

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

NOV 22 2013

In the Matter of:

PUBLIC SERVICE  
COMMISSION

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

CASE NO.: 2013-00396

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:

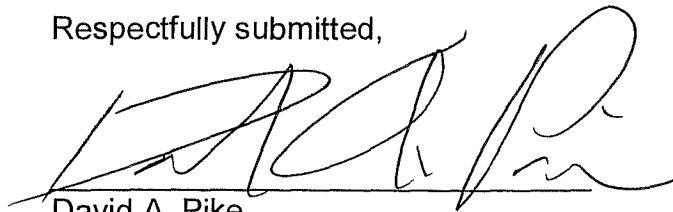
David A. Pike  
Pike Legal Group, PLLC  
1578 Highway 44 East, Suite 6  
P. O. Box 369  
Shepherdsville, KY 40165-0369  
Telephone: (502) 955-4400  
Telefax: (502) 543-4410  
Email: dpike@pikelegal.com

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 |
|-----|------------|------|---------------------------|

### Licensee

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

### Contact

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

### Ownership and Qualifications

Radio Service Type    Mobile  
Regulatory Status    Common Carrier    Interconnected    Yes

### Alien Ownership

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

### Basic Qualifications

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

### Demographics

|           |  |        |  |
|-----------|--|--------|--|
| Race      |  | Gender |  |
| Ethnicity |  |        |  |



ULS License

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

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

**Market**

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

**Dates**

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

**Buildout Deadlines**

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

**Notification Dates**

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

**Licensee**

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

**Licensee**

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

**Contact**

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

**Ownership and Qualifications**

Radio Service Type Mobile  
Regulatory Status Common Carrier Interconnected Yes

**Alien Ownership**

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

**Basic Qualifications**

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

**Tribal Land Bidding Credits**

This license did not have tribal land bidding credits.

**Demographics**

Race

Ethnicity

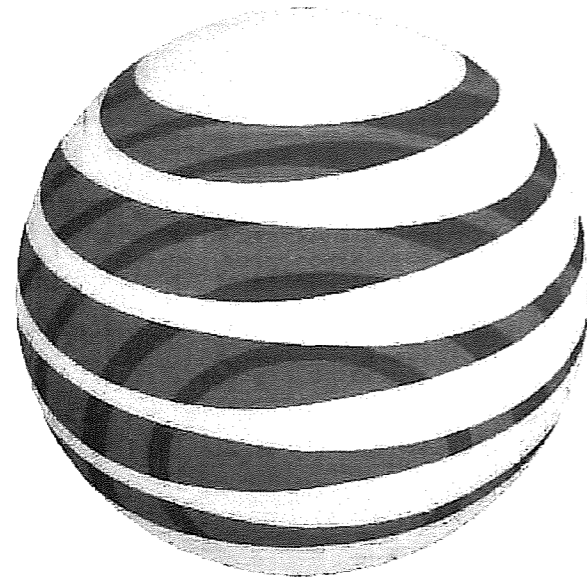
Gender

**EXHIBIT B**

**SITE DEVELOPMENT PLAN:**

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





# at&t

SITE NAME:

## COUCHTOWN

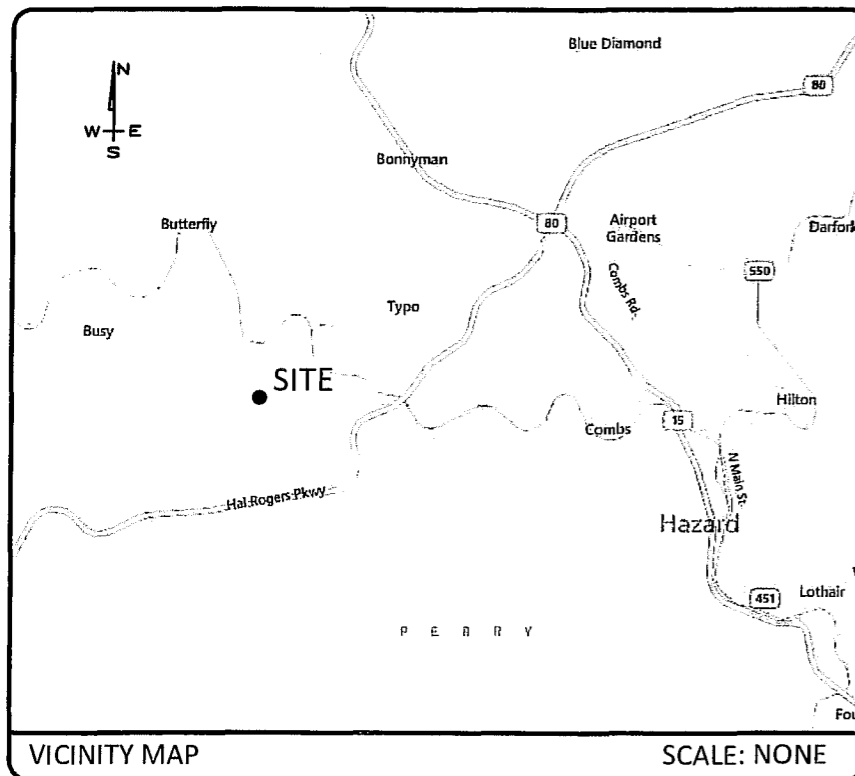
SITE NUMBER

## KYALU6155

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



Know what's below.  
Call before you dig.



### 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"

2012 IBC

2011 NEC

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

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

### 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

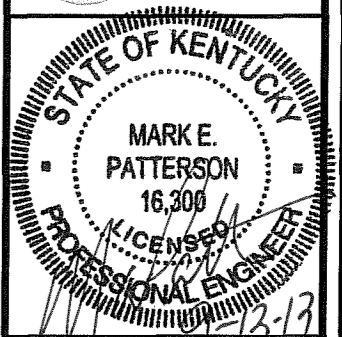
**TELEPHONE COMPANY**  
WINDSTREAM KENTUCKY EAST  
PHONE: (501) 748-7000

### 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



### 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:  
**TITLE SHEET AND PROJECT INFORMATION**

SHEET NUMBER:  
**T-1**

**LEGAL DESCRIPTIONS**

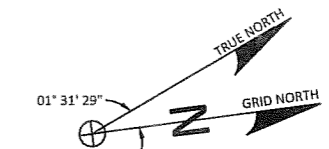
THE FOLLOWING IS A DESCRIPTION OF AN AREA TO BE LEASED FROM THE PROPERTY OF CLIFFORD WOOTON AND BETTY JEAN WOOTON, WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

**PROPOSED LEASE AREA**

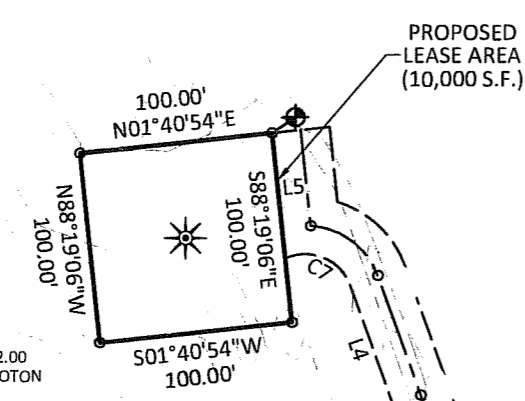
BEGINNING AT A SET PK NAIL AT THE INTERSECTION OF THE CENTERLINE OF SNATCH CREEK ROAD AND THE NORTH PROPERTY LINE OF THE PROPERTY CONVEYED TO CLIFFORD WOOTON AND BETTY JEAN WOOTON AS RECORDED IN DEED BOOK 136, PAGE 159 IN THE OFFICE OF THE CLERK OF PERRY COUNTY, KENTUCKY WITH THE KENTUCKY STATE PLANE 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

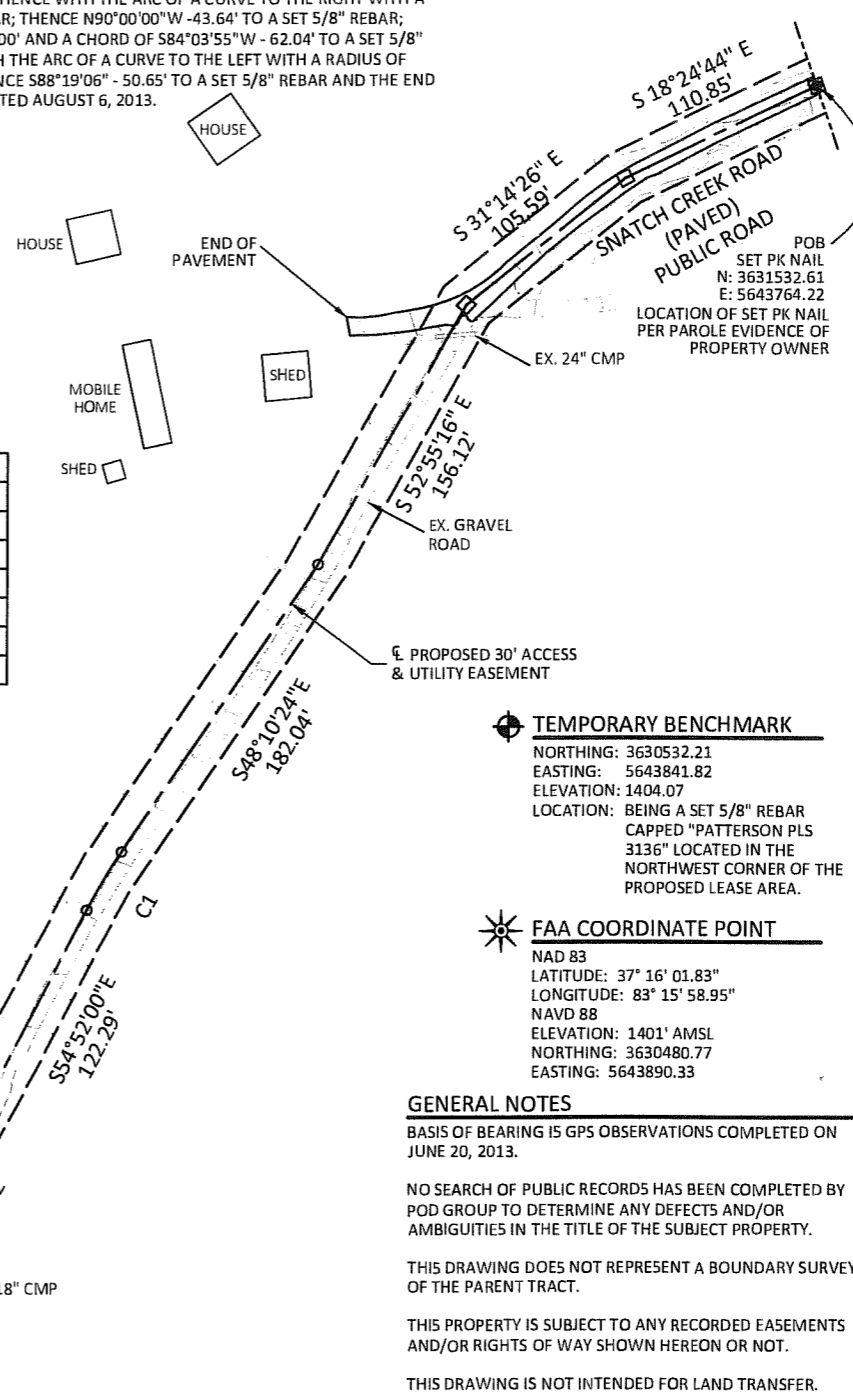


TAX MAP # 063-00 00 012.00  
CLIFFORD AND BETTY J WOOTON  
DB 136 PG 159

| 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.

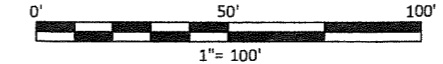
**FAA COORDINATE POINT**  
NAD 83  
LATITUDE: 37° 16' 01.83"  
LONGITUDE: 83° 15' 58.95"  
NAVD 88  
ELEVATION: 1401' AMSL  
NORTHING: 3630480.77  
EASTING: 5643890.33

**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**

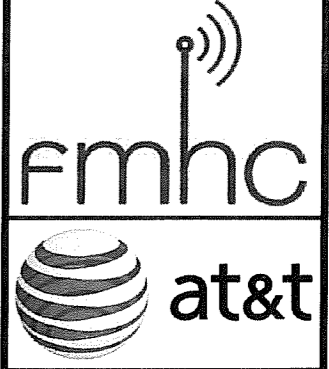
I HEREBY CERTIFY THAT THE SURVEY OF THE LEASE AREA DEPICTED BY THE PLAT WAS PERFORMED BY PERSONS UNDER MY DIRECT SUPERVISION BY THE METHOD OF RANDOM TRAVERSE WITH SIDE SHOTS. THE UNADJUSTED PRECISION RATIO OF THE TRAVERSE EXCEEDED 1:10,000 AND WAS NOT ADJUSTED FOR CLOSURE. THIS SURVEY MEETS OR EXCEEDS 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



**SURVEY**

| REV. | DATE | DESCRIPTION |
|------|------|-------------|
|      |      |             |
|      |      |             |
|      |      |             |
|      |      |             |

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

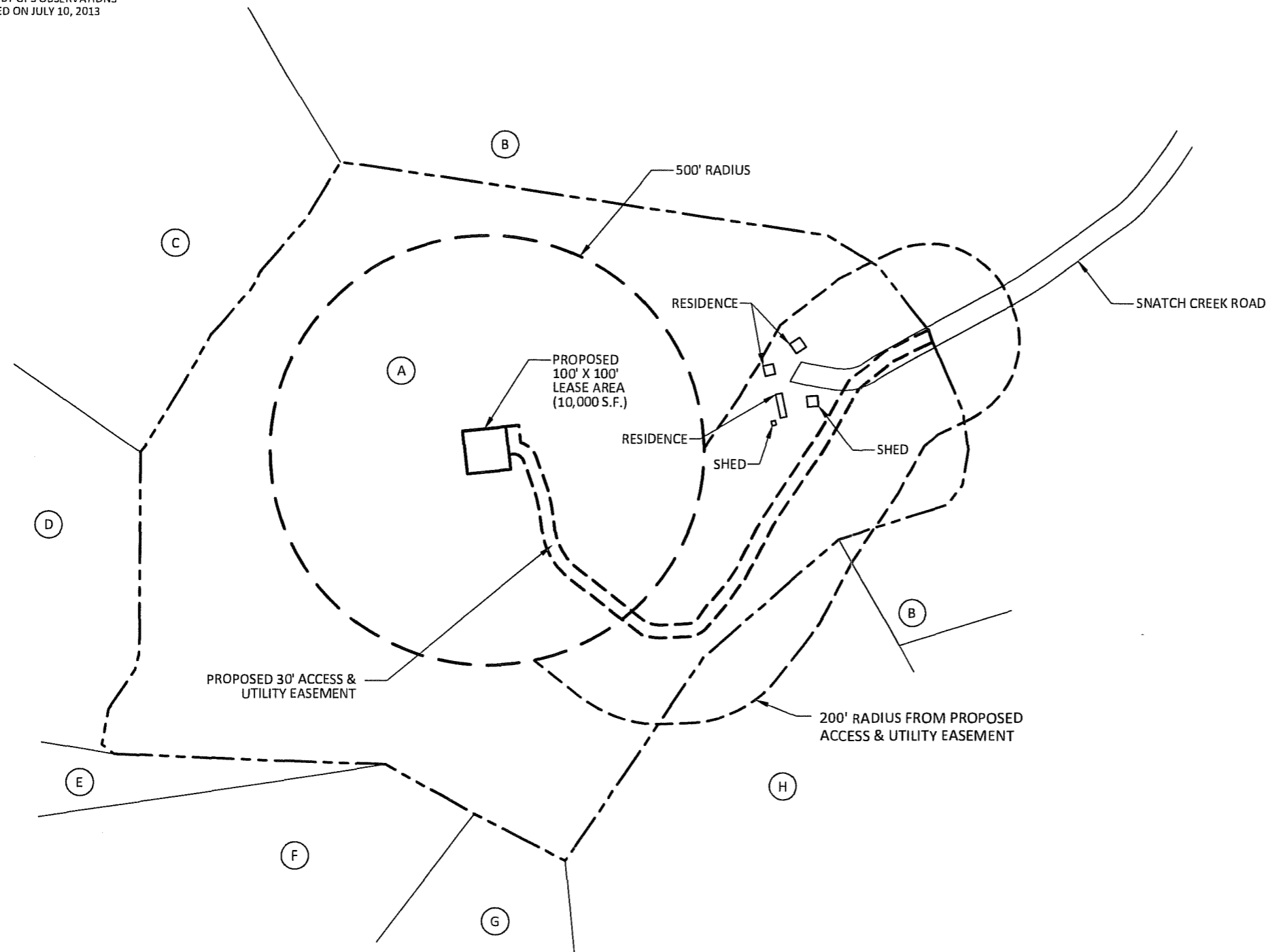
SITE NUMBER:  
KYALU6155  
  
POD NUMBER: 13-0727  
  
DRAWN BY: DSR  
CHECKED BY: MEP  
DATE: 07.23.13

SHEET TITLE:  
**SITE SURVEY**  
  
SHEET NUMBER:  
**B-1**

**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           |

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

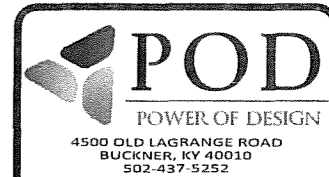
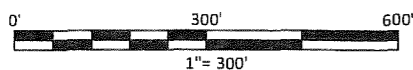
(F) PARCEL # 063-00\_00\_027.00  
 BOBBY JEAN HOWARD  
 137 CAMPBELL LANE  
 KRYPTON, KY 41754  
 D.B. 146, PG. 435  
 NO ZONING

(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

| REV. | DATE     | DESCRIPTION     |
|------|----------|-----------------|
| 1    | 08.28.13 | 500' RADIUS MAP |
|      |          |                 |
|      |          |                 |
|      |          |                 |

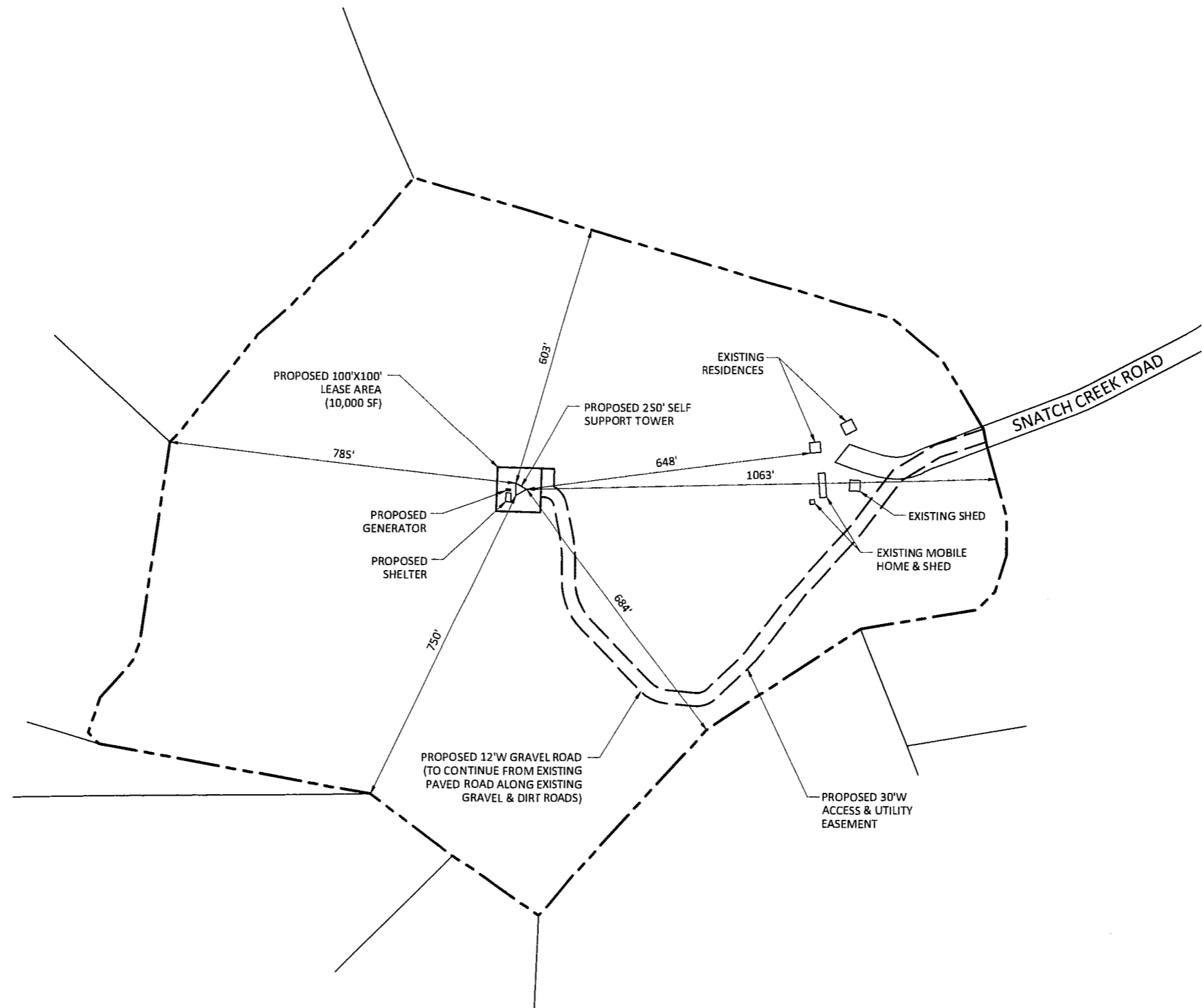
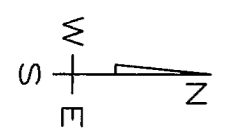
SITE INFORMATION:  
**COUCHTOWN**  
1023 SNATCH CREEK ROAD  
BUSY, KY 41723

SITE NUMBER:  
**KYALU6155**

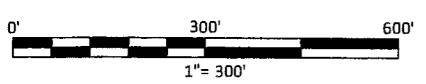
POD NUMBER: 13-0729  
DRAWN BY: CMD  
CHECKED BY: MEP  
DATE: 08.22.13

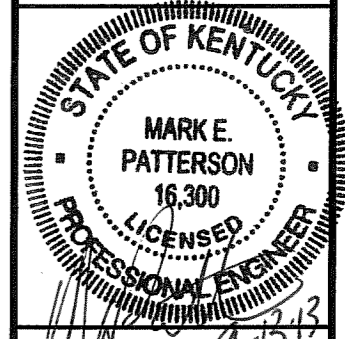
SHEET TITLE:  
**OVERALL SITE LAYOUT**

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 |
|      |          |                 |
|      |          |                 |
|      |          |                 |
|      |          |                 |

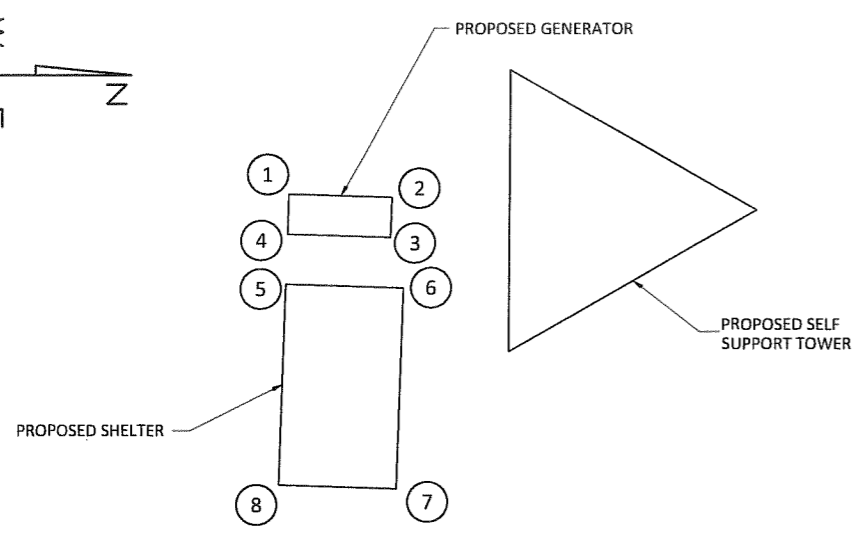
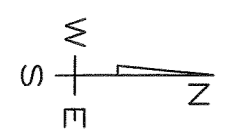
SITE INFORMATION:  
**COUCHTOWN**  
1023 SNATCH CREEK ROAD  
BUSY, KY 41723

SITE NUMBER:  
**KYALU6155**

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

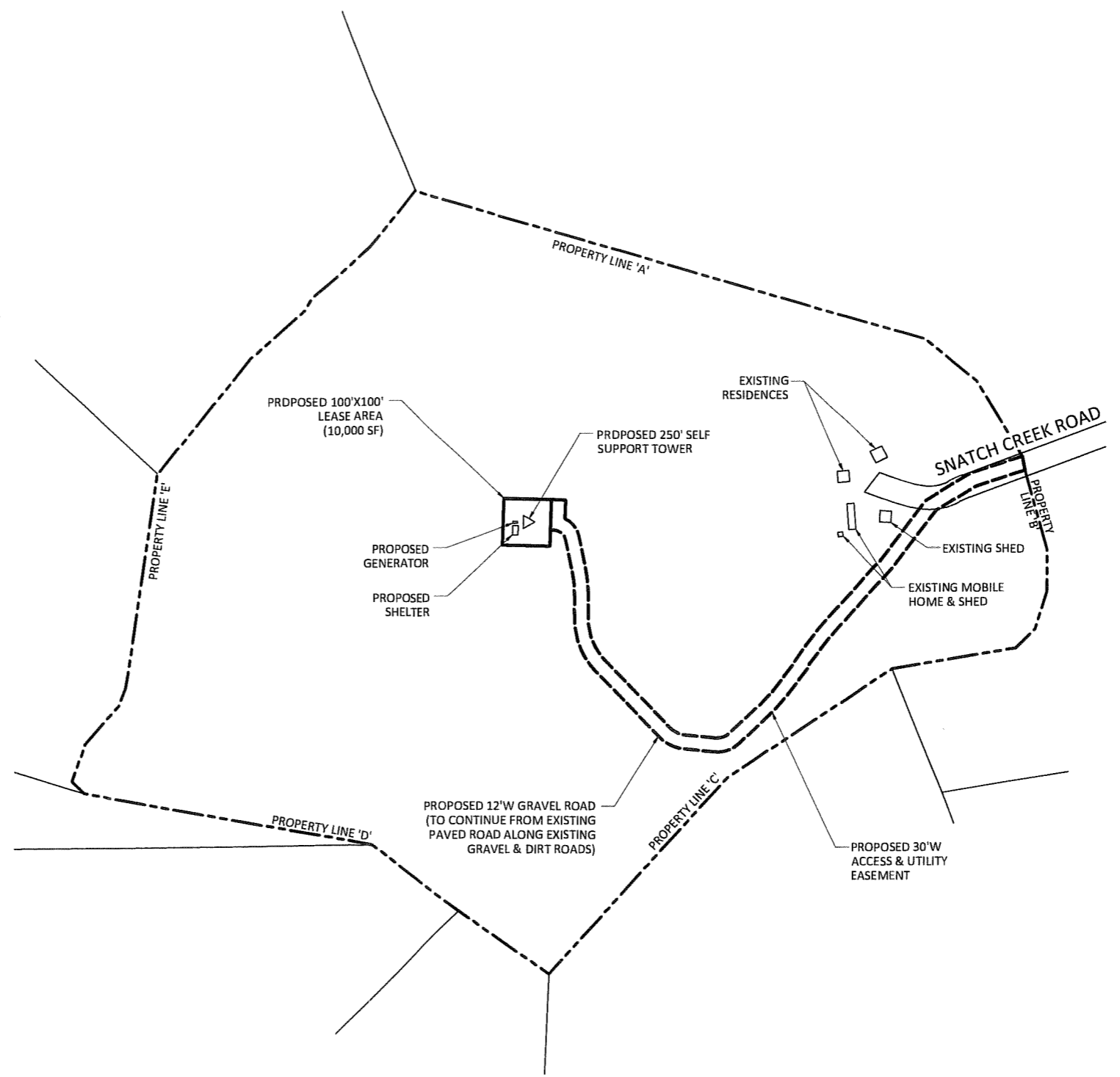
SHEET TITLE:  
**OVERALL SITE LAYOUT-CONT'D**

SHEET NUMBER:  
**C-2**

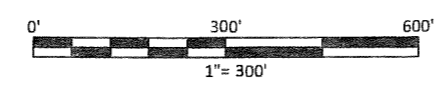


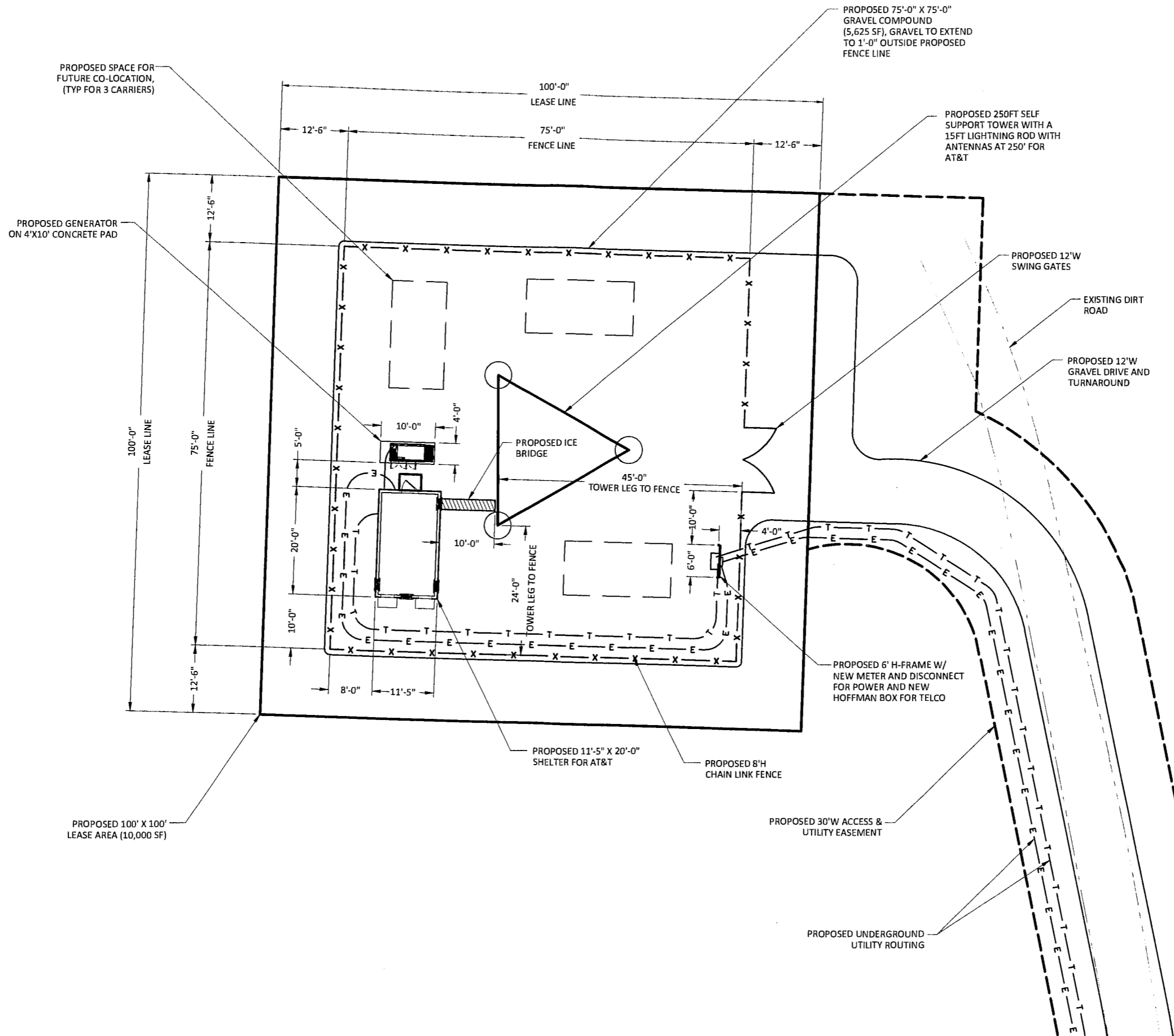
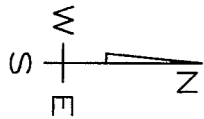
EQUIPMENT ENLARGEMENT  
NTS

| 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'     |

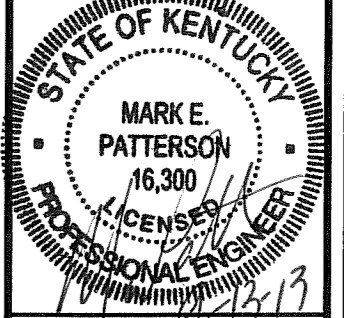
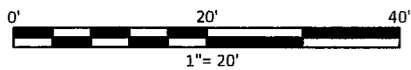
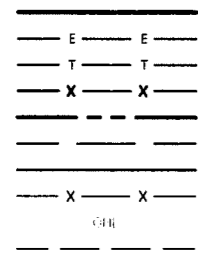


- (P) LEASE LINE
- (P) ELECTRIC
- (P) TELEPHONE
- (P) FENCE
- (E) PROPERTY LINE
- (E) EDGE OF PAVEMENT
- (E) RIGHT OF WAY
- (E) FENCE
- (E) OVERHEAD ELECTRIC
- (E) LOT LINES





- (E) UTILITY POLE
- (E) 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 |
|      |          |                 |
|      |          |                 |

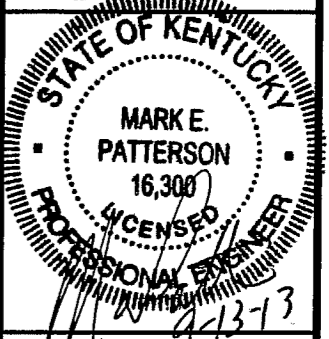
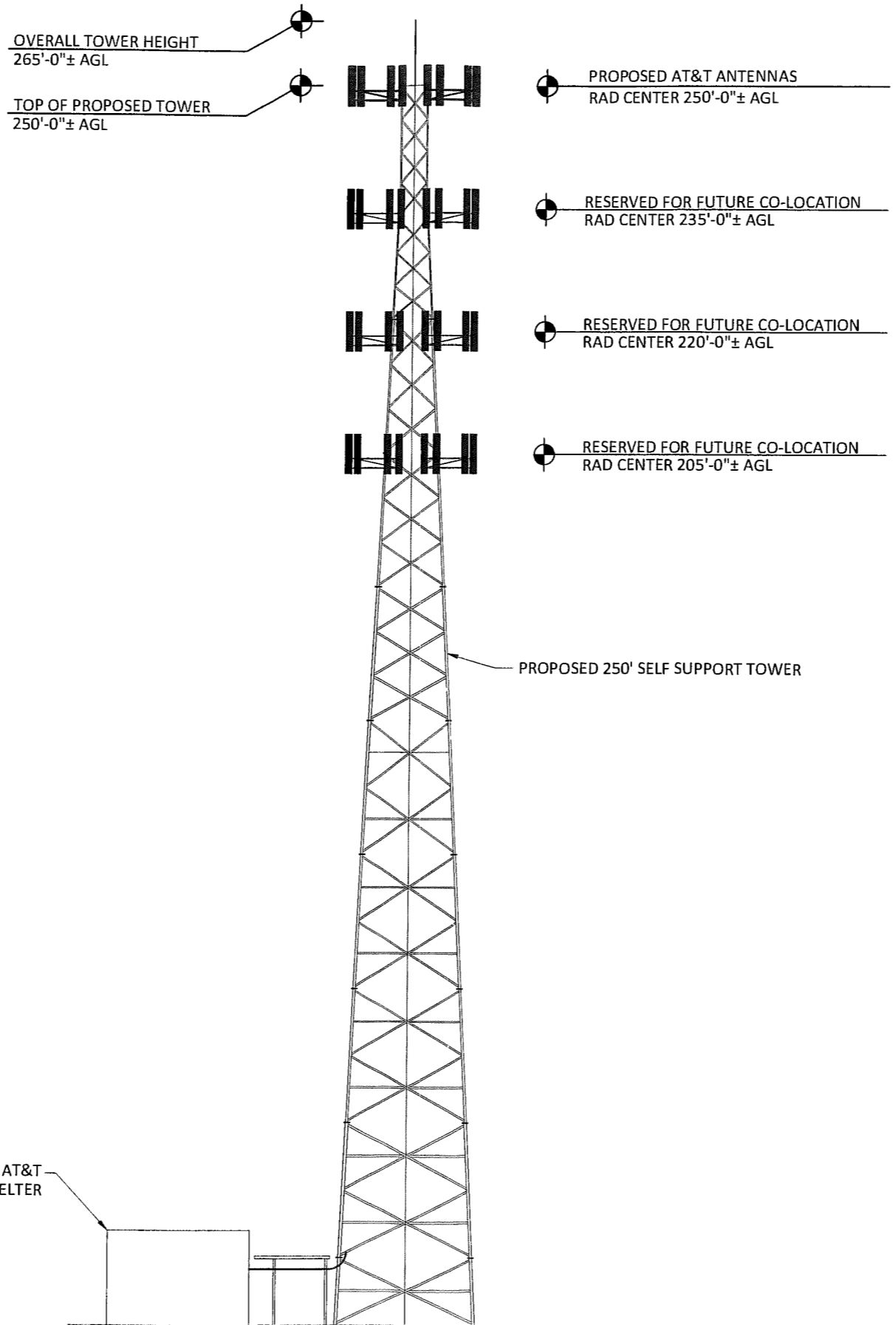
SITE INFORMATION:  
**COUCHTOWN**  
 1023 SNATCH CREEK ROAD  
 BUSY, KY 41723

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**



ZONING DRAWINGS

| REV. | DATE     | DESCRIPTION     |
|------|----------|-----------------|
| 1    | 08.28.13 | 500' RADIUS MAP |
|      |          |                 |
|      |          |                 |
|      |          |                 |

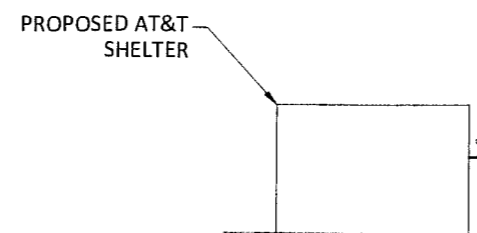
SITE INFORMATION:  
**COUCHTOWN**  
 1023 SNATCH CREEK ROAD  
 BUSY, KY 41723

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**



**1 TOWER ELEVATION**  
 NOT TO SCALE

**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



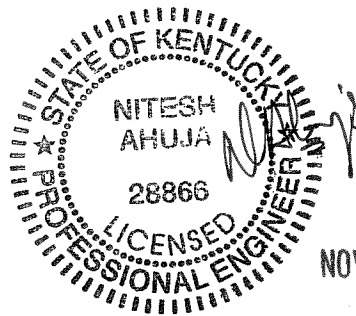
While failure is extremely rare in any kind of tower, it is especially so for monopoles and self-supporting towers. In fact, only if a self-supporting tower were subjected to a direct hit from a tornado or the severest of hurricanes would failure be predicted. We are aware of very few instances of self-supporting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

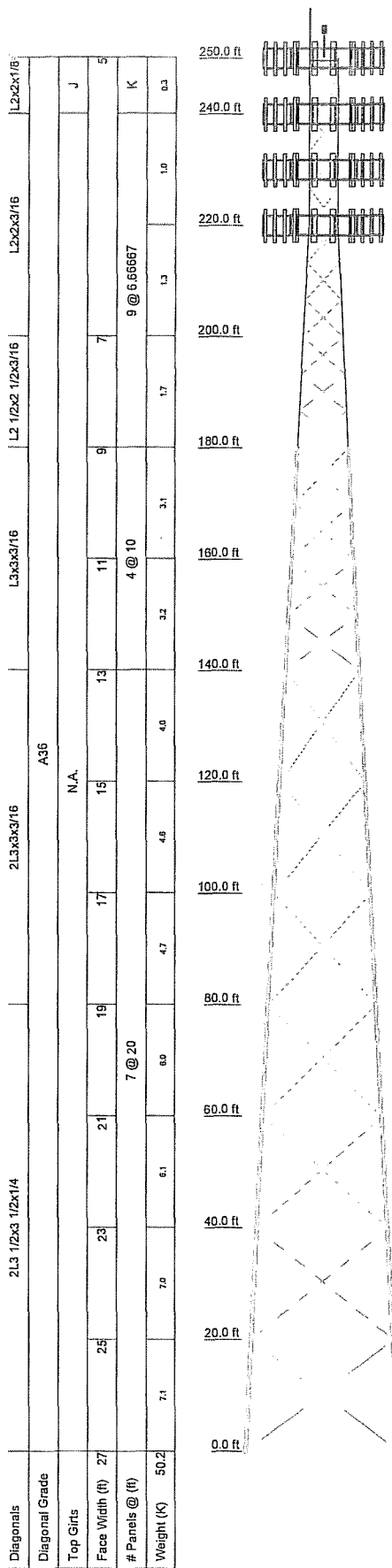
We trust the above and the attached will be helpful to you. If you should need anything else, please let us know at your convenience.

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**

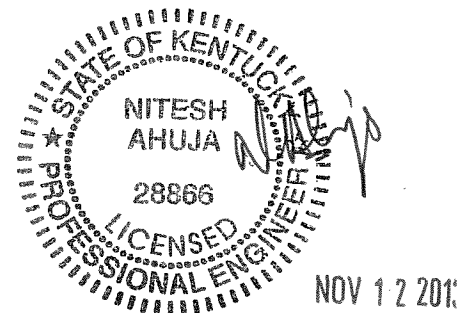
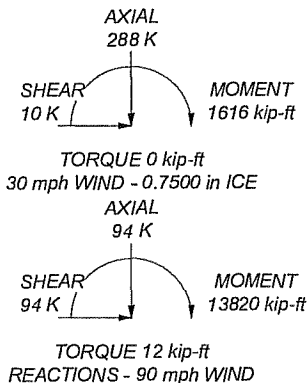
| GRADE   | Fy     | Fu     | GRADE | Fy     | Fu     |
|---------|--------|--------|-------|--------|--------|
| A572-50 | 50 ksi | 65 ksi | A36   | 36 ksi | 58 ksi |

**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%

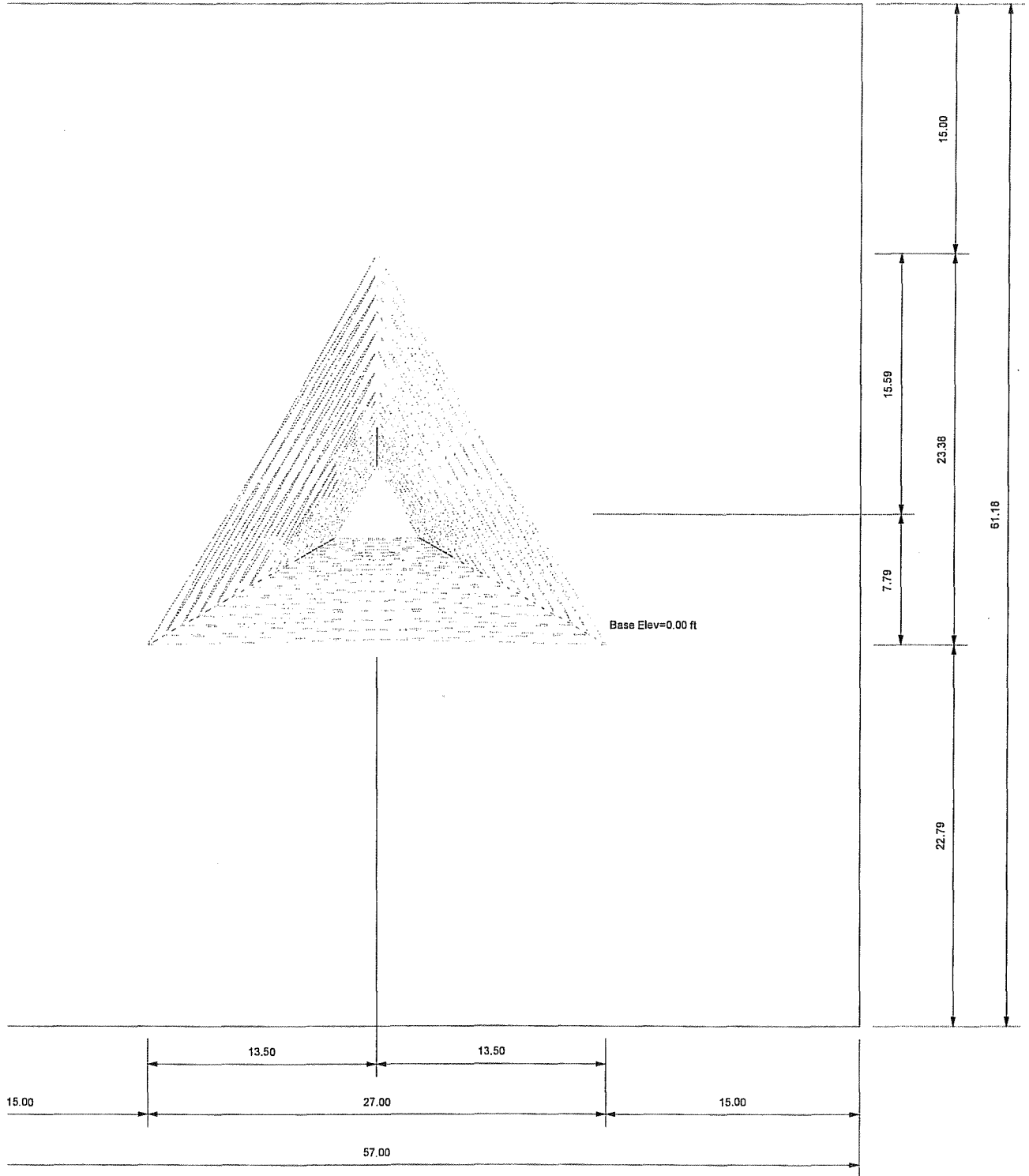
ALL REACTIONS ARE FACTORED


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



|  |  |   |  |
|--|--|---|--|
| <p><b>valmont</b><br/>         STRUCTURES<br/>         Valmont Industries Inc. - Speciality Structures Group</p> | 1545 Pidco Drive<br>Plymouth, IN 46563<br>Phone: (574) 936-4221<br>FAX: (574) 936-6458 | Job: <b>238614</b><br>Project: <b>V-27 x 250' #282079 Couchtown, KY</b><br>Client: American Tower Corp.<br>Code: TIA-222-G<br>Path: | Drawn by: na1<br>Date: 11/11/13<br>Scale: NTS<br>Dwg No. E-1 |
|--|--|---|--|

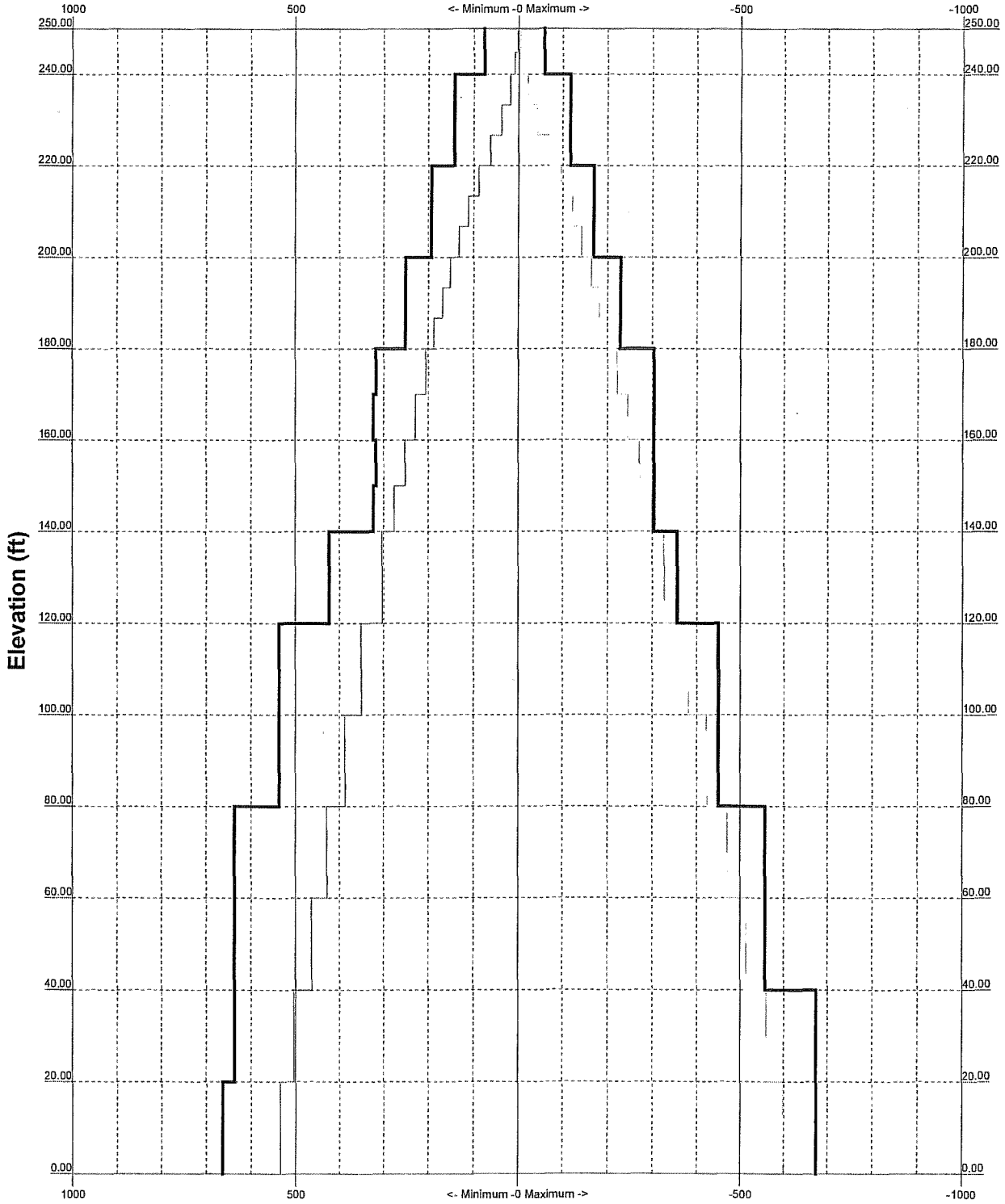
**Plot Plan**  
Total Area - 0.08 Acres



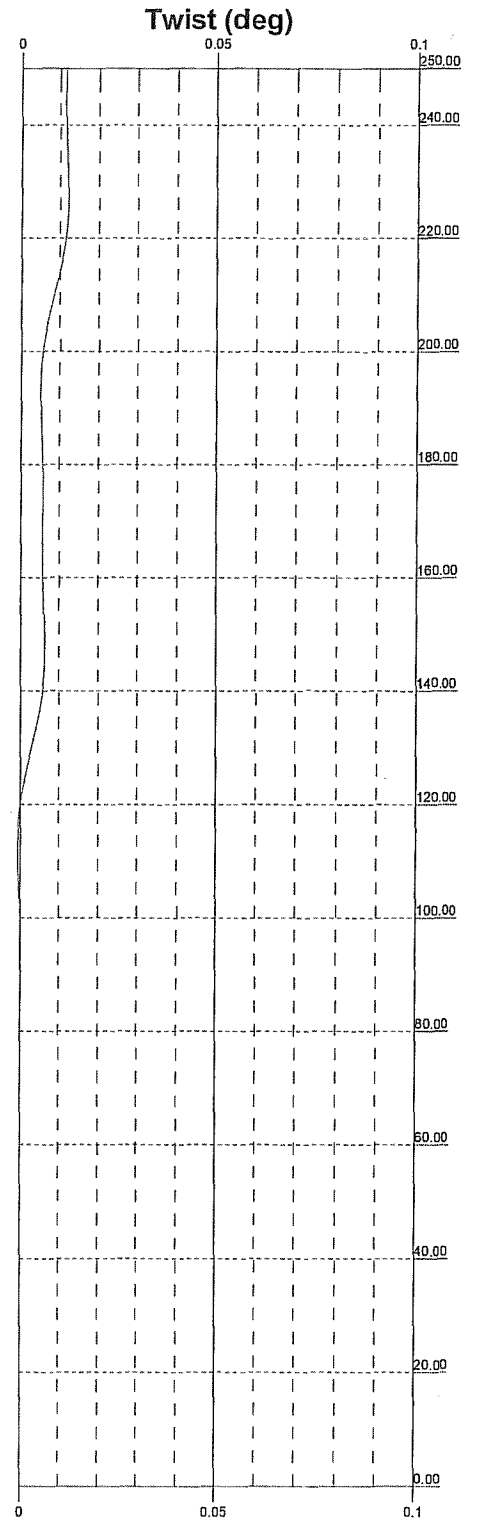
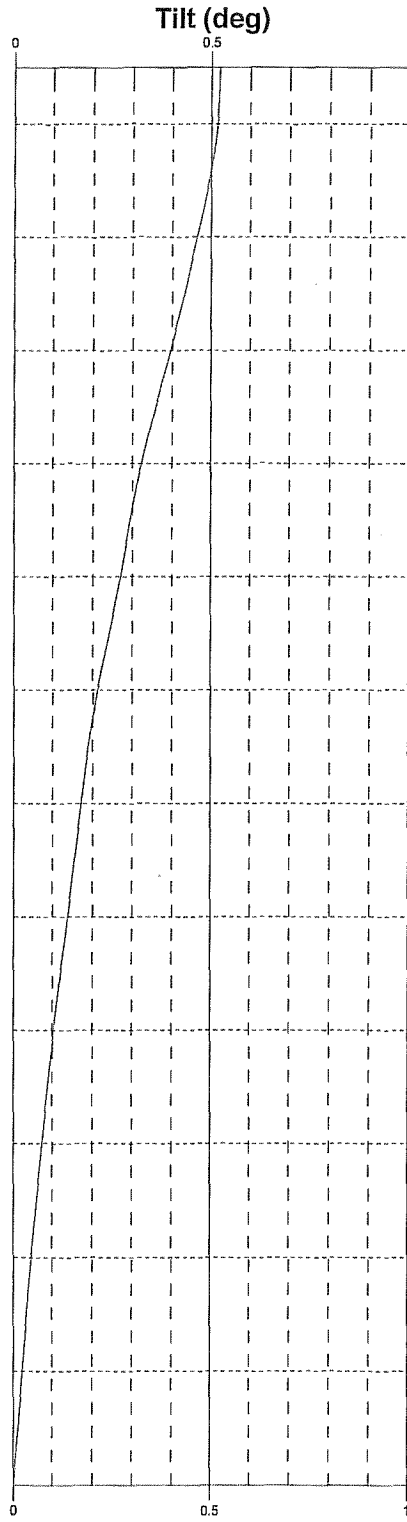
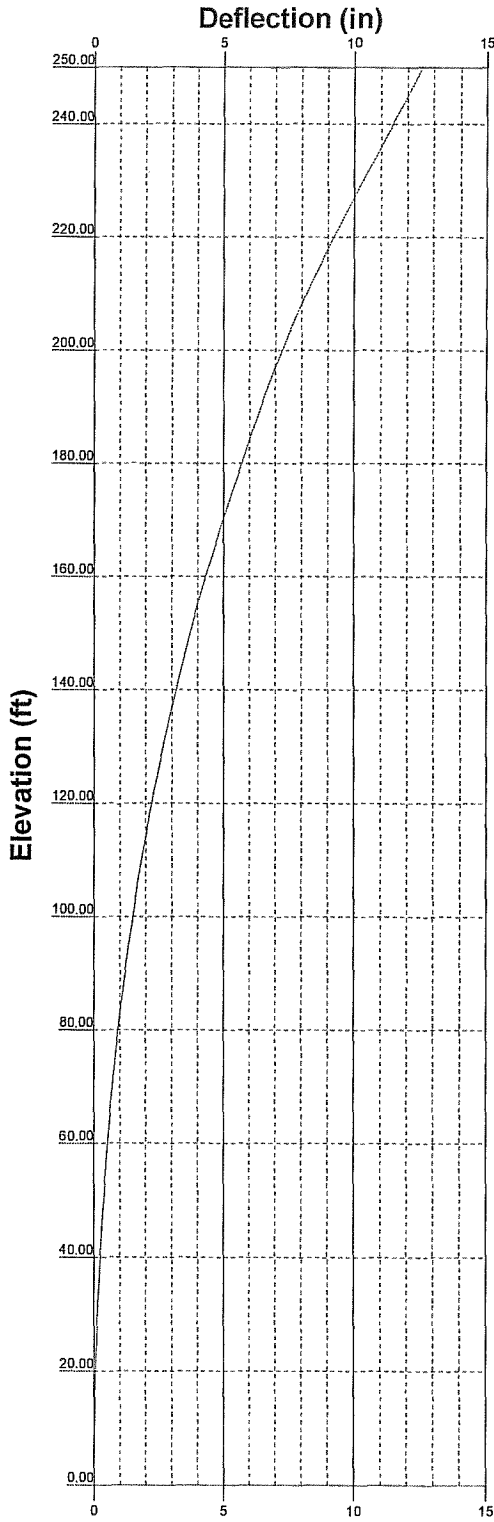
|   |   |                |            |
|---|---|----------------|------------|
|  <p>1545 Pidco Drive<br/>STRUCTURES Plymouth, IN 46563<br/>Valmont Industries Inc. - Speciality Structures Group<br/>Phone: (574) 936-4221<br/>FAX: (574) 936-6458</p> | Job: <b>238614</b>                               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



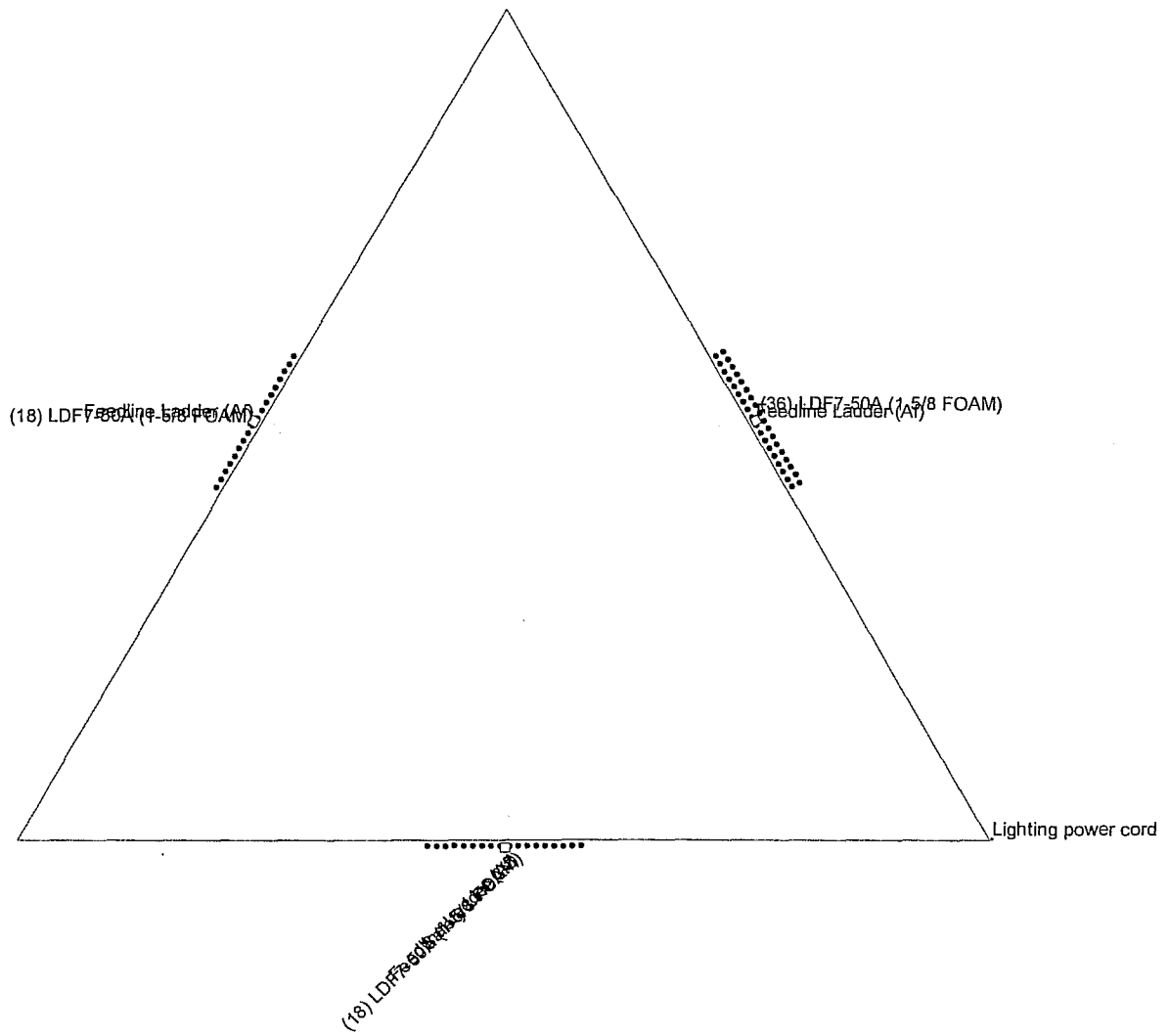
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|---|---|---|------------|
|  <p>1545 Pidco Drive<br/>STRUCTURES Plymouth, IN 46563<br/>Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221 FAX: (574) 936-6458</p> | Job: <b>238614</b>  | Project: <b>V-27 x 250' #282079 Couchtown, KY</b> |            |
|   | 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\10230131414 ATC V27\250_Couchtown KY\27 Tower E-3\31414 V2 E-3.dwg</small> |   |            |




|  |   |
|--|---|
|  <p>1545 Pidco Drive<br/>STRUCTURES Plymouth, IN 46563<br/>Valmont Industries Inc. - Specialty Structures Group<br/>Phone: (574) 936-4221<br/>FAX: (574) 936-6458</p> | Job: <b>238614</b>  |
|  | Project: <b>V-27 x 250' #282079 Couchtown, KY</b>   |
|  | Client: American Tower Corp.      Drawn by: na1      App'd:   |
|  | Code: TIA-222-G      Date: 11/11/13      Scale: NTS   |
|  | Path: <small>\\valmont\shared\structures\2013\11\TIA-222-G-Couchtown-KY\Tower\DWG\238614\238614.dwg</small> Dwg No. E-5 |

# Feedline Plan

Round Flat App In Face App Out Face Truss-Leg



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



# Feedline Distribution Chart

## 0' - 250'

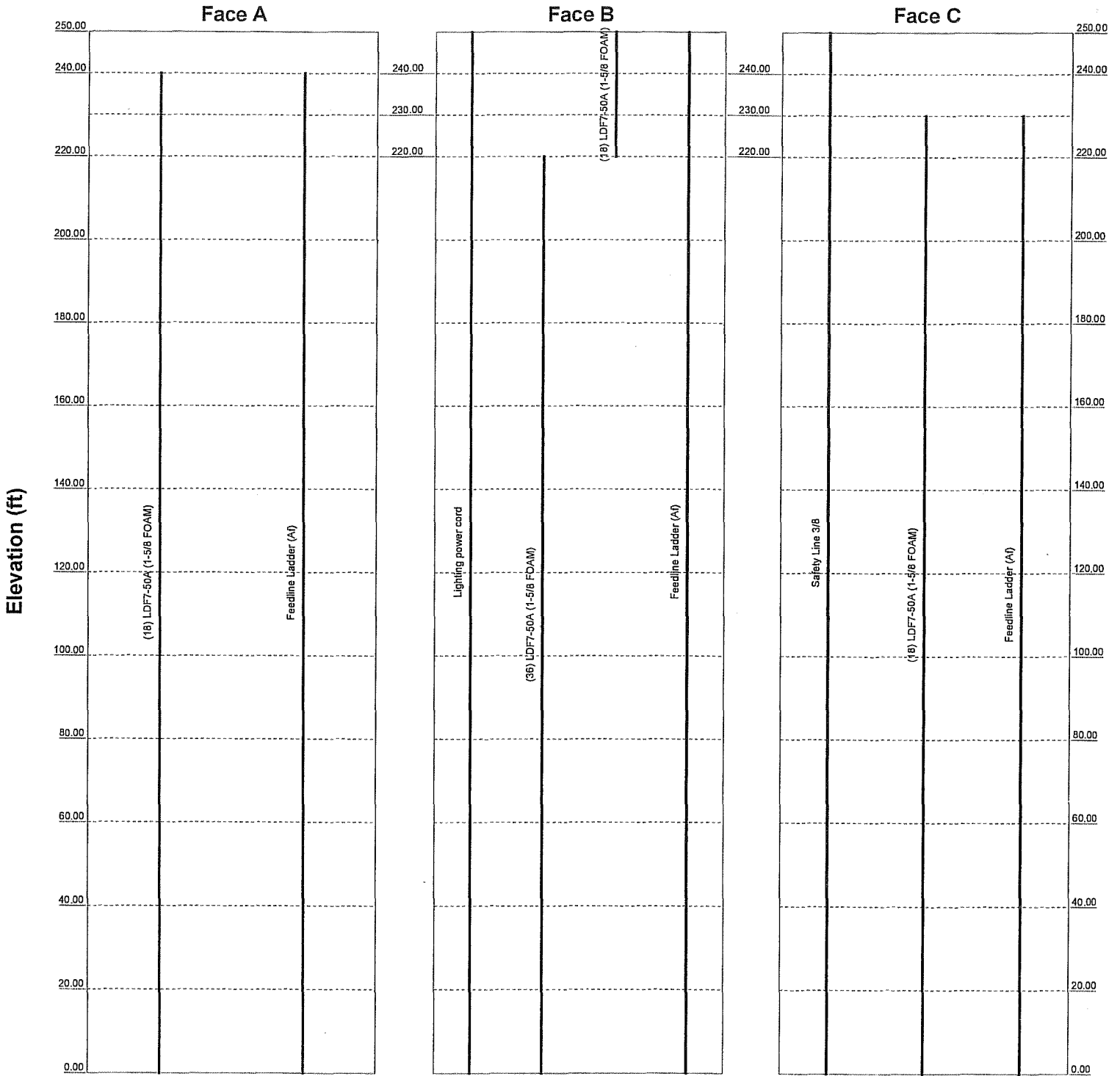
Round

Flat

App In Face

App Out Face

Truss Leg



|   |  |   |            |             |
|---|--|---|------------|-------------|
| <p style="margin-top: 5px;">1545 Pidco Drive<br/>                 STRUCTURES Plymouth, IN 46563<br/>                 Valmont Industries Inc. - Speciality Structures Group Phone: (574) 936-4221<br/>                 FAX: (574) 936-6458</p> | Job: <b>238614</b>   | Project: <b>V-27 x 250' #282079 Couchtown, KY</b> |            |             |
|   | 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 KY Tower Cell\238614-07.dwg |   |            |             |

|   |         |                                   |             |                   |
|---|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1343 Picco Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4321<br>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               |

|   |         |                                   |             |                   |
|---|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1343 Picco Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4321<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 2 of 59           |
|   | 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.

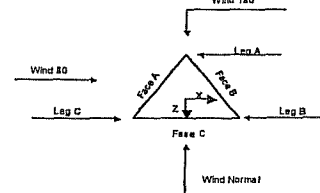
Deflections calculated using a wind speed of 60 mph.

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

|                                     |                                    |                                    |
|-------------------------------------|------------------------------------|------------------------------------|
| Consider Moments - Legs             | Distribute Leg Loads As Uniform    | Treat Feedline Bundles As Cylinder |
| Consider Moments - Horizontals      | Asym Leg Flange                    | Use ASCE 10 X-Brace Ly Bolts       |
| Consider Moments - Diagonals        | Assume Right Index Plate           | Calculate Redundant Bracing Forces |
| Use Moment Magnification            | Use Clear Span For Wind Area       | Ignore Redundant Members in FEA    |
| Use Code Stress Ratios              | Use Clear Span For KLR             | SR Leg Bolts Resist Compression    |
| Use Code Safety Factors - Guys      | Retention Guys To Initial Tension  | All Leg Panels Have Some Allowable |
| Estimate Ice                        | Bypass Mast Stability Checks       | Offset Clrt At Foundation          |
| Always Use Max Kz                   | Use Azimuth Dllh Coefficient       | Consider Feedline Torque           |
| Use Special Wind Profile            | Project Wind Area of Appart.       | Include Angle Block Shear Check    |
| Include Bolt In Member Capacity     | Assume Torque Area Area            | Include Shear-Torsion Interaction  |
| Leg Bolts Are At Top Of Section     | SR Members Have Cut Ends           | Always Use Sub-Critical Flow       |
| Secondary Horizontal Brace Leg      | Sort Capacity Reports By Component | Use Top Mounted Sockets            |
| Use Diamond Inner Bracing (4 Sided) | Triangulate Diamond Inner Bracing  |                                    |
| Add IRC 60xW Combination            |                                    |                                    |

### Tower Section Geometry

| Tower Section | Tower Elevation | Assembly Database | Description           | Section Width | Number of Sections | Section Length |
|---------------|-----------------|-------------------|-----------------------|---------------|--------------------|----------------|
| 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 |
|---------------|-----------------|------------------|--------------|-------------------------|-----------------|-----------------|--------------------|
| 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              | 0.0000          | 0.0880             |

|   |         |                                   |             |                   |
|---|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1343 Picco Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4321<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 3 of 59           |
|   | Project | V-27 x 250' #282079 Coughtown, KY | Date        | 09:16:09 11/11/13 |
|   | Client  | American Tower Corp.              | Designed by | na1               |

|   |         |                                   |             |                   |
|---|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1343 Picco Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4321<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 4 of 59           |
|   | Project | V-27 x 250' #282079 Coughtown, KY | Date        | 09:16:09 11/11/13 |
|   | Client  | American Tower Corp.              | Designed by | na1               |

| Tower Section | Tower Elevation | Diagonal Spacing | Bracing Type | Has K Braces End Panels | Has Horizontals | Top Clrt Offset | Bottom Clrt Offset |
|---------------|-----------------|------------------|--------------|-------------------------|-----------------|-----------------|--------------------|
| T3            | 220.00-200.00   | 6.67             | X Brace      | No                      | No              | 0.0000          | 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              | 0.0000          | 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          | 0.0000             |
| 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          | 0.0000             |
| T10           | 80.00-60.00     | 20.00            | X Brace      | No                      | No              | 0.0000          | 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          | 0.0000             |
| T13           | 20.00-0.00      | 20.00            | X Brace      | No                      | No              | 0.0000          | 0.0000             |

| 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      |                  | A36               |

### 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" - 0.715" conn.-10'                           | A372-50 (50 ksi) | Equal Angle        | 1.2x2x1/8         | A36 (36 ksi)   |
| T2 240.00-220.00 | Pipe      | P-4.08" - 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" - 8.75" conn.-Trans-20'                      | A372-50 (50 ksi) | Equal Angle        | 1.2x2x3/16        | A36 (36 ksi)   |
| T4 200.00-180.00 | Pipe      | P-6.00" - 0.715" conn.-HDD-Trans-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 - 1.71" - 1.80" conn.-HDD-Trans (Pirad 22911)  | A372-50 (50 ksi) | Equal Angle        | 1.3x3x1/16        | A36 (36 ksi)   |
| T6 160.00-140.00 | Truss Leg | #122G - 1.71" - 1.00" conn.-HDD-Trans (Pirad 22911)  | A372-50 (50 ksi) | Equal Angle        | 1.3x3x1/16        | A36 (36 ksi)   |
| T7 140.00-120.00 | Truss Leg | #122G - 2.00" - 0.875" conn.-HDD-Trans (Pirad 20832) | A372-50 (50 ksi) | Double Equal Angle | 2L3x3x3/16        | A36 (36 ksi)   |
| T8 120.00-100.00 | Truss Leg | #122G - 2.25" - 0.875" conn. (Pirad 20833)           | A372-50 (50 ksi) | Double Equal Angle | 2L3x3x3/16        | A36 (36 ksi)   |
| T9 100.00-80.00  | Truss Leg | #122G - 2.50" - 0.875" conn. (Pirad 20834)           | A372-50 (50 ksi) | Double Equal Angle | 2L3x3x3/16        | A36 (36 ksi)   |
| T10 80.00-60.00  | Truss Leg | #122G - 2.75" - 0.875" conn. (Pirad 20835)           | A372-50 (50 ksi) | Double Equal Angle | 2L3 1/2x3 1/2x1/4 | A36 (36 ksi)   |
| T11 60.00-40.00  | Truss Leg | #122G - 3.00" - 0.875" conn. (Pirad 20836)           | A372-50 (50 ksi) | Double Equal Angle | 2L3 1/2x3 1/2x1/4 | A36 (36 ksi)   |
| T12 40.00-20.00  | Truss Leg | #122G - 3.25" - 0.875" conn. (Pirad 20837)           | A372-50 (50 ksi) | Double Equal Angle | 2L3 1/2x3 1/2x1/4 | A36 (36 ksi)   |
| T13 20.00-0.00   | Truss Leg | #122G - 3.50" - 0.875" conn. (Pirad 20838)           | A372-50 (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 <sub>f</sub> | Adjust. Factor A <sub>s</sub> | Height Adj. H <sub>f</sub> | Double Angle Spacing Diagonals | Double Angle Spacing Horizontals |
|-----------------|------------------------|------------------|--------------|-------------------------------|-------------------------------|----------------------------|--------------------------------|----------------------------------|
| T1              | 8.08                   | 0.2388           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.0000                        | 36.0000                          |
| T2              | 0.00                   | 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                   | 0.3750           | 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              | 0.00                   | 0.6238           | A36 (36 ksi) | 1                             | 1                             | 1.85                       | 36.0000                        | 36.0008                          |
| T8              | 0.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.8880                        | 36.0000                          |
| T9              | 0.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.85                       | 36.0008                        | 36.0000                          |
| T10             | 0.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.0000                        | 36.8000                          |
| T11             | 0.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.0000                        | 36.0008                          |
| T12             | 8.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.8000                        | 36.0000                          |
| T13             | 0.00                   | 0.6230           | A36 (36 ksi) | 1                             | 1                             | 1.05                       | 36.0000                        | 36.0008                          |

### Tower Section Geometry (cont'd)

| Tower Elevation | Calc. E | Calc. K | Legs | X Braces Diags | K Braces Diags | Single Diags | Horiz. | Sec. Horiz. | Inner Brace |
|-----------------|---------|---------|------|----------------|----------------|--------------|--------|-------------|-------------|
| T1              | Yes     | Yes     | 1    | 1              | 1              | 1            | 1      | 1           | 1           |
| T2              | Yes     | Yes     | 1    | 1              | 1              | 1            | 1      | 1           | 1           |
| T3              | Yes     | Yes     | 1    | 1              | 1              | 1            | 1      | 1           | 1           |
| T4              | Yes     | Yes     | 1    | 1              | 1              | 1            | 1      | 1           | 1           |

### Tower Section Geometry (cont'd)

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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

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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

K Factors table with columns: Tower Elevation, Cale K Single Angles, Cale K Solid Rounds, Legs, X Brace Diags, Y Brace Diags, Single Diags, Girts, Horiz., Sec. Horiz., Inner Brace.

Tower Section Geometry table with columns: Tower Elevation, Leg, Diagonal, Top Girt, Bottom Girt, Mid Girt, Long Horizontal, Short Horizontal.

Tower Section Geometry (cont'd)

Truss-Legs Used As Leg Members and Truss-Legs Used As Inner Members tables.

Tower Section Geometry (cont'd)

Composites Offsets and K-Bracing tables.

Tower Section Geometry (cont'd)

Table with columns: Tower Elevation, Leg, Connection Offsets, K-Bracing.

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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

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Project V-27 x 250' #282079 Couchtown, KY Date 09:16:09 11/11/13
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Table with columns: Tower Elevation, Leg, Connection Offsets, K-Bracing.

Description Face Allow Shield Component Type Placement Face Offset Lateral Offset # Clear Spacing Width or Perimeter Weight

Tower Section Geometry (cont'd)

Feed Line/Linear Appurtenances Section Areas

Table with columns: Tower Elevation, Leg Connection Type, Diagonal, Top Girt, Bottom Girt, Mid Girt, Long Horizontal, Short Horizontal.

Table with columns: Tower Elevation, Face, Ar, Ar, C.A. In Face, C.A. Out Face, Weight.

Feed Line/Linear Appurtenances - Entered As Round Or Flat





Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include various elevation points like 240.00-220.00, 220.00-200.00, etc.

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include various elevation points like 208.00-180.00, 180.00-168.00, etc.

Tower Forces - No Ice - Wind 60 To Face

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include T1 (250.00-248.00), T2 (248.00-220.00), etc.

Tower Forces - No Ice - Wind 90 To Face

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include T1 (258.00-240.00), T2 (248.00-220.00), etc.

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Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include 168.00-140.00, 148.00-120.00, etc.

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include 120.00-180.00, 188.00-80.00, etc.

Tower Forces - With Ice - Wind Normal To Face

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include T1 (250.00-248.00), T2 (248.00-220.00), etc.

Tower Forces - With Ice - Wind 60 To Face

Table with 14 columns: Section Elevation, Add Weight, Self Weight, Fa, #, Cr, q, Dr, Dk, Ae, F, w, Cnl. Face. Rows include T1 (248.00-248.00), T2 (248.00-220.00), etc.







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

|  |         |                                   |             |                   |
|--|---------|-----------------------------------|-------------|-------------------|
| <b>tnxTower</b><br>1545 Pido Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4221<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 30 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 K  | V <sub>1</sub> K | V <sub>2</sub> K | V <sub>3</sub> K | OTM <sub>1</sub> kip-ft | OTM <sub>2</sub> kip-ft | Torque kip-ft |        |        |         |       |       |
|-------------|----------------------|----------------|----------------|------|------------------|------------------|------------------|-------------------------|-------------------------|---------------|--------|--------|---------|-------|-------|
| T7          | 140.00-120.00        | 30             | Wind 90        | 0.77 | 0.38             | -0.67            | -101.40          | -62.37                  | 0.03                    |               |        |        |         |       |       |
|             |                      |                | Wind 60        | 0.76 | 0.38             | -0.77            | -103.78          | -62.02                  | 0.02                    |               |        |        |         |       |       |
|             |                      |                | Wind 120       | 0.77 | 0.37             | 0.00             | -1.39            | -119.99                 | 0.01                    |               |        |        |         |       |       |
|             |                      | T8             | 120.80-188.80  | 30   | Wind Normal      | 0.78             | 0.48             | 0.39                    | 51.13                   | -105.53       | 0.00   |        |         |       |       |
|             |                      |                |                |      | Wind 90          | 0.78             | 0.39             | 0.67                    | 99.21                   | -62.95        | -0.01  |        |         |       |       |
|             |                      |                |                |      | Wind 60          | 0.77             | 0.00             | 0.77                    | 113.91                  | -4.75         | -0.02  |        |         |       |       |
|             |                      |                |                | T9   | 160.88-80.80     | 30               | Wind 90          | 0.77                    | -0.38                   | 0.67          | 98.21  | 55.87  | -0.02   |       |       |
|             |                      |                |                |      |                  |                  | Wind Normal      | 0.78                    | -0.67                   | 0.39          | -46.60 | 96.60  | -0.02   |       |       |
|             |                      |                |                |      |                  |                  | Wind 60          | 0.77                    | -0.77                   | 0.00          | -1.59  | 118.50 | -0.01   |       |       |
|             |                      |                |                |      |                  | T10              | 80.08-68.88      | 30                      | Wind 90                 | 0.77          | -0.67  | -0.39  | -19.35  | 93.28 | -0.00 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind Normal             | 0.78          | -0.39  | -0.67  | -102.40 | 51.45 | -0.02 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind 60                 | 0.78          | 0.08   | -0.25  | -29.64  | -5.42 | 0.02  |

| Section No. | Section Elevation ft | Wind Azimuth ° | Directionality | F K  | V <sub>1</sub> K | V <sub>2</sub> K | V <sub>3</sub> K | OTM <sub>1</sub> kip-ft | OTM <sub>2</sub> kip-ft | Torque kip-ft |       |
|-------------|----------------------|----------------|----------------|------|------------------|------------------|------------------|-------------------------|-------------------------|---------------|-------|
| T12         | 40.00-20.00          | 60             | Wind 60        | 0.63 | 0.55             | -0.32            | -18.72           | -33.44                  | 0.03                    |               |       |
|             |                      |                | Wind 90        | 0.64 | 0.64             | 0.08             | -2.87            | -39.98                  | 0.02                    |               |       |
|             |                      |                | Wind Normal    | 0.66 | 0.57             | 0.33             | 13.51            | -36.36                  | 0.01                    |               |       |
|             |                      | T13            | 20.88-8.80     | 60   | Wind Normal      | 0.65             | 0.32             | 0.56                    | 25.10                   | -24.11        | -0.01 |
|             |                      |                |                |      | Wind 90          | 0.64             | 0.00             | 0.64                    | 29.14                   | -7.98         | -0.03 |
|             |                      |                |                |      | Wind 60          | 0.64             | -0.32            | 0.55                    | 24.84                   | 8.02          | -0.03 |

**Mast Totals - With Ice**

| Wind Azimuth ° | V <sub>1</sub> K | V <sub>2</sub> K | V <sub>3</sub> K | OTM <sub>1</sub> kip-ft | OTM <sub>2</sub> 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            | 8.26             | 8.16             | 849.89           | -68.35                  | 0.84                    |               |
| 210            | 4.11             | 7.11             | 870.45           | 489.36                  | -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            | -444.59          | 829.61                  | 8.02                    |               |
| 330            | -4.11            | -7.12            | -916.21          | 445.46                  | 8.16                    |               |

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

|  |         |                                   |             |                   |
|--|---------|-----------------------------------|-------------|-------------------|
| <b>tnxTower</b><br>1545 Pido Drive<br>Plymouth, IN 46363<br>Phone: (317) 936-4221<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 32 of 59          |
|  | 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 <sub>1</sub> K | V <sub>2</sub> K | V <sub>3</sub> K | OTM <sub>1</sub> kip-ft | OTM <sub>2</sub> kip-ft | Torque kip-ft |       |        |         |       |      |
|-------------|----------------------|----------------|----------------|------|------------------|------------------|------------------|-------------------------|-------------------------|---------------|-------|--------|---------|-------|------|
| T1          | 250.00-240.80        | 60             | Wind Normal    | 0.36 | 0.00             | -0.36            | -87.86           | -4.33                   | 0.10                    |               |       |        |         |       |      |
|             |                      |                | Wind 90        | 0.44 | 0.38             | -0.22            | -53.83           | -93.26                  | 0.01                    |               |       |        |         |       |      |
|             |                      |                | Wind 60        | 0.44 | 0.44             | 8.00             | -8.18            | -109.17                 | -0.07                   |               |       |        |         |       |      |
|             |                      | T2             | 240.00-220.80  | 60   | Wind Normal      | 0.36             | 0.11             | 8.18                    | 43.65                   | -76.26        | -0.10 |        |         |       |      |
|             |                      |                |                |      | Wind 90          | 0.24             | 0.12             | 0.21                    | 51.11                   | -29.94        | -0.88 |        |         |       |      |
|             |                      |                |                |      | Wind 60          | 0.33             | 0.00             | 0.33                    | 81.35                   | -0.33         | -0.09 |        |         |       |      |
|             |                      |                |                | T3   | 220.08-200.00    | 60               | Wind Normal      | 0.44                    | -0.22                   | 0.38          | 94.08 | 54.09  | -0.87   |       |      |
|             |                      |                |                |      |                  |                  | Wind 90          | 0.46                    | -0.41                   | 1.23          | 38.54 | 97.92  | -0.21   |       |      |
|             |                      |                |                |      |                  |                  | Wind 60          | 0.44                    | -0.44                   | 0.08          | -0.18 | 108.51 | 0.87    |       |      |
|             |                      |                |                |      |                  | T4               | 208.00-180.08    | 60                      | Wind 60                 | 0.33          | -0.29 | -0.17  | -0.95   | 70.29 | 0.09 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind 90                 | 0.24          | -0.12 | -0.21  | -51.47  | 29.28 | 0.05 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind Normal             | 0.24          | 0.00  | -1.26  | -289.26 | -0.01 | 0.01 |

| Section No. | Section Elevation ft | Wind Azimuth ° | Directionality | F K  | V <sub>1</sub> K | V <sub>2</sub> K | V <sub>3</sub> K | OTM <sub>1</sub> kip-ft | OTM <sub>2</sub> kip-ft | Torque kip-ft |        |         |         |         |       |
|-------------|----------------------|----------------|----------------|------|------------------|------------------|------------------|-------------------------|-------------------------|---------------|--------|---------|---------|---------|-------|
| T6          | 160.00-140.80        | 300            | Wind 60        | 1.61 | -1.39            | -0.88            | -137.80          | 233.62                  | 0.10                    |               |        |         |         |         |       |
|             |                      |                | Wind 90        | 1.65 | -0.82            | -1.43            | -242.95          | 139.14                  | 8.23                    |               |        |         |         |         |       |
|             |                      |                | Wind Normal    | 1.67 | 0.00             | -1.67            | -251.10          | -1.01                   | 0.23                    |               |        |         |         |         |       |
|             |                      | T7             | 140.00-120.00  | 300  | Wind Normal      | 1.77             | 0.89             | 0.00                    | -228.86                 | -133.98       | 0.16   |         |         |         |       |
|             |                      |                |                |      | Wind 90          | 1.51             | 1.65             | -0.93                   | -145.54                 | -248.68       | 8.02   |         |         |         |       |
|             |                      |                |                |      | Wind 60          | 1.77             | 1.77             | 0.08                    | -0.53                   | -266.99       | -0.13  |         |         |         |       |
|             |                      |                |                | T8   | 120.00-100.00    | 300              | Wind Normal      | 1.67                    | 1.45                    | 0.84          | 124.73 | -215.03 | -0.27   |         |       |
|             |                      |                |                |      |                  |                  | Wind 90          | 1.60                    | 0.00                    | 1.60          | 212.81 | -124.19 | -0.27   |         |       |
|             |                      |                |                |      |                  |                  | Wind 60          | 1.60                    | 0.00                    | 1.60          | 239.53 | -1.01   | -8.23   |         |       |
|             |                      |                |                |      |                  | T9               | 100.00-80.80     | 300                     | Wind 90                 | 1.77          | -0.89  | 1.54    | 229.77  | 131.96  | -0.16 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind Normal             | 1.58          | -1.71  | 0.99    | 147.69  | 255.74  | -0.52 |
|             |                      |                |                |      |                  |                  |                  |                         | Wind 60                 | 1.77          | -1.77  | 0.08    | -0.53   | 264.94  | 0.13  |
| T10         | 80.00-60.00          |                |                |      |                  |                  |                  | 300                     | Wind 60                 | 1.68          | -1.39  | -0.88   | -120.58 | 206.90  | 8.22  |
|             |                      |                |                |      |                  |                  |                  |                         | Wind 90                 | 1.64          | -0.82  | -1.42   | -213.90 | 123.77  | 0.27  |
|             |                      |                |                |      |                  |                  |                  |                         | Wind Normal             | 1.58          | 0.00   | 1.58    | -0.08   | -206.47 | 0.16  |



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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

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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

Table with columns: Description, Aiming Azimuth, Weight, Offset x, Offset y, z, Kx, Ky, CxAc Front, CxAc Side, Ix, Iy. Rows include Beacon Extender (4) 803062, BH lightning rod, ATC Loading, etc.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include BH lightning rod - Elevation 234 - From Leg C.

Discrete Appurtenance Vectors - With Ice

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include Beacon - Elevation 214.90 - From Leg A.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include ATC Loading - Elevation 210 - None C.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include Beacon Extender (4) 803060 - Elevation 232.21 - From Leg A.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include ATC Loading - Elevation 240 - None C.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include BH lightning rod - Elevation 234 - From Leg C.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include ATC Loading - Elevation 230 - None C.

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

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include ATC Loading - Elevation 210 - None C.

Table with columns: Description, Aiming Azimuth, Weight, Offset x, Offset y, z, Kx, Ky, CxAc Front, CxAc Side, Ix, Iy. Rows include ATC Loading, ATC Loading, etc.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include ATC Loading - Elevation 210 - None C.

Discrete Appurtenance Vectors - Service

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include Beacon - Elevation 214.90 - From Leg A.

Discrete Appurtenance Totals - With Ice

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include various wind directions from 0 to 330 degrees.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include Beacon Extender (1) 803062 - Elevation 232.21 - From Leg A.

Discrete Appurtenance Pressures - Service GII = 0.150

Table with columns: Description, Aiming Azimuth, Weight, Offset x, Offset y, z, Kx, Ky, CxAc Front, CxAc Side, Ix, Iy. Rows include Beacon Extender (4) 803062, BH lightning rod.

Table with columns: Wind Azimuth, Fx, Fy, Vz, Vx, Vy, OTMx, OTMy, Torque. Rows include BH lightning rod - Elevation 234 - From Leg C.



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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

Table with 10 columns: Section No., Elevation ft, Component Type, Condition, Gov. Load Comb., Axial k, Major Axis Moment kip-ft, Minor Axis Moment kip-ft. Rows include T2, T3, T4, T5, T6.

Table with 10 columns: Section No., Elevation ft, Component Type, Condition, Gov. Load Comb., Axial k, Major Axis Moment kip-ft, Minor Axis Moment kip-ft. Rows include T7, T8, T9, T10, T11, T12.

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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

Table with 10 columns: Section No., Elevation ft, Component Type, Condition, Gov. Load Comb., Axial k, Major Axis Moment kip-ft, Minor Axis Moment kip-ft. Rows include T13.

Table with 7 columns: Load Combination, Vertical k, Shear, K, Shear, K, Overturning Moment, M1 kip-ft, Overturning Moment, M2 kip-ft, Torque kip-ft. Rows include Dead Dry, 1.2 Dead+1.6 Wind 0 deg, etc.

Maximum Reactions

Table with 5 columns: Location, Condition, Gov. Load Comb., Vertical K, Horizontal X K, Horizontal Z K. Rows include Leg C, Leg B, Leg A.

Tower Mast Reaction Summary

Table with 7 columns: Load Combination, Vertical K, Shear, K, Shear, K, Overturning Moment, M1 kip-ft, Overturning Moment, M2 kip-ft, Torque kip-ft.

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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

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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

Table with columns: Load Combination, Vertical, Shear, Shear, Overturning Moment, Overturning Moment, Torque. Rows include various wind and dead load scenarios like '1.2 Dead+1.0 Wind 110', '1.2 Dead+1.0 Wind 210', etc.

Table with columns: Load Comb., Sum of Applied Forces (PX, FY, FZ), Sum of Reactions (RX, RY, RZ), \$t Error. Rows include various load combinations.

Solution Summary

Table with columns: Load Combination, Sum of Applied Forces (FX, FY, FZ), Sum of Reactions (RX, RY, RZ), \$t Error. Rows include various load combinations.

Non-Linear Convergence Results

Table with columns: Load Combination, Converged?, Number of Cycles, Displacement Tolerance, Force Tolerance. Rows include various load combinations.

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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

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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

Table with columns: Section No., Elevation, Horiz. Deflection, Con. Load Comb., Tilt, Twist. Rows include section numbers 29 through 49.

Table with columns: Section No., Elevation, Horiz. Deflection, Con. Load Comb., Tilt, Twist. Rows include section numbers 1 through 28.

Maximum Tower Deflections - Service Wind

Table with columns: Section No., Elevation, Horiz. Deflection, Con. Load Comb., Tilt, Twist. Rows include section numbers T1 through T13.

Critical Deflections and Radius of Curvature - Design Wind

Table with columns: Elevation, Appearance, Con. Load Comb., Deflection, Tilt, Twist, Radius of Curvature. Rows include elevation points 250.00 through 228.00.

Critical Deflections and Radius of Curvature - Service Wind

Table with columns: Elevation, Appearance, Con. Load Comb., Deflection, Tilt, Twist, Radius of Curvature. Rows include elevation points 216.00 through 228.00.

Bolt Design Data

Table with columns: Section No., Elevation, Component Type, Bolt Grade, Bolt Size, Number, Maximum Load per Bolt, Allowable Load, Ratio Allowable, Allowable Ratio, Criteria. Rows include section numbers T1 through T6.

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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

Table with 13 columns: Section No., Elevation, Component Type, Bolt Size, Bolt Grade, Number Of Bolts, Maximum Load per Bolt, Allowable Load, Ratio Allowable, Allowable Ratio, Criteria

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

1 Pw / fPa controls

Compression Checks

Leg Design Data (Compression)

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

Truss-Leg Diagonal Data

Table with 13 columns: Section No., Elevation, Diagonal Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

Diagonal Design Data (Compression)

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

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Project V-27 x 250' #282079 Couchtown, KY Date 09:16:09 11/11/13
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tnxTower Job 238614 Page 56 of 59
Project V-27 x 250' #282079 Couchtown, KY Date 09:16:09 11/11/13
Client American Tower Corp. Designed by na1

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

1 Pw / fPa controls

Top Girt Design Data (Compression)

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

1 Pw / fPa controls

Tension Checks

Leg Design Data (Tension)

Table with 13 columns: Section No., Elevation, Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

Truss-Leg Diagonal Data

Table with 13 columns: Section No., Elevation, Diagonal Size, L, Lw, Kl/r, A, Pw, fPa, Ratio

|  |         |                                   |             |                   |
|--|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1545 Pido Drive<br>Plymouth, IN 46563<br>Phone: (317) 936-4221<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 57 of 59          |
|  | Project | V-27 x 250' #282079 Couchtown, KY | Date        | 09:16:09 11/11/13 |
|  | Client  | American Tower Corp.              | Designed by | na1               |

|  |         |                                   |             |                   |
|--|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1545 Pido Drive<br>Plymouth, IN 46563<br>Phone: (317) 936-4221<br>FAX: (317) 936-6438 | Job     | 238614                            | Page        | 58 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 | Diagonal Size | L <sub>1</sub> ft | L <sub>2</sub> ft | KLR | $\phi P_n$ K | A in <sup>2</sup> | P <sub>n</sub> K | $\phi P_n$ K | Stress Ratio |
|-------------|--------------|---------------|-------------------|-------------------|-----|--------------|-------------------|------------------|--------------|--------------|
|-------------|--------------|---------------|-------------------|-------------------|-----|--------------|-------------------|------------------|--------------|--------------|

### Diagonal Design Data (Tension)

| Section No. | Elevation ft | Size              | L <sub>1</sub> ft | L <sub>2</sub> ft | KLR   | A in <sup>2</sup> | P <sub>n</sub> K | $\phi P_n$ K | Ratio $\frac{\phi P_n}{P_n}$ |
|-------------|--------------|-------------------|-------------------|-------------------|-------|-------------------|------------------|--------------|------------------------------|
| 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                        |

<sup>1</sup> P<sub>n</sub> /  $\phi P_n$  controls

### Top Girt Design Data (Tension)

| Section No. | Elevation ft | Size      | L <sub>1</sub> ft | L <sub>2</sub> ft | KLR  | A in <sup>2</sup> | P <sub>n</sub> K | $\phi P_n$ K | Ratio $\frac{\phi P_n}{P_n}$ |
|-------------|--------------|-----------|-------------------|-------------------|------|-------------------|------------------|--------------|------------------------------|
| T1          | 258 - 240    | L2x2x3/16 | 5.00              | 4.47              | 92.6 | 0.4132            | 1.82             | 17.97        | 0.857                        |

<sup>1</sup> P<sub>n</sub> /  $\phi P_n$  controls

### Section Capacity Table

| Section No. | Elevation ft | Component Type | Size  | Chiral Element | P K     | $\phi P_n$ K | % 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' - 1.80' 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 |

|  |         |                                   |             |                   |
|--|---------|-----------------------------------|-------------|-------------------|
| <b>inxTower</b><br>1545 Pido Drive<br>Plymouth, IN 46563<br>Phone: (317) 936-4221<br>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 <sub>p</sub> : | 5.0   | ft |
| Pad thickness, T:               | 1.50  | ft |
| Depth neglected, N:             | 6.0   | ft |
| Volume, V <sub>c</sub> :        | 86.96 | cy |

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

| Material Properties                 |       |     |
|-------------------------------------|-------|-----|
| Steel tensile str, F <sub>y</sub> : | 60000 | psi |
| Conc. Comp. str, F' <sub>c</sub> :  | 4000  | psi |
| Conc. Density, δ:                   | 150   | pcf |
| Clear cover, cc:                    | 3.00  | in  |

| Reinforcement Design       |    |            |
|----------------------------|----|------------|
| pad, m <sub>p</sub> :      | 67 | bars *     |
| size, s <sub>p</sub> :     | 9  |            |
| vertical, m <sub>v</sub> : | 29 | verticals  |
| size, s <sub>v</sub> :     | 7  | 4.5' cage  |
| ties, m <sub>t</sub> :     | 7  | ties       |
| size, s <sub>t</sub> :     | 4  | w/ overlap |

| Soil Parameters                    |        |         |
|------------------------------------|--------|---------|
| Soil unit weight, γ:               | 110    | pcf     |
| Ultimate Bearing, B <sub>c</sub> : | 30.000 | ksf     |
| Cohesion, C <sub>s</sub> :         | 0.000  | ksf     |
| Friction angle, φ:                 | 0.0    | degrees |
| Ult. Passive P., P <sub>p</sub> :  | 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 |

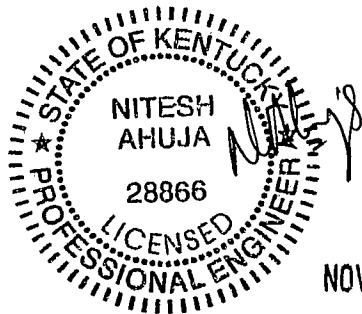
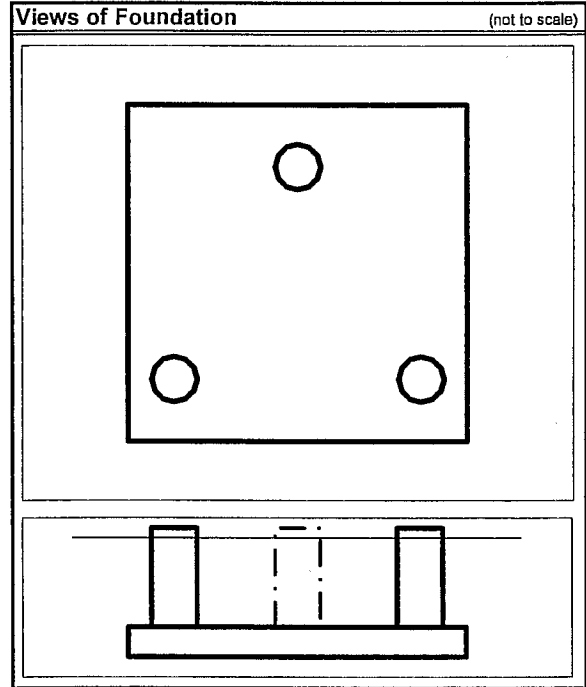
**Tower design conforms to the following:**

- \* 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             |                     |               |                  |
|--------------------------------|---------------------|---------------|------------------|
| <b>Load Case 1</b>             |                     |               |                  |
|                                |                     |               |                  |
|                                |                     |               |                  |
|                                |                     |               |                  |
|                                |                     |               |                  |
| <b>Load Case 2</b>             |                     |               |                  |
|                                | 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 <sub>t</sub> : | 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 <sub>c</sub> : | 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 <sub>c</sub> = | 352.2   | kips |
| Soil weight:     | $W_s = (D - T) * (W^2 - 3 * (d^2 / 4 * \pi)) * \gamma$ | W <sub>s</sub> = | 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 <sub>p</sub> =      | 1.000   |                 |
|                 | $P_{pn} = K_p * \gamma * N + 2 * C_o * \sqrt{(K_p)}$       | P <sub>pn</sub> =     | 0.660   | ksf             |
|                 | $P_{pt} = K_p * \gamma * (D - T) + 2 * C_o * \sqrt{(K_p)}$ | P <sub>pt</sub> =     | 0.495   | ksf             |
|                 | $P_{pb} = K_p * \gamma * D + 2 * C_o * \sqrt{(K_p)}$       | P <sub>pb</sub> =     | 0.660   | ksf             |
|                 | $P_{ptop} = \text{IF}(N < (D - T), P_{pt}, P_{pn})$        | P <sub>ptop</sub> =   | 0.7     | ksf             |
|                 | $P_p' = (P_{ptop} + P_{pb}) / 2$                           | P <sub>p'</sub> =     | 0.660   | ksf             |
| Shear area:     | $T_{pp} = 0$   | T <sub>pp</sub> =     | 0.0     | ft              |
|                 | $A_{pp} = T_{pp} * W$                                      | A <sub>pp</sub> =     | 0.00    | ft <sup>2</sup> |
| Shear Capacity: | $S_{actual} = (P_p' * A_{pp} + \mu * P) * \phi_r$          | S <sub>actual</sub> = | 287.359 | kips            |
| $\phi_r = 0.75$ |  |                       |         |                 |

|       |                                   |    |                |    |
|-------|-----------------------------------|----|----------------|----|
| Check | S <sub>actual</sub> = 287.36 kips | >= | S = 94.94 kips | OK |
|-------|-----------------------------------|----|----------------|----|

Overturning Moment Resistance at Toe:

|                          |  |                    |          |         |
|--------------------------|--|--------------------|----------|---------|
| Wt of soil wedge:        | $W_{sw} = D * (D * \text{TAN}(\phi)) / 2 * W * \gamma$ | W <sub>sw</sub> =  | 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 <sub>a</sub> =   | 3.897    | ft      |
| Resisting moments:       | $M_{rwt} = P * W / 2 - W_t * O_a$                      | M <sub>rwt</sub> = | 19885.65 | ft-kips |
|                          | $M_{rp} = P_p' * A_{pp} * (D - N) / 3$                 | M <sub>rp</sub> =  | 0.00     | ft-kips |
|                          | $M_{rsw} = W_{sw} * (W + D * \text{TAN}(\phi)) / 3$    | M <sub>rsw</sub> = | 0.00     | ft-kips |
| Total resisting:         | $M_{rt} = (M_{rwt} + M_{rp} + M_{rsw}) * \phi_r$       | M <sub>rt</sub> =  | 14914.23 | ft-kips |
| $\phi_r = 0.75$          |  |                    |          |         |
| Total overturning:       | $M_o = M + S * (D + E)$                                | M <sub>o</sub> =   | 14575.31 | ft-kips |

|       |                                    |    |                                   |    |
|-------|------------------------------------|----|-----------------------------------|----|
| Check | M <sub>rt</sub> = 14914.23 ft-kips | >= | M <sub>o</sub> = 14575.31 ft-kips | OK |
|-------|------------------------------------|----|-----------------------------------|----|

Bearing Resistance due to Pressure Distribution:

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

|       |                            |    |  |    |
|-------|----------------------------|----|--|----|
| Check | q <sub>a</sub> = 4.660 ksf | <= | B <sub>c</sub> * $\phi_r$ = 22.500 ksf | OK |
|-------|----------------------------|----|--|----|

Concrete Shear Strength:

One way beam action at d<sub>t</sub> from tower

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

|       |                               |    |                              |    |
|-------|-------------------------------|----|------------------------------|----|
| Check | V <sub>c1</sub> = 810.76 kips | >= | V <sub>n1</sub> = 70.32 kips | OK |
|-------|-------------------------------|----|------------------------------|----|

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:<br>$\phi_s = 0.75$ [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:<br>[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 |
|-------|-------------------|------|--------|-------------------|------|----|

**Column Compression Capacity:**

|  |  |                |      |
|--|--|----------------|------|
| Compression reaction:<br>$\phi_c = 0.65$ [ACI 9.3.2.2] | $P_c = \phi_c * 0.8 * F'c * (d_i^2 / 4 * \pi)$ | $P_c = 5881.1$ | kips |
|--|--|----------------|------|

|       |                 |      |        |              |      |    |
|-------|-----------------|------|--------|--------------|------|----|
| Check | $P_c = 5881.06$ | kips | $\geq$ | $C = 628.22$ | kips | OK |
|-------|-----------------|------|--------|--------------|------|----|

**Pier Reinforcement:**

|   |                           |                    |                 |
|---|---------------------------|--------------------|-----------------|
| Cross-sectional area:                                     | $A_g = d_i^2 * \pi / 4$   | $A_g = 2827.43$    | in <sup>2</sup> |
| Min. area of steel (pier):<br>[ACI 10.9.1] & [ACI 10.8.4] | $A_{st,c} = A_g * 0.005$  | $A_{st,c} = 14.14$ | in <sup>2</sup> |
| 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 <sup>2</sup> |
|   | $A_{s,c} = A_{b,c} * m_c$ | $A_{s,c} = 17.40$  | in <sup>2</sup> |

|       |                   |                 |        |                    |                 |    |
|-------|-------------------|-----------------|--------|--------------------|-----------------|----|
| Check | $A_{s,c} = 17.40$ | in <sup>2</sup> | $\geq$ | $A_{st,c} = 14.14$ | in <sup>2</sup> | OK |
|-------|-------------------|-----------------|--------|--------------------|-----------------|----|

|                       |   |                      |         |
|-----------------------|---|----------------------|---------|
| 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 |
|-------|----------------------|---------|--------|--------------------|---------|----|

|                 |   |                  |    |
|-----------------|---|------------------|----|
| Bar separation: | $B_{s,c} = (d_o * \pi) / m_c - d_{b,c}$ | $B_{s,c} = 4.97$ | in |
|-----------------|---|------------------|----|

|       |       |        |                  |    |        |      |    |
|-------|-------|--------|------------------|----|--------|------|----|
| Check | 11.13 | $\geq$ | $B_{s,o} = 4.97$ | in | $\geq$ | 4.5" | OK |
|-------|-------|--------|------------------|----|--------|------|----|

**Vertical Rebar Development Length:**

|   |   |                           |    |
|---|---|---------------------------|----|
| Reinforcement location:<br>[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:<br>[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:<br>[ACI 12.2.4]               | $\psi_t \psi_{e,c} =$ the product of $\psi_t$ & $\psi_e$ , need not be taken larger than 1.7  | $\psi_t \psi_{e,c} = 1.3$ |    |
| Reinforcement size:<br>[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:<br>[ACI 12.2.4]  | $\lambda_c =$ if lightweight concrete is used, 1.3, else use 1.0  | $\lambda_c = 1.0$         |    |
| Spacing/cover:<br>[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:<br>[ACI 12.2.3]        | $k_{tr,c} = 0$ in (per simplification)  | $k_{tr,c} = 0$            | in |
| Max term:<br>[ACI 12.2.3]               | $c_c' = \text{MIN}(2.5, (c_c + k_{tr,c}) / d_{b,c})$  | $c_c' = 2.500$            |    |
| Excess reinforcement:<br>[ACI 12.2.5]   | $R_c = M_{max} / M_{allow}$   | $R_c = 0.81$              |    |
| Development (tensile):<br>[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:<br>[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.):<br>[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 |
|--------------------------|-------------------|-----------------|----|

|       |                 |    |        |                   |    |       |
|-------|-----------------|----|--------|-------------------|----|-------|
| 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:<br>[ACI 12.5.3] | $\alpha_h$ if the bar size $\leq 11$ and side cc $\geq 2.5"$ , use 0.7, else use 1.0 | $\psi_{t,h} = 0.7$      |
| Epoxy coating:<br>[ACI 12.5.2]          | $\beta_h$ if epoxy-coated bars are used, use 1.2, else use 1.0                       | $\psi_{e,h} = 1.0$      |
| Light weight concrete:<br>[ACI 12.5.2]  | $\lambda_h$ if lightweight concrete is used, 1.3, else use 1.0                       | $\lambda_h = 1.0$       |
| Development (hook):<br>[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:<br>[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      |
|   | <b>Check</b> $L_{vp} = 15.0$ 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    |
|   | <b>Check</b> $L_{h\_pad} = 30.0$ in $\geq$ $L_{h\_tail} = 14.0$ in                   | OK                      |

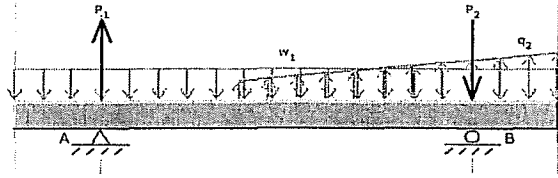
**Pier Ties:**

|   |  |                                 |
|---|--|---------------------------------|
| Minimum size:<br>[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 <sup>2</sup> |
| Allowable tie spacing:                                |  |                                 |
| per vertical rebar<br>[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<br>[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<br>[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<br>[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         |
|   | $m_{t\_min} = (D - T + E) / B_{s\_t\_max} + 2$   | $m_{t\_min} = 6.3$              |
|   | <b>Check</b> $m_t = 7.0$ $\geq$ $m_{t\_min} = 6.3$   | 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   |
|                        | <b>Check</b> $L_{das} = 32.19$ 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   |
|                        | <b>Check</b> $E_{as} = 51.50$ in $\leq$ $E_{as\_max} = 72.74$ in      | OK                          |
| To top rebar grid:     | $\text{rebar @} = D + E - T + cc$                                     | $\text{rebar @} = 63.00$ in |
|                        | <b>Check</b> $63 + 6$ 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     |
|                        | <b>Check</b> $d_o = 54.00$ 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)

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

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

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

Distributed Soil Pressure:  
(Linearly Increasing)

$q_{2,2L} = 0$

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

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

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

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

**MDSolids Design Result**

Option 1:

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

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

Option 2:

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

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

Max moment:

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

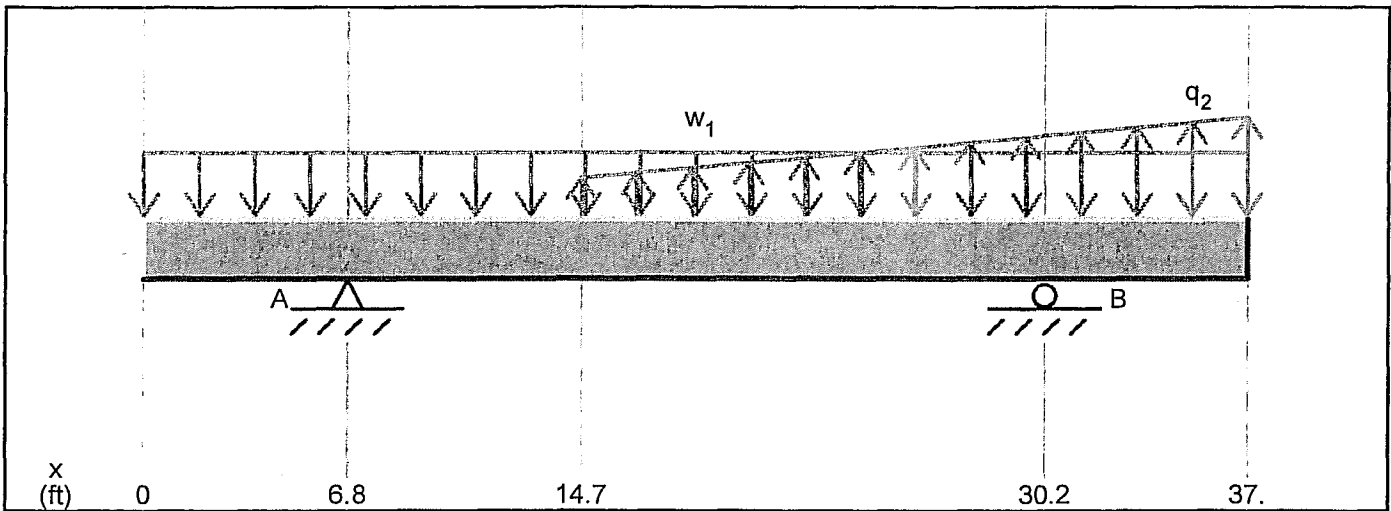
$M_{maxp} = 3028.00 \text{ ft*kips}$

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

$M_n = M_{maxp} / \phi_t$

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

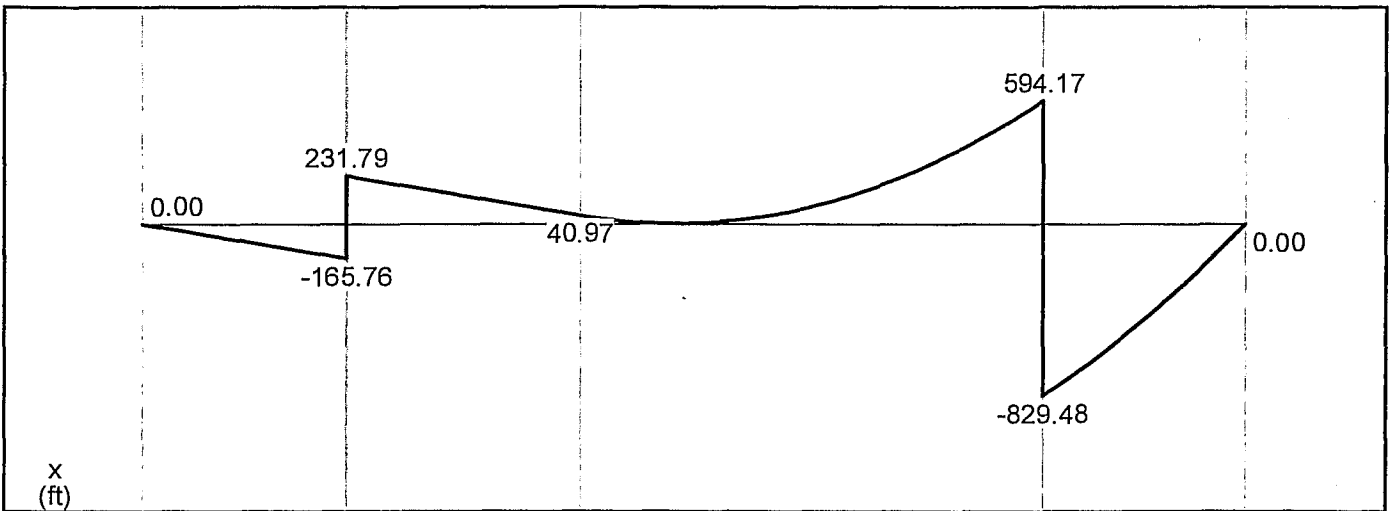
### Load Case 2 Option 1



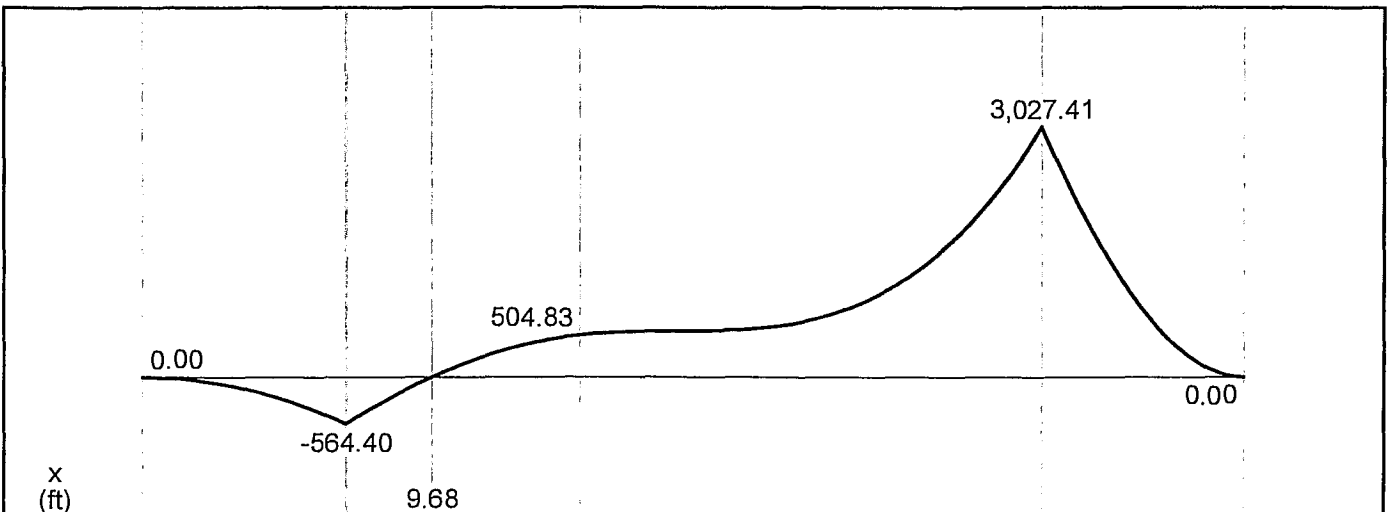
Load Diagram

$w_1 = 24.34$  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)

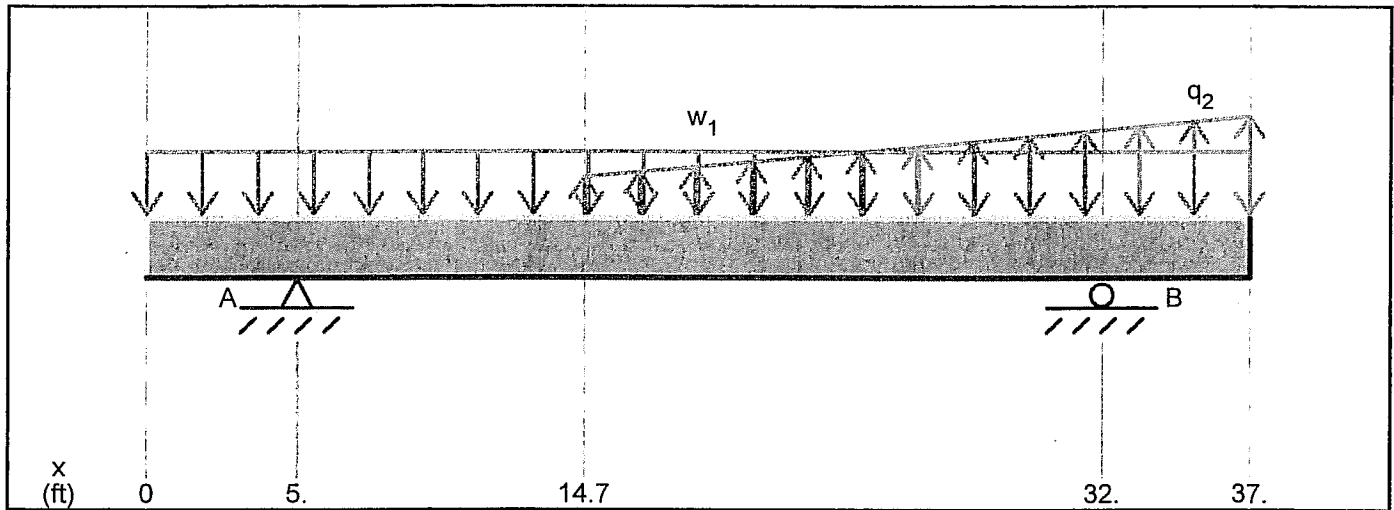


Shear Diagram (kip)



Moment Diagram (kip-ft)

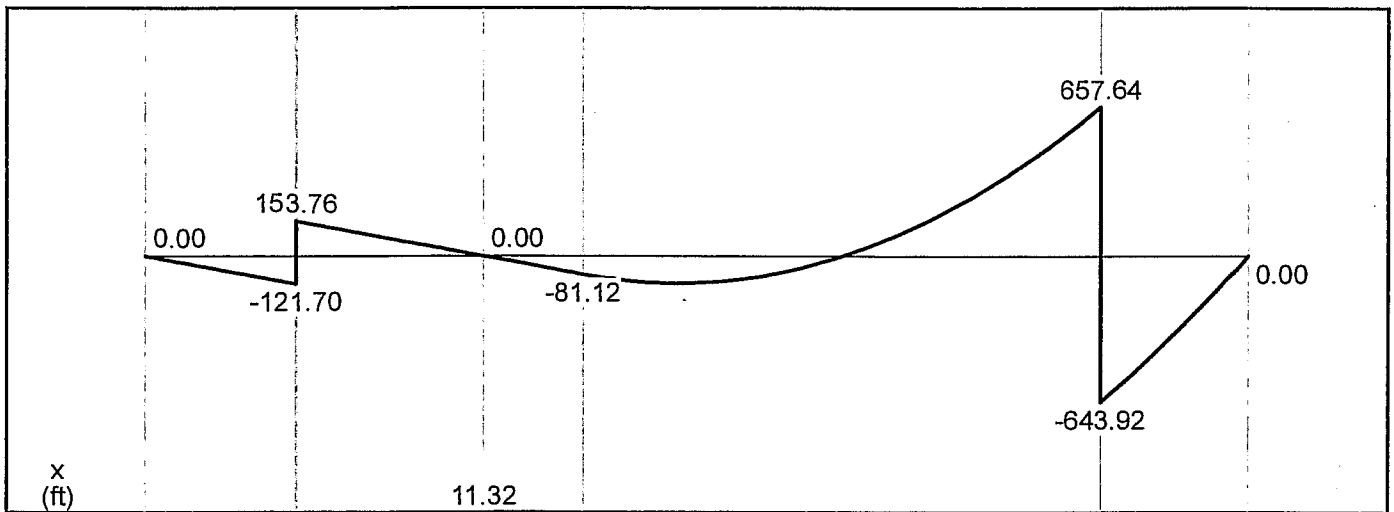
### Load Case 2 Option 2



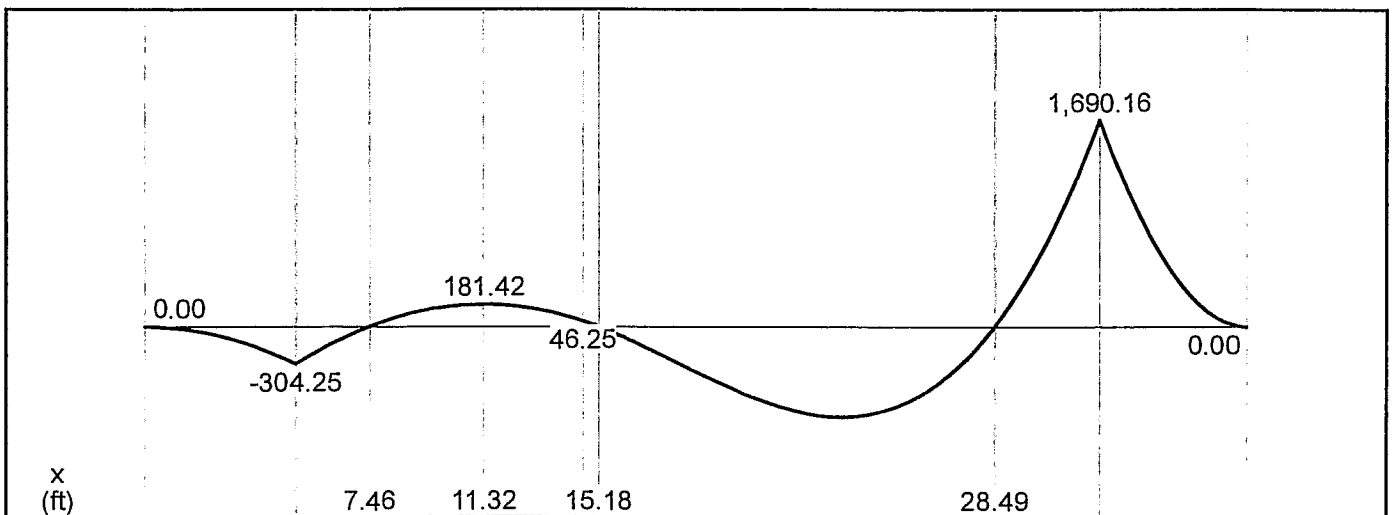
Load Diagram

$w_1 = 24.34$  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 <sup>2</sup> |
|                  | $a_p = A_{st\_p}' * F_y / (\beta * F'c * W_e)$   | $a_p = 2.68$             | 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 <sup>2</sup> |
| 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 <sup>2</sup> |
|                  | $A_{st\_p} = \text{MAX}(A_{st\_p\_st}, A_{st\_p\_sh})$   | $A_{st\_p} = 66.992$     | in <sup>2</sup> |
| Rebar:           | $s_p = 9$ Equally spaced, top and bottom, both directions.   | $d_{b\_p} = 1.128$       | in              |
|                  | $m_p = 67$   | $A_{b\_p} = 1$           | in <sup>2</sup> |
|                  | $A_{s\_p} = A_{b\_p} * m_p$  | $A_{s\_p} = 67.00$       | in <sup>2</sup> |
|                  | <b>Check</b> $A_{s\_p} = 67.00$ in <sup>2</sup> $\geq$ $A_{st\_p} = 66.99$ in <sup>2</sup>         |                          | OK              |
| Bar separation:  | $B_{s\_p} = (W - 2 * cc - db\_p) / (m_p - 1) - db\_p$  | $B_{s\_p} = 5.49$        | in              |
|                  | <b>Check</b> $10.87 \geq B_{s\_p} = 5.49$ in $\geq 4.5$ "  |                          | 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 $\psi_t$ & $\psi_e$ , 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 |
|                          | <b>Check</b> $L_{pad} = 57.00$ 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 <sup>2</sup> |
| <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 <sup>2</sup>  |
| 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 in<sup>2</sup>  
 Actual area of steel = 17.44 in<sup>2</sup>      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 in<sup>2</sup>  
 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 in<sup>2</sup>  
 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 in<sup>3</sup>  
 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 <sup>2</sup> ) | 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. |

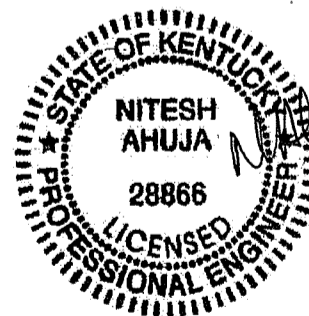
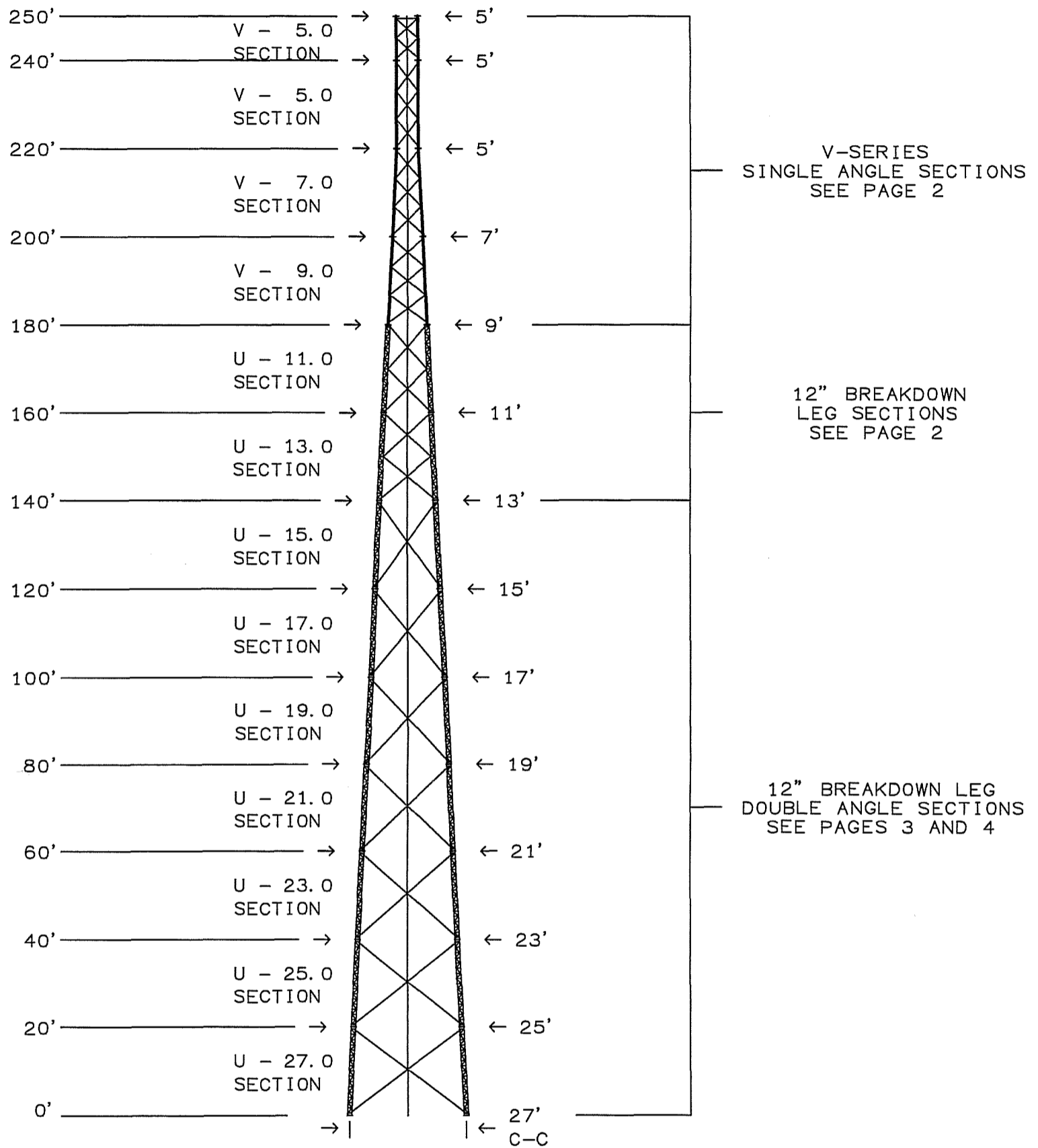
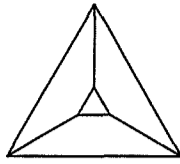
|               |                    |        |     |                                       |             |
|---------------|--------------------|--------|-----|---------------------------------------|-------------|
| Anchor Steel: | Part number:       | 103182 |     | Angle of anchor steel in foundation = | 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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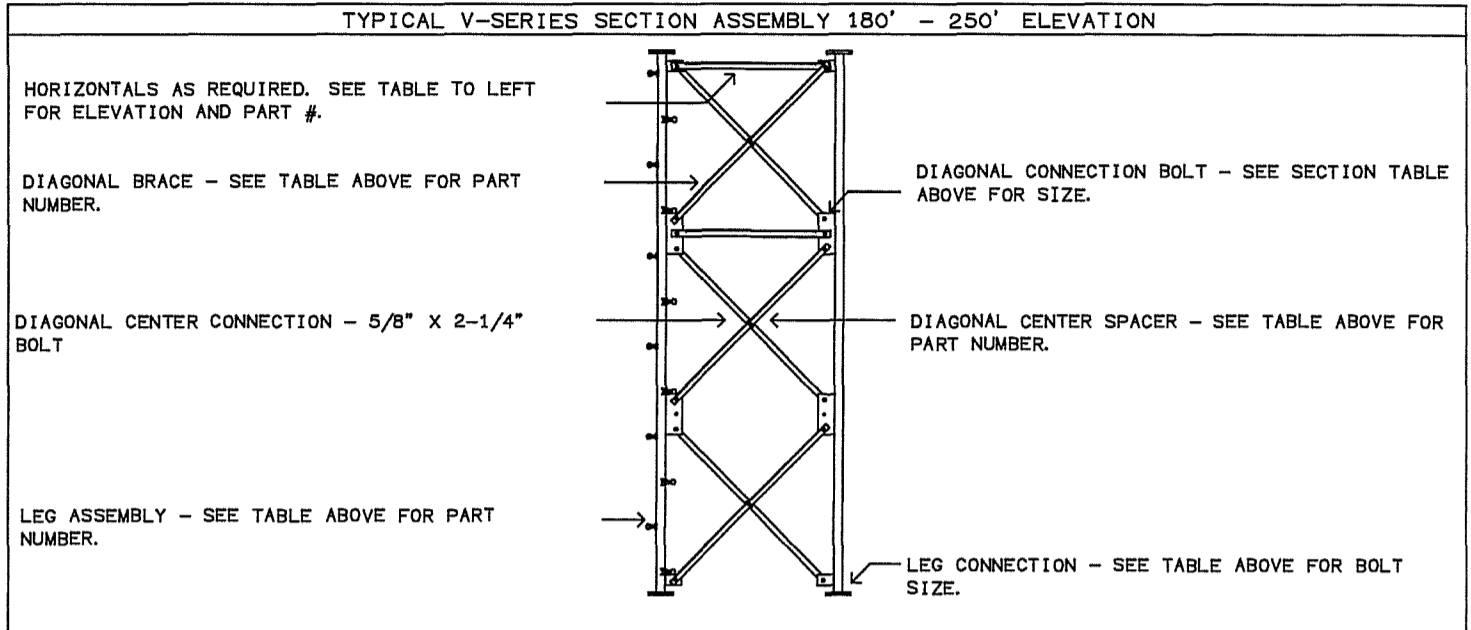
Nitesh Ahuja, KY Professional Engineer #28866

|  |                          |     |            |  |     |   |
|--|--------------------------|-----|------------|--|-----|---|
|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>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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| Printed from 251811_01@A.DWG - 11/11/2013 09:57 @ 11/12/2013 10:27   |                          |     |            | ENG. FILE NO. A-238614-<br>ARCHIVE F-1015737                   |     | PAGE 1 OF 10  |

| V-SERIES LEG SECTION DATA 180' - 250' ELEVATION |        |          |          |       |         |          |        |           |        |               |                |                |        |        |        |       |              |        |        |     |
|---|--------|----------|----------|-------|---------|----------|--------|-----------|--------|---------------|----------------|----------------|--------|--------|--------|-------|--------------|--------|--------|-----|
| SECTION   |        |          | LEG      |       |         |          |        |           |        |               | DIAGONAL BRACE |                |        |        |        |       | HOR          |        |        |     |
| #   | LENGTH | * WEIGHT | NOM SIZE | WALL  | GRADE   | CLIMBING |        | NON-CLIMB |        | CONNECT BOLT+ |                | PART NUMBER ** |        |        | ANGLE  |       | CONNECT BOLT |        | CENTER | 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 |     |

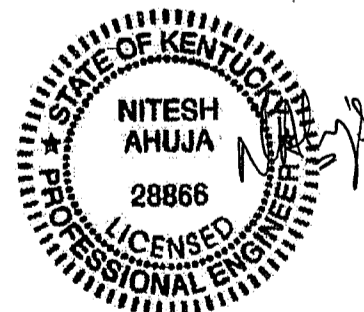
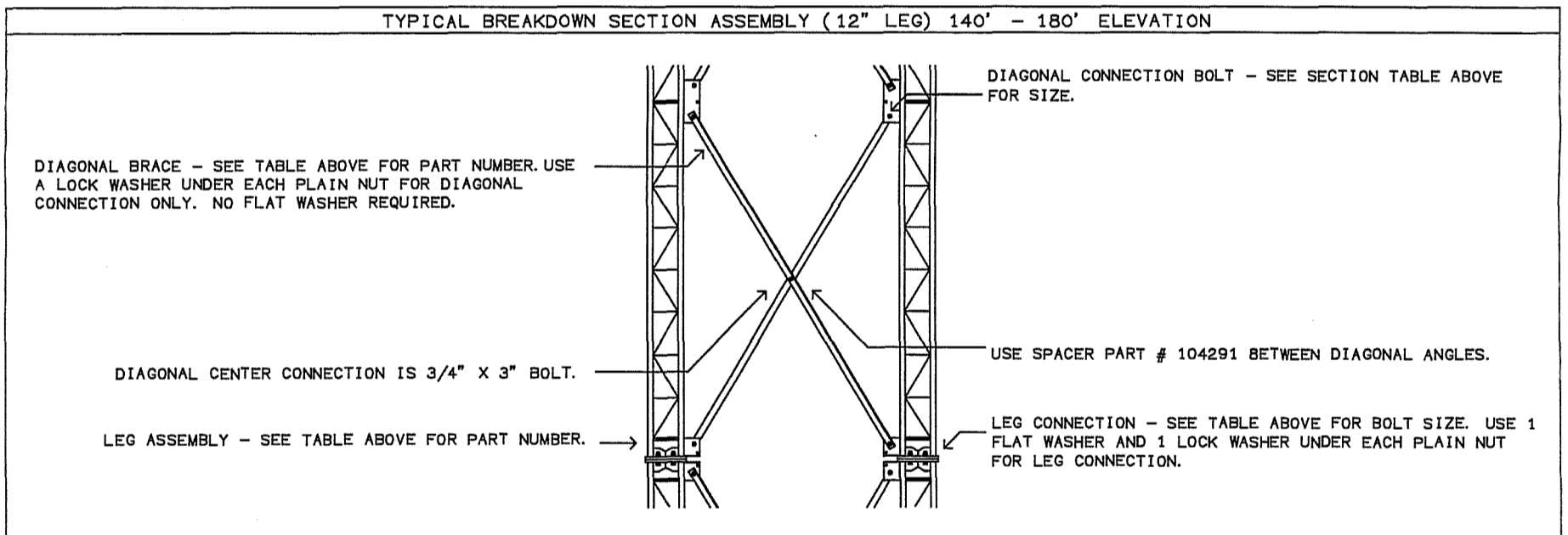
+ AT BOTTOM OF SECTION  
\* THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.  
\*\* PANELS ARE NUMBERED BEGINNING AT THE TOP OF THE SECTION.

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



| BREAKDOWN SECTION DATA (12" LEG) 140' - 180' ELEVATION |                |          |           |                |                |                |              |       |        |                   |        |                   |        |
|--|----------------|----------|-----------|----------------|----------------|----------------|--------------|-------|--------|-------------------|--------|-------------------|--------|
| SEC #  | SECTION LENGTH | LEG SIZE | LEG PART# | TOP DIAG PART# | BOT DIAG PART# | DIAGONAL ANGLE | SECTION FACE | THICK | WEIGHT | LEG CONNECT+ DIAM | LENGTH | DIAG CONNECT DIAM | 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.<br>#282079 COUCHTOWN, KY<br>V-27.0 X 250'   |   |                                   |
| KENTUCKY C. O. A. 1542<br>APPROVED/ENG. M_S 11/11/2013<br>APPROVED/FOUND. N/A<br>COPYRIGHT 2013<br>DRAWN BY KWD                            | 1-877-467-4763 Plymouth, IN<br>1-888-880-9191 Salem, OR<br>STRUCTURES |                                   |
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| From: F1015737.DFT - 11/11/2013 09:41<br>Printed from 251811_02@@.DWG - 11/11/2013 09:57 @ 11/12/2013 10:27                                |   | ARCHIVE F-1015737<br>PAGE 2 OF 10 |

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

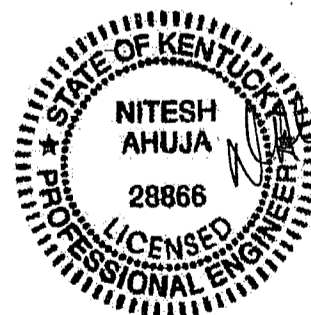
| SECTION |        |        |         | LEG      |        | LEG CONNECT @ BOTTOM+ |        |    |
|---------|--------|--------|---------|----------|--------|-----------------------|--------|----|
| #       | MODEL  | LENGTH | WEIGHT* | SIZE     | PART # | DIAM                  | LENGTH | #  |
| 7       | 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'

|                        |                        |
|------------------------|------------------------|
| KENTUCKY C. O. A. 1542 |                        |
| APPROVED/ENG.          | M_S 11/11/2013         |
| APPROVED/FOUND.        | N/A                    |
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251811

PAGE

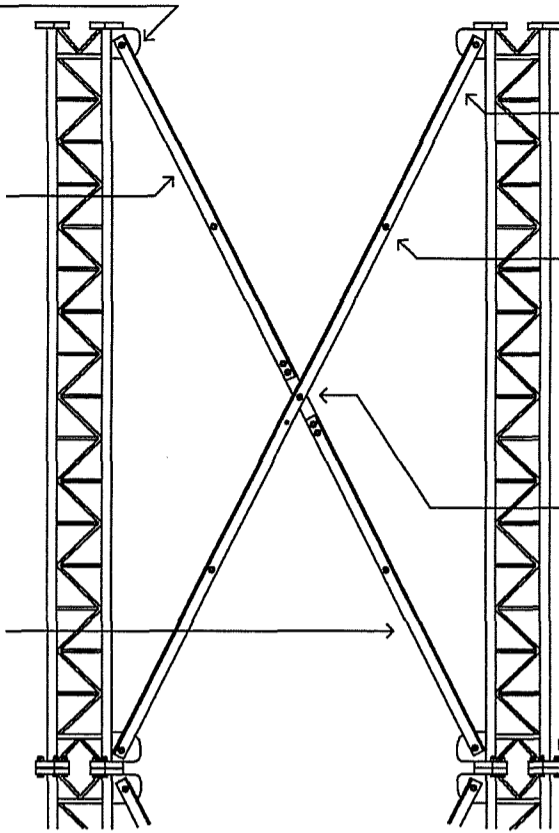
3 OF 10

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 #.

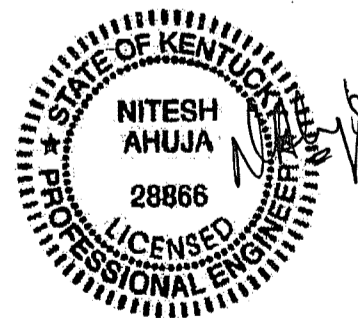
INTERMEDIATE DIAGONAL BOLTS WITH SPACER - SEE TABLE ON PG. 3 FOR SIZE, SPACER PART # AND NUMBER OF LOCATIONS PER PANEL ON EACH FACE. USE 1 SPACER PER BOLT. SEE DRAWING # 214823 FOR DETAILS.

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            |
| COPYRIGHT 2013         |                |
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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 |                |
| APPROVED/ENG.          | M_S 11/11/2013 |
| APPROVED/FOUND.        | N/A            |
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ARCHIVE F-1015737

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PAGE

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FOUNDATION NOTES

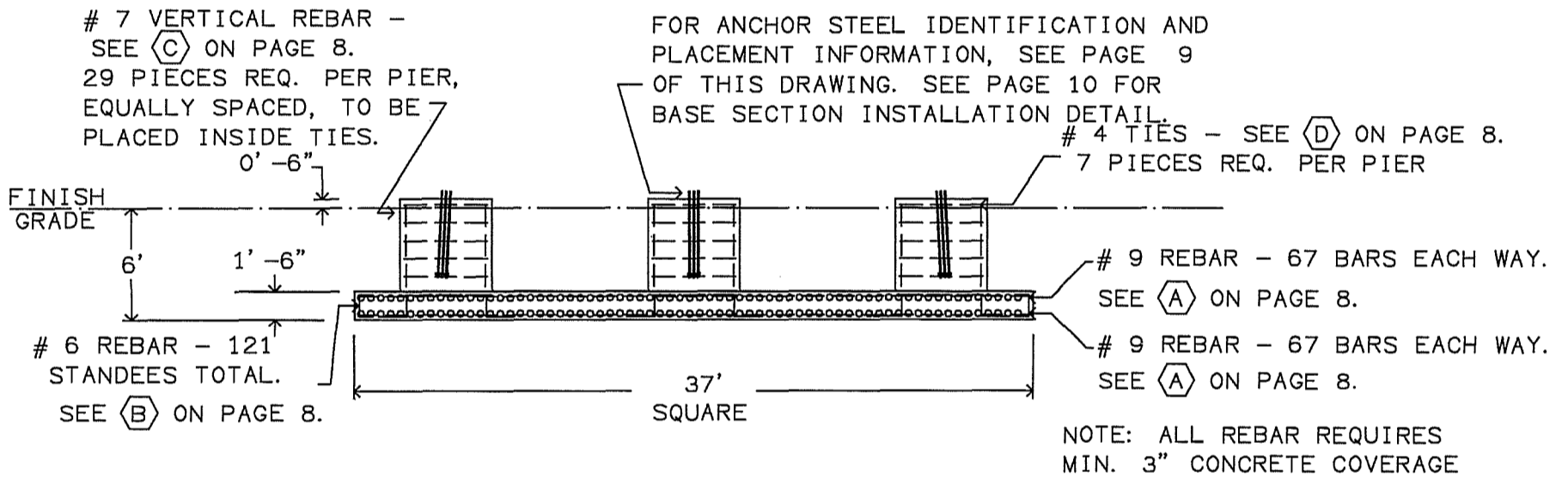
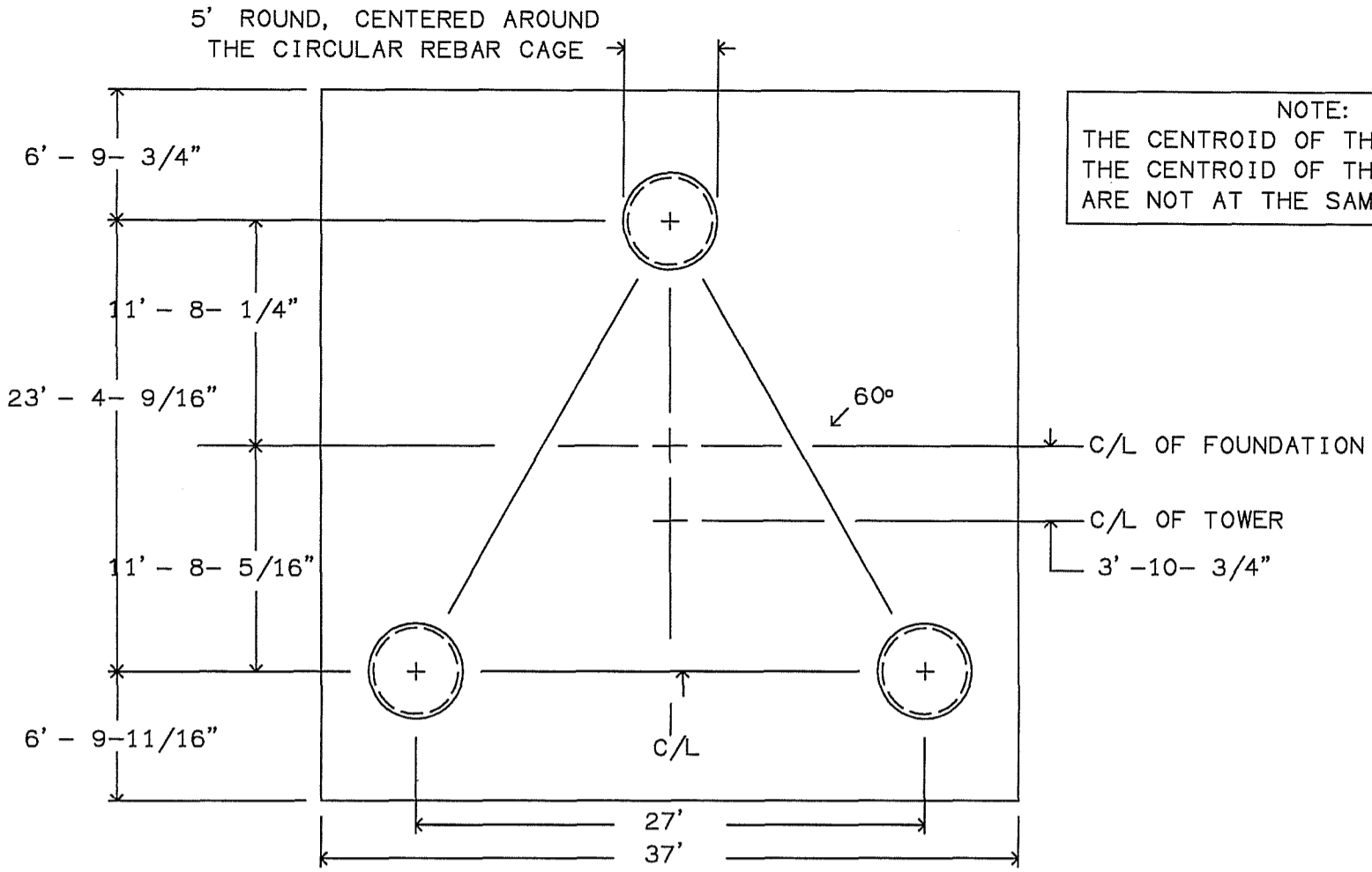
1. SOIL AS PER REPORT BY FDH, DATED: 10/16/13 (PROJECT#1305531600) & EMAIL DATED: 11/11/13
2. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 (2008) BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE 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

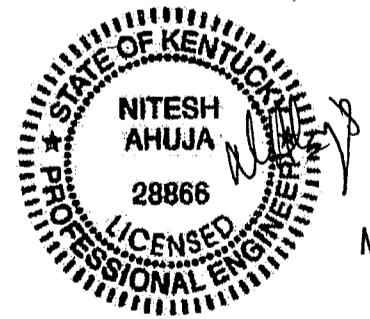
Nitesh Ahuja, KY Professional Engineer #28866

|  |                          |     |            |  |     |  |
|--|--------------------------|-----|------------|--|-----|--|
|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>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.

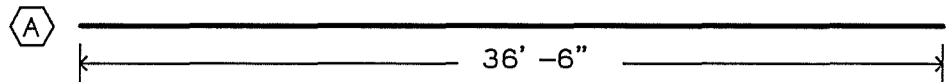


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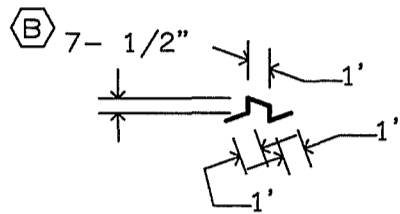
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|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>V-27.0 X 250' |                |
|  |                          |     |            | KENTUCKY C. O. A. 1542   |                |
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|  |                          |     |            | PAGE 7 OF 10   |                |



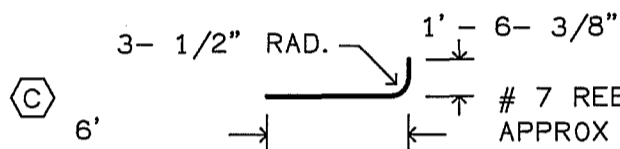


# 9 REBAR - 268 PIECES REQ. TOTAL  
 APPROX WT = 124.1# EACH, 33259# TOTAL

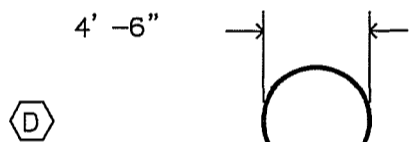
REBAR SUPPORTS MAY CONSIST OF ANY ACCEPTABLE MEANS OF SECURELY SUPPORTING THE TOP REINFORCEMENT GRID ABOVE THE BOTTOM REINFORCEMENT GRID WHILE MAINTAINING A SEPARATION OF 1' (OUTSIDE REBAR TO OUTSIDE REBAR).



# 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

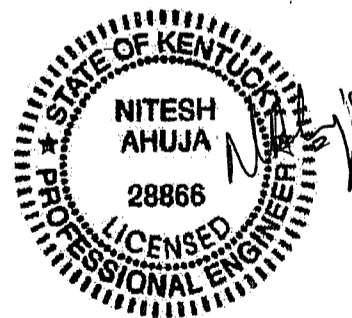


# 4 REBAR - 21 PIECES REQUIRED TOTAL  
 APPROX UNBENT LENGTH = 15'-8-1/4"  
 APPROX WT = 10.5# EACH, 221# TOTAL

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

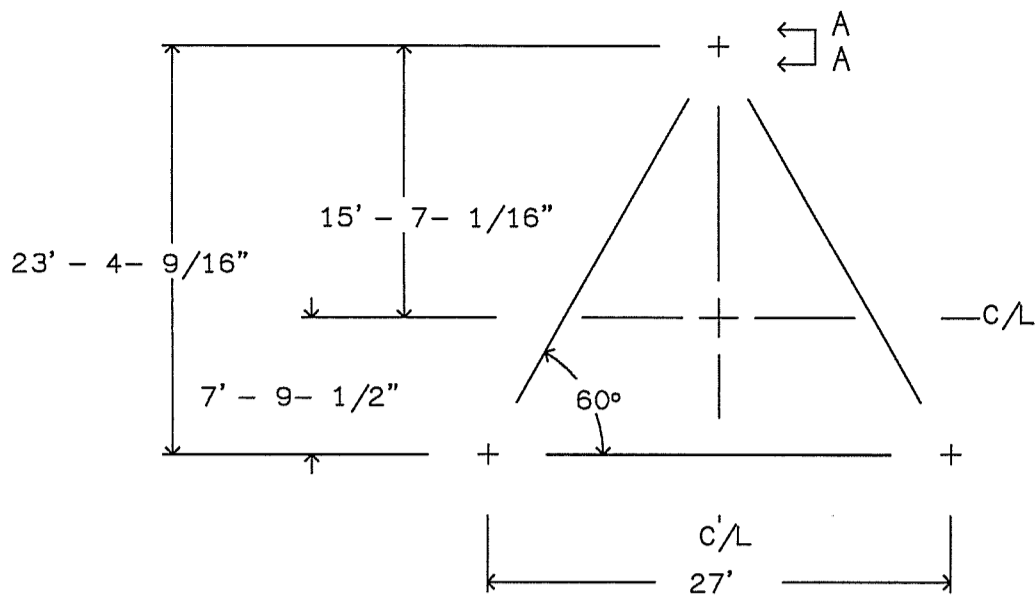
TOTAL APPROX REBAR WEIGHT = 35556#  
 REINFORCING BAR TO CONFORM TO  
 ASTM A615 GRADE 60 SPECIFICATIONS.



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

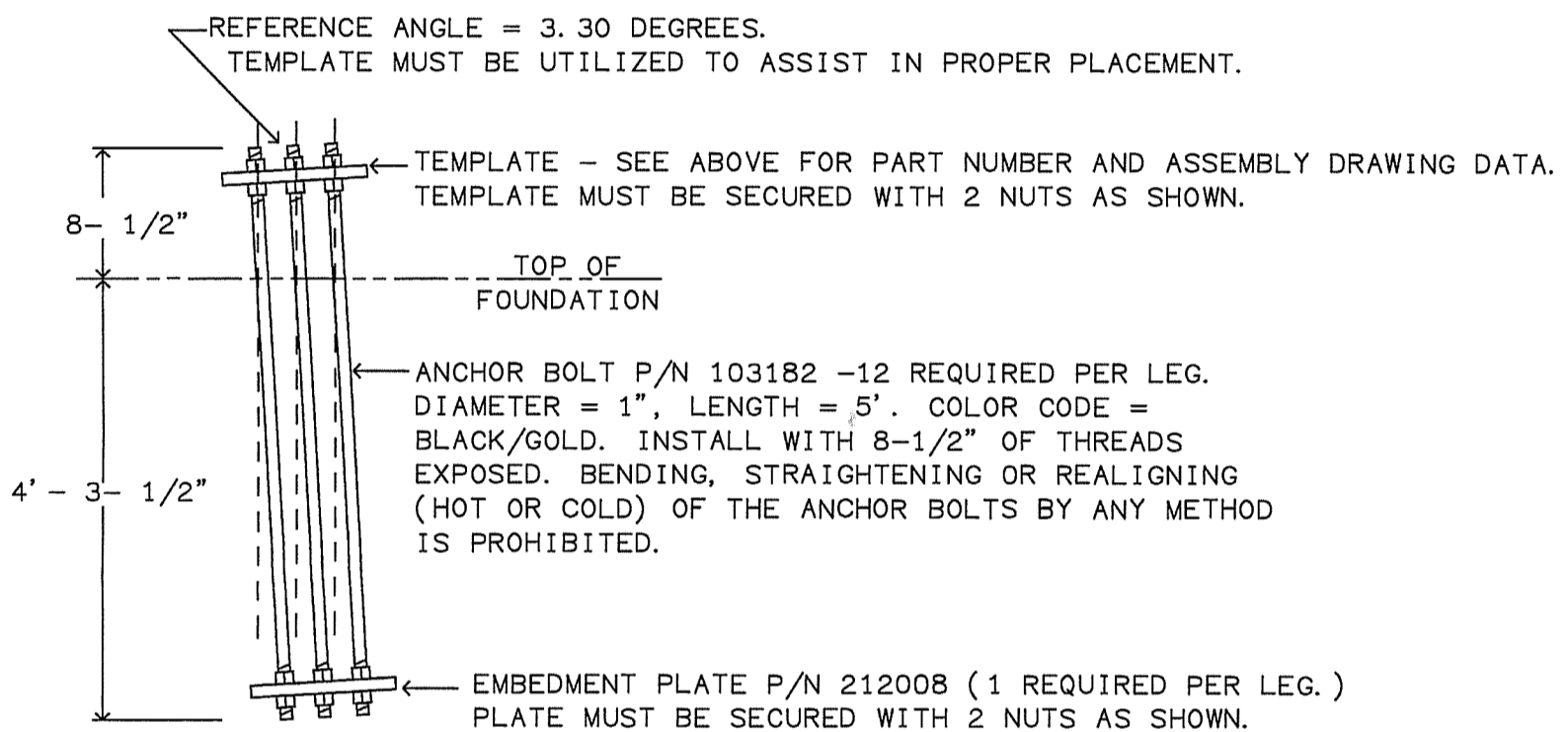
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|--|--------------------------|-----|------------|--|-----|---|
|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>V-27.0 X 250' |     |   |
|  |                          |     |            | KENTUCKY C. O. A. 1542   |     |   |
| A  | ADDED FOUNDATION         | JAK | 11/11/2013 | APPROVED/ENG.  | M_S | 11/11/2013  |
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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.

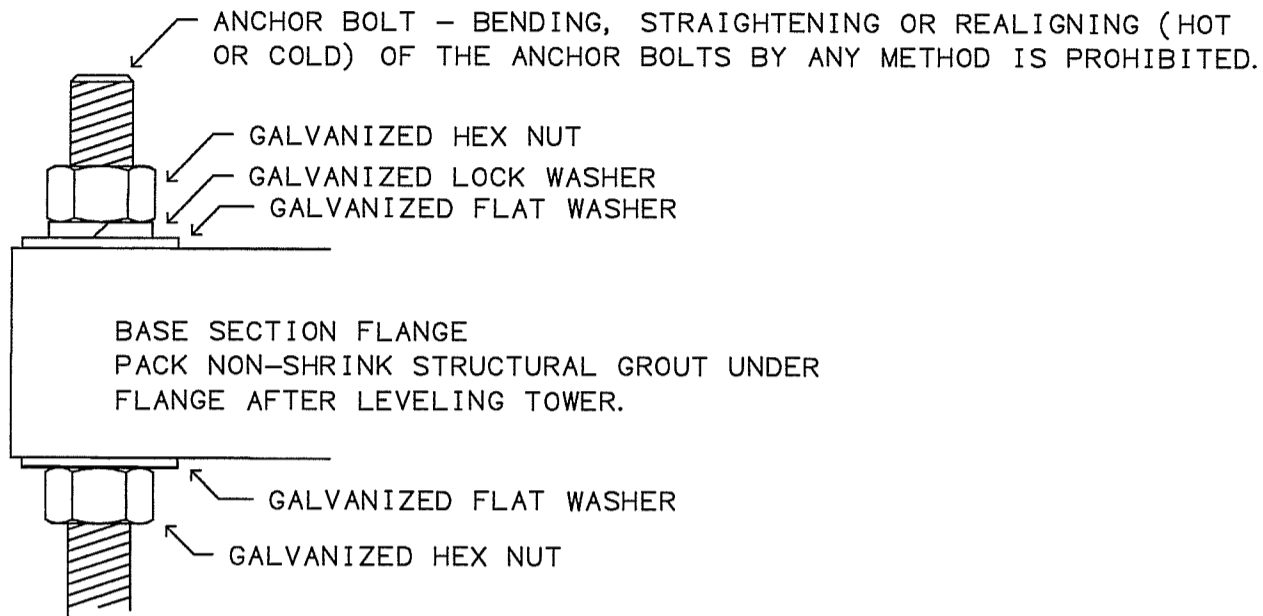
IF THERE ARE ANY DISCREPANCIES, PLEASE NOTIFY PIROD, INC. PRIOR TO INSTALLATION!!



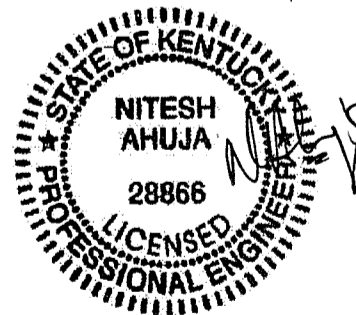
NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

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|--|--------------------------|-----|------------|--|-----|---|
|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>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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BASE SECTION INSTALLATION DETAIL



NOV 12 2013

Nitesh Ahuja, KY Professional Engineer #28866

|  |                          |     |            |  |     |               |
|--|--------------------------|-----|------------|--|-----|---------------|
|  |                          |     |            | AMERICAN TOWER CORP.<br>#282079 COUCHTOWN, KY<br>V-27.0 X 250' |     |               |
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|  |                          |     |            |  |     | 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

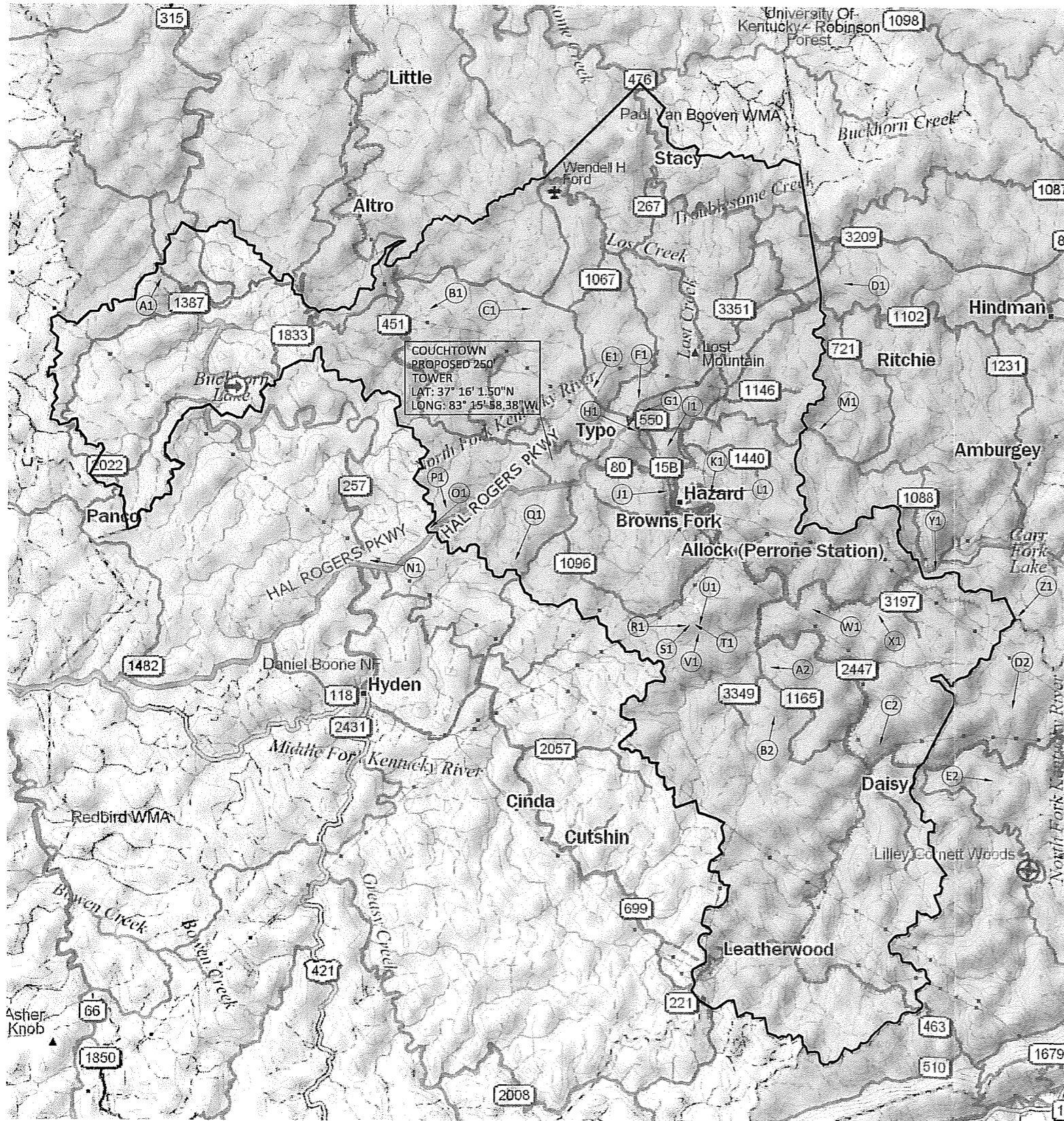
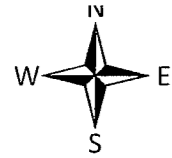
Fax: 919.755.1031 s Email: cfairbanks@fdh-inc.com<mailto:cfairbanks@fdh-inc.com>

[www.fdhengineering.com](http://www.fdhengineering.com/)<<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.

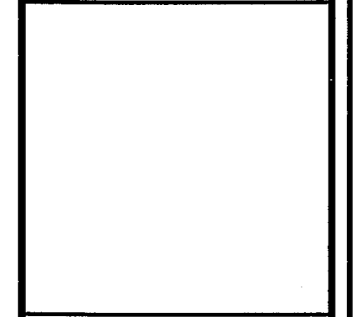
USGS 7.5 MINUTE QUADRANGLE: HAZARD, KY

# PERRY COUNTY, KENTUCKY

## AT&T SITE NAME: COUCHTOWN

### EXISTING TOWER LEGEND

- |  |  |
|--|--|
| Ⓐ FCC REGISTRATION #: 1228252<br>LAT: N37° 21' 06.30"<br>LONG: W83° 29' 17.60" | Ⓜ FCC REGISTRATION #: 1236687<br>LAT: N37° 13' 22.30"<br>LONG: W83° 17' 12.60" |
| Ⓑ FCC REGISTRATION #: 1235226<br>LAT: N37° 20' 19.00"<br>LONG: W83° 20' 07.00" | Ⓨ FCC REGISTRATION #: 1275573<br>LAT: N37° 11' 34.20"<br>LONG: W83° 11' 23.40" |
| Ⓒ FCC REGISTRATION #: 1042395<br>LAT: N37° 20' 18.30"<br>LONG: W83° 16' 42.60" | Ⓩ FCC REGISTRATION #: 1044020<br>LAT: N37° 11' 35.00"<br>LONG: W83° 11' 17.00" |
| Ⓓ FCC REGISTRATION #: 1009007<br>LAT: N37° 21' 05.40"<br>LONG: W83° 05' 57.60" | ⓐ FCC REGISTRATION #: 1048810<br>LAT: N37° 11' 36.00"<br>LONG: W83° 11' 04.00" |
| Ⓚ FCC REGISTRATION #: 1274202<br>LAT: N37° 18' 08.00"<br>LONG: W83° 14' 31.80" | ⓑ FCC REGISTRATION #: 1043131<br>LAT: N37° 11' 38.00"<br>LONG: W83° 10' 52.00" |
| Ⓛ FCC REGISTRATION #: 1238020<br>LAT: N37° 17' 53.00"<br>LONG: W83° 13' 00.00" | ⓓ FCC REGISTRATION #: 1204858<br>LAT: N37° 11' 21.80"<br>LONG: W83° 10' 57.40" |
| Ⓜ FCC REGISTRATION #: 1246956<br>LAT: N37° 17' 29.30"<br>LONG: W83° 12' 52.60" | ⓔ FCC REGISTRATION #: 1236687<br>LAT: N37° 12' 05.30"<br>LONG: W83° 07' 01.60" |
| Ⓝ FCC REGISTRATION #: 1237058<br>LAT: N37° 16' 57.00"<br>LONG: W83° 13' 05.70" | ⓕ FCC REGISTRATION #: 1270918<br>LAT: N37° 11' 54.60"<br>LONG: W83° 04' 44.90" |
| Ⓞ FCC REGISTRATION #: 1229714<br>LAT: N37° 16' 32.50"<br>LONG: W83° 12' 00.50" | ⓖ FCC REGISTRATION #: 1260112<br>LAT: N37° 12' 55.00"<br>LONG: W83° 03' 11.00" |
| Ⓟ FCC REGISTRATION #: 1043132<br>LAT: N37° 15' 18.00"<br>LONG: W83° 12' 03.00" | ⓗ FCC REGISTRATION #: 1043804<br>LAT: N37° 11' 52.80"<br>LONG: W82° 59' 55.70" |
| Ⓠ FCC REGISTRATION #: 1042056<br>LAT: N37° 15' 16.30"<br>LONG: W83° 10' 28.70" | ⓘ FCC REGISTRATION #: 1287373<br>LAT: N37° 10' 27.80"<br>LONG: W83° 08' 26.60" |
| Ⓡ FCC REGISTRATION #: 1061535<br>LAT: N37° 15' 21.00"<br>LONG: W83° 10' 25.00" | ⓙ FCC REGISTRATION #: 1210134<br>LAT: N37° 09' 05.30"<br>LONG: W83° 08' 19.60" |
| Ⓢ FCC REGISTRATION #: 1274629<br>LAT: N37° 17' 03.60"<br>LONG: W83° 06' 46.10" | ⓚ FCC REGISTRATION #: 1281419<br>LAT: N37° 08' 20.30"<br>LONG: W83° 04' 42.20" |
| Ⓣ FCC REGISTRATION #: 1286454<br>LAT: N37° 13' 21.00"<br>LONG: W83° 22' 08.40" | ⓛ FCC REGISTRATION #: 1263525<br>LAT: N37° 09' 20.70"<br>LONG: W83° 00' 07.50" |
| Ⓤ FCC REGISTRATION #: 1261729<br>LAT: N37° 14' 20.70"<br>LONG: W83° 20' 0.630" | ⓜ FCC REGISTRATION #: 1286558<br>LAT: N37° 07' 21.10"<br>LONG: W83° 00' 50.90" |
| ⓖ FCC REGISTRATION #: 1272180<br>LAT: N37° 14' 49.40"<br>LONG: W83° 19' 33.90" |  |



### COUNTY TOWER MAP

| REV. | DATE | DESCRIPTION |
|------|------|-------------|
|      |      |             |
|      |      |             |
|      |      |             |
|      |      |             |
|      |      |             |

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

SITE NUMBER:  
**KYALU6155**

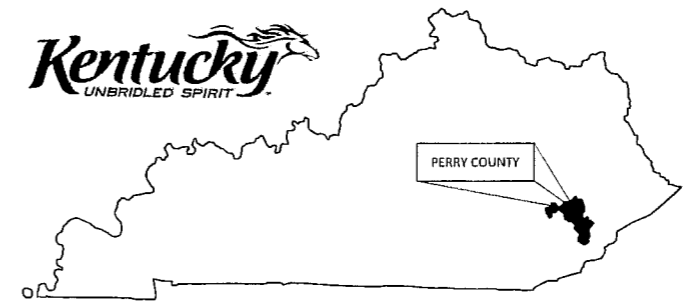
POD NUMBER: 13-0815

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<br>Sign/Lease<br>ID   | Name  | FRN        | Radio<br>Service | Status | Expiration<br>Date |
|----|--|---|------------|------------------|--------|--------------------|
| 1  | <span style="border: 1px solid black; padding: 1px;">PA</span> 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 | <span style="border: 1px solid black; padding: 1px;">PA</span> WQDI527 | Cricket License Company, LLC                          | 0018402123 | CW               | Active | 09/06/2015         |

|  | Call<br>Sign/Lease<br>ID | Name | FRN | Radio<br>Service | Status | Expiration<br>Date |
|--|--------------------------|------|-----|------------------|--------|--------------------|
|--|--------------------------|------|-----|------------------|--------|--------------------|

**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

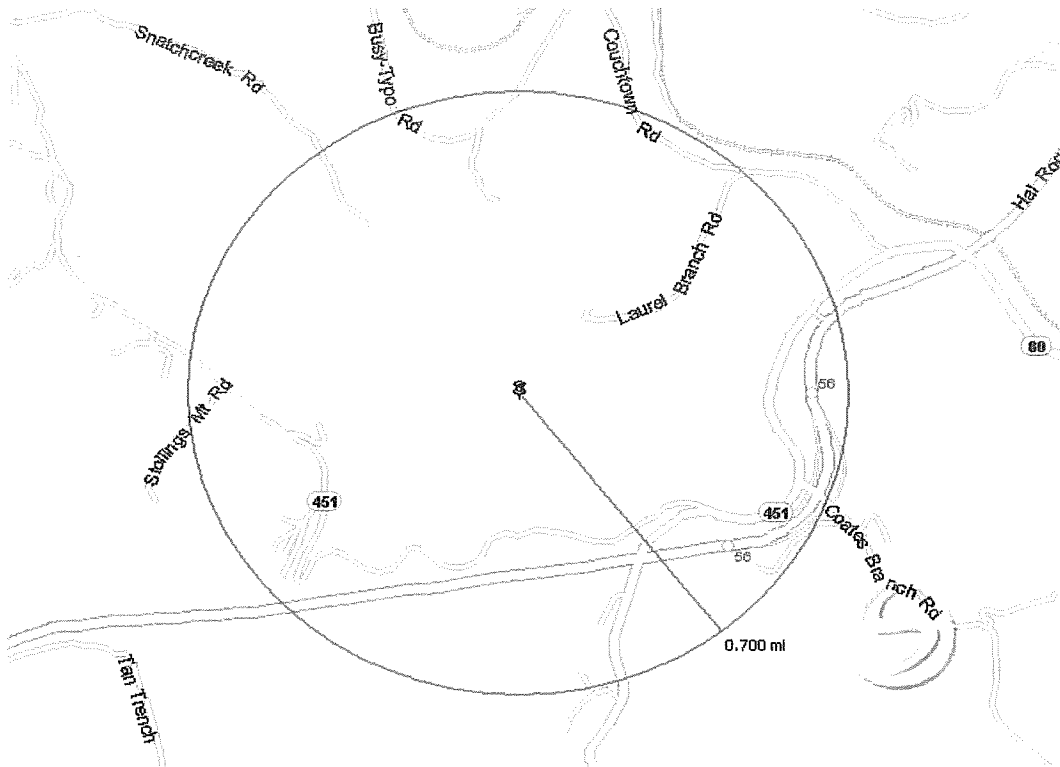
Dear Commissioners:

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:

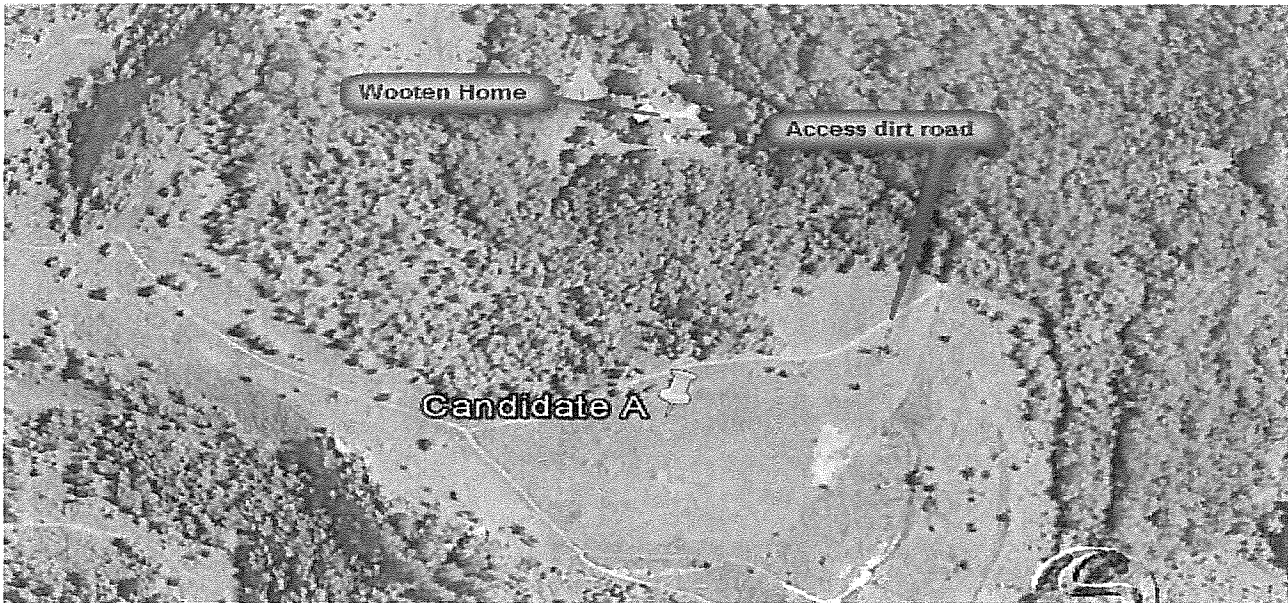
- Wooten property, # 063-00-00-012.00
- Crawford property, # 063-00-00-017.00
- Thomas property, # 063-00-00-013.00
- Odell property, # 063-00-00-029.00

**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<br>FREQUENCY | HIGH<br>FREQUENCY | FREQUENCY<br>UNIT | ERP  | ERP<br>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](http://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

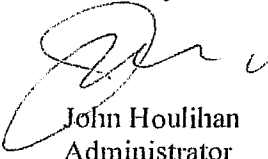
SUBJECT: AS-097-K20-2013-160

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:

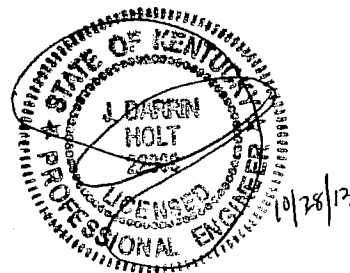
*Cedric D. Fairbanks*

*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.



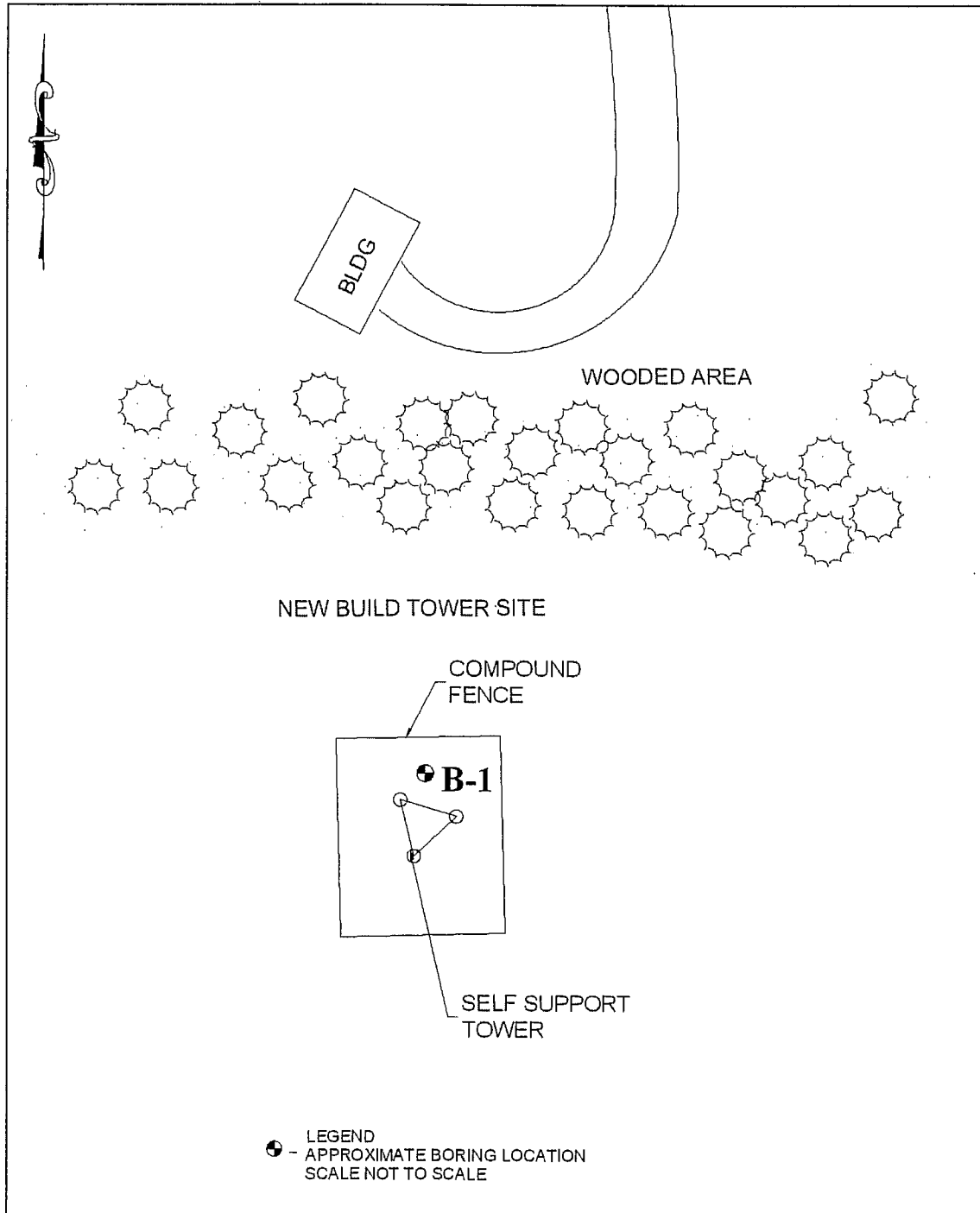
**Table 1**  
**ULTIMATE SOIL STRENGTH PARAMETERS**

**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              |



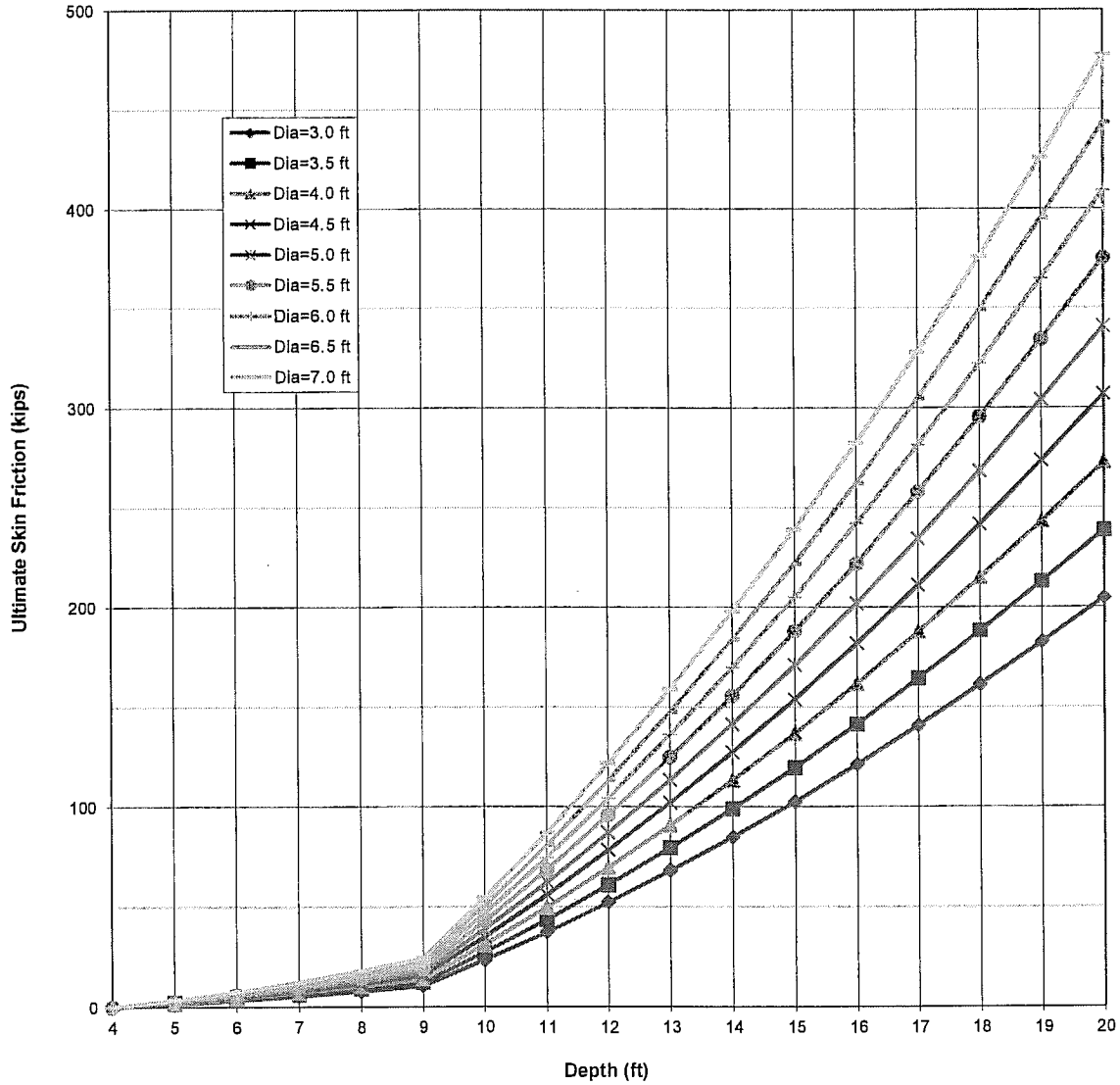
**FIGURE 1: Site Plan – 1023 Snatchcreek Road - Busy, KY 41723**





**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

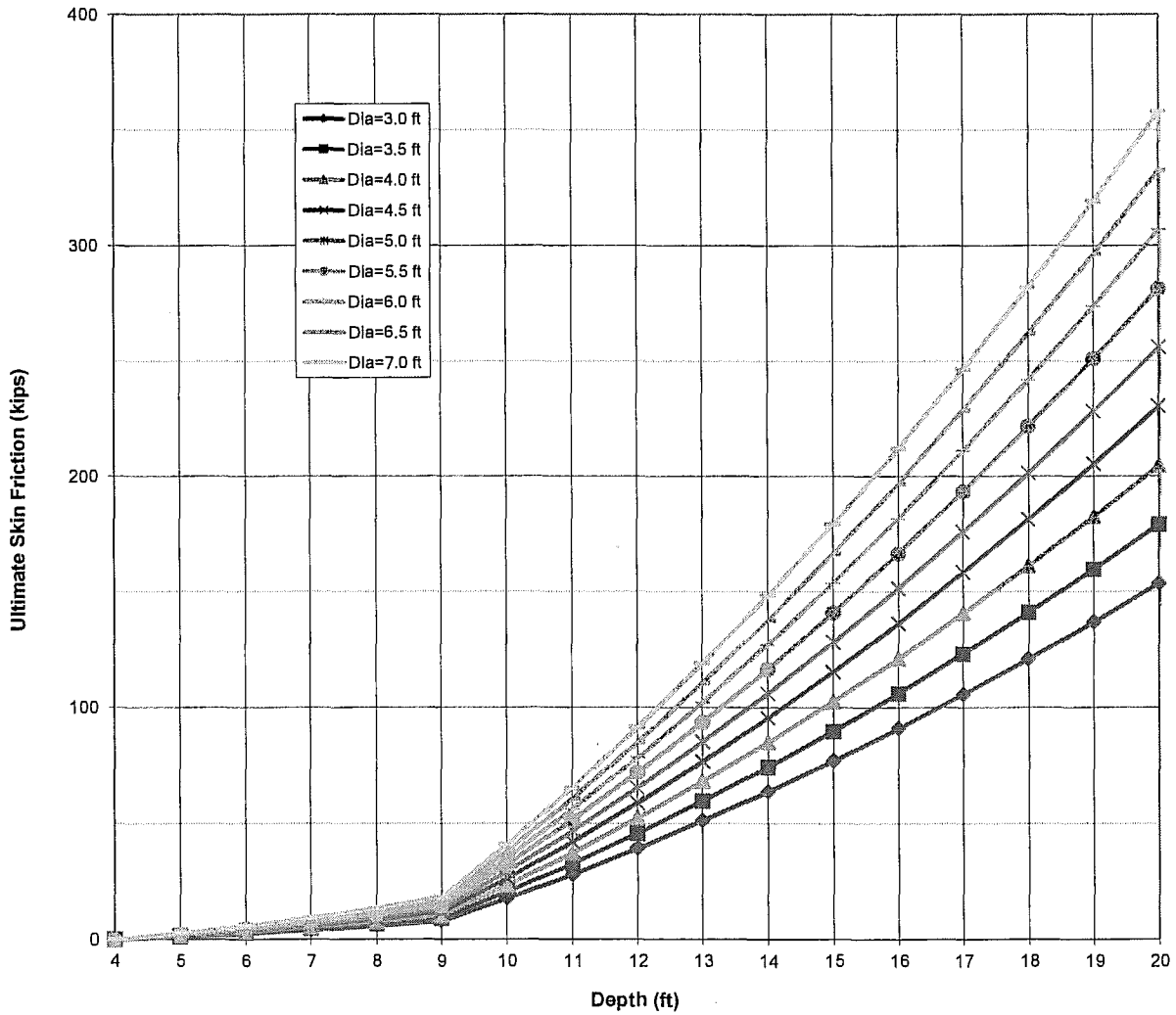






**FIGURE 3: Ultimate Uplift Skin Friction vs. Depth**  
Soil Boring B-1, 3.0 ft to 7.0 ft Diameter Caissons

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

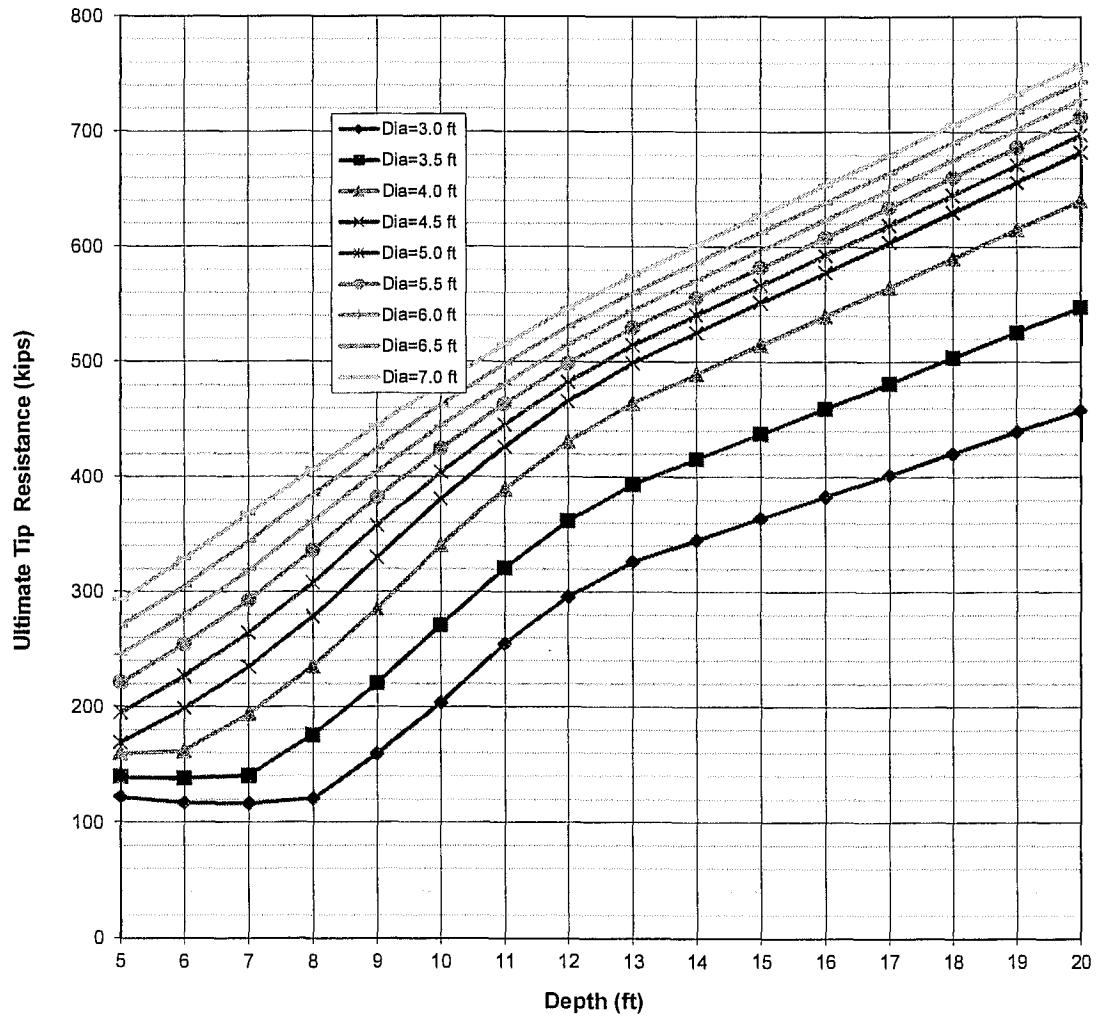
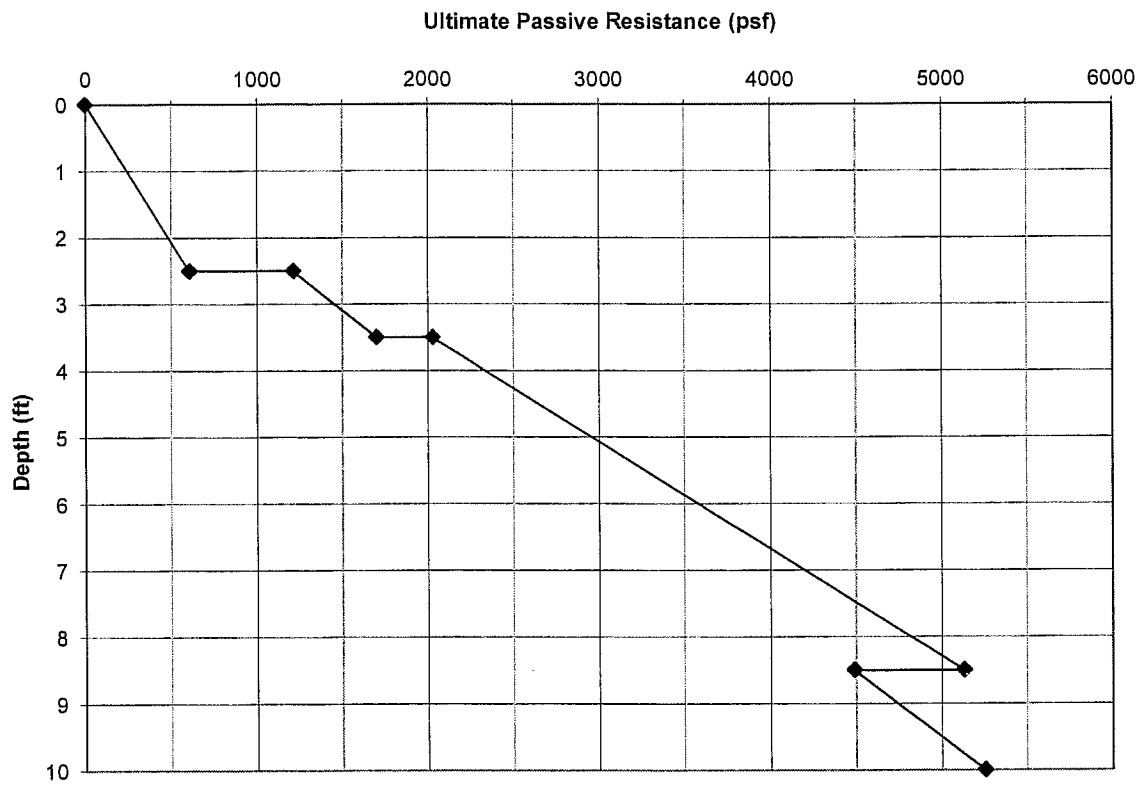




FIGURE 5: Ultimate Passive Resistance vs. Depth  
Soil Boring B-1





**PROJECT NAME:** Couchtown (144886-A)  
**PROJECT LOCATION:** 1023 Snatchcreek Road - Busy, KY 41723  
**CLIENT:** FMHC Corporation

**PROJECT NUMBER:** 1305531600

**Boring No.:** B-1

PAGE 1 OF 1

**DATE DRILLED :** 10/9/2013  
**DRILLING METHOD :** Hollow Stem Auger  
**GROUND ELEVATION :**  
**BORING DEPTH (ft) :** 19

**GROUND WATER LEVELS:**  
 ▽ **AT TIME OF DRILLING :** -- No Groundwater Encountered  
 ▼ **AT END OF DRILLING :** --  
 ▽ **AFTER DRILLING :** --

| DEPTH (ft) | MATERIAL DESCRIPTION   | SAMPLE TYPE | MATERIAL CLASSIFICATION | Cohesion (tsf)  | BLOWS 1st       | BLOWS 2nd | BLOWS 3rd | N VALUE | ▲ SPT N VALUE ▲ |    |    |    |                 |    |    |    |    |  |  |  |  |  |  |
|------------|--|-------------|-------------------------|-----------------|-----------------|-----------|-----------|---------|-----------------|----|----|----|-----------------|----|----|----|----|--|--|--|--|--|--|
|            |  |             |                         |                 |                 |           |           |         | 10              | 20 | 30 | 40 | 50              | 60 | 70 | 80 | 90 |  |  |  |  |  |  |
| 0          | Dense Clayey Sand (probable mine spoils), dark gray, moist             |             | SC                      |                 | 13              | 17        | 17        | 34      | ▲ SPT N VALUE ▲ |    |    |    |                 |    |    |    |    |  |  |  |  |  |  |
|            | Changes to very dense  |             |                         |                 |                 |           |           |         | 45              | 39 | 29 | 68 | ▲ SPT N VALUE ▲ |    |    |    |    |  |  |  |  |  |  |
| 5          | Changes to with rock fragments   |             |                         |                 |                 |           |           |         | 50              | 39 | 40 | 79 | ▲ SPT N VALUE ▲ |    |    |    |    |  |  |  |  |  |  |
| 10         | Dense Partially Weathered Rock with sand (Probable Shale), gray, moist |             |                         |                 |                 |           |           |         | 34              | 17 | 28 | 45 | ▲ SPT N VALUE ▲ |    |    |    |    |  |  |  |  |  |  |
| 15         | Changes to very dense  | 35          | 50/5"                   | 100             | ▲ SPT N VALUE ▲ |           |           |         |                 |    |    |    |                 |    |    |    |    |  |  |  |  |  |  |
| 20         | Refusal at 19.0 feet.<br>Bottom of borehole at 19.0 feet.              | 50/6"       | 100                     | ▲ SPT N VALUE ▲ |                 |           |           |         |                 |    |    |    |                 |    |    |    |    |  |  |  |  |  |  |
| 25         |  |             |                         |                 |                 |           |           |         | ▲ SPT N VALUE ▲ |    |    |    |                 |    |    |    |    |  |  |  |  |  |  |

**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 Walford *Jeff Walford*  
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 9<sup>th</sup> 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 9<sup>th</sup> 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]

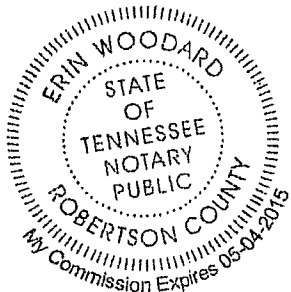
**TENANT ACKNOWLEDGMENT**

STATE OF TENNESSEE)

) ss:

COUNTY OF WILLIAMSON)

On the 9<sup>th</sup> 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 9<sup>th</sup> 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**

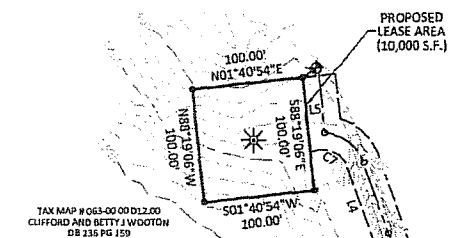
THE FOLLOWING IS A DESCRIPTION OF AN AREA TO BE LEASED FROM THE PROPERTY OF CLIFFORD WOOTON AND BETTY JEAN WOOTON, WHICH IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

**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 59°51'21"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°3'78"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 515°03'06"E - 41.45' TO A SET 5/8" REBAR; THENCE 505°21'14"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°06'44"W - 103.94' 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 108°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°21'14"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°06'44"W - 103.94' 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.



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 # 063-00-00-011.00  
CLIFFORD AND BETTY J. WOOTON  
DB 136 PG 159

- LEGEND**
- UTILITY POLE: EOP EDGE OF PAVEMENT, COHC CONCRETE
  - LIGHT POST: CONIC CONCRETE
  - TELECO 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 P/NAIL
  - SET 5/8" REBAR 20" LONG (UNLESS OTHERWISE NOTED): SET 5/8" REBAR 20" LONG (UNLESS OTHERWISE NOTED)
  - FOUND MONUMENT AS 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**

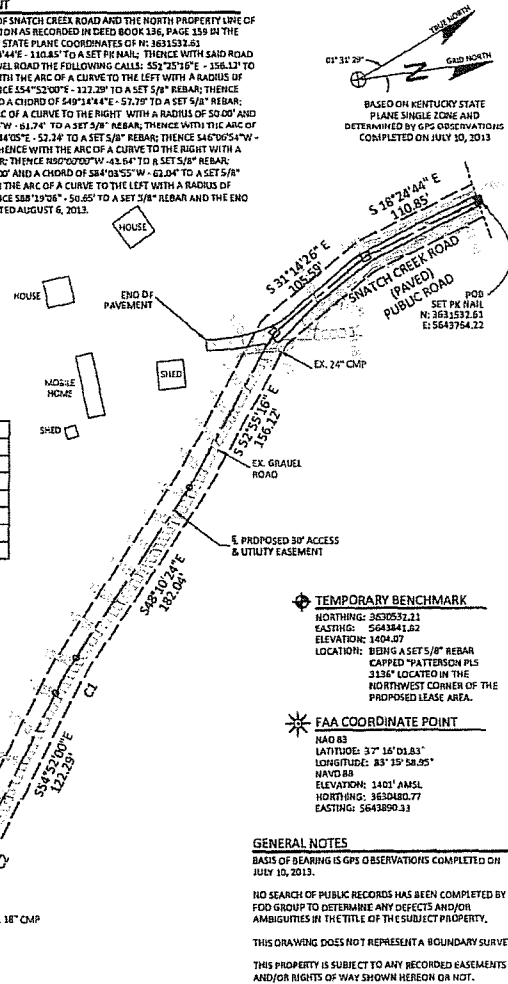
THE PROPOSED LEASE AREA SHOWN HEREON IS NOT LOCATED IN A 100-YEAR FLOOD HAZARD BOUNDARY MAP, COMMUNITY-PANEL NUMBER 2119C01750, DATED AUGUST 2, 2006. THE PROPOSED LEASE AREA IS LOCATED IN ZONE X.

**SITE INFORMATION**

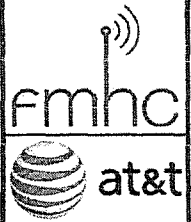
TAX PARCEL NUMBER: 063-00-00-012.00

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

SOURCE OF TITLE: DB 136 PG 159



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



**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

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**

## Couhtown 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