7	Yes	12	0.00000001	0.00010061
8	Yes	12	0.00000001	0.00010352
9	Yes	12	0.00000001	0.00009460
10	Yes	12	0.00000001	0.00009524
11	Yes	12	0.00000001	0.00008670
12	Yes	12	0.00000001	0.00018347
13	Yes	12	0.00000001	0.00009457
14	Yes	12	0.00000001	0.00009796
15	Yes	12	0.00000001	0.00010559
16	Yes	12	0.00000001	0.00010358
17	Yes	12	0.00000001	0.00009459
18	Yes	12	0.00000001	0.00009460
19	Yes	12	0.00000001	0.00008670
20	Yes	12	0.00000001	0.00010352
21	Yes	12	0.00000001	0.00009460
22	Yes	12	0.00000001	0.00010974
23	Yes	12	0.00000001	0.00010060
24	Yes	12	0.00000001	0.00010348
25	Yes	12	0.00000001	0.00009458
26	Yes	9	0.00000001	0.00009563
27	Yes	12	0.00000001	0.00009852
28	Yes	12	0.00000001	0.00010002

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29	Yes	12	0.00000001	0.00010153
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	0.00009224
37	Yes	12	0.00000001	0.00009044
38	Yes	12	0.00000001	0.00009311
39	Yes	12	0.00000001	0.00009158
40	Yes	12	0.00000001	0.00009072
41	Yes	12	0.00000001	0.00009249
42	Yes	12	0.00000001	0.00009158
43	Yes	12	0.00000001	0.00009242
44	Yes	12	0.00000001	0.00009093
45	Yes	12	0.00000001	0.00009542
46	Yes	12	0.00000001	0.00009542
47	Yes	12	0.00000001	0.00009385
48	Yes	12	0.00000001	0.00009315
49	Yes	12	0.00000001	0.00009698
50	Yes	12	0.00000001	0.00009546

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horiz. Deflection in	Con. Load Comb.	Tilt	
				°	Twist
T1	250 - 240	45.897	2	1.8772	0.0442
T2	240 - 220	41.165	2	1.8532	0.0410
T3	220 - 200	33.140	2	1.6717	0.0313
T4	200 - 180	26.867	2	1.4120	0.0228
T5	180 - 160	20.905	2	1.1515	0.0180
T6	160 - 140	15.419	2	0.9675	0.0144
T7	140 - 120	11.345	2	0.7654	0.0111
T8	120 - 100	8.884	2	0.6150	0.0084
T9	100 - 80	5.984	2	0.4927	0.0062
T10	80 - 60	3.348	2	0.3691	0.0045
T11	60 - 40	1.862	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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horiz. Deflection in	Con. Load Comb.	Tilt	
				°	Twist
T1	250 - 240	12.548	39	0.4227	0.0123
T2	240 - 220	11.459	39	0.4159	0.0113
T3	220 - 200	9.219	39	0.3451	0.0086
T4	200 - 180	7.251	39	0.2928	0.0063
T5	180 - 160	5.764	39	0.2303	0.0050
T6					

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Section No.	Elevation ft	Component Type	Bolt Size	Bolt Grade	Number of Bolts	Maximas Load per Bolt K	Allowable Load K	Ratio Load Allowable	Allowable Ratio	Criteria
T7	140	Leg	A325N	1.0000	12	25.32	53.01	0.478	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	15.79	31.32	0.504	✓	1 Member Bearing
T8	130	Leg	A325N	1.0000	12	29.35	53.01	0.554	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	14.70	31.32	0.469	✓	1 Member Bearing
T9	100	Leg	A325N	1.0000	12	32.38	53.01	0.611	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	14.81	31.32	0.471	✓	1 Member Bearing
T10	80	Leg	A325N	1.0000	12	35.84	53.01	0.676	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	14.83	41.76	0.355	✓	1 Member Bearing
T11	60	Leg	A325N	1.0000	12	38.76	53.01	0.731	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	15.85	41.76	0.380	✓	1 Member Bearing
T12	40	Leg	A325N	1.0000	12	42.95	53.01	0.793	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	16.16	41.76	0.387	✓	1 Member Bearing
T13	20	Leg	F1554-10	1.0000	12	44.61	55.22	0.808	✓	1 Bolt Tension
		Diagonal	A325N	0.8750	1	17.54	41.76	0.420	✓	1 Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T1	250-240	P-2.50"-0.75" conn-10' -C(Pirod 226172)	10.00	4.79	60.7	1.7040	-10.04	38.58	0.171 ¹
T2	240-220	P-4.00"-0.75" conn-20' -C-Trans-6B-4B-(Pirod 226184)	20.00	6.67	53.0	3.1741	-68.87	116.32	0.593 ¹
T3	220-200	P-5.00"-0.75" conn-Trans-20'-C-(Pirod 226280)	20.03	6.68	42.7	4.2999	-142.43	169.37	0.841 ¹
T4	200-180	P-6.00"-0.75" conn-HBD-Trans-20' -C-(Pirod 229377)	20.03	6.68	35.7	5.5813	-201.87	228.83	0.882 ¹
T5	188-160	#12ZG-1.75"-1.00" conn-HBD-Trans (Pirod 229583)	20.03	10.82	30.4	7.2158	-245.69	303.46	0.810 ¹
T6	160-140	#12ZG-1.75"-1.80" conn-HBD-Trans (Pirod 229583)	20.03	10.02	30.4	7.2158	-299.04	303.46	0.985 ¹
T7	140-120	#12ZG-2.00"-0.875" conn-HBD-Trans (Pirod 208332)	20.03	20.03	48.8	9.4248	-327.24	356.29	0.913 ¹
T8	120-100	#12ZG-2.25"-0.875" conn. (Pirod 208334)	20.03	20.03	48.8	11.9282	-392.21	451.15	0.877 ¹

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Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T4	200-180	L2 1/2x3 1/2x3/16	9.60	4.80	117.2	8.9020	-9.04	14.17	0.637 ¹
T5	180-160	L3x3x3/16	12.65	6.43	129.5	10.9900	-10.33	14.34	0.710 ¹
T6	160-140	L3x3x3/16	14.10	7.14	143.8	10.9900	-10.20	11.92	0.856 ¹
T7	140-120	2L3x3x3/16	22.66	11.95	152.8	21.8000	-17.71	21.10	0.839 ¹
T8	120-100	2L3x3x3/16	23.79	12.45	159.1	21.8000	-15.62	19.45	0.803 ¹
T9	100-80	2L3x3x3/16	25.03	13.02	164.4	21.8000	-16.52	17.79	0.929 ¹
T10	80-60	2L3 1/2x3 1/2x1/4	26.36	13.63	170.1	3.3750	-16.15	33.05	0.477 ¹
T11	60-40	2L3 1/2x3 1/2x1/4	27.77	14.33	175.5	3.3750	-17.31	30.72	0.570 ¹
T12	40-20	2L3 1/2x3 1/2x1/4	29.25	15.04	165.4	3.3750	-16.29	27.86	0.585 ¹
T13	20-0	2L3 1/2x3 1/2x1/4	30.70	15.80	173.7	3.3750	-19.62	25.27	0.716 ¹

¹ P_n / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T1	250-240	L2x2x3/16	3.00	4.47	136.1	0.7150	-1.16	8.72	0.133 ¹

¹ P_n / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T1	250-240	P-2.50"-0.75" conn-10' -C-(Pirod 226172)	10.00	4.79	60.7	1.7040	8.54	76.68	0.111
T2	240-220	P-4.00"-0.75" conn-20' -C-Trans-6B-4B-(Pirod 226184)	20.00	6.67	53.0	3.1741	62.73	142.33	0.439 ¹

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Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T9	100-80	#12ZG-2.25"-0.875" conn. (Pirod 208334)	20.03	20.03	48.8	11.9282	-424.91	451.13	0.940 ¹
T10	80-60	#12ZG-2.50"-0.875" conn. (Pirod 208335)	20.03	20.83	48.7	14.7262	-472.37	557.27	0.848 ¹
T11	60-40	#12ZG-2.50"-0.875" conn. (Pirod 208335)	20.03	20.03	48.7	14.7262	-514.03	557.27	0.932 ¹
T12	40-20	#12ZG-2.75"-0.875" conn. (Pirod 208337)	20.03	20.03	48.6	17.8187	-561.53	674.68	0.832 ¹
T13	20-0	#12ZG-2.75"-0.875" conn. (Pirod 208337)	20.03	20.03	48.6	17.8187	-598.87	674.68	0.888 ¹

¹ P_n / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	KL/r	φP _n K	A in ²	P _n K	φ _c K	Stress Ratio
T3	180-160	0.5	1.40	94.1	324.71	0.1963	2.61	4.63	0.563
T6	160-140	0.5	1.40	94.1	324.71	0.1963	1.60	4.63	0.345
T7	140-120	0.5	1.39	93.2	424.12	0.1963	1.53	4.67	0.327
T8	120-100	0.5	1.38	92.4	536.77	0.1963	1.68	4.71	0.357
T9	100-80	0.5	1.38	92.4	536.77	0.1963	1.30	4.71	0.276
T10	80-60	0.5	1.36	91.6	662.68	0.1963	1.24	4.75	0.261
T11	60-40	0.5	1.36	91.6	662.68	0.1963	1.26	4.75	0.267
T12	40-20	0.625	1.35	72.6	801.84	0.3068	1.19	8.74	0.149
T13	20-0	0.625	1.35	72.6	801.84	0.3068	0.71	8.74	0.094

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T1	250-240	L2x2x1/8	5.75	2.69	90.8	0.4844	-2.88	9.97	0.289 ¹
T2	240-220	L2x2x3/16	7.17	3.40	107.6	0.7150	-11.12	12.59	0.883 ¹
T3	220-200	L2x2x3/16	8.11	4.07	123.9	0.7150	-8.39	10.32	0.812 ¹

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Section No.	Elevation ft	Size	L ft	L _w ft	KL/r	A in ²	P _n K	φP _n K	Ratio P _n / φP _n
T3	220-200	P-5.00"-0.75" conn.-Trans-20'-C-(Pirod 226200)	20.03	6.68	42.7	4.2999	132.30	193.49	0.681 ¹
T4	200-180	P-6.00"-0.75" conn.-HBD-Trans-20' -C-(Pirod 229377)	20.03	6.68	35.7	5.5813	187.85	251.16	0.748 ¹
T5	180-160	#12ZG-1.75"-1.00" conn.-HBD-Trans (Pirod 229583)	20.03	10.02	30.4	7.2158	228.89	324.71	0.705 ¹
T6	160-140	#12ZG-1.75"-1.00" conn.-HBD-Trans (Pirod 229583)	20.03	18.02	30.4	7.2158	276.92	324.71	0.851 ¹
T7	140-120	#12ZG-2.00"-0.875" conn.-HBD-Trans (Pirod 208332)	20.03	28.03	48.8	9.4248	303.87	424.12	0.716 ¹
T8	120-100	#12ZG-2.25"-0.875" conn. (Pirod 208334)	20.03	20.03	48.8	11.9282	352.24	456.77	0.656 ¹
T9	100-80	#12ZG-2.25"-0.875" conn. (Pirod 208334)	20.03	20.03	48.8	11.9282	388.54	536.77	0.724 ¹
T10	80-60	#12ZG-2.50"-0.875" conn. (Pirod 208335)	20.03	20.03	48.7	14.7262	430.07	662.68	0.640 ¹
T11	60-40	#12ZG-2.50"-0.875" conn. (Pirod 208335)	20.03	20.03	48.7	14.7262	463.06	662.68	0.702 ¹
T12	40-20	#12ZG-2.75"-0.875" conn. (Pirod 208337)	20.03	20.03	48.6	17.8187	504.62	801.84	0.629 ¹
T13	20-0	#12ZG-2.75"-0.875" conn. (Pirod 208337)	20.03	20.03	48.6	17.8187	535.26	801.84	0.668 ¹

¹ P_n / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	KL/r	φP _n K	A in ²	P _n K	φ _c K	Stress Ratio
T5	180-160	0.5	1.40	94.1	324.71	0.1963	2.61	4.63	0.563
T6	160-140	0.5	1.40	94.1	324.71	0.1963	1.60	4.63	0.345
T7	148-120	0.5	1.39	93.2	424.12	0.1963	1.53	4.67	0.327
T8	120-100	0.5	1.38	92.4	536.77	0.1963	1.68	4.71	0.357
T9	100-80	0.5	1.38	92.4	536.77	0.1963	1.30	4.71	0.276
T10	80-60	0.5	1.36	91.6	662.68	0.1963	1.24	4.75	0.261
T11	60-40	0.5	1.36	91.6	662.68	0.1963	1.26	4.75	0.267
T12	40-20	0.625	1.35	72.6	801.84				

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Section No.	Elevation ft	Diagonal Size	L ₁ ft	L ₂ ft	KLR	A in ²	P _s K	φP _s K	Ratio
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Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ₁ ft	L ₂ ft	KLR	A in ²	P _s K	φP _s K	Ratio
T1	250 - 240	L2x2x1/8	5.75	2.69	55.1	0.2813	2.62	12.23	0.214
T2	240 - 220	L2x2x3/16	7.17	3.40	69.7	0.4132	10.79	17.97	0.608
T3	220 - 208	L2x2x3/16	7.66	3.85	78.6	0.4132	8.37	17.97	0.466
T4	208 - 188	L2 1/2x2 1/2x3/16	9.60	4.88	76.9	0.5535	8.95	24.88	0.372
T5	180 - 168	L3x3x3/16	12.63	6.43	84.7	0.6193	9.28	28.68	0.324
T6	168 - 148	L3x3x3/16	14.18	7.14	91.7	0.6193	18.15	28.68	0.351
T7	148 - 128	2L3x3x3/16	22.66	11.95	155.2	1.3537	15.79	58.80	0.258
T8	120 - 108	2L3x3x3/16	23.79	12.45	161.5	1.3537	14.70	58.89	0.238
T9	100 - 80	2L3x3x3/16	25.83	13.82	168.8	1.3537	14.81	58.89	0.232
T10	80 - 60	2L3 1/2x3 1/2x1/4	26.36	13.65	152.1	2.1563	14.83	93.80	0.158
T11	68 - 40	2L3 1/2x3 1/2x1/4	27.77	14.33	159.6	2.1563	15.85	93.88	0.169
T12	48 - 20	2L3 1/2x3 1/2x1/4	29.25	15.04	167.5	2.1563	16.16	93.80	0.172
T13	20 - 0	2L3 1/2x3 1/2x1/4	38.78	15.88	175.8	2.1563	17.54	93.88	0.187

¹ P_s / φP_s controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ₁ ft	L ₂ ft	KLR	A in ²	P _s K	φP _s K	Ratio
T1	258 - 240	L2x2x3/16	5.00	4.47	92.6	0.4132	1.82	17.97	0.857

¹ P_s / φP_s controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _s K	R Capacity	Pass/Fail
T1	258 - 240	Leg	P-2.50' - 0.75' conn-10'	3	-10.04	58.58	17.1	Pass
T2	240 - 220	Leg	P-4.80' - 0.75' conn-20'	21	-68.87	116.32	59.2	Pass
T3	220 - 208	Leg	C-Trans-GB-10'(Prod 226183)	42	-142.43	169.37	84.1	Pass
T4	208 - 188	Leg	P-5.60' - 0.75' conn-Trans-20'	63	-201.87	228.83	88.2	Pass
T5	180 - 160	Leg	P-6.00' - 0.75' conn-10D-Trans-20'-C'(Prod 229377)	84	-245.69	303.46	81.0	Pass
T6	160 - 140	Leg	#1220 - 1.75' - 1.00' conn-10D-Trans (Prod 229518)	99	-299.04	363.46	98.5	Pass
T7	140 - 120	Leg	#1220 - 2.00' - 0.875' conn-10D-Trans (Prod 229518)	114	-327.24	356.29	91.8	Pass
T8	128 - 188	Leg	#1220 - 2.25' - 0.875' conn. (Prod 283333)	123	-382.21	451.15	84.7	Pass
T9	180 - 98	Leg	#1220 - 2.25' - 0.875' conn. (Prod 208333)	132	-424.81	451.15	94.8	Pass
T10	80 - 68	Leg	#1220 - 2.50' - 0.875' conn. (Prod 208333)	141	-472.37	557.27	84.8	Pass
T11	68 - 48	Leg	#1220 - 2.50' - 0.875' conn. (Prod 283333)	158	-514.03	557.27	92.2	Pass
T12	48 - 20	Leg	#1220 - 2.75' - 0.875' conn. (Prod 283333)	159	-561.53	674.68	83.2	Pass
T13	20 - 8	Leg	#1220 - 2.75' - 0.875' conn. (Prod 208333)	168	-598.87	674.68	88.8	Pass
T1	250 - 248	Diagonal	L2x2x1/8	18	-2.88	9.97	28.9	Pass
T2	240 - 220	Diagonal	L2x2x3/16	24	-11.12	12.59	83.3	Pass
T3	220 - 208	Diagonal	L2x2x3/16	45	-8.39	10.32	81.3	Pass
T4	200 - 188	Diagonal	L2 1/2x2 1/2x3/16	66	-9.04	14.17	63.7	Pass
T5	188 - 168	Diagonal	L3x3x3/16	87	-10.33	14.54	71.0	Pass
T6	168 - 140	Diagonal	L3x3x3/16	183	-18.20	11.92	85.6	Pass
T7	140 - 120	Diagonal	2L3x3x3/16	117	-17.71	21.18	83.9	Pass
T8	120 - 108	Diagonal	2L3x3x3/16	126	-15.62	19.45	88.5	Pass
T9	108 - 80	Diagonal	2L3x3x3/16	135	-16.52	17.79	92.9	Pass
T10	88 - 68	Diagonal	2L3 1/2x3 1/2x1/4	144	-16.15	33.85	47.7	Pass
T11	68 - 40	Diagonal	2L3 1/2x3 1/2x1/4	153	-17.51	30.72	57.0	Pass
T12	40 - 20	Diagonal	2L3 1/2x3 1/2x1/4	162	-16.29	27.86	58.5	Pass
T13	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	171	-19.62	25.27	77.6	Pass
T1	250 - 248	Top Girt	L2x2x3/16	5	-1.16	8.72	13.3	Pass
							Summary	
							Leg (T6)	98.5 Pass
							Diagonal (T9)	92.9 Pass
							Top Girt (T1)	13.3 Pass
							Ball Checks	87.1 Pass
							RATING =	98.5 Pass

inxTower 1545 Pido Drive Plymouth, IN 46563 Phone: (317) 936-4221 FAX: (317) 936-6438	Job	238614	Page	59 of 59
	Project	V-27 x 250' #282079 Couchtown, KY	Date	09:16:09 11/11/13
	Client	American Tower Corp.	Designed by	na1

UNIT BASE FOUNDATION SUMMARY

American Tower Corp.
#282079 Couchtown, KY

V- 27.0 250
A- 238614

V 2.0

Foundation Dimensions		
Pad width, W:	37.0	ft
Depth, D:	6.0	ft
Ext. above grade, E:	0.5	ft
Pier diameter, d _p :	5.0	ft
Pad thickness, T:	1.50	ft
Depth neglected, N:	6.0	ft
Volume, V _c :	86.96	cy

Soil Information Per:
FDH, Dated: 10/16/13 (Project#1305531600)

Material Properties		
Steel tensile str, F _y :	60000	psi
Conc. Comp. str, F' _c :	4000	psi
Conc. Density, δ:	150	pcf
Clear cover, cc:	3.00	in

Soil Parameters		
Soil unit weight, γ:	110	pcf
Ultimate Bearing, B _c :	30.000	ksf
Cohesion, C _s :	0.000	ksf
Friction angle, φ:	0.0	degrees
Ult. Passive P., P _p :	0.110	pcf
Base sliding, μ:	0.35	
Seismic Zone:	1	
Water at:	none	ft

Backfill Compaction		
Lift thickness:	8	in
Compaction:	95	%
Standard Proctor:	ASTM	D698

Reinforcement Design		
pad, m _p :	67	bars *
size, s _p :	9	
vertical, m _v :	29	verticals
size, s _v :	7	4.5' cage
ties, m _t :	7	ties
size, s _t :	4	w/ overlap

Anchor Steel Selection		
Part Number, P/N:	103182	Dia = 1" Length = 67"

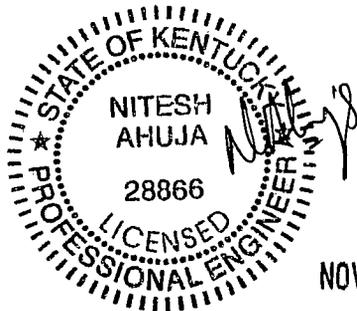
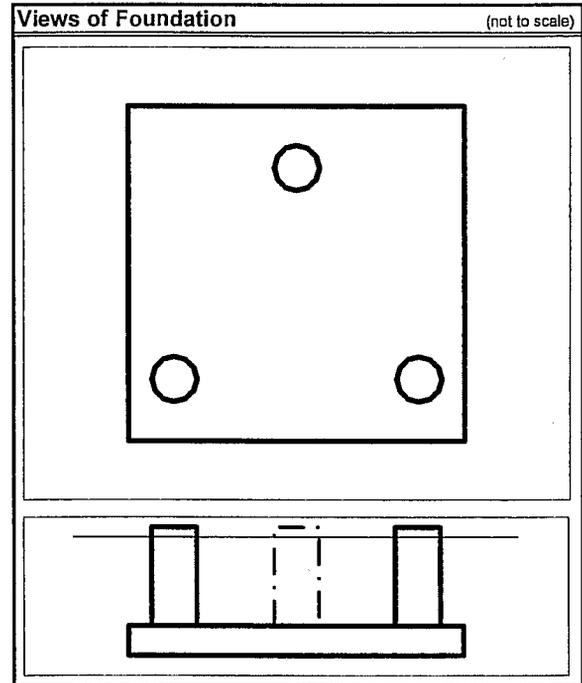
Tower design conforms to the following:

- * 1997 Uniform Building Code (UBC)
- * 2000 & 2003 International Building Code (IBC)
- * ANSI TIA-222-G
- * Building Code Requirements for Reinforced Concrete (ACI 318-05)

* Rebar to be equally spaced, both ways, top & bottom
 * Use standees to support top rebar above bottom rebar in mat

Note: The centroid of the tower is offset from the centroid of the foundation

Foundation Loading			
Load Case 1			
Load Case 2			
	stress ratio: 99.0%	mark up: 1.0%	
Shear (total), 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



Additional Notes:

- * No foundation modifications listed.
- * See attached "Foundation Notes" for further information.

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 DIFFICULTIES DURING EXCAVATION MAY ARISE DUE TO THE PRESENCE OF BOULDERS, COBBLES, AND/OR SHALLOW BEDROCK. THE BOULDERS, COBBLES, AND/OR ROCK MUST BE REMOVED FROM THE EXCAVATION.

- 3 ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL.

- 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.
#282079 Couchtown, KY

V- 27.0 250
A- 238614

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 _c :	94.00 kips	=	94.00 kips	

Soil per: FDH, Dated:10/16/13 (Project#1305531600)

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 =	87.0	cy
Concrete weight:	$W_c = V * \delta$	W _c =	352.2	kips
Soil weight:	$W_s = (D - T) * (W^2 - 3 * (d^2 / 4 * \pi)) * \gamma$	W _s =	648.5	kips
Total weight:	$P = W_c + W_s + W_t$	P =	1094.70	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} =	0.660	ksf
	$P_{pt} = K_p * \gamma * (D - T) + 2 * C_o * \sqrt{(K_p)}$	P _{pt} =	0.495	ksf
	$P_{pb} = K_p * \gamma * D + 2 * C_o * \sqrt{(K_p)}$	P _{pb} =	0.660	ksf
	$P_{ptop} = \text{IF}(N < (D - T), P_{pt}, P_{pn})$	P _{ptop} =	0.7	ksf
	$P_p' = (P_{ptop} + P_{pb}) / 2$	P _{p'} =	0.660	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} =	287.359	kips
$\phi_r = 0.75$				

Check	S _{actual} = 287.36 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 =	6.809	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} =	19885.65	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} =	14914.23	ft-kips
$\phi_r = 0.75$				
Total overturning:	$M_o = M + S * (D + E)$	M _o =	14575.31	ft-kips

Check	M _{rt} = 14914.23 ft-kips	>=	M _o = 14575.31 ft-kips	OK
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Bearing Resistance due to Pressure Distribution:

Area of mat:	area = W ²	area =	1369.0	ft ²
Section modulus:	SM = W ³ / 6	SM =	8442.2	ft ³
Factored total weight:	$P' = W_t + 0.9 * (W_c + W_s)$	P' =	994.6	kfp
Pressure exerted:	$P_{pos} = P' / \text{area} + M_o / \text{SM}$	P _{pos} =	2.453	ksf
	$P_{neg} = P' / \text{area} - M_o / \text{SM}$	P _{neg} =	-1.000	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 =	14.65	ft
	$P_{adj} = 2 * P' / (3 * W * (W / 2 - e_c))$	P _{adj} =	4.7	ksf
Adj. applied pressure:	$q_a = \text{IF}(P_{neg} >= 0, P_{pos}, P_{adj})$	q _a =	4.660	ksf
$\phi_r = 0.75$				

Check	q _a = 4.660 ksf	<=	B _c * ϕ_r = 22.500 ksf	OK
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Concrete Shear Strength:

One way beam action at d_t from tower

Effective depth:	$d_c = T - cc - db_p / 2$	d _c =	14.436	in
Factored Intensity:	$q_s = C / \text{area}$	q _s =	0.459	ksf
Required shear:	$V_{n1} = q_s * (O - dl / 2 - dc) * W / \phi_s$	V _{n1} =	70.32	kips
$\phi_s = 0.75$ [ACI 9.3.2.3]				
Available shear:	$V_{c1} = 2 * \sqrt{(F'c)} * W * dc$	V _{c1} =	810.76	kips
[ACI 12.2.4]				

Check	V _{c1} = 810.76 kips	>=	V _{n1} = 70.32 kips	OK
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Two way beam action at $d_f / 2$ 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]	$V_{n2} = q_s / \phi_s * (\text{area} - (d_i + d_c)^2 * \pi / 4)$	$V_{n2} = 819.14$	kips
Available shear: [ACI 12.2.2]	$V_{e2} = 4 * \sqrt{F'c} * P_o * d_c$	$V_{e2} = 854.02$	kips

Check	$V_{e2} = 854.02$ kips	\geq	$V_{n2} = 819.14$ kips	OK
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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
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Check	$P_c = 5881.06$ kips	\geq	$C = 628.22$ kips	OK
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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:	$d_o = d_i - 2 * cc$	$d_o = 54.00$	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
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Actual moment:	$M_{max} = (D - T + E) * S / 2$	$M_{max} = 237.35$	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	$M_{max} = 237.35$ ft-kips	OK
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Bar separation:	$B_{s,c} = (d_o * \pi) / m_c - d_{b,c}$	$B_{s,c} = 4.97$	in
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Check	11.13	\geq	$B_{s,o} = 4.97$ in	$\geq 4.5"$	OK
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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]	$\psi_t \psi_{e,c} =$ the product of ψ_t & ψ_e , need not be taken larger than 1.7	$\psi_t \psi_{e,c} = 1.3$
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]	$k_{tr,c} = 0$ in (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]	$R_c = M_{max} / M_{allow}$	$R_c = 0.81$
Development (tensile): [ACI 12.2.2]	$L_{dt,c} = (3 / 40) * (F_y / \sqrt{F'c}) * (\psi_t \psi_{e,c} * \psi_{s,c} * \lambda_c * R_c / c_c') * d_{b,c}$	$L_{dt,c} = 26.16$ in
Minimum length: [ACI 12.2.1]	$L_{d,min} = 12$ inches	$L_{d,min} = 12.0$ in
Development length:	$L_{dt,c} = \text{MAX}(L_{d,min}, L_{dt,c})$	$L_{dt,c} = 26.16$ in
Development (comp.): [ACI 12.3.2]	$L_{dc,c} = 0.02 * d_{b,c} * F_y * R_c / \sqrt{F'c}$	$L_{dc,c} = 13.42$ in
	$L_{dc,c} = 0.0003 * d_{b,c} * F_y * R_c$	$L_{dc,c} = 12.73$ in
Development length:	$L_{dc,c} = \text{MAX}(L_{dc,c}, L_{dc,c})$	$L_{dc,c} = 13.42$ in
Length available in pier:	$L_{vc} = D - T + E - cc$	$L_{vc} = 57.0$ in

Check	$L_{vc} = 57.0$ in	\geq	$L_{dt,c} = 26.2$ in	OK
Check	$L_{vc} = 57.0$ in	\geq	$L_{dc,c} = 13.4$ in	OK

Length available in pad:	$L_{vp} = T - cc$	$L_{vp} = 15.0$	in
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Check	$L_{vp} = 15.0$ in	\geq	$L_{dt,c} = 26.2$ in	HOOKS
Check	$L_{vp} = 15.0$ in	\geq	$L_{dc,c} = 13.4$ 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	$\psi_{t,h} = 0.7$
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]	$L_{dh} = 0.02 * \psi_{t,h} * \psi_{e,h} * \lambda_h * F_y / \sqrt{F'_c} * db_c$	$L_{dh} = 11.6$ 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
	Check $L_{vp} = 15.0$ in \geq $L_{dh} = 11.6$ in	OK
Hook tail length:	$L_{h_tail} = 12 * db$ beyond the bend radius	$L_{h_tail} = 14.0$ in
Length available in pad:	$L_{h_pad} = (W - w' - di) / 2$	$L_{h_pad} = 30$ in
	Check $L_{h_pad} = 30.0$ in \geq $L_{h_tail} = 14.0$ in	OK

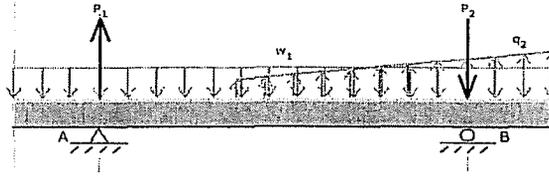
Pier Ties:

Minimum size: [ACI 7.10.5.1]	$s_{t_min} = IF(s_c \leq 10, 3, 4)$	$s_{t_min} = 3$
z factor:	$z = 0.5$ if the seismic zone is less than 2, else 1.0	$z = 0.5$
Tie parameters:	$s_t = 4$	$d_{b,t} = 0.5$ in
	$m_t = 7$	$A_{b,t} = 0.2$ 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
	$m_{t_min} = (D - T + E) / B_{s_t_max} + 2$	$m_{t_min} = 6.3$
	Check $m_t = 7.0$ \geq $m_{t_min} = 6.3$	OK

Anchor Steel:

A/S parameters:	$P_{as} = 103182$	$L_{as} = 60$ in
	$d_{as} = 1$ 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)	$L_{das_min} = 26.16$ in
	Check $L_{das} = 32.19$ in \geq $L_{das_min} = 26.16$ in	OK
To bottom rebar grid:	$E_{as_max} = D + E - cc - 2 * db_p$	$E_{as_max} = 72.744$ in
	Check $E_{as} = 51.50$ in \leq $E_{as_max} = 72.74$ in	OK
To top rebar grid:	$\text{rebar @} = D + E - T + cc$	$\text{rebar @} = 63.00$ in
	Check $63 + 6$ in \geq $E_{as} = 51.50$ in or \leq 63 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:

$$B_{L2,1} = W$$

$$B_{L2,1} = 37 \text{ ft}$$

Location of Left Support:

$$S_{L2,1} = 0$$

$$S_{L2,1} = 6.809 \text{ ft}$$

Location of Right Support:

$$S_{R2,1} = W - 0$$

$$S_{R2,1} = 30.19 \text{ ft}$$

MDSolids Geometry Input (Option 2)

Total Beam Length:

$$B_{L2,2} = W$$

$$B_{L2,2} = 37.0 \text{ ft}$$

Location of Left Support:

$$S_{L2,2} = (W - w) / 2$$

$$S_{L2,2} = 5.00 \text{ ft}$$

Location of Right Support:

$$S_{R2,2} = S_{L1,2} + w$$

$$S_{R2,2} = 32.00 \text{ ft}$$

MDSolids Load Input (Option 1 & Option 2)

Uplift:

$$P_{2,1} = U$$

$$P_{2,1} = 559.5 \text{ kips}$$

Compression:

$$P_{2,2} = C$$

$$P_{2,2} = 628.22 \text{ kips}$$

Weight of Overburden:
(Distributed)

$$w_{2,1} = 0.9 * (W_c + W_u) / W$$

$$w_{2,1} = 24.34 \text{ klf}$$

Applied over the beam starting at 0' and ending at W=37ft.

Distributed Soil Pressure:
(Linearly Increasing)

$$q_{2,2L} = 0$$

$$q_{2,2L} = 0.00 \text{ klf}$$

$$q_{2,2R} = q_u * W$$

$$q_{2,2R} = 172.41 \text{ klf}$$

This linearly increasing load is applied from e=14.65ft to W=37ft

MDSolids Design Result

Option 1:

$$M_{max2,1} = M_{max2,1} \text{ (Max. Moment calculated from MDSolids for Option 1)}$$

$$M_{max2,1} = 3028.00 \text{ ft*kips}$$

Option 2:

$$M_{max2,2} = M_{max2,2} \text{ (Max. Moment calculated from MDSolids for Option 2)}$$

$$M_{max2,2} = 1691.00 \text{ ft*kips}$$

Max moment:

$$M_{maxp} = \text{Max}(M_{max2,1}, M_{max2,2})$$

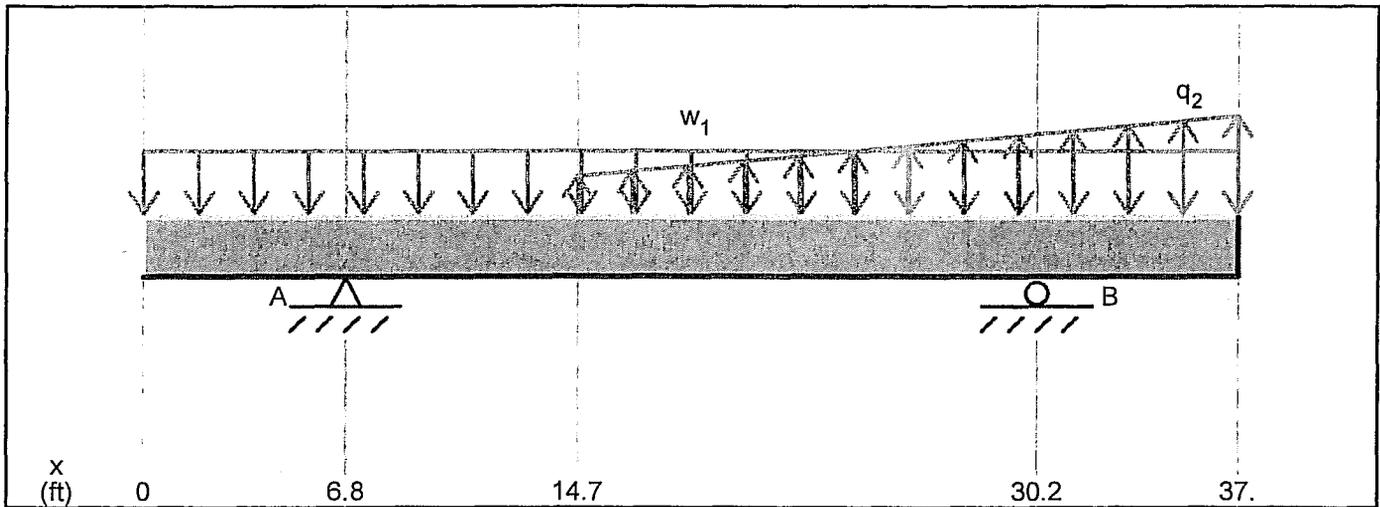
$$M_{maxp} = 3028.00 \text{ ft*kips}$$

Required moment:
 $\phi_t = 0.9$ [ACI 9.3.2.1]

$$M_n = M_{maxp} / \phi_t$$

$$M_n = 3384.44 \text{ ft*kips}$$

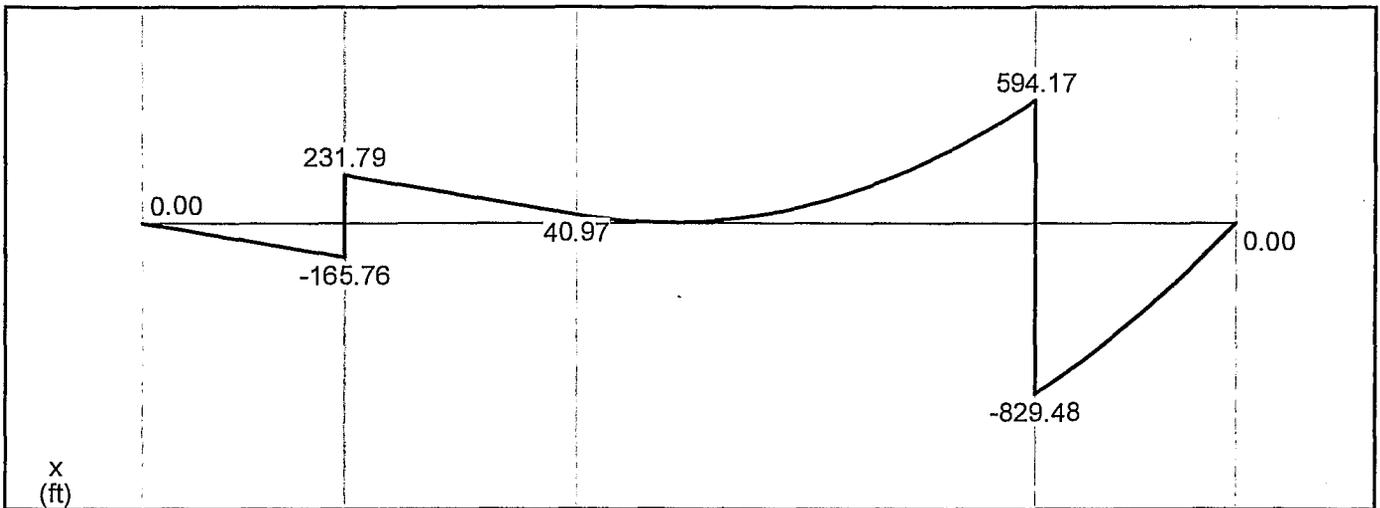
Load Case 2 Option 1



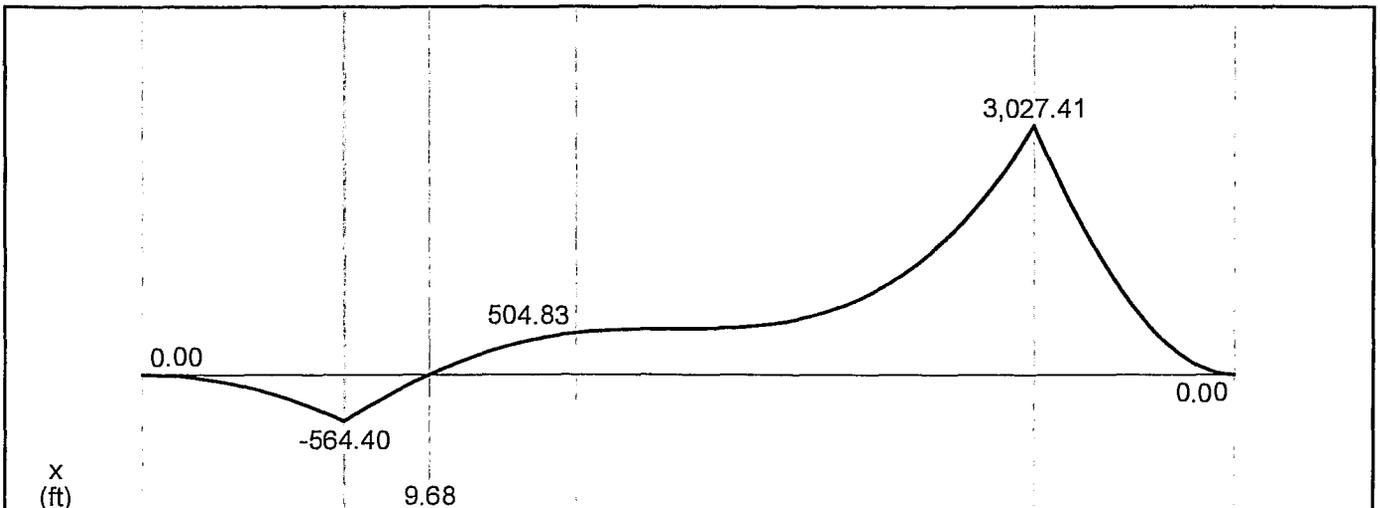
Load Diagram

$w_1 = 24.34$ kip/ft (down)
 $q_2 = 0.0$ to 172.41 kip/ft (up)

$A_y = 397.55$ kip (up)
 $B_y = 1,423.65$ kip (down)

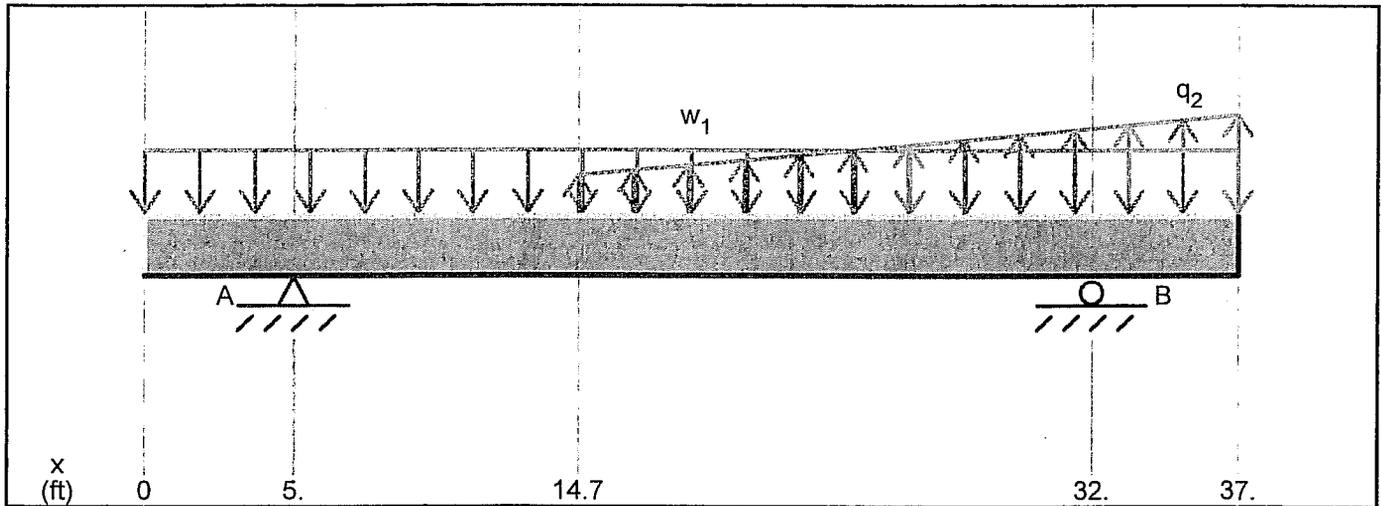


Shear Diagram (kip)



Moment Diagram (kip-ft)

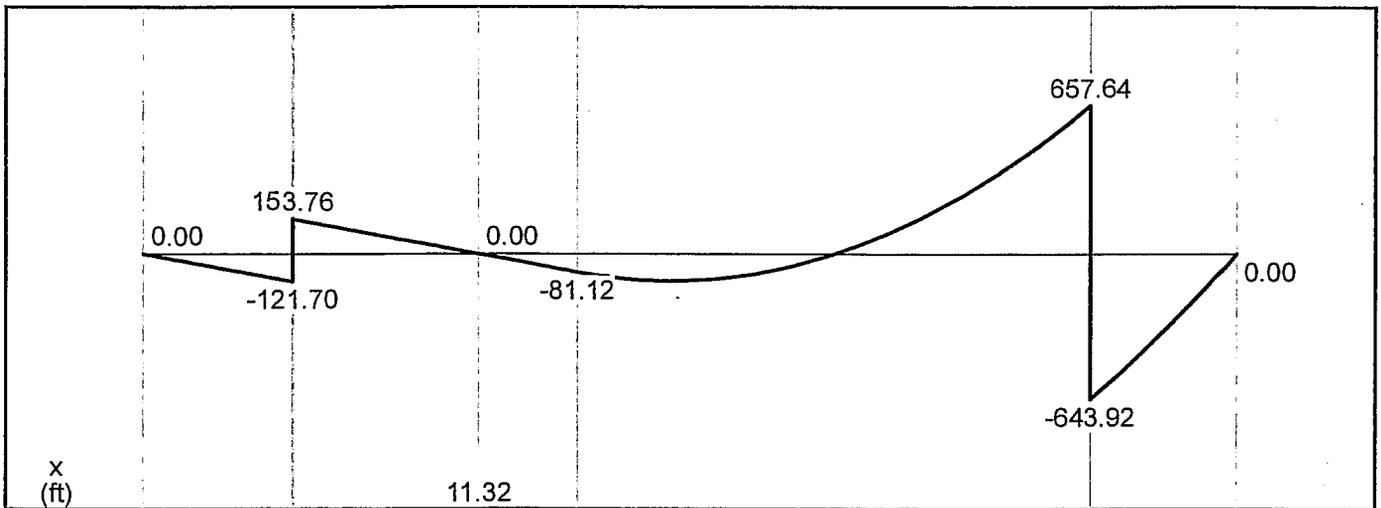
Load Case 2 Option 2



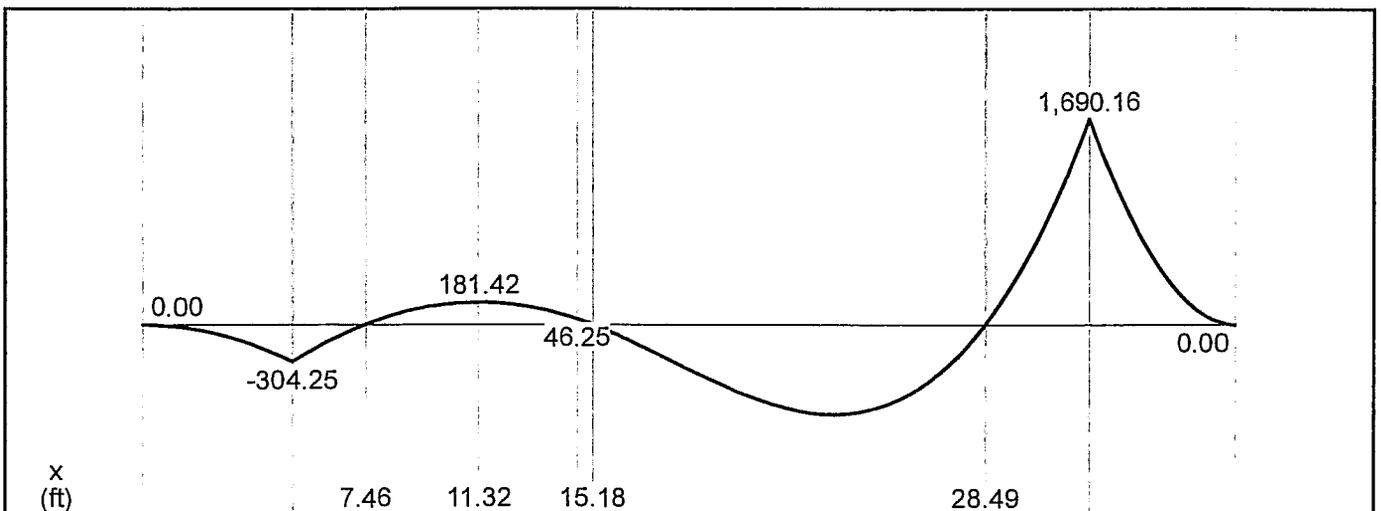
Load Diagram

$w_1 = 24.34$ kip/ft (down)
 $q_2 = 0.0$ to 172.41 kip/ft (up)

$A_y = 275.46$ kip (up)
 $B_y = 1,301.56$ 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
	$A_{st_p}' = Mn / (0.9 * F_y * d_c)$	$A_{st_p}' = 51.791$	in ²
	$a_p = A_{st_p}' * F_y / (\beta * F'c * W_e)$	$a_p = 2.68$	in
Required steel:	$A_{st_p_st} = Mn / (F_y * (d_c - a_p / 2)) * (W / W_e)$	$A_{st_p_st} = 66.992$	in ²
Shrinkage:	$\rho_{sh} = \text{IF}(F_y >= 60000, 0.0018, 0.002)$	$\rho_{sh} = 0.0018$	
	$A_{st_p_sh} = psh * W * T / 2$	$A_{st_p_sh} = 7.193$	in ²
	$A_{st_p} = \text{MAX}(A_{st_p_st}, A_{st_p_sh})$	$A_{st_p} = 66.992$	in ²
Rebar:	$s_p = 9$ Equally spaced, top and	$d_{b_p} = 1.128$	in
	$m_p = 67$ bottom, both directions.	$A_{b_p} = 1$	in ²
	$A_{s_p} = A_{b_p} * m_p$	$A_{s_p} = 67.00$	in ²
	Check $A_{s_p} = 67.00$ in ² \geq $A_{st_p} = 66.99$ in ²		OK
Bar separation:	$B_{s_p} = (W - 2 * cc - db_p) / (m_p - 1) - db_p$	$B_{s_p} = 5.49$	in
	Check $10.87 \geq B_{s_p} = 5.49$ in ≥ 4.5 "		OK

Pad Development Length:

Reinforcement location:	$\psi_{t_p} =$ if the space under the rebar > 12 in, use 1.3, else use 1.0	$\psi_{t_p} = 1$	
[ACI 12.2.4]			
Epoxy coating:	$\psi_{e_p} =$ if epoxy-coated bars are not used, use 1.0; but if epoxy-coated bars are used, then if $B_s < 6 * db$ or $cc < 3 * db$, use 1.5, else 1.2	$\psi_{e_p} = 1.0$	
[ACI 12.2.4]			
Max term:	$\psi_1 \psi_{e_p} =$ the product of ψ_t & ψ_e , need not be taken larger than 1.7	$\psi_1 \psi_{e_p} = 1$	
[ACI 12.2.4]			
Reinforcement size:	$\psi_{s_p} =$ if the bar size is 6 or less, then use 0.8, else use 1.0	$\psi_{s_p} = 1$	
[ACI 12.2.4]			
Light weight concrete:	$\lambda_p =$ if lightweight concrete is used, 1.3, else use 1.0	$\lambda_p = 1.0$	
[ACI 12.2.4]			
Spacing/cover:	$c_p =$ the smaller of: half the bar spacing or the concrete edge distance	$c_p = 3.56$	in
[ACI 12.2.4]			
Transverse bars:	$k_{tr_p} = 0$ in (per simplification)	$k_{tr_p} = 0$	in
[ACI 12.2.3]			
Max term:	$c_p' = \text{MIN}(2.5, (c_p + k_{tr_p}) / db_p)$	$c_p' = 2.500$	
[ACI 12.2.3]			
Excess reinforcement:	$R_p = A_{st_p} / A_{s_p}$	$R_p = 1.00$	
[ACI 12.2.5]			
Development (tensile):	$L_d = (3 / 40) * (F_y / \sqrt{F'c}) * \psi_t \psi_{e_p} * \psi_{s_p} * \lambda_p * R_p * db_p / c_p'$	$L_d' = 32.1$	in
[ACI 12.2.2]			
Minimum length:	$L_{d_min} = 12$ inches	$L_{d_min} = 12.0$	in
[ACI 12.2.1]			
Development length:	$L_{dp} = \text{MAX}(L_{d_min}, L_{dp}')$	$L_{dp} = 32.1$	in
Length available in pad:	$L_{pad} = (W / 2 - w' / 2) - cc$	$L_{pad} = 57.0$	in
	Check $L_{pad} = 57.00$ in \geq $L_{dp} = 32.10$ 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)

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 =	67		Rebar yield strength =	60000 psi
	Clear spacing =	5.49	in.		
	Are there hooks?	n			
	Check Compression?	n			

Anchor Steel:	Part number:	103182		Actual Bending Moment =	237.35	ft-kips
	Embedment length =	51.5	in.	Allowable Bending Moment =	293.69	ft-kips
	Bolt Diameter =	1"		Excess Reinforcement Ratio =	0.808	

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) =	26.16	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.

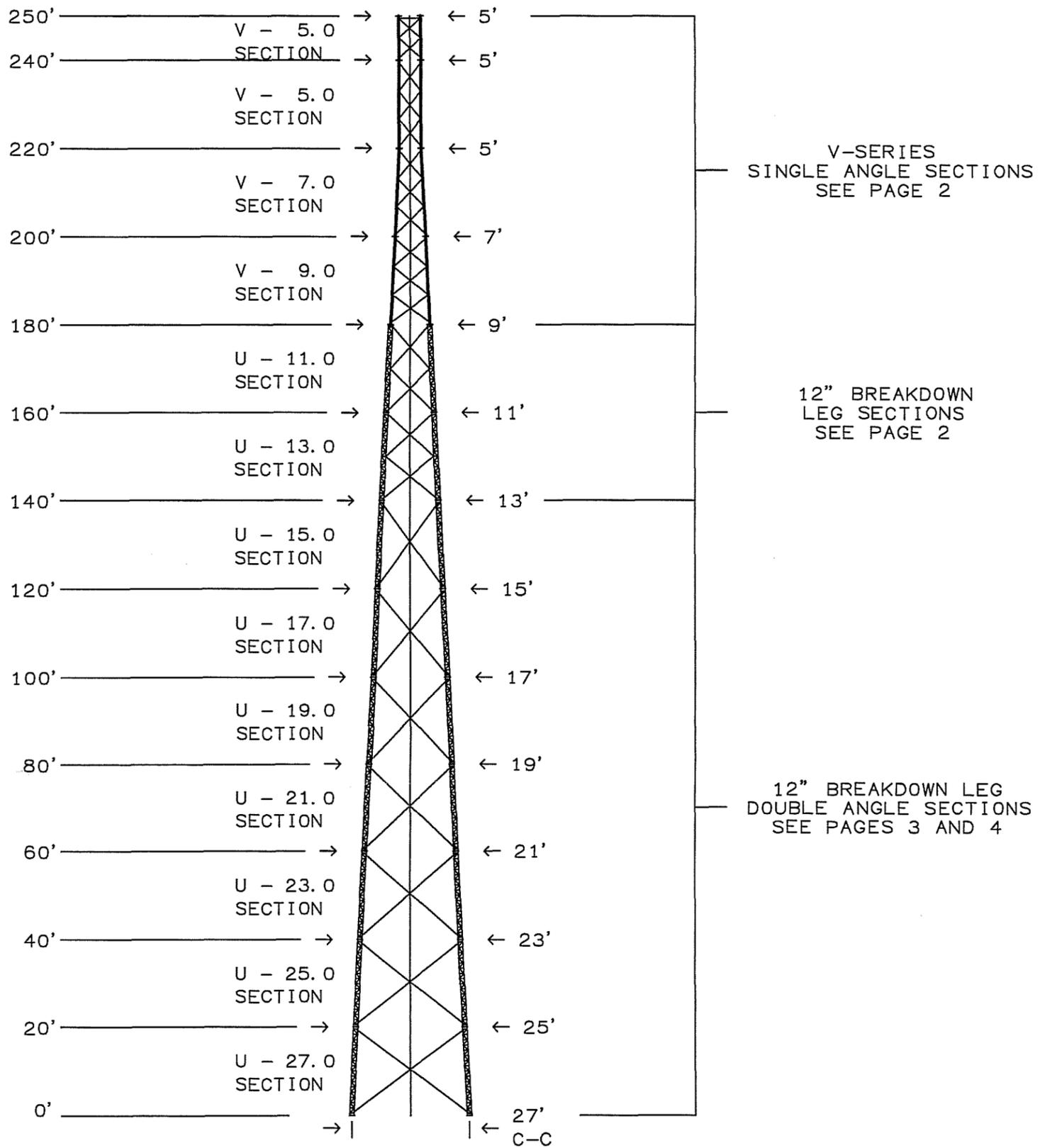
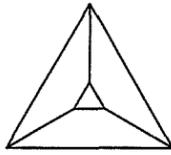
Anchor Steel:	Part number:	103182		Angle of anchor steel in foundation =	3.3 degrees
	Embedment length =	51.5	in.		

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.



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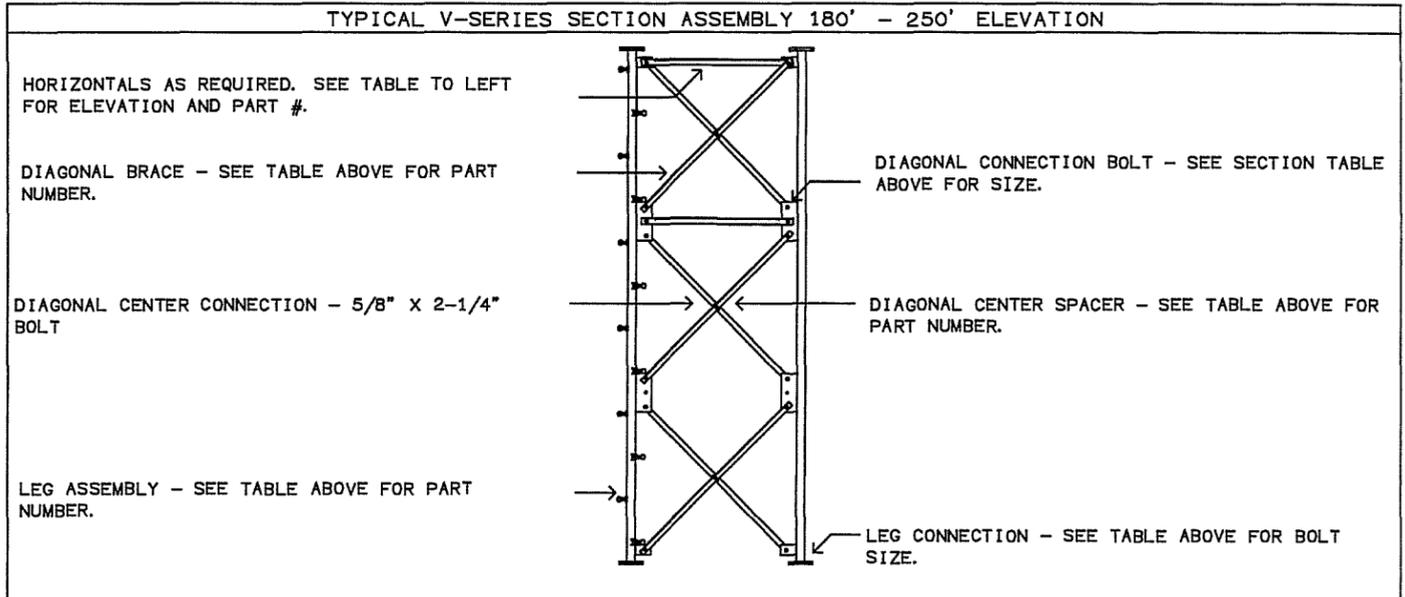
Nitesh Ahuja, KY Professional Engineer #28866

				AMERICAN TOWER CORP. #282079 COUCHTOWN, 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.	N/A	
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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	QTY
						QTY	PART#	QTY	PART#	DIAM	LENGTH	#1	#2	#3	FACE	THICK	DIAM	LENGTH	SPACER	
V- 5.0	10'	528#	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'	1285#	4"	0.237	A572-50	1	226184	2	226185	3/4"	3-1/2"	227113	227113	227113	2"	3/16"	3/4"	2-1/4"	116467	
V- 7.0	20'	1609#	5"	0.258	A572-50	1	226200	2	226201	3/4"	3-1/2"	226190	226189	231342	2"	3/16"	3/4"	2-1/4"	116467	
V- 9.0	20'	2293#	6"	0.280	A572-50	3	229377			1"	4-3/4"	225035	225034	231345	2-1/2"	3/16"	3/4"	2-1/4"	116467	

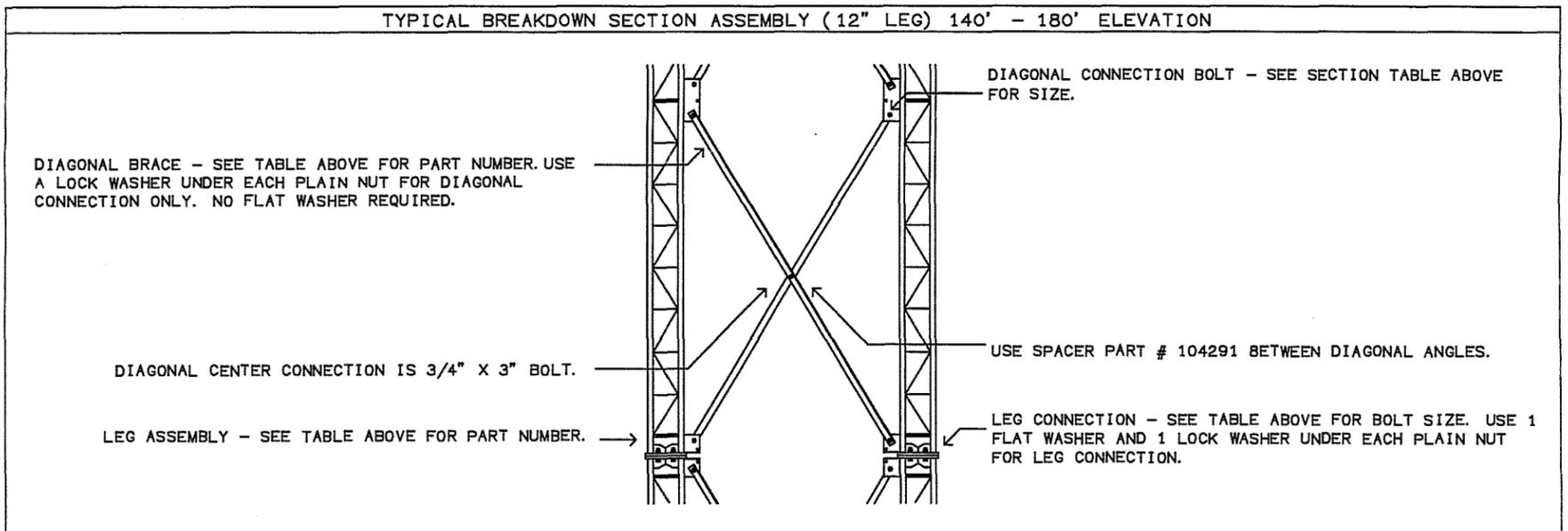
+ AT BOTTOM OF SECTION
* THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.
** PANELS ARE NUMBERED BEGINNING AT THE TOP OF THE SECTION.

HORIZONTAL DATA		
HORIZ HT	IN SEC#	HORIZ PART#
250	V- 5.0	227584



BREAKDOWN SECTION DATA (12\"/>													
SEC #	SECTION LENGTH	LEG SIZE	LEG PART#	TOP DIAG PART#	BOT DIAG PART#	DIAGONAL ANGLE	SECTION FACE	SECTION THICK	SECTION WEIGHT	LEG CONNECT+ DIAM	LEG CONNECT+ LENGTH	DIAG CONNECT DIAM	DIAG CONNECT LENGTH
U-11.0	20'	1- 3/4"	229588	105568	105571	3"	3/16"	2990#	1"	4-3/4"	1"	2-1/4"	
U-13.0	20'	1- 3/4"	229588	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.
#282079 COUCHTOWN, KY
V-27.0 X 250'

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PAGE

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

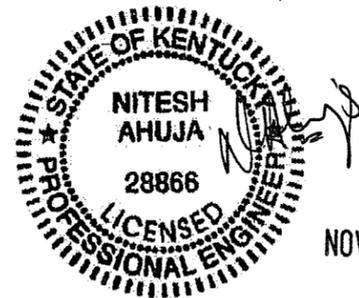
SECTION				LEG		LEG CONNECT @ BOTTOM+		
#	MODEL	LENGTH	WEIGHT*	SIZE	PART #	DIAM	LENGTH	#
7	U-15.0	20'	3953#	2 "	208332	1"	4-3/4"	12
6	U-17.0	20'	4615#	2- 1/4 "	208334	1"	4-3/4"	12
5	U-19.0	20'	4676#	2- 1/4 "	208334	1"	4-3/4"	12
4	U-21.0	20'	6016#	2- 1/2 "	208335	1"	4-3/4"	12
3	U-23.0	20'	6119#	2- 1/2 "	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.
 #282079 COUCHTOWN, KY
 V-27.0 X 250'

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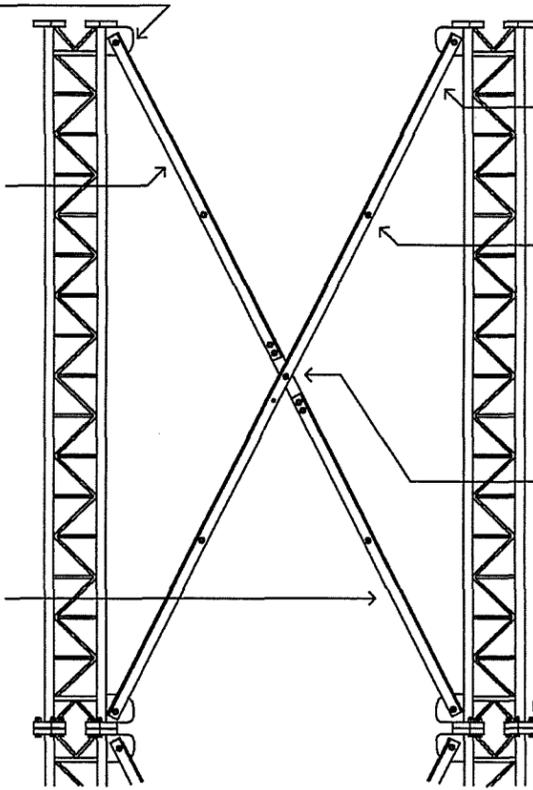
3 OF 10

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.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282079 COUCHTOWN, KY
V-27.0 X 250'

KENTUCKY C. O. A. 1542	
APPROVED/ENG.	M_S 11/11/2013
APPROVED/FOUND.	N/A
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DRAWN BY	KWD



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From: F1015737.DFT - 11/11/2013 09:41

ENG. FILE NO. A-238614-

251811

Printed from 251811_04@@.DWG - 11/11/2013 09:57 @ 11/12/2013 10:27

ARCHIVE F-1015737

PAGE

4 OF 10

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 DIPPEO) 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 PROVIDED 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 COLOR GALVANIZING COMPOUND AFTER FINAL TIGHTENING.
14. TIA-222-G GROUNDING FOR TOWER.
15. TOWER LIGHTING SUPPLIED BY OTHERS.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

AMERICAN TOWER CORP.
#282079 COUCHTOWN, KY
V-27.0 X 250'

KENTUCKY C. O. A. 1542	
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APPROVED/FOUND.	N/A
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ENG. FILE NO.	A-238614-
ARCHIVE	F-1015737



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251811

PAGE

5 OF 10

FOUNDATION NOTES

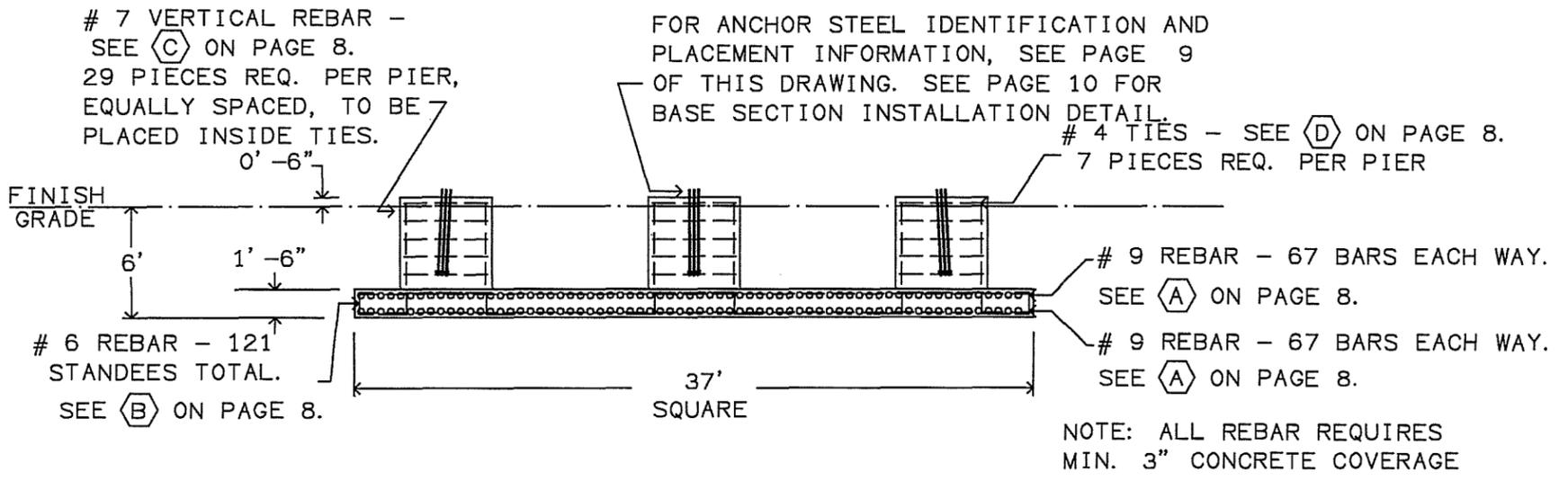
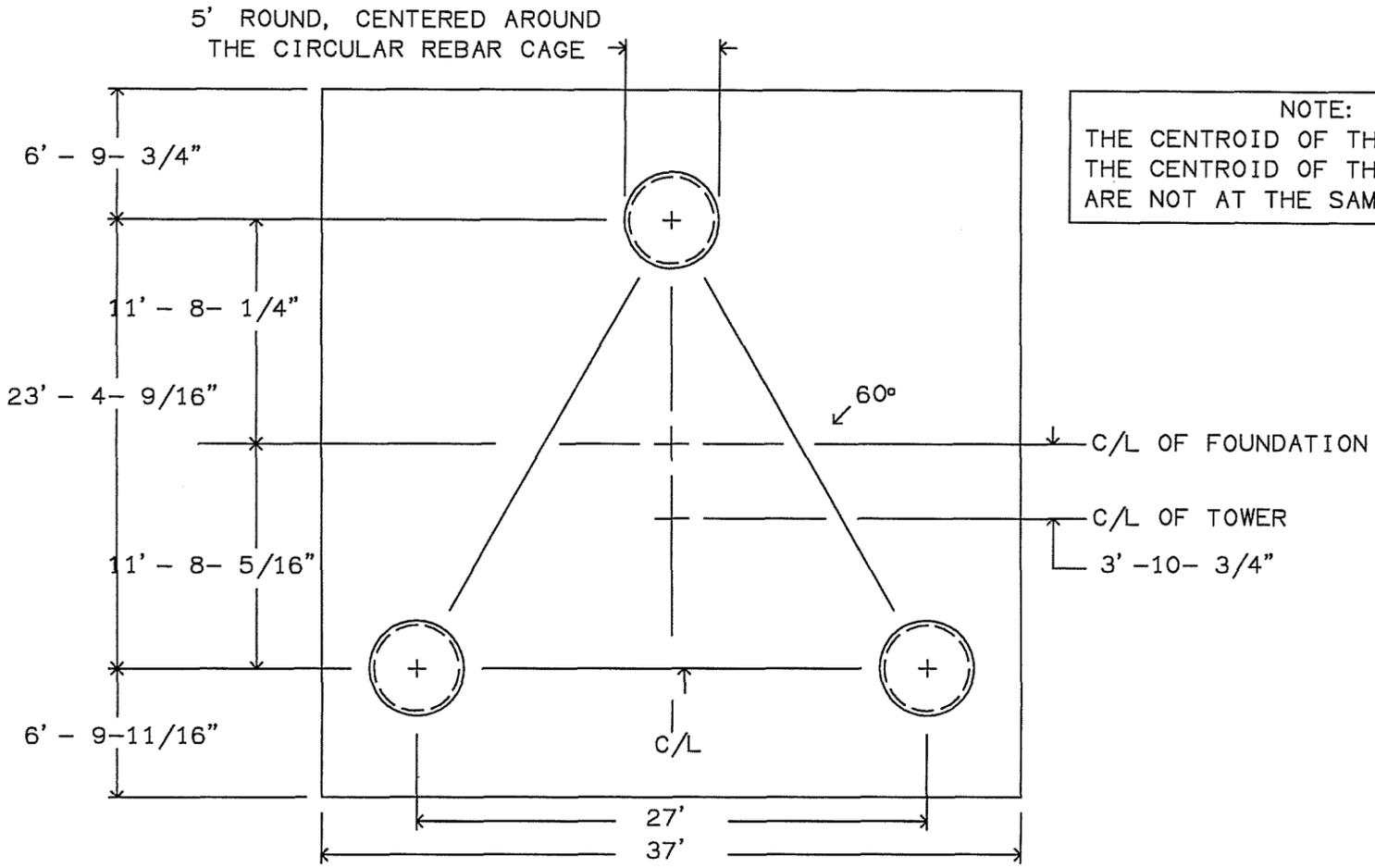
1. SOIL AS PER REPORT BY FDH, DATED: 10/16/13 (PROJECT#1305531600) & EMAIL DATED: 11/11/13
2. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 (2008) BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE 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. DIFFICULTIES DURING EXCAVATION MAY ARISE DUE TO THE PRESENCE OF BOULDERS, COBBLES, AND/OR SHALLOW BEDROCK. THE BOULDERS, COBBLES, AND/OR ROCK MUST BE REMOVED FROM THE EXCAVATION.
9. ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL.
10. SUBGRADE PREPARATIONS AND BACKFILLING MUST BE COMPLETED PER THE SPECIFICATIONS IN THE REFERENCED GEOTECHNICAL REPORT ABOVE.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

				AMERICAN TOWER CORP. #282079 COUCHTOWN, 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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TOWER FOUNDATION

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

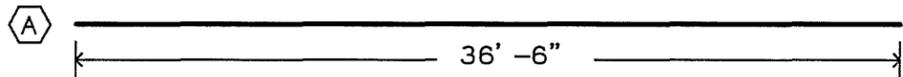


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Nitesh Ahuja, KY Professional Engineer #28866

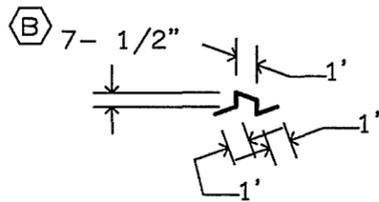
AMERICAN TOWER CORP.
#282079 COUCHTOWN, KY
V-27.0 X 250'

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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Printed from 251811_07@A.DWG - 11/11/2013 10:25 @ 11/12/2013 10:27					ARCHIVE		F-1015737	PAGE 7 OF 10

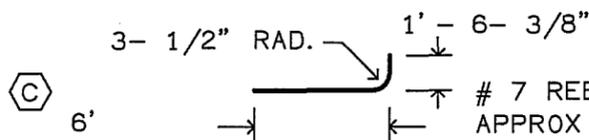


9 REBAR - 268 PIECES REQ. TOTAL
 APPROX WT = 124.1# EACH, 33259# TOTAL

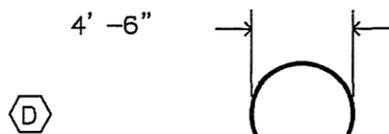
REBAR SUPPORTS MAY CONSIST OF ANY ACCEPTABLE MEANS OF SECURELY SUPPORTING THE TOP REINFORCEMENT GRID ABOVE THE BOTTOM REINFORCEMENT GRID WHILE MAINTAINING A SEPARATION OF 1' (OUTSIDE REBAR TO OUTSIDE REBAR).



6 REBAR - 121 PIECES REQUIRED TOTAL
 TYPE 26 STANDEE PLACED BETWEEN REBAR GRIDS ON NOMINAL 4' SPACING THROUGHOUT
 APPROX UNBENT LENGTH = 4'-2"
 APPROX WT = 6.3# EACH, 762# TOTAL



7 REBAR - 87 PIECES REQUIRED TOTAL
 APPROX UNBENT LENGTH = 7'-4-7/8"
 APPROX WT = 15.1# EACH, 1314# TOTAL



4 REBAR - 21 PIECES REQUIRED TOTAL
 APPROX UNBENT LENGTH = 15'-8-1/4"
 APPROX WT = 10.5# EACH, 221# 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

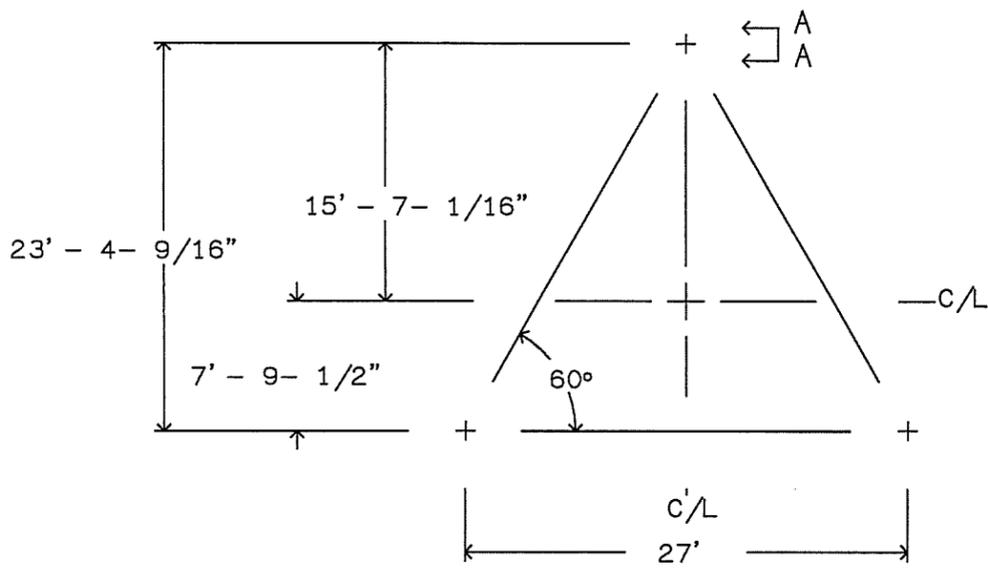
TOTAL APPROX REBAR WEIGHT = 35556#
 REINFORCING BAR TO CONFORM TO
 ASTM A615 GRADE 60 SPECIFICATIONS.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

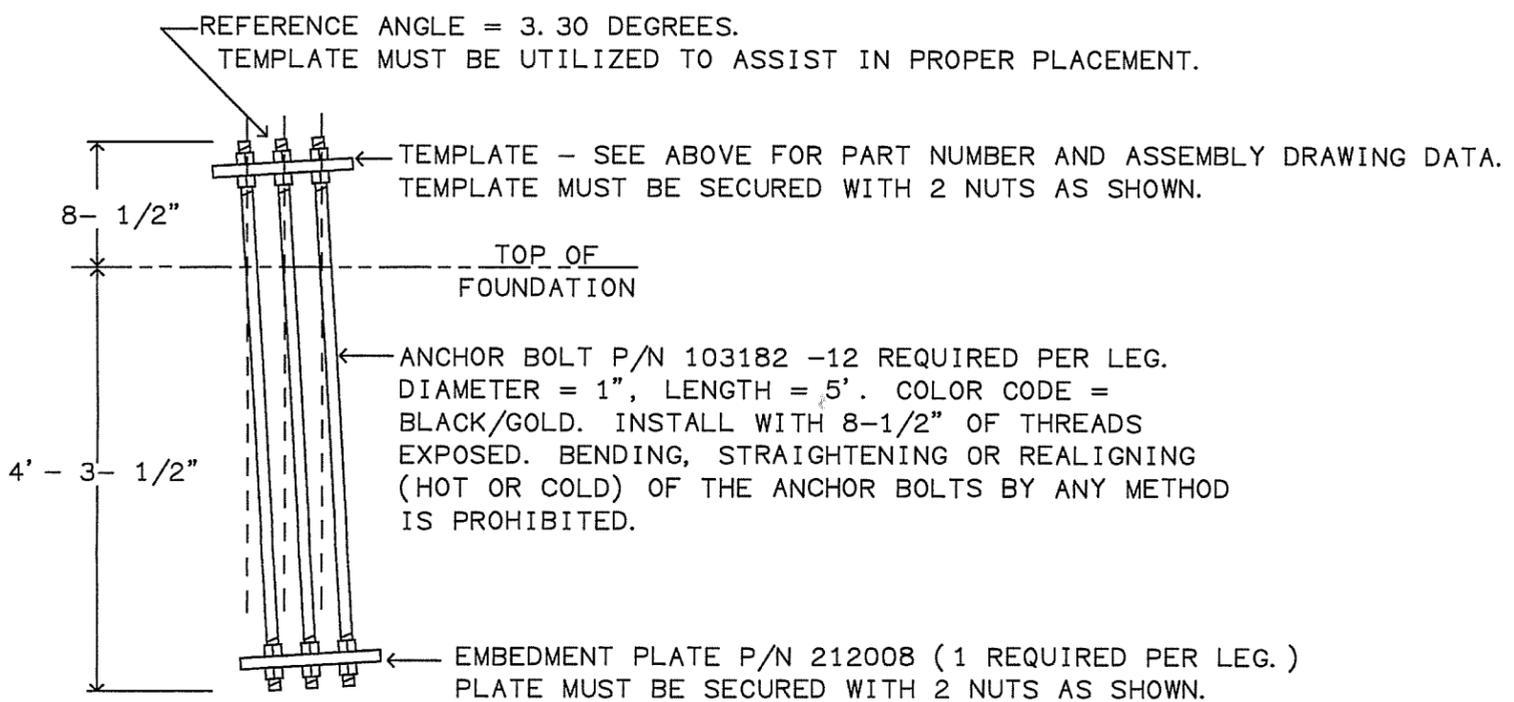
				AMERICAN TOWER CORP. #282079 COUCHTOWN, KY V-27.0 X 250'	
				KENTUCKY C. O. A. 1542	
A	ADDED FOUNDATION	JAK	11/11/2013	APPROVED/ENG.	M_S 11/11/2013
REV	DESCRIPTION OF REVISIONS	INI	DATE	APPROVED/FOUND.	M_S 11/11/2013
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				DRAWING NO. 251811	
				PAGE 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.

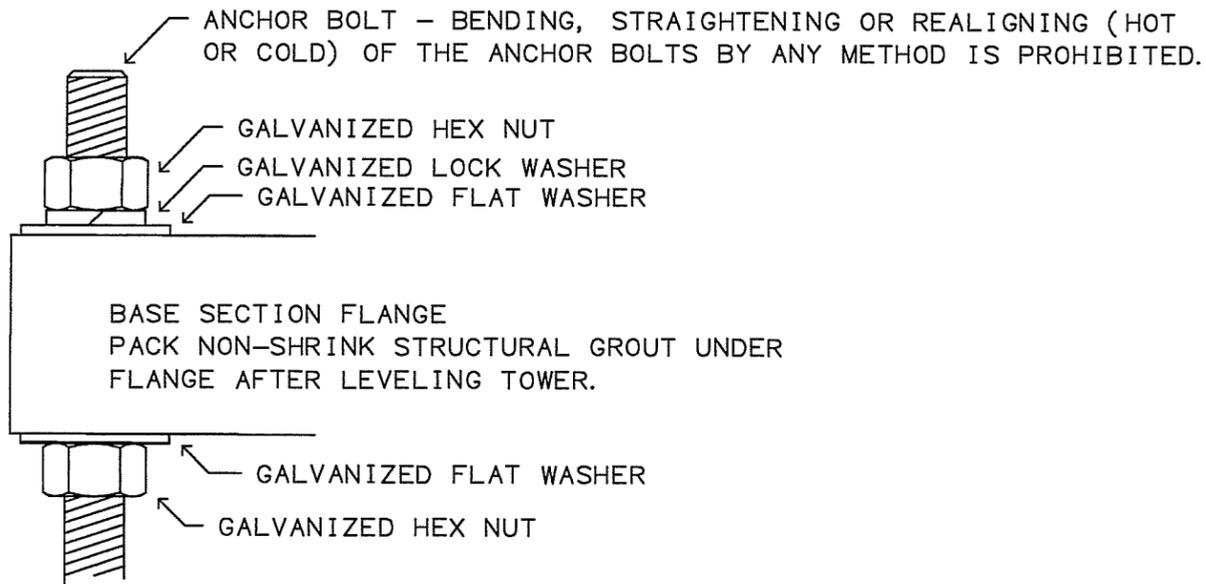
IF THERE ARE ANY DISCREPANCIES, PLEASE NOTIFY PIROD, INC. PRIOR TO INSTALLATION!!



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

				AMERICAN TOWER CORP. #282079 COUCHTOWN, 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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				DRAWING NO. 251811	
				PAGE 9 OF 10	



BASE SECTION INSTALLATION DETAIL



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Nitesh Ahuja, KY Professional Engineer #28866

				AMERICAN TOWER CORP. #282079 COUCHTOWN, 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-1015737		251811
						PAGE 10 OF 10



4E0DD8665D7B8942A4535D9902F11CA9@fmhccloud.download

From: Cedric Fairbanks
Sent: Monday, November 11, 2013 10:11 AM
To: 'jak0@valmont.com'
Subject: Couchtown Bearing Capacity

Greetings,

Per our conversation at approximately 10 am today. This is email is to confirm that if a 37.0' by 37.0' mat foundation is constructed to support the proposed Couchtown tower, a net ultimate bearing capacity of 30,000 psf is acceptable. Please let me know if you have any further questions or concerns.

Best regards,

Cedric

Cedric D. Fairbanks, PhD, P.E.

Senior Geotechnical Engineer

FDH Engineering, Inc.

6521 Meridien Drive

Raleigh, NC 27616

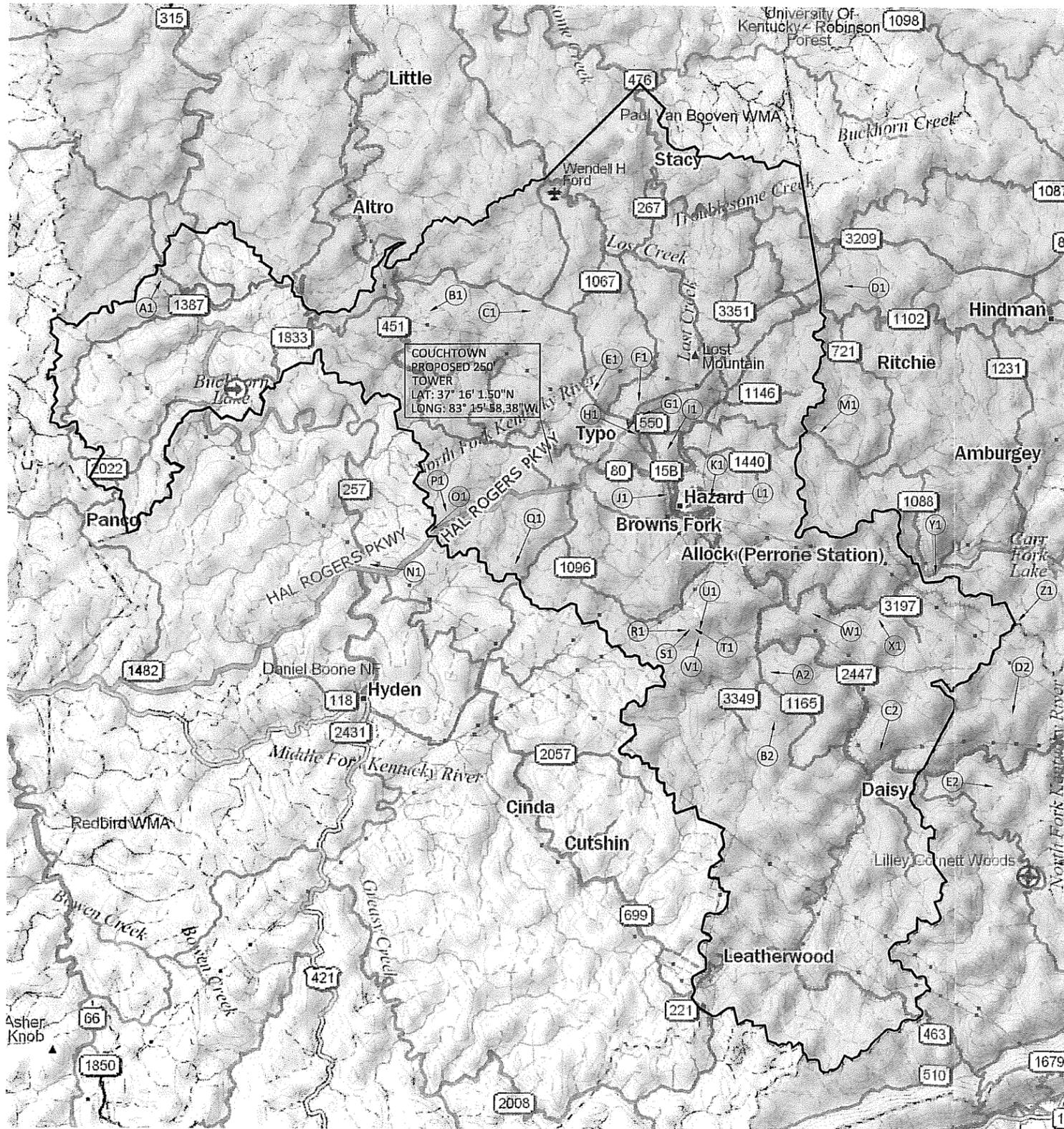
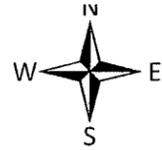
Office: 919.755.1012 s Mobile: 803.413.3525

Fax: 919.755.1031 s Email: cfairbanks@fdh-inc.com<mailto:cfairbanks@fdh-inc.com>

www.fdhengineering.com<<http://www.fdhengineering.com/>>

RaleighSt. LouisBaton Rouge

EXHIBIT D
COMPETING UTILITIES, CORPORATIONS, OR PERSONS LIST
AND MAP OF LIKE FACILITIES IN VICINITY



NOTE: TOWERS DEPICTED ARE ALL EXISTING TOWER SITES REGISTERED WITH THE FEDERAL COMMUNICATIONS COMMISSION IN PERRY COUNTY, KENTUCKY.

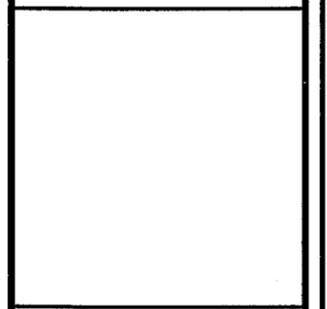
USGS 7.5 MINUTE QUADRANGLE: HAZARD, KY

PERRY COUNTY, KENTUCKY

AT&T SITE NAME: COUCHTOWN

EXISTING TOWER LEGEND

- | | |
|--|--|
| Ⓐ FCC REGISTRATION #: 1228252
LAT: N37° 21' 06.30"
LONG: W83° 29' 17.60" | Ⓜ FCC REGISTRATION #: 1236687
LAT: N37° 13' 22.30"
LONG: W83° 17' 12.60" |
| Ⓑ FCC REGISTRATION #: 1235226
LAT: N37° 20' 19.00"
LONG: W83° 20' 07.00" | Ⓨ FCC REGISTRATION #: 1275573
LAT: N37° 11' 34.20"
LONG: W83° 11' 23.40" |
| Ⓒ FCC REGISTRATION #: 1042395
LAT: N37° 20' 18.30"
LONG: W83° 16' 42.60" | Ⓩ FCC REGISTRATION #: 1044020
LAT: N37° 11' 35.00"
LONG: W83° 11' 17.00" |
| Ⓓ FCC REGISTRATION #: 1009307
LAT: N37° 21' 05.40"
LONG: W83° 05' 57.60" | ⓐ FCC REGISTRATION #: 1048810
LAT: N37° 11' 36.00"
LONG: W83° 11' 04.00" |
| Ⓚ FCC REGISTRATION #: 1274202
LAT: N37° 18' 08.00"
LONG: W83° 14' 31.80" | ⓑ FCC REGISTRATION #: 1043131
LAT: N37° 11' 38.00"
LONG: W83° 10' 52.00" |
| Ⓛ FCC REGISTRATION #: 1238020
LAT: N37° 17' 53.00"
LONG: W83° 13' 00.00" | ⓓ FCC REGISTRATION #: 1204858
LAT: N37° 11' 21.80"
LONG: W83° 10' 57.40" |
| Ⓜ FCC REGISTRATION #: 1246956
LAT: N37° 17' 29.30"
LONG: W83° 12' 52.60" | ⓔ FCC REGISTRATION #: 1236687
LAT: N37° 12' 05.30"
LONG: W83° 07' 01.60" |
| Ⓝ FCC REGISTRATION #: 1237058
LAT: N37° 16' 57.00"
LONG: W83° 13' 05.70" | ⓕ FCC REGISTRATION #: 1270918
LAT: N37° 11' 54.60"
LONG: W83° 04' 44.90" |
| Ⓞ FCC REGISTRATION #: 1229714
LAT: N37° 16' 32.50"
LONG: W83° 12' 00.50" | ⓖ FCC REGISTRATION #: 1260112
LAT: N37° 12' 55.00"
LONG: W83° 03' 11.00" |
| Ⓟ FCC REGISTRATION #: 1043132
LAT: N37° 15' 18.00"
LONG: W83° 12' 03.00" | ⓗ FCC REGISTRATION #: 1043804
LAT: N37° 11' 52.80"
LONG: W82° 59' 55.70" |
| Ⓠ FCC REGISTRATION #: 1042056
LAT: N37° 15' 16.30"
LONG: W83° 10' 28.70" | ⓘ FCC REGISTRATION #: 1287373
LAT: N37° 10' 27.80"
LONG: W83° 08' 26.60" |
| Ⓡ FCC REGISTRATION #: 1061535
LAT: N37° 15' 21.00"
LONG: W83° 10' 25.00" | ⓙ FCC REGISTRATION #: 1210134
LAT: N37° 09' 05.30"
LONG: W83° 08' 19.60" |
| Ⓢ FCC REGISTRATION #: 1274629
LAT: N37° 17' 03.60"
LONG: W83° 06' 46.10" | ⓚ FCC REGISTRATION #: 1281419
LAT: N37° 08' 20.30"
LONG: W83° 04' 42.20" |
| Ⓣ FCC REGISTRATION #: 1286454
LAT: N37° 13' 21.00"
LONG: W83° 22' 08.40" | ⓛ FCC REGISTRATION #: 1263525
LAT: N37° 09' 20.70"
LONG: W83° 00' 07.50" |
| Ⓤ FCC REGISTRATION #: 1261729
LAT: N37° 14' 20.70"
LONG: W83° 20' 0.630" | ⓜ FCC REGISTRATION #: 1286558
LAT: N37° 07' 21.10"
LONG: W83° 00' 50.90" |
| Ⓜ FCC REGISTRATION #: 1272180
LAT: N37° 14' 49.40"
LONG: W83° 19' 33.90" | |



COUNTY TOWER MAP

REV.	DATE	DESCRIPTION

SITE INFORMATION:
COUCHTOWN
1023 SNATCH CREEK ROAD
BUSY, KY 41723

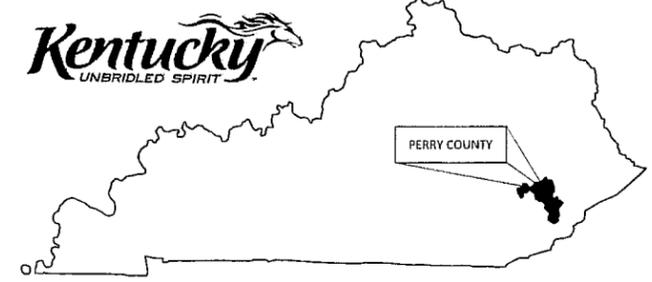
SITE NUMBER:
KYALU6155

POD NUMBER: 13-0815

DRAWN BY: SMR
CHECKED BY: MEP
DATE: 08.20.13

SHEET TITLE:
TOWER GRID MAP

SHEET NUMBER:
C-1



License Search

Search Results**Specified Search**State = **Kentucky**County = **PERRY**Radio Service = **CL, CW**Status = **Active**Matches **1-10** (of **10**)

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

	Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date
1	PA KNKN809	East Kentucky Network, LLC d/b/a Appalachian Wireless	0001786607	CL	Active	10/01/2021
2	KNKN841	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CL	Active	10/01/2021
3	KNLF252	WIRELESSCO, L.P.	0002316545	CW	Active	06/23/2015
4	KNLH256	Cellco Partnership	0003290673	CW	Active	04/28/2017
5	KNLH398	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017
6	KNLH399	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017
7	WPOI255	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CW	Active	06/23/2015
8	WQCS428	Cellco Partnership	0003290673	CW	Active	05/13/2015
9	WQCX683	T-Mobile License LLC	0001565449	CW	Active	06/20/2015
10	PA WQDI527	Cricket License Company, LLC	0018402123	CW	Active	09/06/2015

	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
Certificate of Public Convenience and Necessity
Applicant: AT&T Mobility
Site Location: 1023 Snatchcreek Road, Busy, KY 41723
Site Name: Couchtown

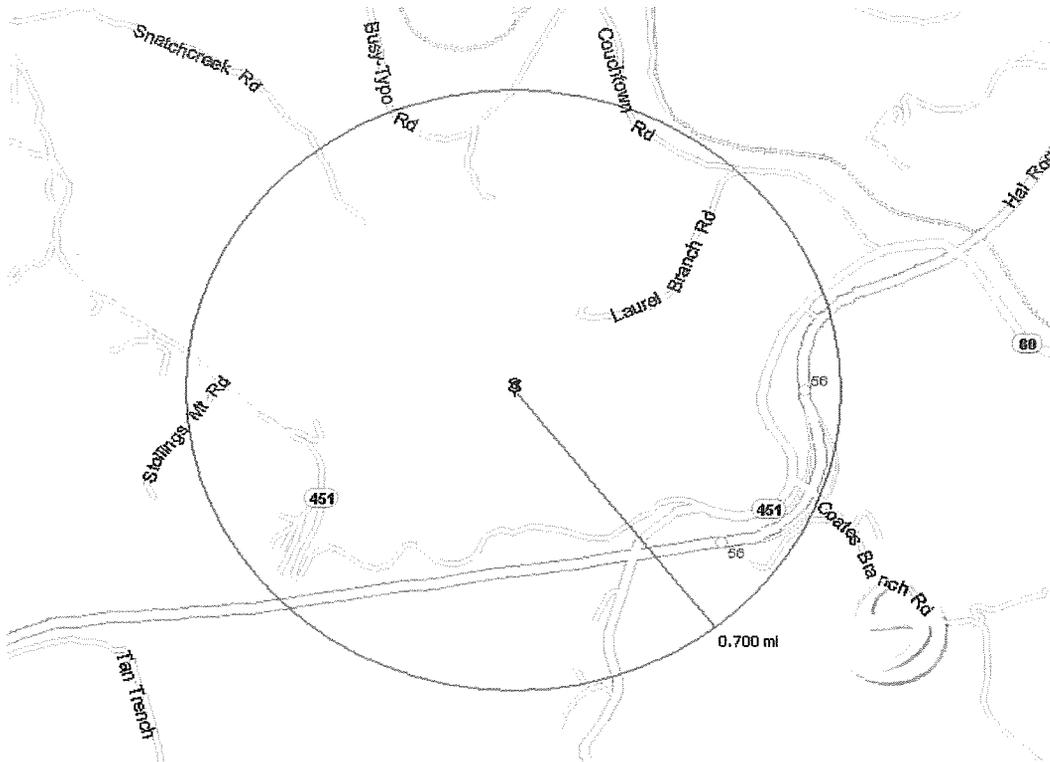
Dear Commissioners:

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 Hal Rogers Parkway, due north/west of Hazard, 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. In this instance, the search ring has a radius of 0.7 miles and is centered on a particular hill that is high in elevation. A copy of the search ring map is shown below.



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, there were no suitable tall structures within the search area for collocation. The hill that the search ring area is designed around has an elevation of approximately 1,400'. This hill has been strip mined and reclaimed from Kem Coal Company. There is only one road leading to the top of this hill, Snatchcreek Road. All other surrounding roads within the search area are at lower elevations and would not offer any access to higher elevations within the search area ring.

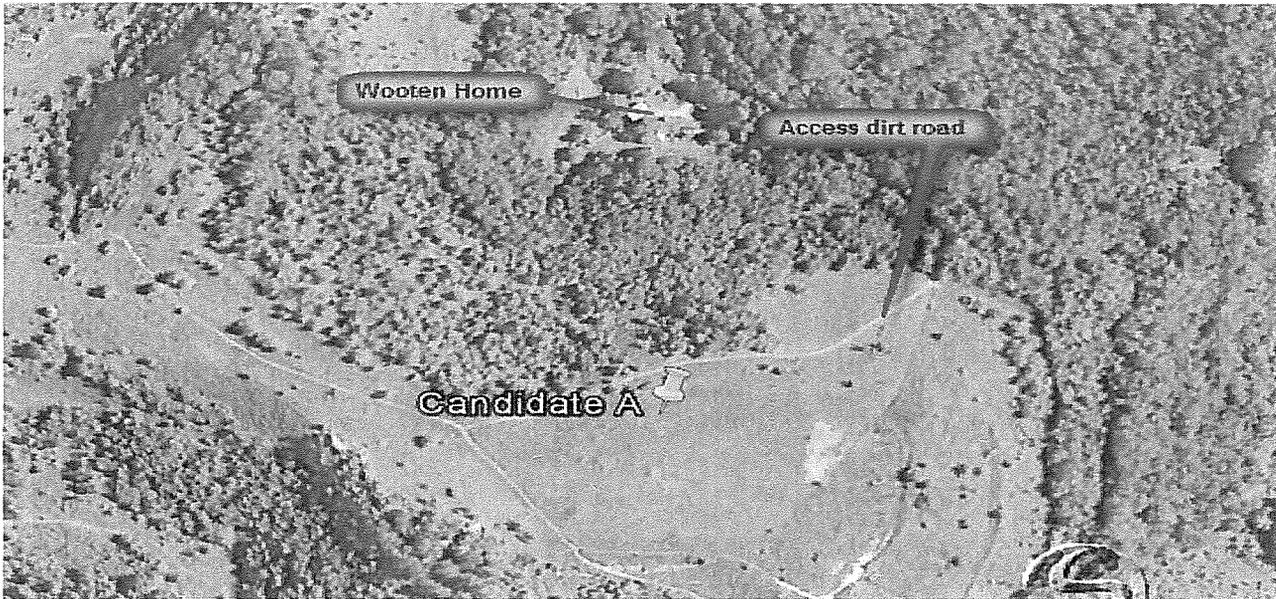
Step 4: Review of the Area's Zoning Classification. Once the site development team determined that there are no available existing tall structures which are technically feasible and suitable for co-location, the team next reviewed local zoning requirements to identify parcels located within the search area that might be suitable from a land use perspective to host an antenna site. In this case, the search ring is located in unincorporated Perry County where there is no zoning designation. Most of the neighboring property within the search ring area is homes, small businesses and gas stations at much lower elevations at the bottom of the hill on Hwy 451. After visiting the Perry Co PVA office in Hazard, KY, the site acquisition agent was able to identify four parcels that could meet AT&T objectives, identified below:

- Wooten property, # 063-00-00-012.00
- Crawford property, # 063-00-00-017.00
- Thomas property, # 063-00-00-013.00
- Odell property, # 063-00-00-029.00

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, the four property parcels identified were properties within the search ring and had sufficient size for the construction of a cell site and possibly access from a public roadway. Inquiry letters were sent to the above parcel owners.

Betty Wooten and Doug Crawford were the only two property owners that responded to the inquiry letters. After meeting with Betty Wooten and Doug Crawford, it was determined that the Wooten property was the best choice from a constructability stand point. There is an existing Coal Mine Road in place on the Wooten property that goes to the top of the hill. No clearing of trees or road construction will be needed. The Crawford property was heavily wooded and had steep elevation climbs to the top of the hill and no access in place from Hwy 451.

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, the top three candidates were on the Wooten property and those were submitted to AT&T for review. Betty Wooten was contacted and she was interested in a proposed lease agreement. Mrs. Wooten's property is a 40 acre tract that is partially wooded at lower elevations and flat with grass at the top of the hill. This property was previously strip mined and was reclaimed roughly 10 years ago. Mrs. Wooten offered three different locations on her 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 at 1,400' and sits very near the search area center. An aerial map of the Wooten property and the chosen candidate is shown below.



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 of four property owners responded to letters of interest sent to them, and those two were contacted. The Wooten property was chosen by AT&T's RF Department because it was near the center of the search ring, had road access to the build site, and is high in elevation with a flat construction site.

Step 8: Application. Once a lease was obtained and all site due diligence was completed, AT&T Mobility prepared and filed the accompanying application 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 RF Department 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

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-8015-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 Couchtown
Location: Busy, KY
Latitude: 37-16-01.83N NAD 83
Longitude: 83-15-58.95W
Heights: 1401 feet site elevation (SE)
65 feet above ground level (AGL)
1466 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-8015-OE.

Signature Control No: 197610751-201774889

(DNE)

Carole Bernacchi
Technician

Attachment(s)
Frequency Data

cc: FCC

Frequency Data for ASN 2013-ASO-8015-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-097-K20-2013-160

STRUCTURE: Antenna Tower
LOCATION: Busy, KY
COORDINATES: 37° 16' 1.83" N / 83° 15' 58.95" W
HEIGHT: 265' AGL/1666' 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,



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: Couchtown
Site ID: 144886-A

1023 Snatchcreek Road - Busy, KY 41723
Lat: 37.267081
Lon: -83.266475

FDH Project Number 1305531600

Prepared by:

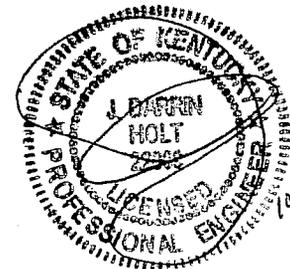
Cedric D. Fairbanks

J. Darrin Holt

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



10/16/2013



EXECUTIVE SUMMARY

Project Location: 1023 Snatchcreek Road – Busy, KY 41723
Structure Type: Self-Support
Site ID/Number: 144886-A
Number of Borings: One (1)
Depth of Borings: B-1 to 19.0 ft, drilled to refusal

INTRODUCTION

FDH Engineering, Inc. understands that a 250-ft tall self-support telecommunication tower 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.

SITE INVESTIGATIONS

The project site is slightly sloping to northwest 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 – 8.5	SC - Dense to Very Dense Clayey Sand (Probable Mine Spoils)
II	8.5 – 19.0	Dense to Very Dense Partially Weathered Rock with sand (Probable Shale)



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 Perry 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), Pad & Pier type foundation or single Mat 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.



Due to the sand encountered at the project site, the excavation may be susceptible to caving. 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 and Mat Foundation

Should three (3) pad & pier foundations or one (1) single mat foundation be used, we recommend the pad & pier or mat 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 or mat 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
8.0 × 8.0	4.0	30,000	0.35
	6.0	30,000	0.35
	8.0	30,000	0.35
10.0 × 10.0	4.0	30,000	0.35
	6.0	30,000	0.35
	8.0	30,000	0.35
12.0 × 12.0	4.0	30,000	0.35
	6.0	30,000	0.35
	8.0	30,000	0.35

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



• **Net Ultimate Bearing Capacity for MAT Foundation:**

Pad Dimensions (ft)	Mat Bearing Depth (ft)	Net Ultimate Bearing Capacity (psf)	Sliding Friction Factor
25.0 × 25.0	4.0	30,000	0.35
	6.0	30,000	0.35
30.0 × 30.0	4.0	30,000	0.35
	6.0	30,000	0.35
35.0 × 35.0	4.0	30,000	0.35
	6.0	30,000	0.35

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 or mat 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 or mat 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

Couchtown
Site ID: 144886-A

Boring #	Depth (ft)	Unified Soil Classification	Moist Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
B-1	0.0 – 3.5	SC	126	36	0
	3.5 – 8.5	SC	135	40	0
	8.5 – 13.5	PWR	127	37	0
	13.5 – 19.0	PWR	140	42	0



FDH Engineering, Inc., 6521 Meridien Drive, Raleigh, NC 27616, Ph: 919.755.1012, Fax: 919.755.1031

FIGURE 1: Site Plan – 1023 Snatchcreek Road - Busy, KY 41723

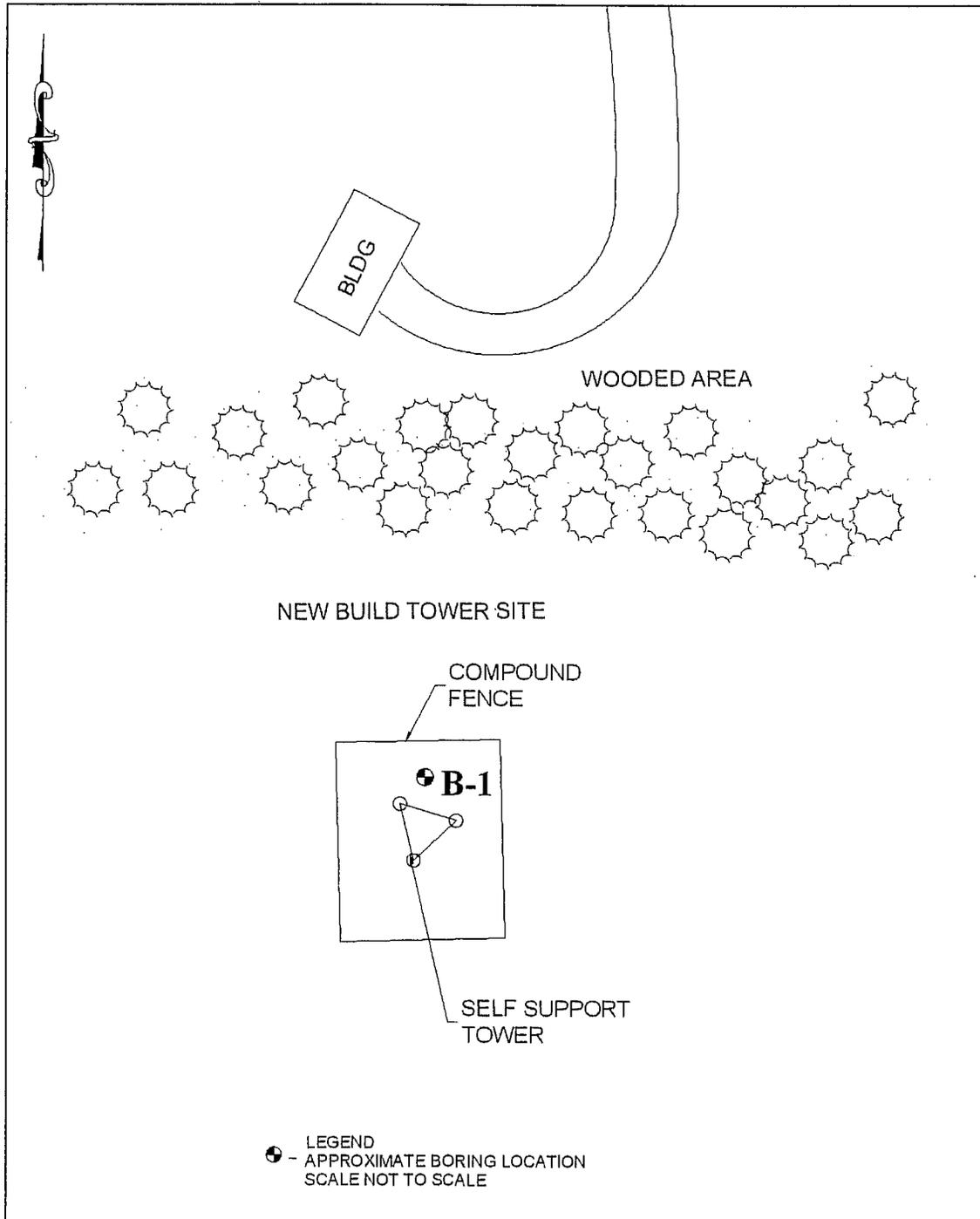




FIGURE 2: Ultimate Skin Friction vs. Depth
Soil Boring B-1, 3.0 ft to 7.0 ft Diameter Caissons

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

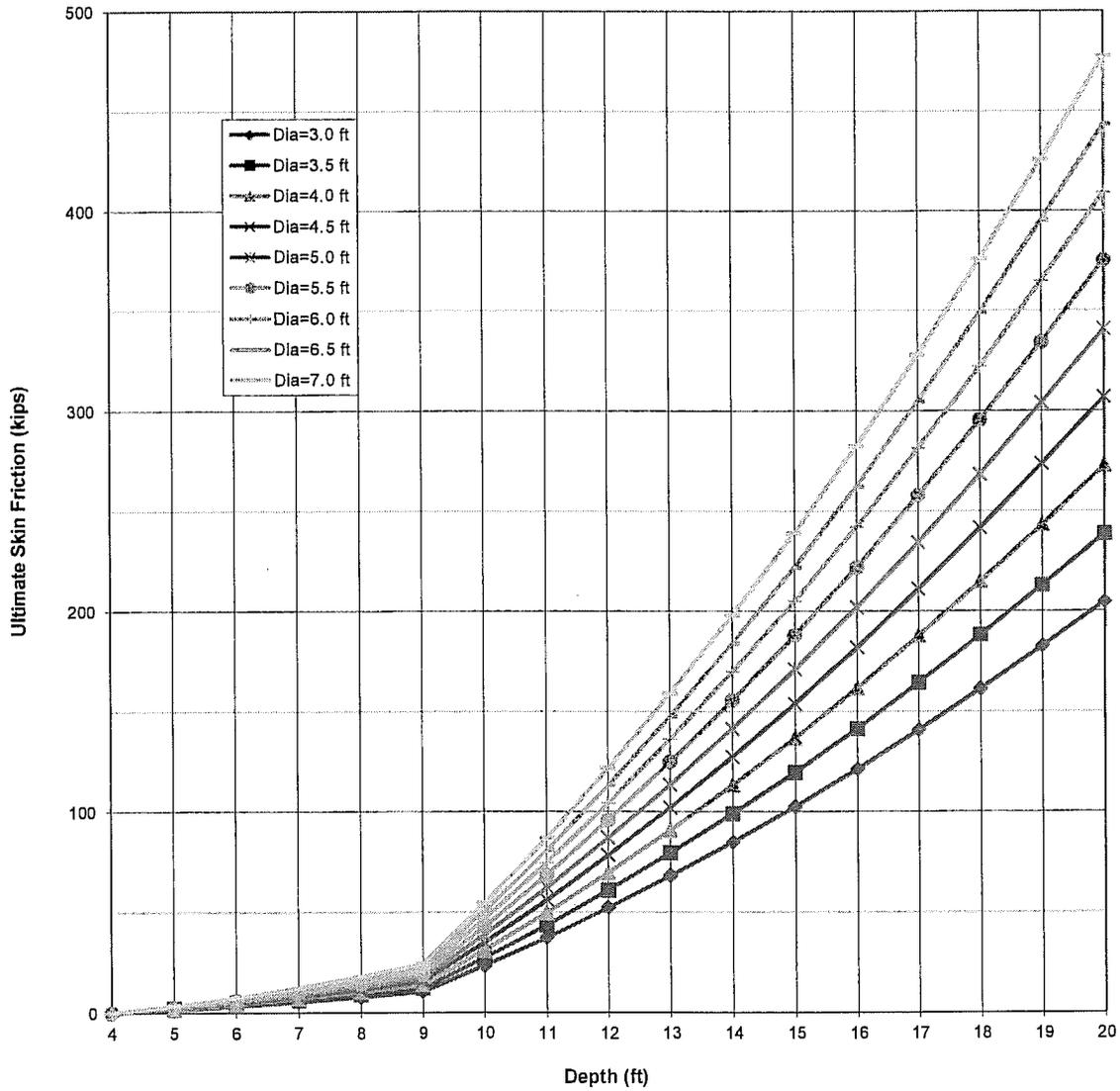




FIGURE 3: Ultimate Uplift Skin Friction vs. Depth
Soil Boring B-1, 3.0 ft to 7.0 ft Diameter Caissons

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

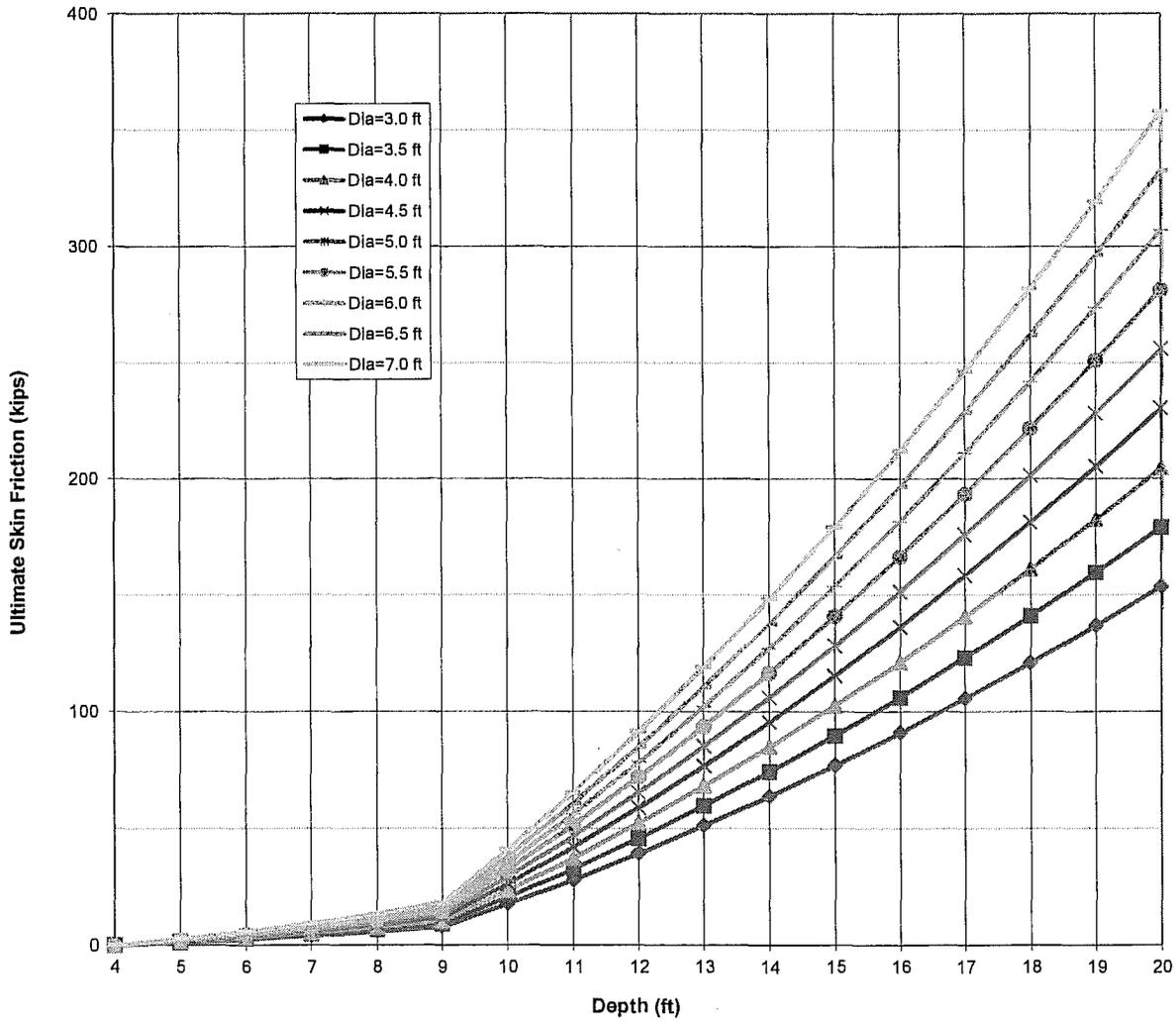




FIGURE 4: Ultimate Tip Resistance vs. Depth
Soil Boring B-1, 3.0 ft to 7.0 ft Diameter Calssons

An appropriate factor of safety should be used with this figure

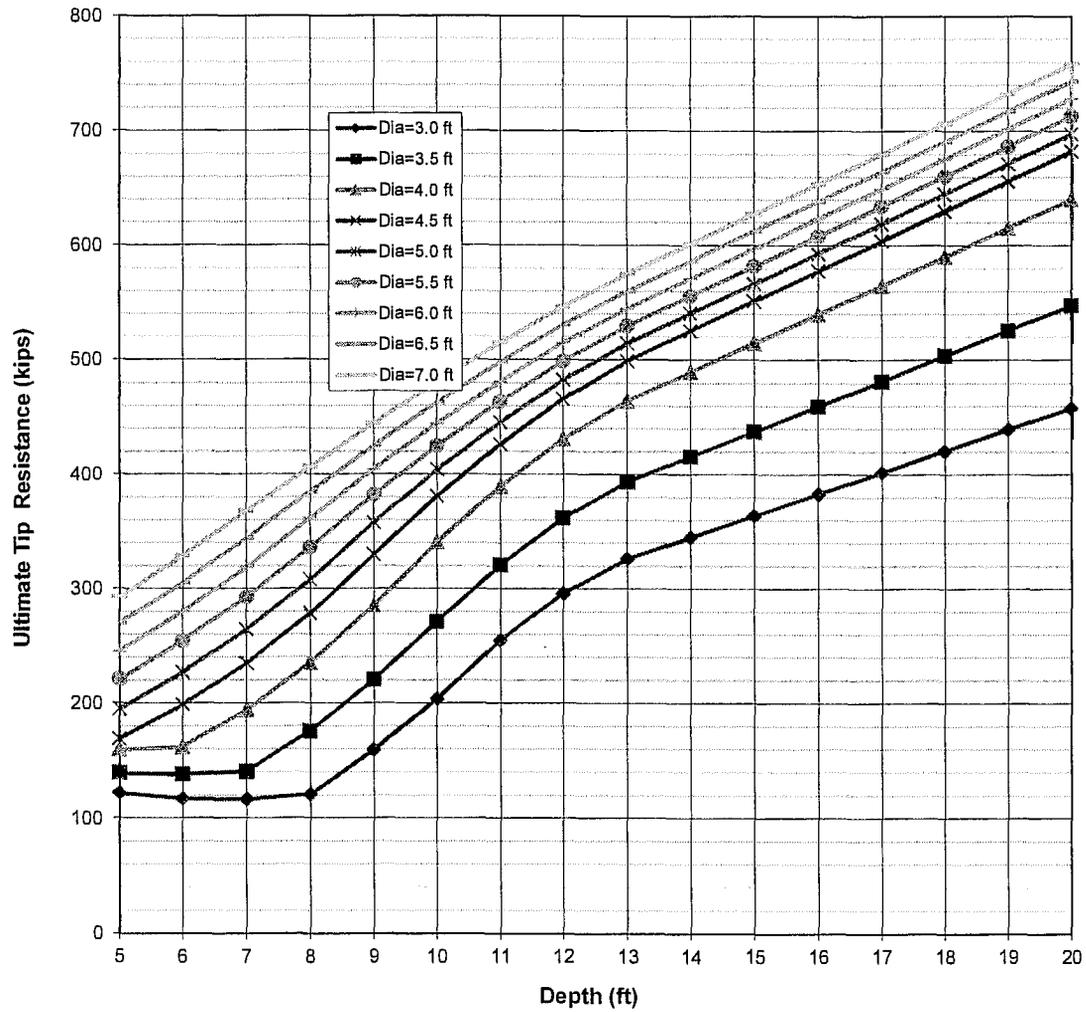




FIGURE 5: Ultimate Passive Resistance vs. Depth
Soil Boring B-1

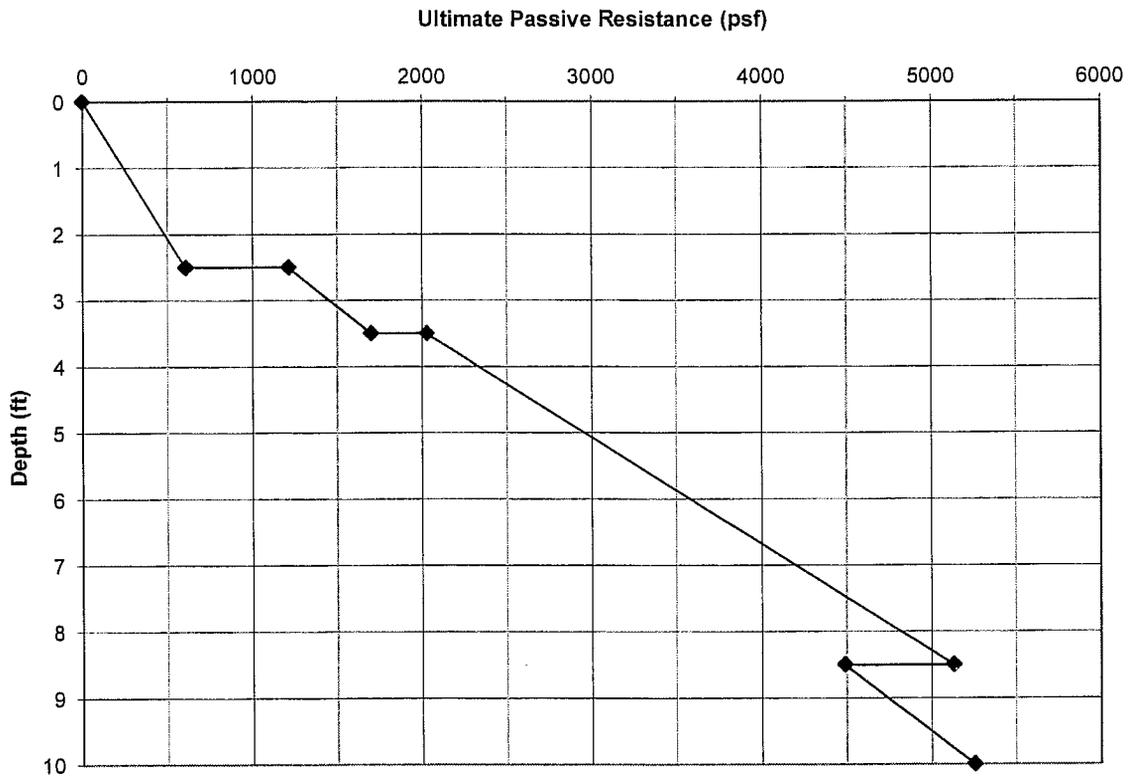
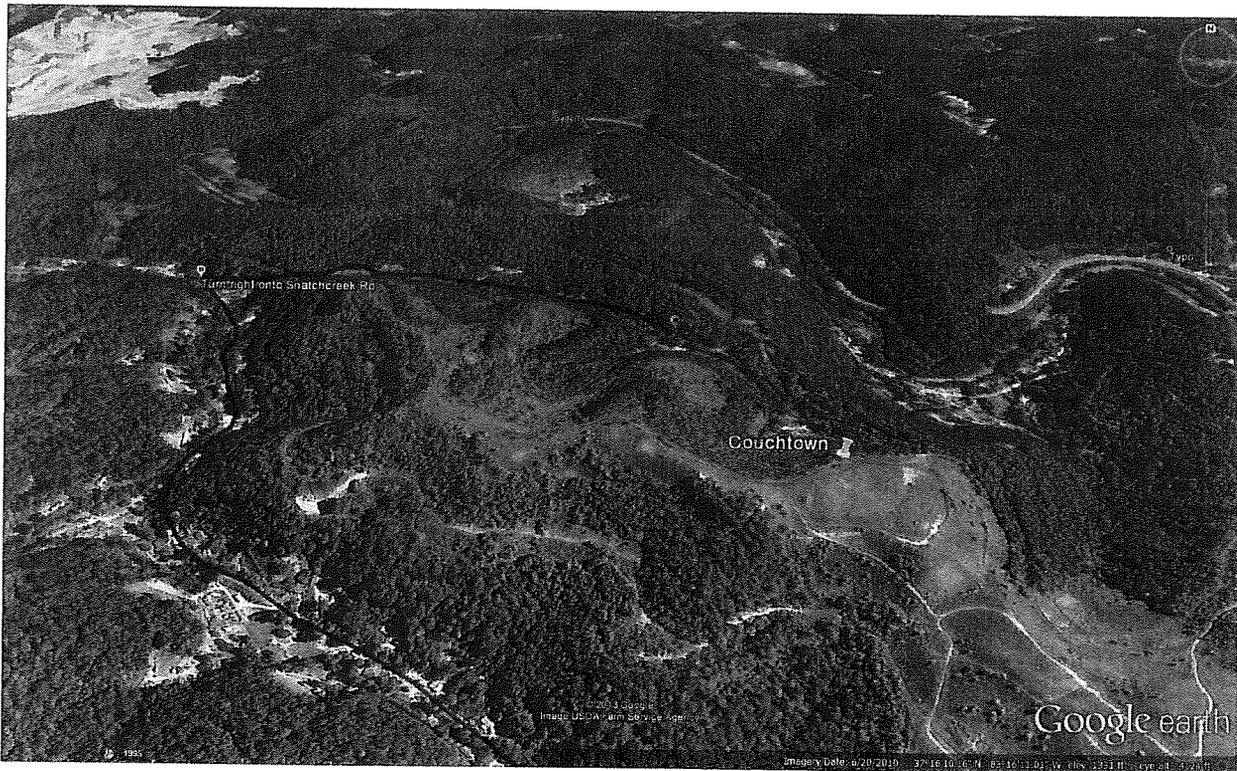


EXHIBIT I
DIRECTIONS TO WCF SITE

Driving Directions to the Proposed Tower Site at Couchtown

1. Beginning at the Perry County Clerk's office located at 148 Chester Street, Hazard, KY 41701, head southwest toward East Main Street.
2. Turn right onto KY 15 BUS-N / East Main Street and travel approximately .1 miles.
3. Turn left onto Main Street. Main Street will turn into KY-451 North. Follow KY-451 North for approximately 4.3 miles.
4. Turn left onto KY-451 North / KY-80W. Remain on KY-451 North and travel Approximately 2.9 miles.
5. Turn right onto Snatch Creek Road and travel approximately 0.7 miles. The site will be on your left. The address is 1023 Snatch Creek Road, Busy, KY 41723.
6. The site coordinates are
 - a. 37 deg 16' 01.83"
 - b. 83 deg 15' 58.95"



Prepared by:
Robert W. Grant
Pike Legal Group PLLC
1578 Highway 44 East, Suite 6
P.O. Box 369
Shepherdsville, KY 40165-3069
Telephone: 502-955-4400 or 800-516-4293

EXHIBIT J
COPY OF REAL ESTATE AGREEMENT

RECEIVED
PERRY COUNTY CLERK

2013 NOV 13 AM 8:31

MEMORANDUM OF LEASE

Prepared by:

Jeff Wolford *Jeff Wolford*
FMHC Corporation
6924 Peppermill Lane
Louisville, KY 40228

Return to:

Suite 13-F West Tower
575 Morosgo Drive
Atlanta, GA 30324
Attn: Network Real Estate Administration

Re: Cell Site #KYALU6155; Cell Site Name: Couhctown
Fixed Asset #12674957
State: Kentucky
County: Perry

MEMORANDUM
OF
LEASE

This Memorandum of Lease is entered into on this 9th day of August, 2013, by and between Betty Jean Wooton, having a mailing address of 1023 Snatchcreek Road Busy, KY 41723 (hereinafter referred to as "**Landlord**") and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of Suite 13-F West Tower, 575 Morosgo Drive, Atlanta, GA 30324 (hereinafter referred to as "**Tenant**").

1. Landlord and Tenant entered into a certain Option and Lease Agreement ("**Agreement**") on the 9th 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"

Betty Jean Wooton

By: Betty J Wooton

Print Name: Betty Jean Wooton

Its: Owner

Date: 7-9-13

"TENANT"

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

By: AT&T Mobility Corporation

Its: Manager

By: Daniel L

Print Name: Daniel Toth

Its: Manager Real Estate and Construction

Date: 8/9/13

[ACKNOWLEDGMENTS APPEAR ON THE NEXT PAGE]

TENANT ACKNOWLEDGMENT

STATE OF TENNESSEE)

) ss:

COUNTY OF WILLIAMSON)

On the 9th 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 as such 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 Perry)

On the 9th day of July, 2013 before me, personally appeared Betty Jean Wooton, 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.

Geraldine Colwell
Notary Public: Geraldine Colwell
My Commission Expires: 2-23-17

EXHIBIT 1

DESCRIPTION OF PREMISES

Page 1 of 3

to the Memorandum of Lease dated August 9, 2013, by and between Betty Jean Wooton, as Landlord, and New Cingular Wireless PCS, LLC, a Delaware limited liability company, as Tenant.

The Property is legally described as follows:

A certain tract or parcel of land lying and being
in Perry County, Kentucky and described as follows:

Lying on Willard Creek of North Fork of
the Kentucky River, a tributary of the
Kentucky River and bounded and described
as follows:

BEGINNING upon a cross fence near the
graveyard; thence down the hill with the
fence to the creek; thence up the hill
with the cross fence to the top of the
ridge between the two Willard Creeks; thence
up the top of the hill between the two
Willard Creeks to the Ben Couch line;
thence down the ridge with the Ben
Couch line to the beginning, containing
40 acres, more or less.

The Premises are described and/or depicted as follows:

See attached sheet, next page.

LEGAL DESCRIPTIONS

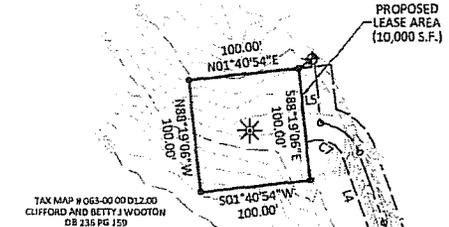
THE FOLLOWING IS A DESCRIPTION OF AN AREA TO BE LEASED FROM THE PROPERTY OF CLIFFORD WOOTON AND BETTY JEAN WOOTON, WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

PROPOSED LEASE AREA

BEGINNING AT A SET P/NAIL AT THE INTERSECTION OF THE CENTERLINE OF SNATCH CREEK ROAD AND THE NORTH PROPERTY LINE OF THE PROPERTY CONVEYED TO CLIFFORD WOOTON AND BETTY JEAN WOOTON AS RECORDED IN DEED BOOK 136, PAGE 159 IN THE OFFICE OF THE CLERK OF PERRY COUNTY, KENTUCKY WITH THE KENTUCKY STATE PLANE COORDINATES OF N: 3631531.63 E: 5643764.23; THENCE WITH THE CENTER OF SNATCH CREEK ROAD 518°24'44"E - 110.85' TO A SET P/NAIL; THENCE WITH SAID ROAD 531°14'26"E - 105.59' TO A SET P/NAIL; THENCE WITH AN EXISTING GRAVEL ROAD THE FOLLOWING CALLS: 552°25'18"E - 156.12' TO A SET 5/8" REBAR; 348°20'24"E - 182.04' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF 593°12'21"E - 35.61' TO A SET 5/8" REBAR; THENCE 554°53'02"E - 222.29' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 300.00' AND A CHORD OF 549°14'44"E - 57.79' TO A SET 5/8" REBAR; THENCE 543°37'28"E - 97.61' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 58.00' AND A CHORD OF 515°03'06"E - 41.45' TO A SET 5/8" REBAR; THENCE 505°21'16"W - 61.74' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 75.00' AND A CHORD OF 525°44'05"W - 52.24' TO A SET 5/8" REBAR; THENCE 546°06'54"W - 193.94' GRAVEL ROAD ENDS AND DIRT PATH BEGINS ALONG THIS CALL; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS 150' AND A CHORD OF 585°03'27"W - 112.10' TO A SET 5/8" REBAR; THENCE N90°00'00"W - 43.64' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF 584°03'55"W - 62.04' TO A SET 5/8" REBAR; THENCE 578°07'50"W - 66.89' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 40.00' AND A CHORD OF 545°05'26"W - 43.62' TO A SET 5/8" REBAR; THENCE 588°19'06"W - 50.62' TO A SET 5/8" REBAR; THENCE 501°40'54"W - 15.00' TO A SET 5/8" REBAR AND THE TRUE POINT OF BEGINNING OF THE PROPOSED LEASE AREA; THENCE S 88°19'06"W - 100.00' TO A SET 5/8" REBAR; THENCE S 81°40'54"W - 100.00' TO A SET 5/8" REBAR; BEING 188°19'06"W - 100.00' TO A SET 5/8" REBAR; THENCE N 01°40'54"E - 100.00' TO THE TRUE POINT OF BEGINNING CONTAINING 10,000 SQ. FT. AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED AUGUST 6, 2013.

CENTERLINE PROPOSED 30' ACCESS & UTILITY EASEMENT

BEGINNING AT A SET P/NAIL AT THE INTERSECTION OF THE CENTERLINE OF SNATCH CREEK ROAD AND THE NORTH PROPERTY LINE OF THE PROPERTY CONVEYED TO CLIFFORD WOOTON AND BETTY JEAN WOOTON AS RECORDED IN DEED BOOK 136, PAGE 159 IN THE OFFICE OF THE CLERK OF PERRY COUNTY, KENTUCKY WITH THE KENTUCKY STATE PLANE COORDINATES OF N: 3631531.63 E: 5643764.23; THENCE WITH THE CENTER OF SNATCH CREEK ROAD 518°24'44"E - 110.85' TO A SET P/NAIL; THENCE WITH SAID ROAD 531°14'26"E - 105.59' TO A SET P/NAIL; THENCE WITH AN EXISTING GRAVEL ROAD THE FOLLOWING CALLS: 552°25'18"E - 156.12' TO A SET 5/8" REBAR; 348°20'24"E - 182.04' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF 551°31'12"E - 35.61' TO A SET 5/8" REBAR; THENCE 554°52'00"E - 112.29' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 300.00' AND A CHORD OF 549°14'44"E - 57.79' TO A SET 5/8" REBAR; THENCE 549°17'21"E - 87.61' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 50.00' AND A CHORD OF 515°08'06"E - 41.45' TO A SET 5/8" REBAR; THENCE 505°21'16"W - 61.74' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS OF 75.00' AND A CHORD OF 525°44'05"W - 52.24' TO A SET 5/8" REBAR; THENCE 546°06'54"W - 193.94' GRAVEL ROAD ENDS AND DIRT PATH BEGINS ALONG THIS CALL; THENCE WITH THE ARC OF A CURVE TO THE RIGHT WITH A RADIUS 150' AND A CHORD OF 585°03'27"W - 112.10' TO A SET 5/8" REBAR; THENCE N90°00'00"W - 43.64' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 300.00' AND A CHORD OF 584°03'55"W - 62.04' TO A SET 5/8" REBAR; THENCE 578°07'50"W - 66.89' TO A SET 5/8" REBAR; THENCE WITH THE ARC OF A CURVE TO THE LEFT WITH A RADIUS OF 40.00' AND A CHORD OF 545°05'26"W - 43.62' TO A SET 5/8" REBAR; THENCE 588°19'06"W - 50.62' TO A SET 5/8" REBAR AND THE END OF SAID EASEMENT AS PER SURVEY BY MARK PATTERSON, LPLS #3136 DATED AUGUST 6, 2013.



CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	S51°31'12"E	35.61'	300.00'	35.63'
C2	S49°14'44"E	57.79'	300.00'	57.88'
C3	S19°08'06"E	41.45'	50.00'	42.74'
C4	S25°44'05"W	52.24'	75.00'	53.36'
C5	S68°03'27"W	112.10'	150.00'	114.89'
C6	S84°03'55"W	62.04'	300.00'	62.15'
C7	S45°05'26"W	43.62'	40.00'	46.13'

LINE	BEARING	DISTANCE
L1	S43°37'28"E	97.61'
L2	S05°21'16"W	61.74'
L3	N90°00'00"W	43.64'
L4	S78°07'50"W	66.89'
L5	S88°19'06"W	50.65'

TAX MAP # 063-00-00-012.00
CLIFFORD AND BETTY J. WOOTON
DB 136 PG 159

- LEGEND**
- UTILITY POLE: EOP EDGE OF PAVEMENT, COHC CONCRETE
 - LIGHT POST: CONIC CONCRETE
 - TELCO PEDESTAL: ROW RIGHTS OF WAY
 - TRANSFORMER: POB POINT OF BEGINNING
 - GUY WIRE: IPC IRON PIN CAPPED
 - OVERHEAD ELECTRIC: EX OVERHEAD ELECTRIC
 - OVERHEAD ELECTRIC & TELEPHONE: EX OVERHEAD ELECTRIC & TELEPHONE
 - UNDERGROUND TELEPHONE: EX UNDERGROUND TELEPHONE
 - FENCE LINE: EX FENCE LINE
 - DITCH: EX DITCH
 - SET P/NAIL: SET 5/8" REBAR 20" LONG (UNLESS OTHERWISE NOTED)
 - FOUND MONUMENT AS NOTED

LAND SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE SURVEY DEPICTED BY THE PLAN WAS PERFORMED BY PERSONS UNDER MY DIRECT SUPERVISION BY THE METHOD OF RANDOM TRAVERSE WITH SINE 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 AS ESTABLISHED BY THE STATE OF KENTUCKY, PER 201 KAR 18:150 AND IN EFFECT ON THE DATE OF THIS SURVEY.

MARK PATTERSON, LPLS #3136 DATE



FLOOD NOTE

THE PROPOSED LEASE AREA SHOWN HEREON IS NOT LOCATED IN A 100-YEAR FLOOD HAZARD BOUNDARY MAP, COMMUNITY-PANEL NUMBER 2119C01750, DATED AUGUST 2, 2006. THE PROPOSED LEASE AREA IS LOCATED IN ZONE X.

SITE INFORMATION

TAX PARCEL NUMBER: 063-00-00-012.00

PROPERTY OWNER: BETTY J. WOOTON
1004 SNATCHCREEK ROAD
BUSY, KY 41723

SOURCE OF TITLE: DB 136 PG 159

GENERAL NOTES

BASIS OF BEARING IS GPS OBSERVATIONS COMPLETED ON JULY 10, 2013.

NO SEARCH OF PUBLIC RECORDS HAS BEEN COMPLETED BY FOD GROUP TO DETERMINE ANY DEFECTS AND/OR AMBIGUITIES IN THE TITLE OF THE SUBJECT PROPERTY.

THIS DRAWING DOES NOT REPRESENT A BOUNDARY SURVEY.

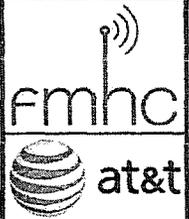
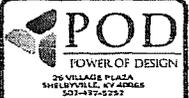
THIS PROPERTY IS SUBJECT TO ANY RECORDED EASEMENTS AND/OR RIGHTS OF WAY SHOWN HEREON OR NOT.

TEMPORARY BENCHMARK

NORTHING: 3630532.21
EASTING: 5643841.02
ELEVATION: 1404.07
LOCATION: BENCH A SET 5/8" REBAR CAPPED PATTERSON PLS 3136 LOCATED IN THE NORTHWEST CORNER OF THE PROPOSED LEASE AREA.

FAA COORDINATE POINT

NAD 83
LATITUDE: 37° 16' 18.83"
LONGITUDE: 83° 15' 58.55"
HARDEN
ELEVATION: 1401' AMSL
NORTHING: 3630480.77
EASTING: 5643890.33



SURVEY

REV.	DATE	DESCRIPTION

SITE INFORMATION:

COUCHTOWN

1024 SNATCHCREEK ROAD
BUSY, KY 41723

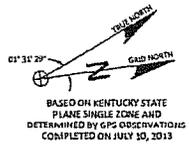
SITE NUMBER:
KYALU6155

PDD NUMBER: 13-0727
DRAWN BY: DSR
CHECKED BY: MEP
DATE: 07.23.13

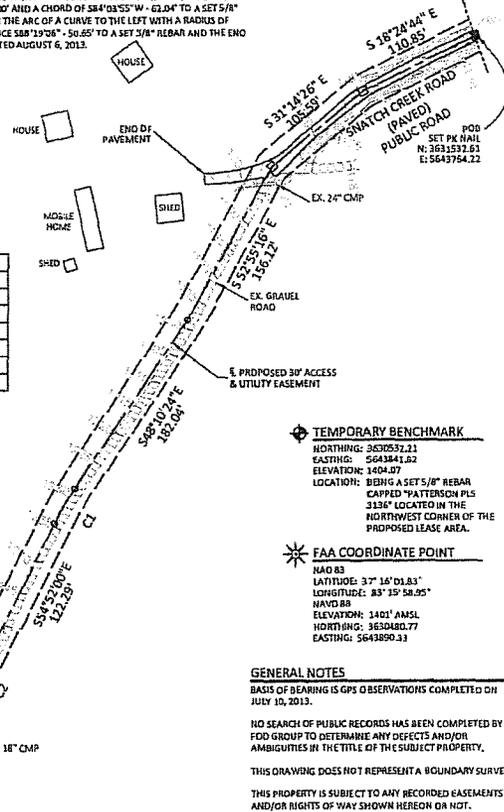
SHEET TITLE:

SITE SURVEY

SHEET NUMBER:
B-1



BASED ON KENTUCKY STATE PLANE SINGLE ZONE AND DETERMINED BY GPS OBSERVATIONS COMPLETED ON JULY 10, 2013



STATE OF KENTUCKY

COUNTY OF PERRY

I, HAVEN KING, CLERK OF THE STATE AND COUNTY AFORESAID DO CERTIFY THAT
THE FOREGOING INSTRUMENT WAS LODGED FOR RECORD IN MY OFFICE AND THE FOREGOING
CERTIFICATE HAVE BEEN DULY RECORDED IN MY OFFICE IN *Seal* BOOK NO.

 72 PAGE 245 .

WITNESS MY HAND THIS 13 DAY OF *November* 2013.

HAVEN KING, CLERK
PERRY COUNTY

BY *Garen Lilla* D.C.

**EXHIBIT K
NOTIFICATION LISTING**

Couchtown Landowner Notice Listing

Clifford & Betty J. Wooton
1004 Snatch Creek Road
Busy, KY 41723

Ron Deaton
P.O. Box 222
Chavies, KY 41727

Jessie Thomas
6279 KY Hwy 451
Hazard, KY 41701

Douglas Crawford
P.O. Box 581
Hazard, KY 41701

Mary Fields and Martha Greer
79 Jess Fields Lane
Hazard, KY 41701

Bobby Jean Howard
137 Campbell Lane
Krypton, KY 41754

Eugene Fields
P.O. Box 95
Hazard, KY 41702

Odell & Rebecca Couch
109 Fields Lane
Busy, KY 41723

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: Couchtown**

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 1023 Snatch Creek Road, Busy, KY 41723 (37°16'01.83" North latitude, 83°15'58.95" West longitude). The proposed facility will include a 250-foot tall antenna tower, plus a 15-foot lightning arrestor 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 Perry 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 2013-00396 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. Denny Ray Noble
Perry County Judge Executive
P.O. Box 210
Hazard, KY 41702

RE: Notice of Proposal to Construct Wireless Communications Facility
Kentucky Public Service Commission Docket No. 2013-00396
Site Name: Couchtown

Dear Judge Noble:

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 1023 Snatch Creek Road, Busy, KY 41723 (37°16'01.83" North latitude, 83°15'58.95" West longitude). The proposed facility will include a 250-foot tall antenna tower, plus a 15-foot lightning arrestor 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 2013-00396 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: COUCHTOWN
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. 2013-00396 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. 2013-00396 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: 606-436-3140

The Hazard Herald
Attn: Barbara Marshall
439 High Street
P.O. Box
Hazard, KY 41702

RE: Legal Notice Advertisement
Site Name: Couchtown

Dear Ms. Marshall:

Please publish the following legal notice advertisement in the next edition of *The Hazard Herald*:

NOTICE

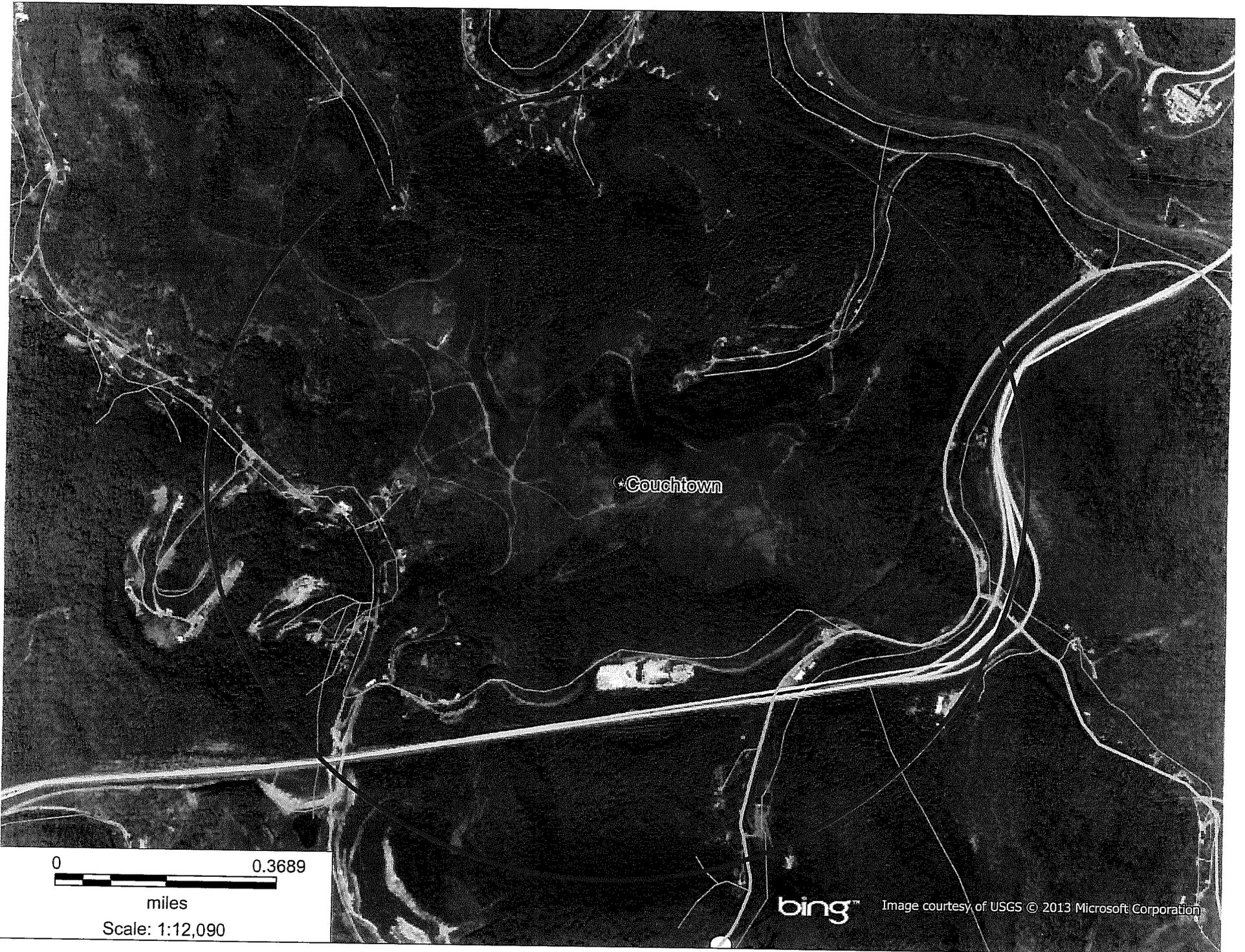
New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility has filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 1023 Snatch Creek Road, Busy, KY 41723 (37°16'01.83" North latitude, 83°15'58.95" 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 2013-00396 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



*Couchtown

0 0.3689



miles

Scale: 1:12,090

bing™

Image courtesy of USGS © 2013 Microsoft Corporation