## COMMONWEALTH OF KENTUCKY RECEIVED BEFORE THE PUBLIC SERVICE COMMISSION

MAR 07 2014

In the Matter of:	WAILOU
	PUBLIC SERVICE COMMISSION
THE APPLICATION OF	) COMMISSION
NEW CINGULAR WIRELESS PCS, LLC	)
AND AMERICAN TOWERS LLC	)
FOR ISSUANCE OF A CERTIFICATE OF PUBLIC	) CASE NO.: 2014-00044
CONVENIENCE AND NECESSITY TO CONSTRUCT	)
A WIRELESS COMMUNICATIONS FACILITY	)
IN THE COMMONWEALTH OF KENTUCKY	)
IN THE COUNTY OF WOLFE	)
	•

SITE NAME: HAZEL GREEN

APPLICATION FOR

# 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 ("AT&T Mobility"), and American Towers LLC, a Delaware limited liability company d/b/a Delaware American Towers LLC ("Applicants"), 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 submit 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 AT&T Mobility with wireless communications services.

In support of this Application, Applicants respectfully provide and state the following information:

- 1. The complete name and address of the Applicants: 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; American Towers LLC, a Delaware limited liability company d/b/a Delaware American Towers LLC, having a mailing address of 10 Presidential Way, Woburn, Massachusetts 01801.
- 2. Applicants propose construction of an antenna tower for communications services, which is to be located in an area outside the jurisdiction of a planning commission, and Applicants submit 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 AT&T Mobility 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. A certificate of formation for American Towers LLC is attached as part of **Exhibit A**.
- 4. AT&T Mobility operates on frequencies licensed by the Federal Communications Commission ("FCC") pursuant to applicable FCC requirements. A copy of the AT&T Mobility'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. American Towers LLC will build, own and manage the tower and tower compound where AT&T Mobility will place its equipment building, antennas, radio electronics equipment and appurtenances.
  - 5. The public convenience and necessity require the construction of the

proposed WCF. The construction of the WCF will bring or improve AT&T Mobility's services to an area currently not served or not adequately served by increasing coverage and/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 AT&T Mobility 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 AT&T Mobility's network design that must be in place to provide adequate coverage to the service area.

6. To address the above-described service needs, Applicants propose to construct a WCF at 84 Garry Sparks Drive, Campton, Kentucky 41301, (37°44′52.57″ North latitude, 83°27′31.83″ 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 Billye C. Adams pursuant to a Deed recorded at Deed Book 101, Page 762 in the office of the Wolfe County Clerk. The proposed WCF will consist of a 290-foot tall tower, with an approximately 9 foot tall lightning arrestor attached at the top, for a total height of 299-feet. The WCF will also include concrete foundations and a shelter or cabinets to accommodate the placement of the AT&T Mobility's radio electronics equipment and appurtenant equipment. The WCF 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 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. Applicants have considered the likely effects of the installation of the proposed WCF on nearby land uses and values and have 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 the necessary antennas on an existing structure. When suitable towers or structures exist, AT&T Mobility attempts to co-locate on existing structures such as communications towers or other structures capable of supporting its facilities; however, no other suitable or available co-location site was found to be located in the vicinity of the site. A report detailing the site selection process for the subject site (including documentation as to why co-location is not possible for this site) is attached as **Exhibit E**.

- 11. A copy of the Determination of No Hazard to Air Navigation issued by the Federal Aviation Administration ("FAA") is attached as **Exhibit F**.
- 12. A copy of the Application for Kentucky Airport Zoning Commission ("KAZC")

  Approval to construct the tower 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. Applicants, pursuant to a written agreement, have acquired the right to use the WCF site and associated property rights. A copy of the redacted agreement or an abbreviated agreement recorded with the County Clerk and a copy of the deed to the site parcel are attached as **Exhibit J**. The financial terms of the lease agreement are confidential and proprietary.
- 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 an appropriate scale 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. Applicants have 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. Applicants have 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 requested 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 contains large rural residential parcels and large forested parcels located near the Bert Combs Mountain Parkway.
- 24. The process that was used by the AT&T Mobility 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. AT&T Mobility'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 when searching for sites for antennas that would provide the coverage deemed necessary by AT&T Mobility. 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: <u>dpike@pikelegal.com</u>

Patrick W. Turner
General Attorney-Kentucky
AT&T Kentucky
1600 Williams Street
Suite 5200
Columbia, South Carolina 29201
Telephone: (803) 401-2900

Telephone: (803) 401-2900 Telefax: (803) 254-1731 Email: <u>pt1285@att.com</u>

Matthew Russell Attorney American Towers LLC 10 Presidential Way Woburn, MA 01801

Telephone: 781.926.7154

Email: matthew.russell@americantower.com

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

Respectfully submitted,

David A. Pike

Pike Legal Group, PLLC

1578 Highway 44 East, Suite 6

P. O. Box 369

Shepherdsville, KY 40165-0369

Telephone: (502) 955-4400 Telefax: (502) 543-4410

Email: dpike@pikelegal.com

Attorney for New Cingular Wireless PCS, LLC

d/b/a AT&T Mobility

and

Matthew Russell 10 Presidential Way Woburn, MA 01801

Telephone: 781.926.7154

Email: <u>matthew.russell@americantower.com</u> Attorney for American Towers LLC d/b/a Delaware

American Towers LLC

## **LIST OF EXHIBITS**

Α	-	FCC License Documentation
В	-	Site Development Plan:
		500' Vicinity Map Legal Descriptions Flood Plain Certification Site Plan Vertical Tower Profile
С	-	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
Н	-	Geotechnical Report
l	-	Directions to WCF Site
J	-	Copy of Real Estate Agreement and Deed to Site Parcel
K	-	Notification Listing
L	-	Copy of Property Owner Notification

Copy of County Judge/Executive Notice

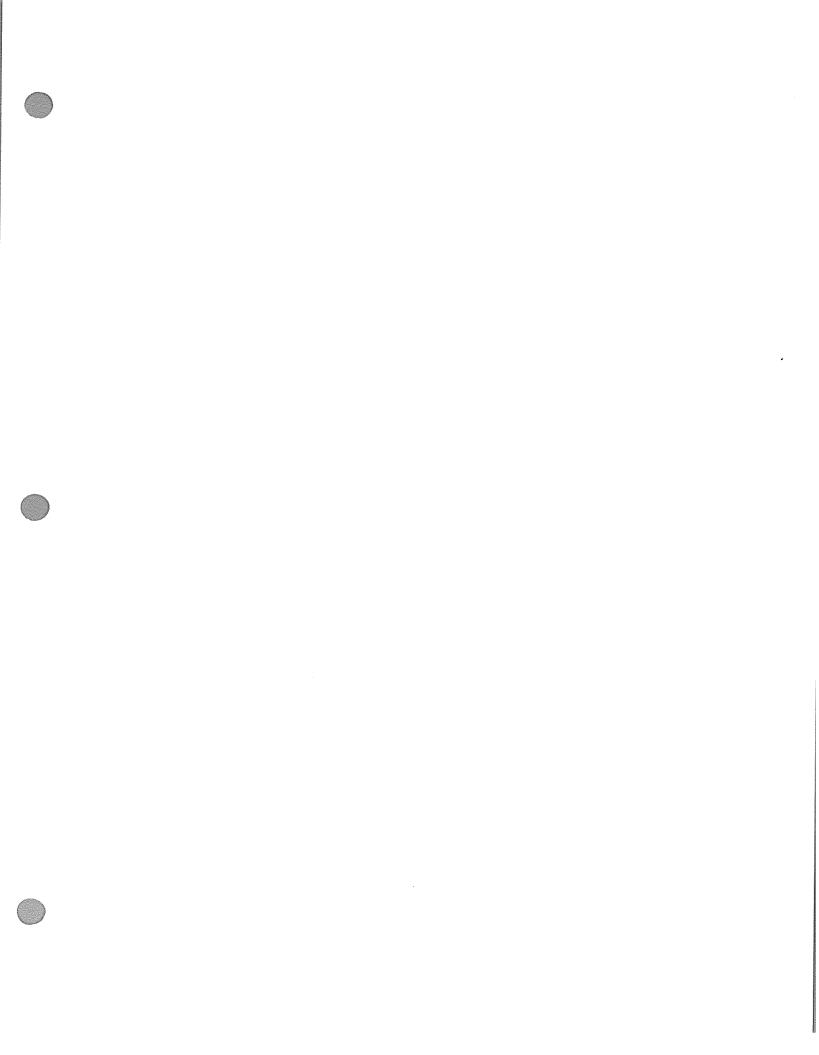
Copy of Radio Frequency Design Search Area

Copy of Posted Notices

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# EXHIBIT A FCC LICENSE DOCUMENTATION

**ULS License** 

## AWS, 1710-1755/2110-2155 MHz bands License - WQGA823 - New Cingular Wireless PCS, LLC

Call Sign WQGA823 Radio Service AW - AWS, 1710-1755/2110-

2155 MHz bands

Status Active Auth Type Regular

Market

Market CMA452 - Kentucky 10 - Channel Block A

Powell

Submarket 0 Associated 001710.00000000-

Frequencies (MHz)

001720.00000000 002110.00000000-002120.00000000

Dates

Grant 11/29/2006 Expiration 11/29/2021

Effective 02/12/2014 Cancellation

**Buildout Deadlines** 

1st 2nd

**Notification Dates** 

1st 2nd

Licensee

FRN 0003291192 Type Limited Liability Company

Licensee

New Cingular Wireless PCS, LLC P:(855)699-7073 3300 E. Renner Road, B3132 F:(972)907-1131 Richardson, TX 75082 E:FCCMW@att.com

ATTN Reginald Youngblood

Contact

AT&T Mobility LLC P:(202)457-2055 Michael P Goggin F:(202)457-3073

1120 20th Street, NW - Suite 1000 E:michael.p.goggin@att.com

Washington, DC 20036 ATTN Michael P. Goggin

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.

**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 - Channel Block A

Powell

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 P:(972)234-7003 2200 N. Greenville Ave, 1W F:(972)301-6893 Richardson, TX 75082 E:FCCMW@att.com

ATTN Reginald Youngblood

Contact

AT&T MOBILITY LLC P:(202)457-2055 Michael P Goggin F:(202)457-3073

1120 20th Street, NW - Suite 1000 E:michael.p.goggin@att.com

Washington, DC 20036 ATTN Michael P. Goggin

Ownership and Qualifications

Radio Service Type Mobile

Regulatory Status Common Carrier Interconnected Yes

**Alien Ownership** 

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

**Basic Qualifications** 

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

Demographics

Race

Ethnicity Gender

**ULS** License

## 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- Channel Block A

Evansvill

Submarket 19 Associated 001850.00000000-

Frequencies (MHz) 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 P:(972)234-7003 2200 N. Greenville Ave, 1W F:(972)301-6893 Richardson, TX 75082 E:FCCMW@att.com

ATTN Reginald Youngblood

Contact

AT&T MOBILITY LLC P:(202)457-2055 Michael P Goggin F:(202)457-3073

1120 20th Street, NW - Suite 1000 E:michael.p.goggin@att.com

Washington, DC 20036 ATTN Michael P. Goggin

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.



## **EXHIBIT B**

## SITE DEVELOPMENT PLAN:

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





SHEET

T-1

S1 S2

S3

S4

S5

Z-2

Z-3

TITLE SHEET

EASEMENT DETAIL

LEGAL DESCRIPTION

LEGAL DESCRIPTION LOCATION PLAN

ENLARGED SITE PLAN

SITE ELEVATION

OVERALL SITE LEGAL DESCRIPTION

ENLARGED COMPOUND PLAN



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AT&T# 143953 ATC# 281338

HAZEL GREEN

84 GARRY SPARKS DRIVE CAMPTON, KY 41301

	DATE.	01/10/14
	PRDJECT#	70-004
ì	SHEET TITLE	

TITLE SHEET

#### CONSULTANT TEAM

PROJECT CONSULTANT:

TERRA CONSULTING GROUP, LTD. 600 BUSSE HIGHWAY PARK RIDGE, IL 60068

(847) 698-6400

SURVEYOR:

ROLLING & HOCEVAR 257 SOUTH COURT ST. SUITE 6

MEDINA, OHIO (330) 723-1828

AT&T SITE # 143953 / ATC SITE #: 281338 **ATC SITE NAME: HAZEL GREEN** 

PROPOSED AT&T ANTENNAS MOUNTED ON A NEW 290' SELF-SUPPORT TOWER WITH AT&T CENTERLINE OF 285'

> (NOT TO EXCEED 299' IN OVERALL STRUCTURE HEIGHT) WITH PROPOSED COMMUNICATIONS EQUIPMENT ON GROUND

V	ICI	Ni.	ΤY	MAP	



CALL BEFORE YOU

DIG - DRILL - BLAST

CALL 811 OR 1-800-752-6007

REQUIRES NOTIFICATION TO

DAYS FOR CONSTRUCTION

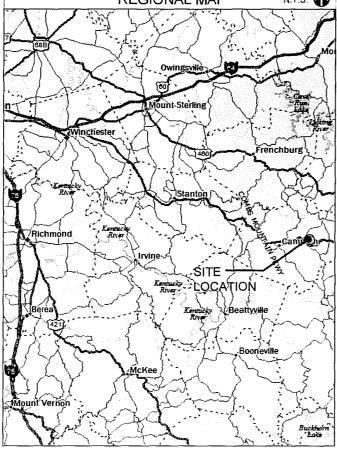
PHASE AND 10 WORKING DAYS FOR DESIGN PHASE BEFORE YOU EXCAVATE.

N.T.S.









	REGIONAL MAP	N.T.S.	PROJ	ECT INFORMATION
J. J		\ P	ATC SITE #:	281338
			ATC SITE NAME:	HAZEL GREEN
Jane -	The Concern	Mo	P.I.N. #:	081-00-00-002.1
	Owingsville		SITE ADDRESS:	84 GARRY SPARKS DRIVE CAMPTON, KY 41301
			JURISDICTION:	WOLFE COUNTY
	Mount-Sterling	- 36	LATITUDE:	N 37° 44′ 52.57" (FROM 1-A)
Winchester		Lackting River	LONGITUDE:	W 83° 27' 31.83" (FROM 1-A)
N. J.	Fren	chburg	TELCO COMPANY:	TBD
Rhi	Stanton		POWER COMPANY:	EAST KENTUCKY POWER 859-744-4812
lond R	Indian Table	Cani	CONSTRUCTION TYPE:	RAW LAND
	A STANLEY		APPLICANT:	AMERICAN TOWER CORPORATION 116 HUNTINGTON AVE BOSTON, MA 02116 (617) 375-7500
	Engage ViBeattyviHe		CONTACT PERSON:	KATHIE TAYLOR PROJECT MANAGER SITE DEVELOPMENT (740) 603-5159
fign	McKee		PROPERTY OWNER:	BILLYE C. ADAMS 1723 BUCHANAN FORK ROAD CAMPTON, KY 41301 606-668-3912

AIC SIIL #.	201300
ATC SITE NAME:	HAZEL GREEN
P.I.N. #:	081-00-00-002.1
SITE ADDRESS:	84 GARRY SPARKS DRIVE CAMPTON, KY 41301
JURISDICTION:	WOLFE COUNTY
LATITUDE:	N 37° 44' 52.57" (FROM 1-A)
LONGITUDE:	W 83° 27' 31.83" (FROM 1-A)
TELCO COMPANY:	TBD
POWER COMPANY:	EAST KENTUCKY POWER 859-744-4812
CONSTRUCTION TYPE:	RAW LAND
APPLICANT:	AMERICAN TOWER CORPORATION 116 HUNTINGTON AVE BOSTON, MA 02116 (617) 375-7500
CONTACT PERSON:	KATHIE TAYLOR PROJECT MANAGER SITE DEVELOPMENT (740) 603-5159
PROPERTY OWNER:	BILLYE C. ADAMS 1723 BUCHANAN FORK ROAD CAMPTON, KY 41301

SHEET INDEX DESCRIPTION

### **DRIVING DIRECTIONS**

FROM WOLFE COUNTY CLERK (10 COURT ST, CAMPTON KY):

HEAD SOUTH ON MARION ST TOWARD MAIN ST (187 FT). TAKE THE 1ST LEFT ONTO KY-191/MAIN ST CONTINUE TO FOLLOW KY-191 (1.1 MI). SLIGHT RIGHT TO STAY ON KY-191 (3.5 MI). SLIGHT RIGHT ONTO CO RD 1812 (1.0 MI). TAKE THE 1ST LEFT ONTO BUCHANAN FORK RD DESTINATION WILL 8E ON THE LEFT.

### SPECIAL NOTES

HANDICAPPED REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION HANDICAPPED ACCESS REQUIREMENTS NOT REQUIRED

#### PLUMBING REQUIREMENTS:

FACILITY HAS NO PLUMBING OR REFRIGERANTS

#### FAA AND FCC REQUIREMENTS:

THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REQUIREMENTS

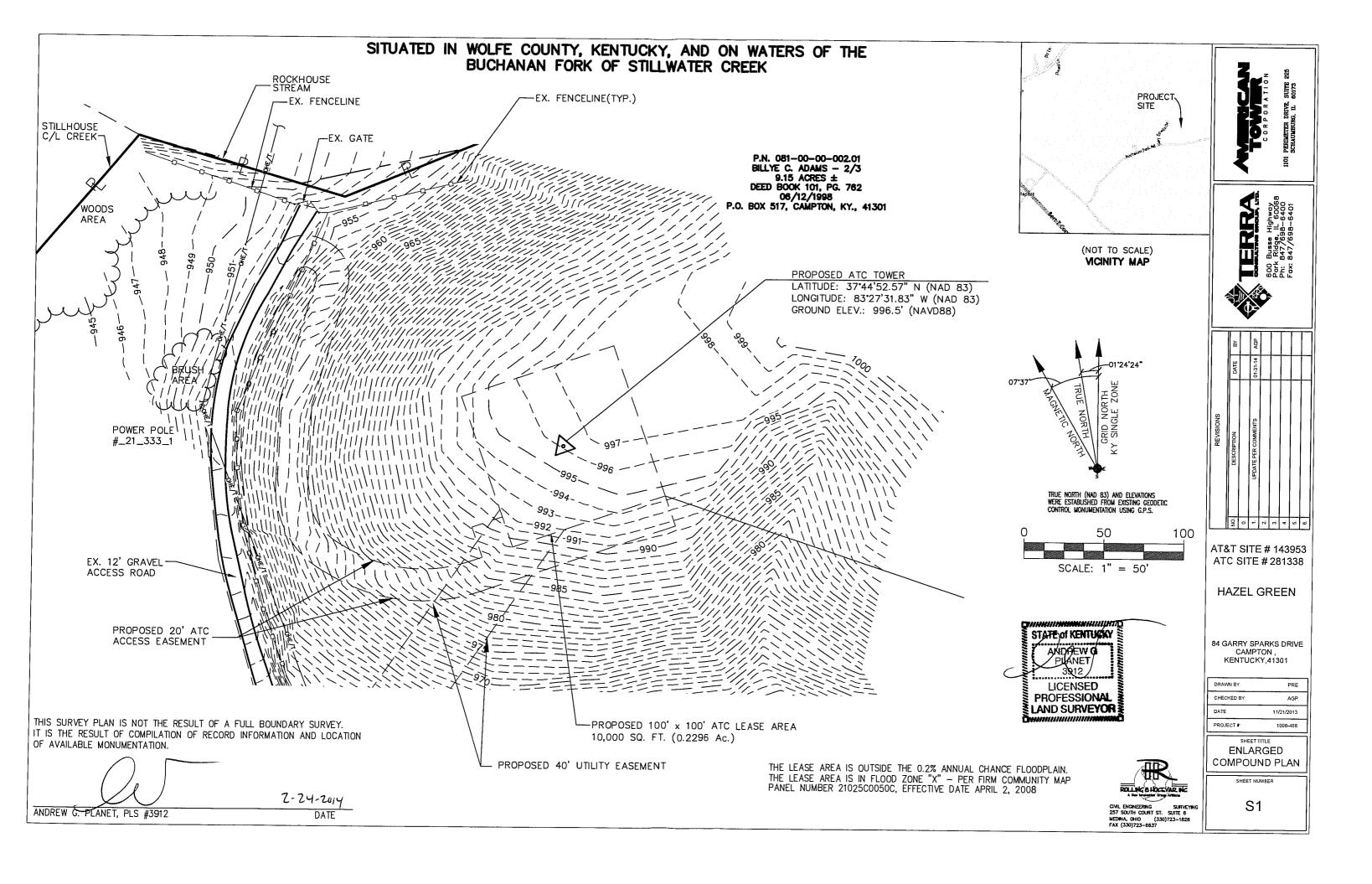
ALL WORK MUST CONFORM TO AMERICAN TOWER CORPORATION & AT&T CONSTRUCTION INSTALLATION STANDARDS & ALL APPLICABLE CODES AND

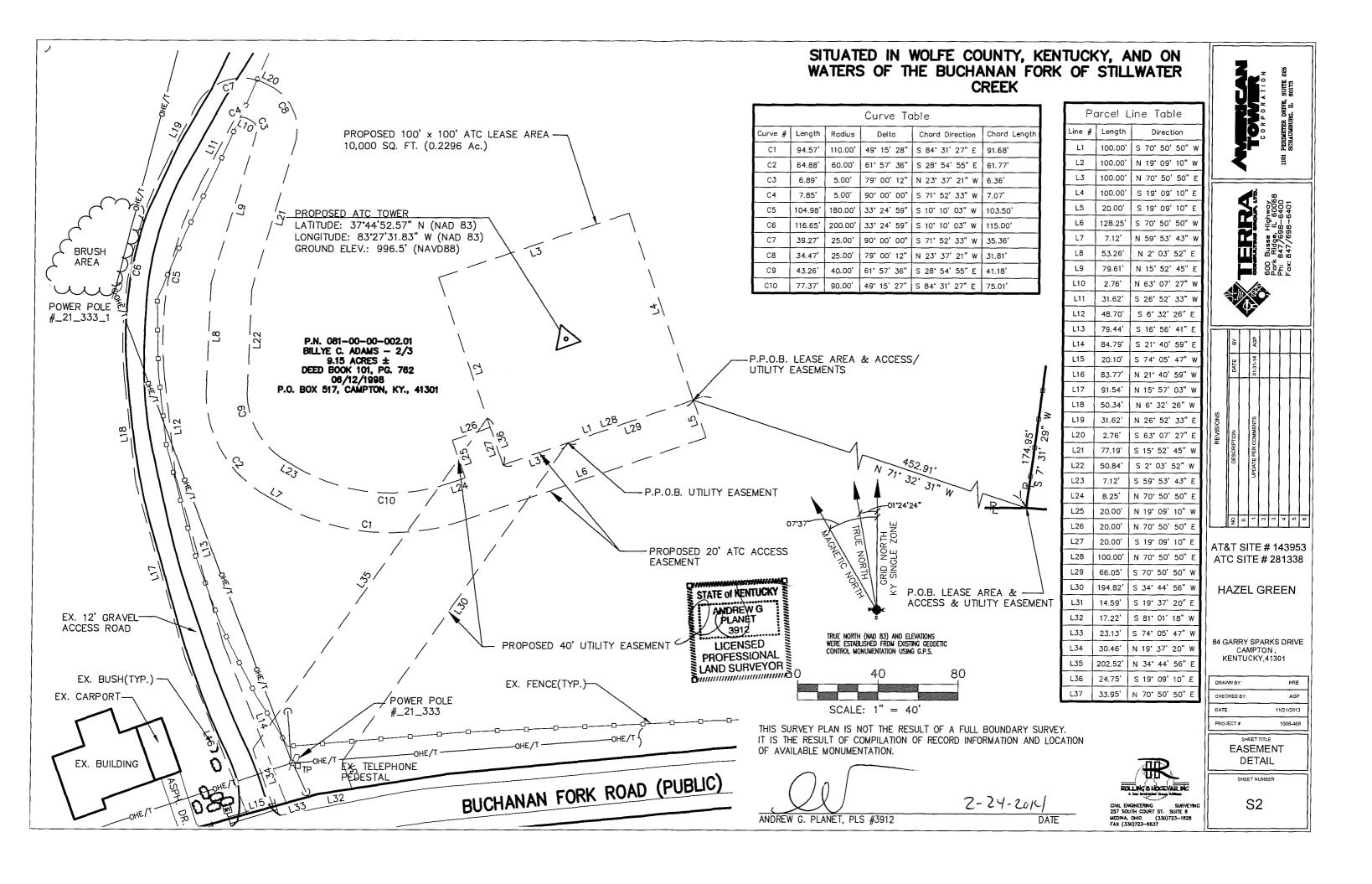
## **APROVALS**

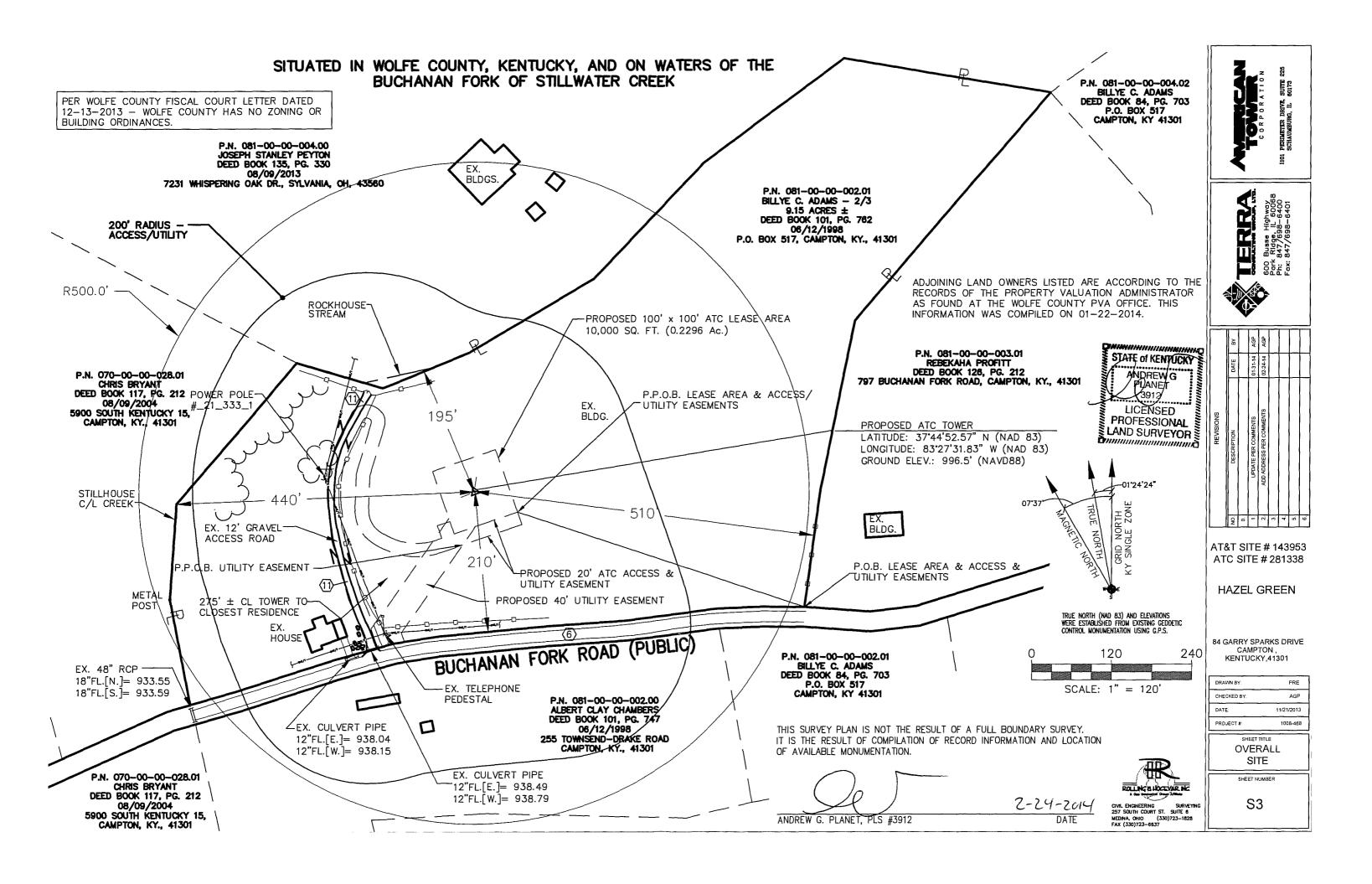
SIGNATURE

LANDLORD		OPERATIONS		TELCO APPROVAL	
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE
RF ENGINEER		CONSTRUCTION FIEL	D MGR.	ELEC. APPROVAL	
SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE
ZONING		SITE ACQUISITION		LESSOR APPROVAL	

SIGNATURE







#### PARENT PARCEL LEGAL DESRIPTION:

SITUATED IN THE COUNTY OF WOLFE AND IN THE STATE OF KENTUCKY: PARENT PARCEL

A CERTAIN TRACT OR PARCEL OF LAND LYING AND BEING IN WOLFE COUNTY, KENTUCKY, AND SITUATED ON THE BUCHANAN FORK OF STILLWATER CREEK AND BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A WHITE OAK STANDING BY THE COUNTY ROAD SIDE NEAR A DRAIN AT THE TENANT HOUSE BELOW THE OLD BARN SITE; THENCE RUNNING A STRAIGHT LINE ACROSS THE BOTTOM TO A SET STONE AT THE CREEK AND DAISY AND HENRY CLAY CHAMBER'S LAND LINE; AND A CORNER TO ROBERT ROTHMAN HEIRS; THENCE RUNNING UP THE CREEK WITH HENRY CLAY CHAMBER'S LAND LINE TO THE LAND LINE OF WILLIE BUCHANAN; THENCE WITH HIS LAND LINE TO THE COUNTY ROAD; THENCE DOWN THE COUNTY ROAD TO THE W.H. CHAMBER'S LAND LINE; THENCE RUNNING UP THE OLD BARN BRANCH WITH WILLIE BUCHANAN AND JOHN BUCHANAN LINE TO JASPER CREECH'S LINE; THENCE WITH JASPER CREECH'S LINE TO THE TOP OF THE RIDGE TO A LOCUST TREE TO THE LAND LINE OF HENRY CLAY CHAMBER'S, WHICH IS A DIVISION OF THIS FARM; THENCE WITH THE DIVIDING RIDGE AND KATE ROSE'S LAND LINE TO A LOCUST TREE AND A CROSS FENCE AT ROBERT ROTHMAN'S LINE; THENCE RUNNING DOWN THE POINT WITH SAID CROSS FENCE AND ROBERT ROTHMAN'S LINE TO THE COUNTY ROAD; THENCE WITH SAID COUNTY ROAD TO THE PLACE OF BEGINNING.

#### SAVE AND EXCEPT:

A CERTAIN TRACT OR PARCEL OF LAND, LYING AND BEING IN WOLFE COUNTY, KENTUCKY, AND SITUATED ON THE BUCHANAN FORK OF STILLWATER CREEK, AND BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A STEEL STAKE ON THE NORTH SIDE OF THE RIGHT OF WAY OF BUCHANAN FORK ROAD AND GOING IN A NORTHERLY DIRECTION 450 FEET TO A STEEL STAKE; THENCE TURNING IN AN EASTERLY DIRECTION AND GOING 178 FEET TO A STEEL STAKE; THENCE TURNING IN A WESTERLY DIRECTION ALONG THE ROAD RIGHT OF WAY 298 FEET TO THE PLACE OF BEGINNING. EXCEPTED OUT OF THIS TRACT OF LAND IS THE FARM ACCESS RD. THAT LEADS TO THE FARM SURROUNDING THIS PROPERTY.

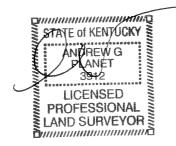
#### ALSO EXCEPT:

ANDREW G. PLANET, PLS #3912

A CERTAIN TRACT OR PARCEL OF LAND LYING AND BEING ON THE WATERS OF BUCHANAN FORK OF STILLWATER CREEK, AND BEING BOUNDED AND DESCRIBED AS FOLLOWS: BEGINNING ON A SMALL PERSIMMON ON TOP OF DIVIDING RIDGE AT THE HEAD OF THE STILLHOUSE BRANCH AND OLD BARN HOLLOW; THENCE A SOUTHERN DIRECTION AND STRAIGHT LINE TO A SMALL MARKED LOCUST, OPPOSITE A DRAIN LEADING DOWN THE HILL; THENCE A NORTHWESTERLY DIRECTION DOWN THE HILL TO A POPLAR TREE MARKED AT THE HEAD OF A DRAIN; THENCE SAME DIRECTION WITH THE SAID DRAIN TO A WHITE OAK STANDING AT THE LANE END FENCE NEAR THE BOTTOM; THENCE RUNNING A NORTHERN DIRECTION AND WITH THE FENCE WHERE IT NOW RUNS AND LANE TO TWO SMALL HICKORIES MARKED AND STANDING BY THE FENCE; THENCE TURNING ACROSS THE BOTTOM A WESTERN DIRECTION AND STRAIGHT LINE TO A POPLAR TREE STANDING ON A BLUFF ABOVE THE BRANCH; THENCE RUNNING SAME DIRECTION UP THE POINT A STRAIGHT LINE TO A LARGE LOCUST TREE IN THE BENCH NEAR A BLUFF; THENCE A STRAIGHT LINE UP OVER THE BLUFF TO A SMALL MARKED BLACK OAK; THENCE SAME DIRECTION TO A SMALL MARKED WHITE OAK: THENCE A STRAIGHT LINE UP THE FLAT POINT TO A LOCUST TREE MARKED; THENCE A STRAIGHT LINE TO A STAKE AND WILD CHERRY TREE ON TOP OF THE RIDGE TO THE LAND LINE OF REBECCA EDWARDS: THENCE WITH THE DIVIDING RIDGE A NORTHERN DIRECTION AND RUNNING WITH THE OLD LAND LINE OF W.H. CHAMBERS DEEDS AND ADJOINING LAND OWNERS DEEDS AND WHERE THE LINES ARE NOW ESTABLISHED TO THE PLACE OF BEGINNING SO AS TO EXCLUDE THE PIECE OF LAND SET A SIDE FOR CARRIE WELLS.

THIS SURVEY PLAN IS NOT THE RESULT OF A FULL BOUNDARY SURVEY. IT IS THE RESULT OF COMPILATION OF RECORD INFORMATION AND LOCATION OF AVAILABLE MONUMENTATION.

2-24-2014 DATE



ALSO:

ON THE WATERS OF THE BUCHANAN FORK OF STILLWATER CREEK AND BOUNDED AND DESCRIBED AS FOLLOWS:
BEGINNING AT A MARKED STEEL POST AT THE CORNER OF WILDA PROFITT LAND LINE AND NORTH SIDE OF BUCHANAN FORK COUNTY ROAD; THENCE RUNNING IN A STRAIGHT LINE NORTH TO A LARGE MARKED BEECH TREE STANDING ON TOP OF THE RIDGE; THENCE GOING EAST ALONG THE PROFITT LAND LINE TO THE CORNER OF BILLYE ADAMS AND WILDA PROFITT LAND LINES; THENCE CONTINUING ALONG THE ADAMS LINE TO A MARKED BIG TWIN HICKORY TREE; THENCE IN A NORTHWESTERLY DIRECTION OVER THE HILL TO A MARKED TREE AT THE FORKS OF ROCKHOUSE STREAM; THENCE TURNING WEST AND RUNNING WITH THE STREAM TO THE INTERSECTION OF ROCKHOUSE STREAM AND STILLHOUSE CREEK; THENCE TURNING SOUTH WITH STILLHOUSE CREEK TO BUCHANAN FORK COUNTY ROAD; THENCE GOING EAST ALONG THE

A CERTAIN TRACT OR PARCEL OF LAND LYING AND BEING IN WOLFE COUNTY, KENTUCKY, AND

SAVE AND EXCEPT:

BEGINNING AT A SASSAFRAS TREE ON THE NORTH SIDE OF THE COUNTY ROAD LEADING UP THE BUCHANAN FORK OF STILLWATER CREEK, THENCE RUNNING A NORTHWARD DIRECTION UP THE HILL A STRAIGHT LINE TO A BEECH TREE ON THE CENTER OF THE POINT; THENCE RUNNING A NORTHEASTWARD DIRECTION WITH THE DIVIDE OF THE RIDGE TO CARRIE WELLS' LINE; THENCE A SOUTHERN DIRECTION AND WITH CARRIE WELLS' LINE DOWN THE HILL TO THE COUNTY ROAD TO A SET STONE; THENCE WITH SAID COUNTY ROAD A WESTERN DIRECTION TO A SASSAFRAS, THE PLACE OF BEGINNING, AND CONTAINING 15 ACRES, MORE OR LESS. TAX I.D. NUMBER: 081-00-00-002.01

#### SCHEDULE B - II ITEMS:

Commitment 01-13138954-01TCommitment Effective Date: 01/17/2014 at 7:00 AM

NORTH OF THE COUNTY ROAD TO THE PLACE OF BEGINNING.

Items 1-5 are NOT survey related.

comment/determination as to effect.]

- (6) RIGHT OF WAY IN FAVOR OF WOLFE COUNTY AND STATE OF KENTUCKY, RECORDED 05/10/1950 IN BOOK 58, PAGE 54 OF WOLFE COUNTY RECORDS.
  [Wholly within and establishes the Right-of-Way of Buchanan Fork Road. Does not effect Subject Parcel.]
- (7) OIL AND GAS LEASE IN FAVOR OF CARL BURNETT, RECORDED ON 03/02/1972 IN LEASE BOOK 13, PAGE 339 OF WOLFE COUNTY RECORDS.
  [Document illegible. Appears to be blanket style lease. Unable to make any comment/determination as to effect.]
- (8) OIL AND GAS LEASE IN FAVOR OF CARL BURNETT, WILLIAM C. ADAMS AND ALBERT CHAMBERS RECORDED ON 05/21/1973 IN LEASE BOOK 14, PAGE 64 OF WOLFE COUNTY RECORDS.

[Document illegible. Appears to be blanket style lease. Unable to make any comment/determination as to effect.]

(9) COAL DEED IN FAVOR OF COLLINS AND MAY MINING CO, RECORDED 07/25/1977 IN MISC BOOK 7, PAGE 49 OF WOLFE COUNTY RECORDS.

[Appears to be blanket style lease. Description sites a document not provided. Unable to make any comment/determination as to effect.]

- (10) OIL AND GAS LEASE IN FAVOR OF C.J. HENDERSON RECORDED ON 10/04/1977 IN LEASE BOOK 17, PAGE 158 OF WOLFE COUNTY RECORDS.
  [Document illegible. Appears to be blanket style lease. Unable to make any
- (11) 12' ACCESS EASEMENT AS CONTAINED IN DEED RECORDED ON 06/12/1998 IN DEED BOOK 101, PAGE 762 OF WOLFE COUNTY RECORDS.

[This is an exception of the 12—foot access road NOT an easement. Access road is not part of lands conveyed to Billye C. Adams, effects propose access easement.]





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AT&T SITE # 143953 ATC SITE # 281338

HAZEL GREEN

84 GARRY SPARKS DRIVE CAMPTON , KENTUCKY,41301

DRAWN BY:	PRE
CHECKED BY:	AGP
DATE:	11/21/2013
PROJECT#	1008-468
SHEET TITLE	
SHEET HILE	

LEGAL
DESCRIPTION

SHEET NUMBER

S4

ROLL NC & HOCK VAR INC A Ger broisted Gray Affects CIMIL ENGINEERING SURVEYING 257 SOUTH COURT ST. SUITE 6

#### LEGAL DESCRIPTIONS:

Legal Description for a 100' X 100' Lease Area Project No. 1008-468 January 31, 2014

Situated in the County of Wolfe and in the State of Kentucky, also known as being a certain tract or parcel of land lying and being in Wolfe County, Kentucky and situated on Buchanan Fork of Stillwater Creek and being part of lands 2/3 conveyed to Billye C. Adams by deed dated June 12, 1998 as recorded in Deed Book 101, Page 762 of Wolfe County Records further bounded and described as follows:

Commencing at the Southwest corner of lands conveyed to Rebekaha Profitt by deed recorded in Deed Book 126, Page 212 of Wolfe County Records;

Thence, bearing North 71°32'31" West, a distance of 452.91 feet to an iron pin set and the TRUE PLACE OF BEGINNING of the Lease Area herein described;

Thence, bearing South 70°50′50" West, a distance of 100.00 feet to an iron pin set:

Thence at a right angle, bearing North 19°09'10" West, a distance of 100.00 feet to an iron pin set:

Thence at a right angle, bearing North 70°50'50" East, a distance of 100.00 feet to an iron pin set:

Thence at a right angle, bearing South 19°09'10" East, a distance of 100.00 feet to an iron pin set and the TRUE PLACE OF BEGINNING, containing 0.2296 acres of land, more or less but subject to all legal highways and all covenants and agreements of record.

Bearings are based on an assumed meridian and are used herein to indicate angles only.

This legal description was prepared based on a survey under the supervision of Andrew G. Planet, PLS #3912 by Rolling & Hocevar, Inc. in January 2014.

Legal Description for a 40-foot Utility Easement Project No. 1008-468 January 31, 2014

Situated in the County of Wolfe and in the State of Kentucky, also known as being a certain tract or parcel of land lying and being in Wolfe County, Kentucky and situated on Buchanan Fork of Stillwater Creek and being part of lands 2/3 conveyed to Billye C. Adams by deed dated June 12, 1998 as recorded in Deed Book 101, Page 762 of Wolfe County Records further bounded and described as follows:

Commencing at the Southwest corner of lands conveyed to Rebekaha Profitt by deed recorded in Deed Book 126, Page 212 of Wolfe County Records;

Thence, bearing North 71'32'31" West, a distance of 452.91 feet to an iron pin set at the Southeast corner of an ATC Lease area;

Thence along the Southern line of said Lease Area, bearing South 70°50'50" West, a distance of 66.05 feet to a point thereon and the TRUE PLACE OF BEGINNING of the Easement Area herein described:

Thence, bearing South 34'44'56" West, a distance of 194.82 feet to a point;

Thence, bearing South 19'37'20" East, a distance of 14.59 feet to a point on the Northern line of Buchanan Fork Road:

Thence along the Northern line of Buchanan Fork Road, bearing South 81°01'18" West, a distance of 17.22 feet to an angle point therein;

Thence continuing along the Northern line of Buchanan Fork Road, bearing South 74°05'47" West, a distance of 23.13 feet to a point thereon;

Thence, bearing North 19'37'20" West, a distance of 30.46 feet to a point;

Thence, bearing North 34\*44'56" East, a distance of 202.52 feet to a point on the Western line of aforesaid ATC Lease Area;

Thence along the Eastern line of said Lease Area, bearing South 19'09'10" East, a distance of 24.75 feet to an iron pin set at the Southwest corner of said Lease Area;

Thence along the Southern line of said Lease Area, bearing North 70°50'50" East, a distance of 33.95 feet to a point thereon and the TRUE PLACE OF BEGINNING, containing 0.1929 acres of land, more or less but subject to all legal highways and all covenants and agreements of

Bearings are based on an assumed meridian and are used herein to indicate angles only.

This legal description was prepared based on a survey under the supervision of Andrew G. Planet, PLS #3912 by Rolling & Hocevar, Inc. in January 2014.



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AT&T SITE # 143953 ATC SITE # 281338

HAZEL GREEN

84 GARRY SPARKS DRIVE CAMPTON, KENTUCKY 41301

DRAWN BY:	PRE
CHECKED BY:	AGF
DATE:	11/21/2013
PROJECT#:	1008-46

LEGAL DESCRIPTION

SHEET NUMBER

**S5** 

STATE of KENTUCKY ANDREWIG LANET **LICENSED PROFESSIONAL** LAND SURVEYOR

THIS SURVEY PLAN IS NOT THE RESULT OF A FULL BOUNDARY SURVEY. IT IS THE RESULT OF COMPILATION OF RECORD INFORMATION AND LOCATION OF AVAILABLE MONUMENTATION.

ANDREW G. PLANET, PLS #3912

2-24-2014

DATE

POLLING S HOCE VAR NO CIVIL ENGINEERING SURVEYING 257 SOUTH COURT ST. SUITE 6 MEDINA, OHIO (330)723-1828 FAX (330)723-6637

#

#### LEGAL DESCRIPTIONS (continued):

Legal Description for a 20-foot Access Easement Project No. 1008-468 January 31, 2014

Situated in the County of Wolfe and in the State of Kentucky, also known as being a certain tract or parcel of land lying and being in Wolfe County, Kentucky and situated on Buchanan Fork of Stillwater Creek and being part of lands 2/3 conveyed to Billye C. Adams by deed dated June 12, 1998 as recorded in Deed Book 101, Page 762 of Wolfe County Records and part of a twelve (12) foot access road to now or former Albert Chambers property as established by a previous land owners as excepted from said lands of Adams further bounded and described as follows:

Commencing at the Southwest corner of lands conveyed to Rebekaha Profitt by deed recorded in Deed Book 126, Page 212 of Wolfe County Records;

Thence, bearing North 71°32'31" West, a distance of 452.91 feet to an iron pin set at the Southeast corner of an ATC Lease area and the TRUE PLACE OF BEGINNING of the Easement Area herein described;

Thence along the Southern projection of the Eastern line of said Lease Area, bearing South 19.09.10" East, a distance of 20.00 feet to a point;

Thence at a right angle and parallel to the Southern line of said Lease Area, bearing South 70.50.70 West, a distance of 128.25 feet to a point;

Thence along a tangent curve to the right with a radius of 110.00 feet, a tangent length of 50.43 feet, the chord of which bears North 84\*31'27" West for a distance of 91.68 feet, along said arc for a distance of 94.57 feet to a point:

Thence, bearing North 59°53'43" West, a distance of 7.12 feet to a point;

Thence along a tangent curve to the right with a radius of 60.00 feet, a tangent length of 36.02 feet, the chord of which bears North 28'54'55" West for a distance of 61.77 feet, along said arc for a distance of 64.88 feet to a point;

Thence, bearing North 02°03'52" East, a distance of 53.26 feet to a point;

Thence, bearing North 15'52'45" East, a distance of 79.61 feet to a point;

Thence along a tangent curve to the left with a radius of 5.00 feet, a tangent length of 4.12 feet, the chord of which bears North 23°37'21" West for a distance of 6.36 feet, along said arc for a distance of 6.89 feet to a point;

Thence, bearing North 63°07'27" West, a distance of 2.76 feet to a point;

Thence along a tangent curve to the left with a radius of 5.00 feet, a tangent length of 5.00 feet, the chord of which bears South 71\*52'33" West for a distance of 7.07 feet, along said arc for a distance of 7.85 feet to a point;

Thence, bearing South 26°52'33" West, a distance of 31.62 feet to a point;

Thence along a tangent curve to the left with a radius of 180.00 feet, a tangent length of 54.03 feet, the chord of which bears South 10°10'03" West for a distance of 103.50 feet, along said arc for a distance of 104.98 feet to a point;

Thence, bearing South 06°32'26" East, a distance of 48.70 feet to a point;

Thence, bearing South 15.57.03" East, a distance of 88.90 feet to a point;

Thence, bearing South 21'40'59" East, a distance of 84.79 feet to a point on the Northern line of Buchanan Fork Road:

Thence along the Northern line of Buchanan Fork Road, bearing South 74°05'47" West, a distance of 20.10 feet to a point thereon;

Thence, bearing North 21'40'59" West, a distance of 83.77 feet to a point;

Thence, bearing North 15'57'03" West, a distance of 91.54 feet to a point;

Thence, bearing North 06°32'26" West, a distance of 50.34 feet to a point;

Thence along a tangent curve to the right with a radius of 200.00 feet, a tangent length of 60.03 feet, the chord of which bears North 10°10'03" East for a distance of 115.00 feet, along said arc for a distance of 116.65 feet to a point;

Thence, bearing North 26'52'33" East, a distance of 31.62 feet to a point;

Thence along a tangent curve to the right with a radius of 25.00 feet, a tangent length of 25.00 feet, the chord of which bears North 71°52′33″ East for a distance of 35.36 feet, along said arc for a distance of 39.27 feet to a point;

Thence, bearing South 63°07'27" East, a distance of 2.76 feet to a point;

Thence along a tangent curve to the right with a radius of 25.00 feet, a tangent length of 20.61 feet, the chord of which bears South 23'37'21" East for a distance of 31.81 feet, along said arc for a distance of 34.47 feet to a point;

Thence, bearing South 15'52'45" West, a distance of 77.19 feet to a point;

Thence, bearing South 02°03'52" West, a distance of 50.84 feet to a point;

Thence along a tangent curve to the left with a radius of 40.00 feet, a tangent length of 24.02 feet, the chord of which bears South 28°54'55" East for a distance of 41.18 feet, along said arc for a distance of 43.26 feet to a point;

Thence, bearing South 59°53'43" East, a distance of 7.12 feet to a point;

Thence along a tangent curve to the left with a radius of 90.00 feet, a tangent length of 41.26 feet, the chord of which bears South 84\*31'27" East for a distance of 75.01 feet, along said arc for a distance of 77.37 feet to a point;

Thence co-linear to and along a projection of the Southern line of the aforesaid ATC Lease Area, bearing North 70°50′50″ East, a distance of 8.25 feet to a point;

Thence at a right angle and parallel to the Western line of said Lease Area, bearing North 19°09'10" West, a distance of 20.00 feet to a point;

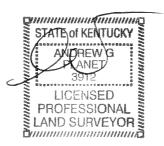
Thence at a right angle and parallel to the Southern line of said Lease Area, bearing North 70°50'50" East, a distance of 20.00 feet to a point on the Western line of said Lease Area;

Thence along Western line of said Lease Area, bearing South 19°09'10" East, a distance of 20.00 feet to an iron pin set at the Southwest corner of said Lease Area;

Thence along Southern line of said Lease Area, bearing North 70°50'50" East, a distance of 100.00 feet to an iron pin set at the Southeast corner of said Lease Area and the TRUE PLACE OF BEGINNING, containing 0.3854 acres of land, more or less but subject to all legal highways and all covenants and agreements of record.

Bearings are based on an assumed meridian and are used herein to indicate angles only.

This legal description was prepared based on a survey under the supervision of Andrew G. Planet, PLS #3912 by Rolling & Hocevar, Inc. in January 2014.



THIS SURVEY PLAN IS NOT THE RESULT OF A FULL BOUNDARY SURVEY. IT IS THE RESULT OF COMPILATION OF RECORD INFORMATION AND LOCATION OF AVAILABLE MONUMENTATION.



2-24-2014 DATE





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AT&T SITE # 143953 ATC SITE # 281338

HAZEL GREEN

84 GARRY SPARKS DRIVE CAMPTON , KENTUCKY,41301

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CHECKED BY:	AGP	
DATE:	11/21/2013	
PROJECT #:	1008-468	
SHEET TITLE		

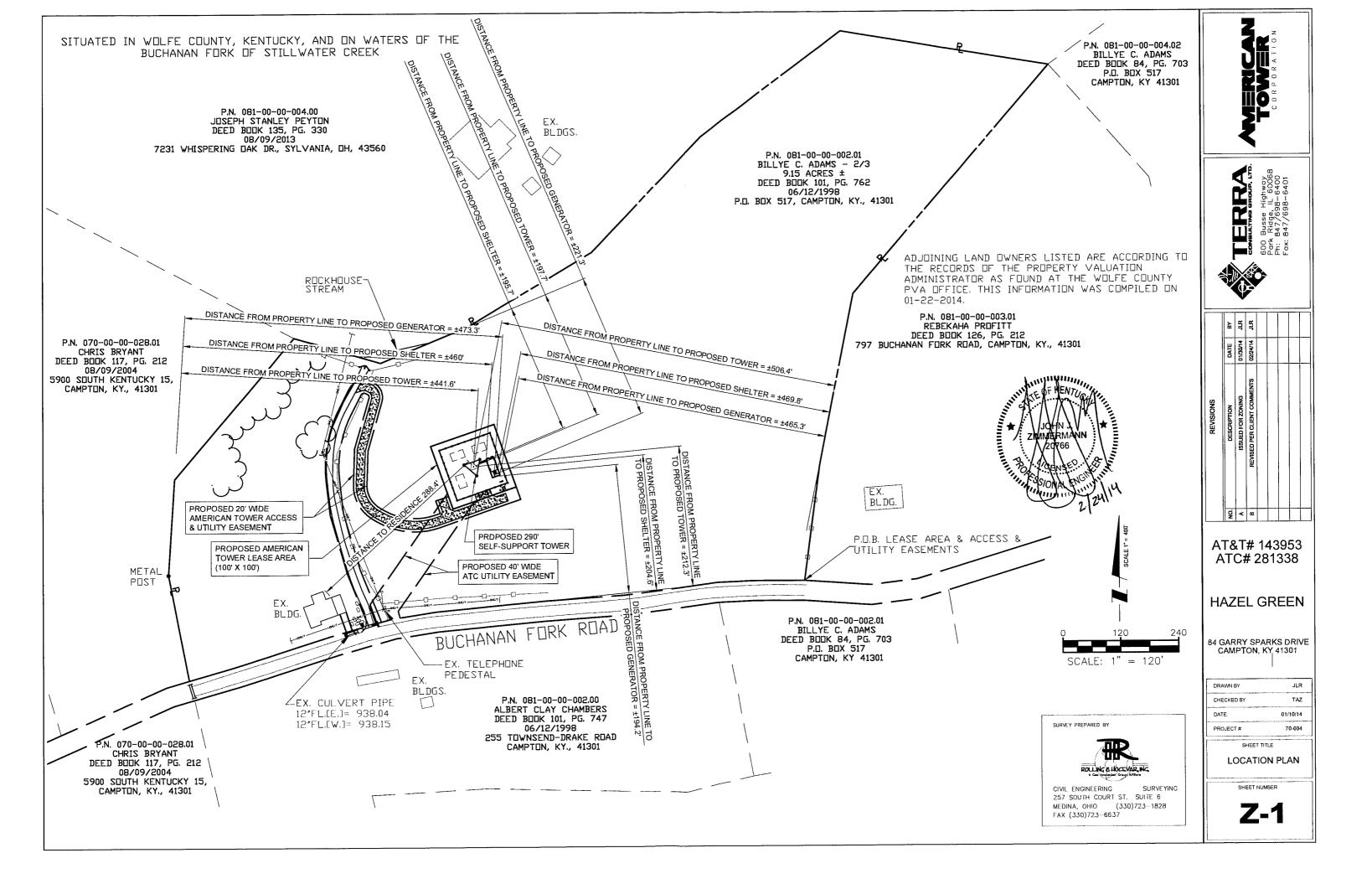
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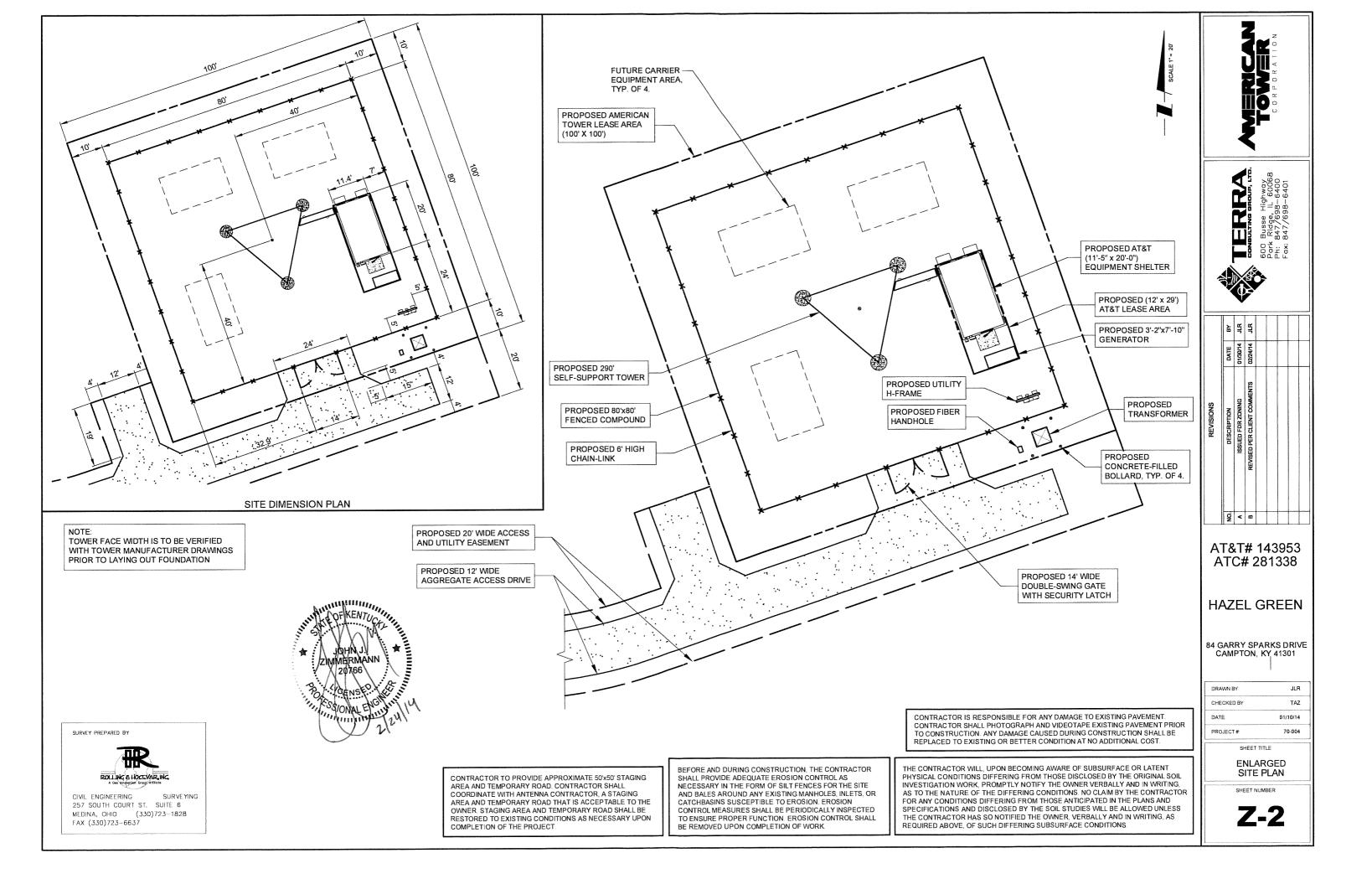
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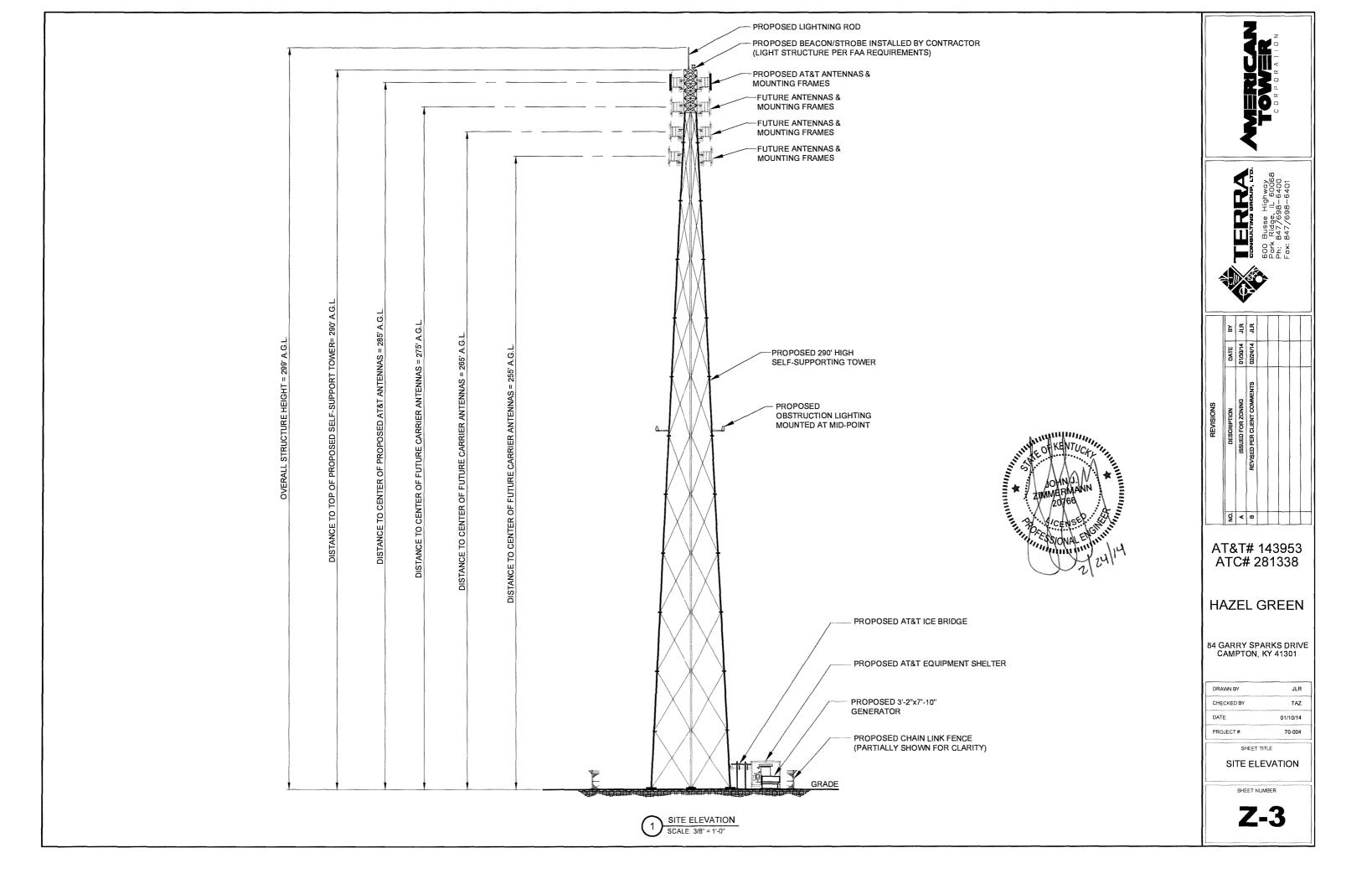
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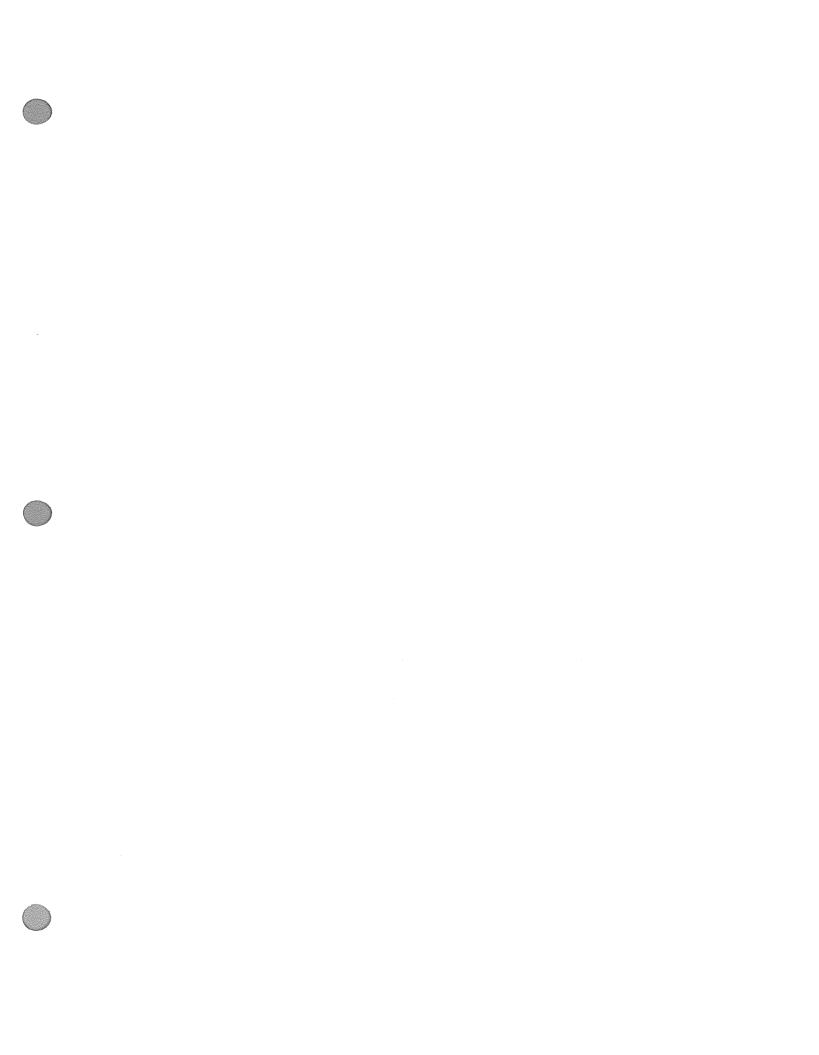
CIVIL ENGINEERING SURVEYING 257 SOUTH COURT ST. SUITE 6 MEDINA, OHIO (330)723-1828 FAX (330)723-6637

ROLLING & HOCEVAR INC









# EXHIBIT C TOWER AND FOUNDATION DESIGN



11/7/13

#### 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

Roy Rich



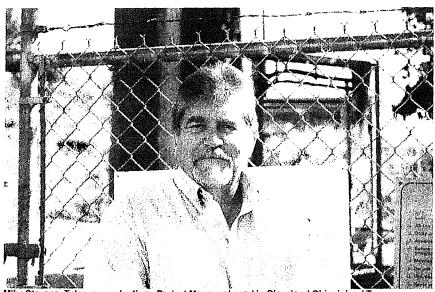
#### John J. Zimmermann, P.E. - President, Terra Consulting Group, Ltd.

John J. Zimmermann has a 25-year career in the practice of land development engineering and civil infrastructure design. He founded Terra Consulting Group, Ltd. in 1994. Over his career Mr. Zimmermann has been involved with various aspects of land development on numerous engineering projects for the Illinois Department of Transportation, Communications & Utility companies, Municipalities, Park Districts, and the Development community. Mr. Zimmermann specializes in site planning and stormwater management applications as they relate to site development, transportation works and utility extensions.

Mr. Zimmermann is a 1987 graduate of Marquette University graduating with a Bachelor of Science degree. He is a registered Professional Engineer in 26 states.

Mr. Zimmermann has been affiliated with the American Society of Civil Engineers (ASCE) for over 30 years. He has served as President of the Illinois Section of ASCE and past chair of the Urban Planning and Development Group.





Mike Stevens, Telecommunications Project Manager based in Cleveland Ohio, joined Terra

Consulting Group in 2009. Mike has a 35 years experience in the Telephony, Wireless & Wireline telecommunications industry. Mike brings Terra valuable experience in facility construction and operation during his tenure at GTE, GTE Mobilnet, Alltei and T-Mobile. Mike's primary responsibility is to manage Terra's operations in Ohio, Western Pennsylvania and Northern Kentucky. Mike will also be involved in site design and layout, sub-consultant operations, and permitting for Terra's telecommunication clients.



#### Thomas A. Zimmermann, P.E.

Thomas A. Zimmermann has been involved with the practice of land development engineering and civil infrastructure design since 1990. Mr. Zimmermann has over 16 years of experience in telecommunications infrastructure design. He joined Terra Consulting Group in 1995 and is currently the Vice President of Operations.

Before joining Terra Consulting Group in 1995, he worked in the field of environmental engineering with Dames & Moore. At Dames & Moore, he was performing environmental Phase I, Phase II reports and field investigations. He was involved with the environmental remediation of soil and groundwater due to leaking underground storage tanks, landfills, and contaminated industrial waste.

At Terra Consulting Group, Mr. Zimmermann has planned and designed various aspects of residential, commercial and industrial developments. He has been involved with feasibility studies, roadway design, site planning and layout, stormwater management and detention system design, storm sewer design, sanitary sewer design and watermain design.

In addition to traditional land development engineering, Mr. Zimmermann has been involved with over 4,000 wireless and broadcast telecommunication projects. He provides the necessary infrastructure design to zone and permit the telecommunications projects.

Mr. Zimmermann received his Bachelor Degree in Science in 1993 and Master's Degree in 1995 from the University of Illinois Urbana-Champaign. He has been affiliated with the American Society of Civil Engineers for 20 years. He is a registered Professional Engineer in Illinois, Michigan and Wisconsin with a license pending reciprocity review in Pennsylvania.

## RAPHAEL I. MOHAMED, MBA, PE, PEng

6921 Palaver Lane Cary, NC 27519

(919) 244-5207 (Mobile)

raphael.mohamed@americantower.com

### **Profile Summary**

Proven telecommunications manager with strong engineering and analytical skills. Certified Professional Engineer who applies top-tier graduate business school education to achieve goals for high-growth organizations. Yellow belt Six Sigma dedicated to continuous learning. Seeking a telecommunications strategic implementation position that will leverage my formal engineering and management education and my extensive wireless industry experience in an S&P 500 company.

Holds American, Canadian and EU passports. Fluent in English and French. Conversational Spanish and Portuguese.

## **Selected Accomplishments**

- Led high-performing engineering team that produced over 17,000 engineering deliverables and achieved departmental revenue of \$30M+, operating profit margins in excess of 80%, and industry-leading cycle times for multi-year periods.
- Recruited and hired 15 engineers in 2 year period.
- Recipient of numerous individual and team recognition rewards including the All American, Hire Good People & Empower Them, Engineering Services Employee of the Quarter, Engineer of the Quarter, and Structural Engineering Team and Individual Awards.
- Created a guy anchor inspection business plan that mitigated tower portfolio risk and contributed to having no engineering-related tower collapses in over 12 years.
- Promoted 4 times in 12 years earning increased responsibility with each transition.
- Committee Sub-Chair for TIA-222-H: Plans, Assembly Tolerances, Marking, Maintenance and Condition Assessment

## **Professional Experience**

#### AMERICAN TOWER CORPORATION (S&P 500 Company), Cary, NC

#### **Engineering Manager, US Tower Division**

2005-Present

- Managed up to 27 structural /electrical engineers responsible for the safety and integrity of a US-based portfolio
  of ± 24.000 telecommunications towers.
- Attested to quality of engineering work by stamping engineering documents (PE letters, structural analyses, modification designs, jurisdictional letters, A&E drawings).
- Developed new relationships and maintained existing relationships with internal customers, major wireless providers (AT&T, Verizon, T-Mobile, Sprint/Nextel), construction field offices, engineering consultants and governmental municipal agencies.
- Led training initiatives and engineering process recommendations for international offices including Brazil, South Africa, Uganda, Ghana, India and Mexico. Assisted with structural analysis and modification designs for African and Latin American markets.
- Served as company subject matter expert at jurisdictional zoning meetings and industry conferences.

Senior Design Engineer2004-2005Senior Project Engineer2002-2004Project Engineer2001-2002Project Administrator2000-2001

### MORRISON HERSHFIELD ENGINEERING CONSULTING, Atlanta, GA

### Project Consultant, Telecommunications Division

2000-2001

• Served as an internal consultant for SpectraSite Communications that brought in over \$3M of revenue.

#### MORRISON HERSHFIELD ENGINEERING CONSULTING, Toronto, ON, Canada

#### Project Engineer, Structural Subdivision of Transportation Department

1998-2000

- Awarded new design proposals for over \$15M in construction contracts through prepared proposals to government agencies.
- Prevented budget overages and avoided delay in scheduling for completion of \$2M bridge rehabilitation project through on-site supervision of construction.
- Conducted structural site condition surveys including AutoCAD drawings of required remediation.

## HUANG & ASSOCIATES GEOTECHNICAL CONSULTING, Markham, ON, Canada Geotechnical Engineer

1997

- Provided general quality control on residential & commercial sites involving concrete/soils testing.
- Surveyed borehole locations.
- Conducted laboratory testing of soils (e.g. proctor/grading/moisture).

## BRISBIN BROOK BEYNON ARCHITECTS, Toronto, ON, Canada

Co-op Student

1993

- Produced AutoCAD drawings for architects.
- Created computer-animated walkthroughs of models using 3D Studio.

### Education

#### DUKE UNIVERSITY, The Fuqua School of Business, Durham, NC

Master of Business Administration. 2008. GPA: 3.83/4.00.

Relevant courses include Strategy, Managerial Effectiveness, Leadership, Managerial Accounting, and Operations.

#### UNIVERSITY OF TORONTO, Ontario, Canada

Bachelor of Applied Science, Civil Engineering. 1998. Honors.

#### Certification

PROFESSIONAL ENGINEER DESIGNATION: Active Licensure in 44 States and 1 Canadian Province

### **Professional Development**

Six Sigma Process Excellence Program: Yellow Belt

Leadership Courses: Harvard Mentor Management Program, Center for Creative Leadership, MIT Managing Technical Professionals, American Management Association, Duke Managerial Effectiveness & Leadership and Development

Professional Engineering Development Hours: 15+ Hours Completed Annually

Professional Society Memberships: TIA/EIA Committee, National Council of Examiner for Engineers and Surveyors, American and Canadian Society of Civil Engineers, American Society of Civil Engineers, National Society of Professional Engineers, North Carolina Structural Engineers Association, International Association of Spatial Structures, American Management Association



## GRAVES & GRAVES CONSTRUCTION COMPANY, INC.

Seneral Contractors
POST OFFICE BOX 370 / PARSONS, TENNESSEE 38363
TELEPHONE (731)847-6391

November 6, 2013

RE:

Dear Commissioners:

The General Contractor for the proposed new communications facility will be Graves and Graves Construction Company INC. Graves and Graves contact information is 1267 West Main Street; Parsons, TN 38363, Contact persons would be either Jon Graves or Kent Hamm and they can both be reached at (731)-847-6391. Graves and Graves Construction Company has been involved with construction of communication sites for over 30 years and a listing of recent job experience is attached.

Thank you,

Jon Graves President

Graves and Graves Construction Co., INC								
Construction Experience List								
		Contract	Completion					
Name of Project	Owner's Name	Amount	Date					
Mt. Jackson VA	Verizon Business	526,008.00	10/19/2011					
Carson, MS	Crown Castle	190,795.00	06/30/2011					
Gismonda, AR	Verizon Wireless	192,917.00	12/07/2011					
Danzler	American Tower	202,185.00	07/09/2012					
Lafayette Springs	American Tower	204,536.00	06/29/2012					
Kimberlin Heights	American Tower	206,110.00	09/27/2012					
Amity AR	Verizon Wireless	192,034.00	08/08/2013					
Fisher Rd Paducah Ky	American Tower	154,260.00	09/17/2013					
Newman KY	American Tower	137,512.00	08/14/2013					
East Tallassee	American Tower	145,791.00	05/23/2013					



December 11, 2013

American Tower Corp.

Attn: Mr. Ron Rohr

SUBJECT: Valmont File #240568 Model V-31.0 x 290' Self Supporting Tower

Site: #281338 Hazel Green - Campton, KY

Thank you for your inquiry concerning tower design codes and practices as they relate to your requested tower designs.

Valmont Structures has been designing and building guyed and self-supporting towers and monopoles since the early 1950's. During this time, we have sold thousands of towers ranging in height form as little as 50' high to in excess of 1400'. These towers 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 present National Tower code, the TIA-222-G, represents the latest refinement of specific minimum requirements for tower engineers and manufacturers to follow to help assure that the tower structure and its foundation are designed to meet the most realistic conditions for local weather while assuring that the tower is designed to stringent factors of safety.

The TIA-222-G code incorporates an escalating wind factor based on tower height. If 90 MPH 3 second gust is the basic design wind speed at the 10 meter height, then per the specification, this speed is then increased in stages up the tower. "Meeting the code" implies that the design will have all of the code requirements for safety factors intact at the wind speed specified. Thus, the ultimate survival speed would be considerably higher.

While failure is extremely rare in any kind of tower, it is especially so for self supported towers and monopoles. In fact, only if a tower or monopole were subjected to a direct hit from a tornado or the severest of hurricanes would failure be predicted, and then usually only if hit by flying debris.

We are aware of only a very few documented instances of a self supporting tower or monopole failure. Self supporting towers and monopoles can be designed such that the most common mode of failure is in the upper middle region of the tower, with the upper portion of the tower remaining connected and "bending and bowing over" against the base of the tower or pole. The fact that the wind is normally greater on the upper portion of the structure contributes to the likelihood of this type of failure.





This particular Tower has a theoretical failure at the tower midpoint or above. The predicted mode of wind induced failure would be a buckling of the tower legs above the tower midpoint with the top sections of the tower folding over on to the intact base sections. This would then affect a "zero fall zone" at ground level.

As Senior Project Engineer of the company and a registered P.E. in 20 states, I oversee all engineering and application of our towers. I am a graduate engineer from Auburn University and work in collaboration with other registered professional engineers on our staff.

Valmont Structures is an AISC approved shop. All Valmont Structures welders are AWS and CWB 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.

DEC 1 1 2013

AHUJA 28866

Sincerely,

Nitesh Ahuja, P.E. Senior Project Engineer

Ext. #5257



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	U	A572-50	-	A36	N.A.	17			<u>140.0 ft</u>	AMERICAN SOCIETION OF THE PROPERTY OF THE PROP
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211	×		2L4x4x1/4					F 8	CHARLESTAN	
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tion		Leg Grade	Diagonals	Diagonal Grade	Top Girts	Face Width (ft)	# Panels @ (ft)	Weight (K)		
Section	Legs	Leg	Diag	Diag	Тор	Face	#Pa	Wei		

#### **DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Beacon	290	ATC Loading	275
Beacon Extender (4') 803062	290	ATC Loading	265
1/2" x 4' lightning rod	290	ATC Loading	255
ATC Loading	285		

#### SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P- 2.50" - 0.75" conn10' -C-(Pirod 226172)	Ī	#12ZG - 2.75" - 0.875" conn. (Pirod 208337)
В	P- 4.00"- 0.75" conn20' -C-Trans-6B-4B-(Pirod 226184)	J	#12ZG -3.00" - 0.875" connTrans (Pirod 208336)
С	P- 5.00"- 0.75" connTrans-20' -C-(Pirod 226200)	К	#12ZG -3,00" - 0.875" conn,-Trans (Pirod 208338)
D	P- 6.00"- 0.75" connHBD-Trans-20' -C-(Pirod	L	L2x2x1/8
	229377)	M	L2 1/2x2 1/2x3/16
E	#12ZG -1.75" - 1.00" connHBD-Trans (Pirod	N	L2x2x3/16
	229588)	0	2 @ 4,79167
F	#12ZG -2.00" - 0.875" connHBD-Trans (Pirod		

## 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 Wolfe County, Kentucky.

- Tower is located in Worle County, Rentacky.
   Tower designed for Exposure C to the TIA-222-G Standard.
   Tower designed for a 90 mph basic wind in accordance with the TIA-222-G Standard.
   Tower is also designed for a 30 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
   Deflections are based upon a 60 mph wind.
- Tower Structure Class II.
- Topographic Category 1 with Crest Height of 0.00 ft
- 8. Zero fall zone radius.
- 9. TOWER RATING: 95.3%

ALL REACTIONS ARE FACTORED

 $\triangle$ 

MAX. CORNER REACTIONS AT BASE:

DOWN: 723 K UPLIFT: -636 K SHEAR: 72 K

AXIAL 349 K

SHEAR MOMENT 12K / 2157 kip-ft

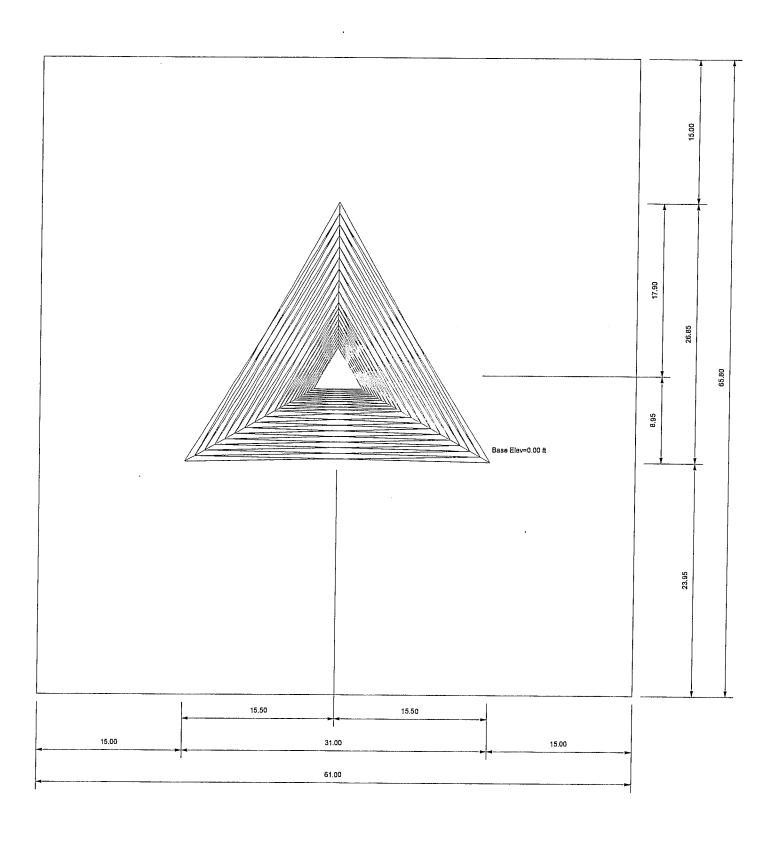
TORQUE 0 kip-ft 30 mph WIND - 0.7500 in ICE

AXIAL 118 K

SHEAR MOMENT 111 K 18361 kip-ft

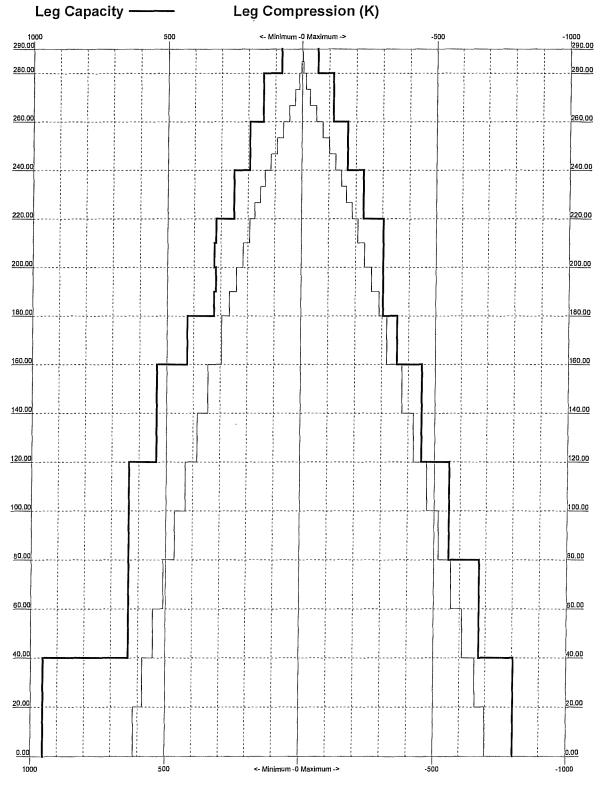
TORQUE 17 kip-ft REACTIONS - 90 mph WIND

Valmont	<sup>Job:</sup> 240568						
1545 Pidco Drive	Project: V-31 x 290' - #281338 Hazel Green, KY						
Plymouth, IN	Client: American Tower Corp.	Drawn by: SKK	App'd;				
Phone: 574-936-4221	Code: TIA-222-G	Date: 12/10/13	Scale: NTS				
FAX:	Path: Volvarrie01VFeRcomtDocumentsU40U40558 ATC F781338 Haze	Green KY V-x280' (zaro bill)02 Towar Calm	Dwg No.				



Valmont	<sup>Job;</sup> 240568					
1545 Pidco Drive						
	Client: American Tower Corp.	Drawn by: SKK	App'd:			
Phone: 574-936-4221	Code: TIA-222-G	Date: 12/10/13	Scale: NTS			
FAX:	Path: Telystyle(1994-Room)Documents/(1004-0588 ATC #781938 Haze	Green KY V-x290 (zero fall902 7ceres Calc	Dwg No.			

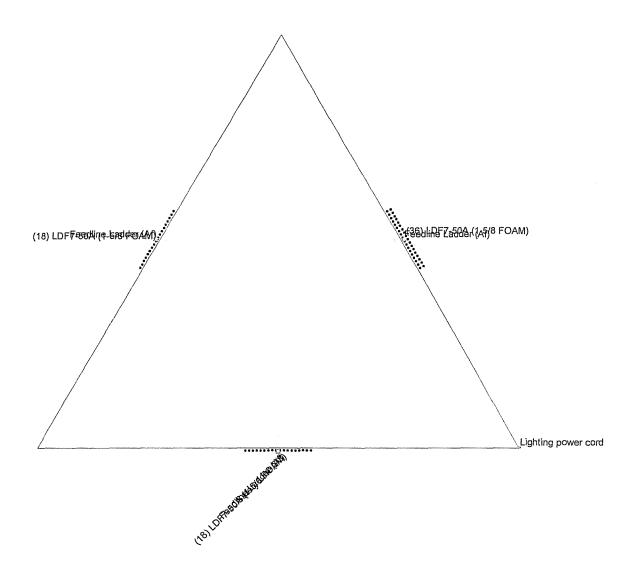
TIA-222-G - 90 mph/30 mph 0.7500 in Ice Exposure C



	<sup>Job:</sup> <b>240</b> 568						
1545 Pidco Drive	Project: V-31 x 290' - #281338 Hazel Green, KY						
Plymouth, IN	<sup>Client:</sup> American Tower Corp.	Drawn by: SKK	App'd:				
Phone: 574-936-4221	Code: TIA-222-G	Date: 12/10/13	Scale: NTS				
FAX:	Path:	Green NY V-X280 (2010 lating) Tower Calcato	Dwg No.				

## Feedline Plan

Round Flat App In Face App Out Face Truss-Leg



Valmont	<sup>Job:</sup> 240568						
1545 Pidco Drive	Project: V-31 x 290' - #281338 Hazel Green, KY						
Plymouth, IN	Client: American Tower Corp.	Drawn by: SKK	App'd:				
Phone: 574-936-4221	Code: TIA-222-G	Date: 12/10/13	Scale: NTS				
FAX:	Path: Toyseffed I Fee Room/Documents/U40/240568 ATC #251338 Haze	i Green KY V-s760' (sero falli802 Tower Calcat	Dwg No.				

# Feedline Distribution Chart 0' - 290'

Round Flat App In Face App Out Face App Out Face

290.00		Face A					Fac	***************************************			_		F	ace C			
280.00				285.00				FOAM)		I	285.00				~***		
	· · · · · · · · · · · · · · · · · · ·			275.00				1-5/8 F			275.00						
		· X · x x x * * * * * * * * * * * * * * * *		265.00				7-50A (1-5/8			265.00				• • • • • • • • • • • • • • • • • • • •	· 1·	•
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140,00	1-5/8 F	*****	Feedline Ladder (Ar)		Lighting power cord		AM)	~~~~~	Ladder (Af)			Safety Line 3/8		8 FOAM	(A)		
	7-50A (		dline La		Lighti		1-5/8 F		Feedline			Sa		DA (1-5/	Ladde		
120.00	(18) LDF7-50A (1-5/8 FOAM)		- F				(36) LDF7-50A (1-5/8 FGAM)							(18) LDF7-504 (1-5/8 FOAM)	Feedline Ladder (A1)		
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Valmont	<sup>Job:</sup> 240568						
1545 Pidco Drive	<sup>Project:</sup> V-31 x 290' - #281338 Hazel Green, KY						
Plymouth, IN	Client: American Tower Corp.	Drawn by: SKK	App'd:				
Phone: 574-936-4221	Code: TIA-222-G	Date: 12/10/13	Scale: NTS				
FAX:	Path:		Dwg No.				

tnxTower	Job 240568	Page 1 of 64
Valimant 1545 Pideo Drive	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymoidly IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

#### **Tower Input Data**

The main tower is a 3x free standing tower with an overall height af 290.00 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 31.00 ft at the base.

This tower is designed using the TIA-222-O standard.

The following design criteria apply:

Tower is located in Wolfe County, Kentucky.

Basic wind speed of 90 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 100 ft.

Neminal ice thickness is considered to increase with height.

Ice density of 56 pef.

A wind speed of 30 mph is used in combination with ice.

Temperature drop of 30 °F.

Deflections calculated using a wind speed of 60 mph.

Zero fall zone radius.

A non-linear (F-dotta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Local bending stresses due ta climbing loads, feedline supports, and appurtenance mounts are not considered.

#### Options

Consider Moments - Legs
Consider Moments - Britzontals
Consider Moments - Disponals
Use Moment Magnification
Use Moment Magnification
Use Code Stress Resion
Use Stress - Cluy
Establated
Away Use Mark Ke
Use Special Wind Profile
Include Bolls In Member Capterily
Legs Bolls Are Al Top Df Section
Legs Bolls Are Al Top Df Section
Use Shamed Include Bolls and Top Long Magnification
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

Distribute Leg Loads As Uniform Assume Legs Finned Assume Right Index Piste Use Ciear Spans For Wind Area Use Ciear Spans For Wind Area Use Ciear Spans For RVA Retension Guys To Initial Tension Bysass Mat Shallity Checks Use Asimush Dish Coefficients Project Wind Area of Appunt Assume Company Area of Appunt Sect Capacity Reports By Companent Triangulate Dismond Inner Bracing

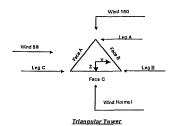
V Treat Feedline Bundler As Cylinder
Use ASCE 10 N-Brees Ly Rulet
Calculate Rendomate Brasing Forces
Ignore Redundant Brasing Forces
Ignore Redundant Brasing Forces
Ignore Redundant All Regulation
All ILeg Panels Have Same Allowable
Officet Gird A Foundation
Consider Feedline Torque
Include Aught Blook Sheet Check
Include Aught Blook Sheet Check
Include Aught Blook Sheet Check
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Use Top Mounted Sockets

tnxTower	Јо <b>ъ</b> 240568	Page 3 of 64
Valmant 1545 Pideo Drive	Project V-31 x 290° - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymawk, IN Phone: 574-936-4221 FAX:	Cilent American Tower Corp.	Dosigned by SKK

Tairer	Tower	Diogonal	Bracing	Hos	Has	Top Girt	Bottom Girl
Section	Elevation	Spacing	Type	K Brace	Horizontals	Offset	Offia1
				End			
	ft	ſ		Panels		in	ln
TI	290.80-280.00	4.79	X Brace	Na	Na	5.0000	0,0000
T2	280.00-260.08	6.67	X Brace	No	No	8,0000	0.0000
T3	268.80-240.80	6.67	X Brace	Na	Nn	0.000g	0.8000
T4	240.80-220.80	6.67	XBrace	No	Na	0.0000	0.8000
T5	220.00-200.00	10,00	X Brace	No	Na	0.0080	0.0000
T6	208.00-180.00	10,00	X Brace	Nn	No	0.0000	0.8000
17	180.00-160.00	20.00	X Braco	No	No	0.0008	0.0000
TE	160.80-140.00	28.80	X Brace	No	Nn	8,0008	0.8000
T9	148.80-120.08	20.88	X Brace	No	Na	0.0880	0.0800
Tia	120.08-180.80	20.00	X Brace	No	Na	0.0000	0.8800
TH	100.08-80.00	20.00	X Brace	No	No	0,0000	0.8000
T12	Eg.00-60,Eg	20.00	X Brace	No	Nn	0.0000	0.0000
T13	60.0E-40.00	20.0g	X Brace	Na	Nn	8,0080	0.0800
T14	40.00-20.80	20.00	X Brace	No	Nn	0.00gg	0,0000
T15	20.08-0.00	20.00	XBrace	No	Nn	0.0000	0,8000

Tower Section Geometry (cont'd)								
Tower Elevatian ft	Leg T)pe	Leg Stre	Leg Grade	Diogonal Type	Diogonal Size	Diagonal Grade		
T1 290.00-280.00	Pipe	P- 2.58" - 0.75" conn10"	A572-50	Equal Angla	L2x2x1/8	A36		
		-C-(Pirod 226172)	(58 kzi)			(36 ksi)		
T2 280.00-260.00	Pipe	P- 4.80"- 8.75" conn20"	A572-50	Equal Angla	1.2x2x3/16	A36		
		-C-Trans-6B-4B-(Pirod 226184)	(50 kai)			(ici 8E)		
T3 268.00-240.00	Pipe	P- 5.08"- 8.75" connTrans-20'	A572-50	Equal Angle	L2x2x3/16	A36		
		-C-(Pired 226200)	(50 ksi)			(36 ksi)		
T4 240.00-220.08	Pipe	P-6,00"- 8.75"	A572-58	Equal Angle	1.2 1/2x2 1/2x3/16	A36		
		connHED-Trans-20' -C-(Pirod 229377)	(50 Esi)			(36 ksi)		
T5 220.00-200.00	Trus Leg	#12ZG -1.75" - 1.00"	A572-50	Equal Angle	L3x3x3/16	A36		
	_	consHHD-Trans (Pirod 229588)	(50 Lai)			(36 ksi)		
T6 200,00-120,80	True Leg	#12ZG -1.75" - 1.00"	A572-50	Equal Angle	L3x3x3/16	A36		
		connHBD-Trans (Pirod 229588)	(50 ksi)			(36 ksi)		
T7 180.00-160.00	Truss Len	#12ZG -2.00" - 0.075"	A572-50	Double Equal	2L3x3x3/16	A36		
		connHBD-Trans (Pirod 208332)	(50 ksi)	Angle		(36 kai)		
T8 160.00-140.00	Trust Log	#12ZG -2.25" - 0.875" conn.	A572-50	Double Equal	2L3x3x3/16	A36		
		(Pirod 208334)	(50 kai)	Angle		(36 ksi)		
19 140.00-120.00	Trues Leg	#122G -2.25" - 0.875" conn.	A572-50	Double Equal	2L3 1/2x3 1/2x1/4	A36		
		(Pirod 208334)	(58 ksi)	Angla		(36 ksi)		
Tlg	Trus Leg	#12ZQ - 2.50* - 0.875* conn.	A572-58	Dnuble Equal	2L3 1/2x3 1/2x1/4	A36		
120.00-100.00		(Piro d 208335)	(50 ksi)	Angle		(36 ksh		
T11 100.00-88.00	Trust Leg	#12ZG - 2.58* - 0.875* conn.	A572-50	Double Equal	2L3 1/2x3 1/2x1/4	A36		
	-	(Pirod 208335)	(50 kzi)	Angle		(36 ksi)		
T12 80.00-60.00	Trust Leg	#12ZG - 2.75" - 0.875" conn.	A572-50	Double Equal	2L3 1/2x3 1/2x1/4	A36		
	_	(Pirod 208337)	(50 ksi)	Angle		(36 ka)		
T13 60.00-48.88	Truss Leg	#122G - 2.75" - 8.875" ennn.	A572-50	Double Equal	2L3 1/2x3 1/2x1/4	A36		
		(Pirod 2083 37)	(50 ksi)	Anglo		(36 kei)		
T14 40,00-20.00	Trust Leg	#1220 ~3.00* - 0.875*	A572-50	Double Equal	2L3 1/2x3 1/2x1/4	A36		
		conn. Trons (Pirod 208336)	(58 Lsi)	Angle		(36 kai)		
T15 20.00-0.00	Truss Leg	#1 22G -3,00" - 0,875"	A572-58	Double Equal	2L4x4x1/4	A36		
		ennnTrons (Pired 208338)	(SE kai)	Angle		(36 ksi)		

tnxTower	Job 240568	Page 2 of 64
Valment 1345 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Phymouth, IN Phora: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK



		To	ower Section Ge	ometry		
Taver Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ß					<u>ft</u>
Tl	290.8E-288.88		V-Series Leg	5.00	1	10.80
T2	280.00-260.00		V-Series Leg	5.08	1	20,00
T3	268,00-240,80		V Series Leg	5,00	1	20.ga
T4	248.00-220.00		V-Series Leg	7.00	1	20.00
T5	228,88-200,00		PiRod 12BD Truss Lee	9.08	1	28.00
T6	200,08-180,00		PiRod 12BD Truss Leg	11.80	t	20.00
17	180.00-160.00		PiRod 12BDH Truss Lee	13,00	1	20.RB
TB	168.80-148.00		PiRod 128DH Truss Leg	15.00	1	20.08
T9	140.00-120.00		PiRod 12BDH Truss Leg	17.00	1	20.00
Tia	120.00-108.RR		PiRod 12BDH Trus Leg	19.0R	i	20.80
Tit	100.80-80.00		PiRod 128DH Truss Leg	21.08	i	20.00
T12	EO.RO-60.RO		PiRod 12BDH Truss Leg	23.00	i	20.00
T13	60.00-40.88		PiRod 12BDH Truss Leg	25.00	į.	20,00
Tia	40.00-20.80		PiRod 12BDH Truss Leg	27.00	i	20,00
T15	20.00-0.08		PiRod 12BDH Trus Leg	29.00	;	20.00

Tower Section Geometry (cont'd)									
Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Hat K Brace End	Has Horizontals	Top Girt Offset	Battom Girt Offset		
	ft	A		Panels		in	in		

tnxTower	Jab 240568	Page 4 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Cliant American Tower Corp.	Designed by SKK

Tower Section Geometry (cont'd)								
Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Battom Giri Type	Bottom Girt Size	Battam Giri Grade		
1 290.00-280.80	Equal Angla	L2x2x3/16	A36 (36 kai)	Salid Round		A36 (36 ksi)		

<u> </u>	<u> </u>		lower	Section	Geom	etry (con	ta)	<u> </u>
Taver Elevotion	Gussel Area (per face) ft <sup>2</sup>	Gusset Thickness In	Guset Grade	Adjust, Freter Ay	Adjust. Foctor A	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stateh Bolt Spacing Hortzontals in
TI	0.00	B.2500	A36	<u> </u>	ī	1.05	36,0000	36,0000
290.00-280.00			(36 ksi)					
T2	0.00	0.2508	A36	1	1	1.05	36,0000	36.0000
280,00-260,80			(36 ksi)					
T3	0.00	0.3750	A36	1	1	1.05	36.0000	36.0000
260.00-248.00			(36 ksi)					
T4	0.00	0.3750	A36	1	1	1.05	36.0000	36,0000
248.00-220.00			(36 ksi)					
T5	0.00	0.5000	A36	1	1	t.05	36.E000	36.0000
220.00-200.80			(36 lai)					
T6	0.00	0.5000	A36	1	1	1.05	36.0000	36.800g
200,00-180.00			(36 ksi)					
T7	0.00	0.6250	A36	1	1	1.05	36.0008	36.0000
180.00-160.80			(36 kai)	_				
T8 160.00-140.80	0.00	0.6250	A36	1	1	1.05	36,0000	36.0000
T9	B.OR	0.6250	(36 kai) A36	1		1.05	36,0000	36,0000
140.00-120.00	H.Ug	0.6230			1	1.03	36,0000	10,0000
T10	0.00	0.6250	(36 kai) A36			1.05	36,8000	36,0000
20.00-100.00	0.00	0.6230		3	t	7.02	36,4000	36,0000
T11	0.00	0.6258	(36 kai) A36	1	1	1.05	36.0000	36,8000
100.00-80 00	0.00	U.0238	(36 kai)	•	1	1.03	30,000	30,8000
T12	0.00	0.6258	A36	1	1	t.05	36 0000	36,0000
80,00-60,00	5.55	0.0238	(36 lai)	•	•	1.03	30.0000	50.000
T13	0.00	0.6250	(36 ESI)	1	1	1.85	36.0000	36.0000
60,80-40,00	0.00	V.023U	(36 kah			1.83	30.000	30.000
T14	0.00	8,6250	A36	1	t	1.85	36.8000	36,0000
40.00-20.00	0.00	0.0230	(36 kai)	•		1.83	30.8000	30,000
15 20.80-0.00	0.00	0.6250	A36	1	1	1.05	36,0000	36,0000
	0,50	0.0230	(36 kai)	•	•	2.03	30.0000	20.0000

Tower Section Geometry (cont'd)

K Factors'

tuxTower	Job 240568	Page 5 of 64
Valmoni 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymoidt, IN Phone: 574-936-4221	Client American Tower Corp.	Designed by SKK

Tower Elevotion	Calc K Single Angles	Cole K Solid Rounds	Legs	X Brace Diags X	K Brace Diags X	Single Diags	Girts X	Horiz. X	Sec. Horiz X	Inner Brace X
ft	Angier	ruma		ř	ŷ	Ŷ	ï	Ŷ	Ŷ	ř
ŤI	Yes	Yes	1	1	1	1	ī	1	1	1
290.00-288.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	ŧ	1	ı	1
280,00-268.00				1	1	1	1	1	1	1
T3	Yes	Yes		1	1	1	ŧ	1	1	1
260.80-240.00				1	1	1	1	1	1	1
T4	Υœ	Yes	1	1	1	t	1	1	į	t
240.00-220.00				1	1	t	1	t	1	1
T5	Yes	Yes	1	1	1	t	1	1	1	ı
220,00-200.00				1	1	ı	1	1	ı	t
T6	Yes	Yes	1	1	1	t	1	1	1	1
200.00-180.00				ı	1	ı	1	1	1	ı
T7	Yes	Yes	t	1	I	1	1	1	1	į
180.00-160.00				ı	1	1	ŧ	ı	1	E
TB	Yes	Yes	t	1	t	1	1	1	1	1
160.00-140.80				1	1	ŧ	t	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	
140.00-120.80				1	1	1	1	1	1	1
T18	Yes	Yes	1	1	1	1	1	1	1	1
120,00-100,00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	ı	1	1	
100.08-80.00				1	1		ŧ	1	1	
T12	Yes	Yes	ŧ	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	ī	1
60.00-40,00				1	1	ı	t	1	1	Į.
T14	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20,00				1	1	1	ŧ	1	1	ı
T15	Yes	Yes	1	1	1	1	1	1	1	
20.00-0.00				1	1	I	1	1	i	1

the ov	erall	lengt

1,34	74 F 12 F	Towe	r Section G	eometry (	cont'd)	A to the st
			Trans-Leg	K Factors	-Legs Used As Irmer M	
	Tnu	s-Legs Used As Leg Me	mbers	Trus	embera	
Tower Elevation	Leg Panels	X Brace Diagonals	Z Bruce Diagonale	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T.5 220.00-200.00	1	0.5	0.7	ı	0,5	0.7
T6 200.00-180.00	1	0.5	0.7	1	0.5	0.7
T7 180.00-160.00	ŧ	0.5	0.7	1	0.5	0.7
T8 160.00-140.00	1	0.5	0.7	1	0.5	0.7
T9 140.00-120.80	1	0.5	0,7	ī	0.5	0.7
T[0 120,00-100.00	•	0.5	0.7	1	0.5	0.7
T1 t 100.00-88.08	1	0.5	0.7	I	0.5	0.7

tnxTower	Jab	240568	Page 7 of 64
Valmont 1543 Pideo Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phore: 574-936-4221 FAY:	Client	American Tower Corp.	Designed by SKK

				tion Offsets						
	Diog	ronal			K-Br	acing				
Vert.	Horit	Vert.	Horiz.	Vers.	Horiz.	Vert.	Horiz			
Top	Top	Bot.	Bot.	Top	Top	Bot.	Bot.			
in	in	in	ía	in	in	in	in			
5.0000	5.0000	5,0000	5.0000	0,0000	0.0000	0.0000	0.0000			
5.0008	5.0000	5,0080	5.0000	0,0000	0.0000	0.000	0.0000			
* ***	c 2400	£ 0000	£ 2500	0.0000	0,000	e 0.000	0.0000			
5.000Q	6,2300	5.0000	6.2309	0.0000	0,0000	8.0000	0.0000			
5 W000	6 2500	5 0000	67500	8 0000	0.8800	0.0000	0.0000			
2.6000	0.2200	2.0000	0.230	9,0000	0.0000					
5.8000	10.7500	5.0088	10.7500	0.0000	0.0000	0.0000	0.0000			
						l				
5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0800			
						l				
5.0000	11.5000	5,0008	11,5008	0.0000	00000.0	0,8000	0.0800			
					0.0000		0.0000			
5.0800	\$1,5008	3.0000	11.5008	0.0000	0.0880	0.0000	0.0000			
<b>* n</b> ana	11 5000	60000	11 1000	A BOOR	0.0000	0.000	8080R			
3.0000	11100	3,0000	11.,000	0.000	0.000	1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	9,0000			
5.0060	11.5000	5.0008	11,5008	0.0000	0.0000	0,0000	8000.0			
						1				
5.8000	11.5000	5.0000	11,5800	0.0000	8000.0	0.0000	0.0000			
5,0000	11,5000	5.0000	11.5800	0.0000.0	0.0800	0.0000	0.0000			
							0.8800			
0000,	11.5000	3.0000	11.5008	0.0000	0.080.0	0.8000	0.8800			
£ 00.00	13 500n	5 0000	11 4000	0.0008	0.0000	0.0800	0.0880			
3.0000	11,3000	3.0000	11.3000	5,500	0.0000		4494			
5,0000	11,5000	5.0000	11,5000	0.0000	0,0000	0.0800	0.0000			
	10000 1.0000	Top         Top           In         in           5,0000         5,0000           5,0000         5,0000           5,0000         5,0000           5,0000         6,2500           5,8000         16,7500           5,0000         10,7500           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000           5,0000         11,5000	Top Top Bet.  In Is  S.0000 5.0000 5.0000 5.0000 5.0000 5.0000 6.2500 5.0000 5.8000 6.2500 5.0000 5.8000 10.7500 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000 5.0000 11.5000 5.0000	Top         Bot.         Bet.         Bet.           In         In         In         In           James         1.0000         5.0000         5.0000           5.0008         5.0000         5.0000         5.0000           5.0000         6.2000         5.0000         6.2300           5.0000         6.2500         5.0080         6.2300           5.0000         10.7300         5.0888         16.7500           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008           5.0000         11.5000         5.0000         11.5008	Top         Top         Bet.         Esc.         Top           in         in         in         in         in           5,0000         3,0000         3,0000         3,0000         0,0000         0,0000           5,0000         5,0000         5,0000         6,0000         0,0000         0,0000           5,0000         6,2500         5,0000         6,2500         0,0000         6,0000         0,0000           5,0000         10,7300         5,0000         10,7500         0,0000         1,0000         0,0000           5,0000         11,5000         5,0000         11,5000         0,0000         1,0000         0,0000           5,0000         11,5000         5,0000         11,3000         0,0000         1,0000         0,0000           5,0000         11,5000         5,0000         11,3000         0,0000         1,0000         0,0000           5,0000         11,5000         5,0000         11,3000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0000         0,0	Top         Bat.         Best.         Top         Top           18	Top         Top         Bot.         Bot.         Top         Top         Bot.           In         in         in         in         in         in         in         in           5,0000         3,0000         3,0000         3,0000         0,0000			

Tower Section Geometry (cont'd)															
Tower Elevation ft	Leg Connection Type	Leg		Diago	nal	Top G	irt	Bottom	Girt	MidG	irt	Long Hart	zantoľ	Short Hor	itomal
,,	****	Boli Sice in	No.	Bolt Size in	No.	Bolt Size In	Na	Bott Size in	Na.	Bolt Stre in	No.	Bolt Size in	No.	Bolt Size in	
T1 290.00-280.00	Flange	0.7500 A325N	4	0.7500 A325N	1	0,7500 A325N	1	1.8000 A325N	0	1,8000 A325N	Ø	1.0000 A325N	0	1,0008 A325N	0
72 280.00-260.80	Flange	8.7500 A325N	6	0.7500 A325N	1	0.8000 A325 N	0	1.0000 A325N	0	1.0000 A325N	0	1.0008 A325N	0	1.0008 A325N	8
T3 260.00-240.00	Flange	0.7500 A325N	В	0.7500 A325N	ŧ	0.0000 A325N	8	1.0008 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T4 248.00-220.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0,0080 A325N	0	1.0088 A325N	0	1,0000 A325N	0	1.0000 A325N	0	1.0000 A325N	8
T5 228.00-200.80	Flange	1.0000 A325N	6	1,0000 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T6 200.00-180.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.0000 A325N	0	1.0000 A325N	8	1,0000 A325N	8	1,0880 A325N	0	1.0008 A325N	0
T7 180.00-160.00	Flange	1.0000 A325N	12	8.8750 A325N	3	8.0000 A325N	ē	1.0000 A325N	G	1.6000 A325N	0	1.0008 A325N	0	\$.0008 A325N	0

tnxTower	Job 240568	Page 6 of 64
Valmont 1345 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221	Client American Tower Corp.	Designed by SKK

		*	* *			
T12	1	8.5	8.7	ı	8.5	0.7
80.00-60.00						
T13	1	0.5	0.7	ŧ	0.5	0,7
60.00-40.00						
T14	1	0.5	0.7	1	0.5	0.7
40.00-20.00						
T15	ı	0.5	0.7	1	0.5	0.7
20 00-0 00						

Yover Elevation fl	Leg		Diago	nal	Top C	ia <b>r</b>	Batton	a Girt	Mid	Girt	Long Ho		Shart Ha	
•	Net Width Deduct in	U	Net Width Deduct in	U	Nes Width Deduct in	U	Net Width Deduct In	U	Net Width Deduct in	U	Net Width Deduct in		Net Width Deduct in	U
T1	0.0000	1	0.0000	0,75	0.0000	0.75	0.0800	0.75	0.0000	0.75	00000.0	0.75	0.0000	0.75
90.00-280.00 12 80.00-260.00	0.0000	t	0.0000	0.75	0.0000	0.75	0,0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 260.00-240.00	0.0000	ı	0.0000	0.75	0.8000	0.75	0000,0	0.75	0.0000	0.75	0,0000	0.75	0,0000	0.75
T4 40.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0,0000	0.75	0.0000	0.75	0,0000	0.75	0.0000	0.75
T5 20.00-200.00	0.0008	ı	0,0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
76 00.00 -t 80.00	0.0000	1	0.0800	0,75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0,0080	0,75
00.061-00.88 T8	0.0000	1	0,0000	0.75	0.0000	0.75	0.0800	0.75	0.0000	0.75	0.0080	0.75	8.8080	0.75
60.00-140.00 T9	0.0000	1	0.0000	0.75	0.0000	0.75	0,0000	0.75	00000.0	0.75	0.0000	0,75	0.0080	0.75
40,00-120.00 T10 20,00-100,00	0.0000	ì	0.0000	0.75	8.0000	0.75	0.0000	0.75	0,0000	0.75	0.0000	0,75	0.0080	0.75
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0080	0.75	0.0000	0.75	0,0000	0,75	0.0000	0.75
T12 80.00-60.00	0,0000	ı	0.0000	0.75	0.8000	0.75	0.0000	0.75	0,0000	0.75	0.0000	0.75	0,0080	0.75
T13 60.00-40.00 T14	0.000.0	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0080	0.75
40.00-20.00 15 20.00-0.00		1	0.0800	0.75	0.0000	0.75	0.0000	0.75	8.0000	0.75	0.0000	0.75	0.0000	0.75

tnxTower	Job 240568	Page 8 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Towar Corp.	Designed by SKK

Tower Section Geometry (cont'd)

Tower Elevation fl	Leg Cannection Type	Leg		Diogon	sal	Top G	irf	Battom	Gin	Mid G	irt	Long Hon	izontal	Shon Hor	izont
,	-27-	Balt Size in	Na.	Bolt Size	Na.	Bolt Size in	Nα	Bolt Size	No.	Bolt Stre	Na.	Bolt Size in	No.	Bolt Size in	No.
TB	Flange	1.0000 A325N	12	0.8750 A325N	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	8	1.0000 A325N	0
T9 T9	Flange	1,0080	12	0.8750	1	0.0800	Q	1,0000	Q	1.0000	0	1.0000	0	1.0000 A325N	0
140.00-120.00 T10	Flange	A325N 1.0000	12	A3 25N 0.8750	1	A325N 0,0000	0	A325N 1.0000	0	A325N 1,0000	0	A325N 1,0000	0	1.0000	0
120.00-100.00		A325N	12	A325N 0.8750		A325N 0.0000		A325N 1.0000	0	A325N 1.0000	0	A325N 1.0000	0	A325N 1.0000	0
T1 t 100.00-80.80	Flange	1.0000 A325N	12	A325N	1	A325N	u	A325N	-	A325N	-	A325N	-	A325N	_
T12 88.00-68.00	Flange	£.8000 A325N	t2	0.8750 A325N	1	0,0000 A325N	8	1.8000 A325N	e	1.0000 A325N	0	1.8000 A325N	0	1.0000 A325N	0
T13	Flange	1,8000	£2	8.8750	i	0.0880	e	1,0000	O	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
60.00-40.00 T14	Finnee	A325N 1,2500	12	A325N 0,8750	1	A325N 0.0000	0	A325N 1.8000	Q	1.0000	0	1.0000	8	8000.1	0
48,00-20.00 15 20.80-0.00		A325N 1.2500	12	A325N 0.8750	1	A325N 0.0000	0	A325N 1.0800	0	A325N 1.0000	0	A325N 1.8080	0	A325N 1.0000	٥
13 20.80-0.00	Fiangs	F1554-105	12	A325N	•	A325N	u	A325N	۰	A325N		A325N		A325N	

Description	Face	Allow Shield	Component Type	Placement	Face Office In	Loteral Offset (Frac FW)	#	Per Row	Clear Spacing In	Width or Diameter In	Perimeter In	Weight plf
Safety Line	Leg	No	Ar (CaAa)	290.00 - 8.88	3.0000	0	1	1	8.3750	0.3750		0.22
3/8												
Lighting power cord	В	Νn	Ar (C±A±)	290.00 - 0.00	0.5000	0.5	ŧ	ŧ	0.200E 8.0000	0.8700		0.15
LDF7-50A	c	No	Ar (CaAa)	265.00 - 0.00	1.0000	٥	16	15	1.0200	1.9800		0.82
(1-5/8 FOAM)						_	36	18	1.0200	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	В	Na	Ar (CaAa)	255.00 - 0.00	1.0000	0	36	18	1.0200	1.9800		V.82
LDF7-50A	8	No	Ar (CaAa)	285.80 - 255.80	1.0000	0	18	18	1.0200	1.9800		0.82
(1-5/8 FOAM)						_			1.0000	1.9800		0.82
LDF7-58A (1-5/8 FOAM)		Na	Ar (CaAn)	275,00 - 0.00	1.0000	0	18	18	1.0200	1.9800		
Feedline	В	No	Af (CaAa)	285.00 - 8.00	1.0000	0	1	1	3,0000	3.0000		8.40
Ladder (Af)						_				1 0000		8.48
Feedline	A	No	Af (CaAa)	275.00 - 0.00	1.0000	0	1	1	3.0000	3.0000		0.48
Ladder (Af)						_			* ****	3.0000		8.40
Feedling	c	No	Af (CaAa)	265,00 - 0.00	1.0008	e	į	ŧ	3.0800	3.0000		0.40
Ludder (Af)												

		Feed	d Line/	_inear	Appurtei	nances	Section	Area
Tower Section	Tower Elevation	Face	Az	Αr	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>M</sub> A Out Face	Weight	-
	A		ft <sup>3</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K	
Tl	290.00-280.00	A	0.080	0.000	0.000	0.000	0.00	
		В	0.000	0.000	21.190	0.000	0.12	
		č	8.008	0.000	0.375	0,000	0.08	
T2	280.00-260.00	Ā	0.008	0,000	60.960	8.000	0.35	

tnxTower	Job 240568	Page 9 of 64
Valmont 1543 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Tower Section	Tower Elevation	Face	Az	Ar	C <sub>a</sub> A <sub>A</sub> In Face	CAA	Weight
Person	fl fl		<sub>ft</sub> *	ft²	in race fi²	Out Face ft <sup>2</sup>	ĸ
		В	0.808	0.000	83,020	0.000	0,47
		С	0.000	0.000	21.070	0,000	0.t2
T3	260.00-240.00	A	0.000	0.008	81:280	0,000	0.46
		В	0.000	0.008	136,480	0.000	0.69
		C	0.000	0.000	82.038	0,000	0,47
T4	248.08-220.88	A	0.088	0.000	81.280	0.000	0,46
		В	8.800	0.000	154,300	0.000	0.76
		C	0.800	0.000	82.03E	0.000	0,47
T5	220.88-200.00	A B	0.000	0,000	81,288	0.000	0.46
		В	0.068	0,000	154,380	0.000	0.76
		С	B.000	0.008	82.030	0.000	0.47
T6	200.00-188.80	A	0.000	0.000	81.280	0.000	0.46
		В	0.008	0.000	154,380	0.000	0.76
		С	0.000	0.000	E2.030	0.000	0.47
17	180,00-168.88	Α.	0.800	0.000	81,280	0.800	0.46
		B	0.808	0.000	154,300	8,000	0.76
		C	0.000	0.008	82.030	0.000	0,47
TS	160.80-140.00	A	0.000	0.000	81.280	0.000	0.46
		В	0.000	0.000	154,300	8.800	0.76
		C	0.800	0.000	82.030	0.008	0.47
T9	140.00-120.00	A	0,000	0.000	81,280	0.000	0.46
		В	0.000	0.000	154,300	0.000	0.76
		B	0,000	0.000	82.030	0.000	0.47
TIO	120,80-100,00	A	0.000	0.000	81.280	0.000	0.46
		B	0.000	0,000	154,300	0.000	0.76
		C	0.000	0.000	82.030	0.000	0.47
TII	180.00-80.00	À	0.000	0.000	81.280	0,000	0.46
		В	0,800	0.000	154,300	0.000	0.76
		c	0.000	0,000	82.030	0,000	0.47
T12	80.00-60.00	A	0.080	0.008	81,288	0.000	0,46
		В	0.000	0.000	154.308	0.000	0.76
		Ċ	0.000	0.000	82,030	0.000	0.47
T13	69,00-40.08	Ä	0,000	0,000	B1.280	0.000	0.46
		В	0.000	0.000	154,300	0.000	0.76
		c	0,000	0.000	82.030	8.000	0.47
T14	40.00-20.00	Ā	0.000	0.000	81.280	0.008	0.46
		В	0.000	0.000	154,300	0.088	0.76
		č	0.000	0,000	82,030	0.000	0.47
T15	20.00-0.00	Ā	0.000	0.000	81.280	0.000	0.46
		В	0,000	0.000	154.300	0.000	0.76
		ë	0.000	0.000	82.030	0.000	0.47

Tower Section	Tower Elevation	Face	Ica Thickness	Az	Α,	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>M</sub> A Out Form	Reight
	ft	Leg	Ín	pt*	A <sup>2</sup>	n'	ft,	ĸ
TI	290,00-280,00	A	1.861	0.000	0.000	0,000	0,000	0.00
		В		0,000	0.000	44,570	0.000	0.76
		C		0.000	0.000	4.097	0.000	0.05
T2	280.00-260.00	A	1.851	0,000	0.000	119.863	0.000	2.07
		В		0.000	0.000	168,961	0.000	2.88
		C		0.000	0.000	48,108	0.000	0.79
73	260,00-240,00	Λ	1.837	0.000	000.0	t59.684	0.000	2.74
		В		0.000	0.000	169,469	0.000	3.75
		С		0,000	0.006	167,780	0.000	2.84
T4	249,80-220.00	A	1.821	0.00E	0.000	139,539	0.000	2.72
		В		0.000	0.080	169.493	0.000	4.02

tnxTower	Jeb 240568	Page 11 of 64
Valtnant 1345 Pidca Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

1.4	35500		Shield	ing Fac	tor Ka	 	121 4 1	
Tower Section	Feed Line Record Na.	Description	Feed Line Segment Elev.	K, No Iss	K. Iso			
TI	1	Safety Line 3/8	288.00 -	0.6000	0.5635			
Ti	2	Lighting power cord	290.00 280.00 - 290.00	0.6000	0,5635			
TI	5	LDF7-50A (1-5/8 FOANI)		0,6000	0,5635			
Ti	7	Feedline Ludder (Af)	280.00 - 215.00	t.0000	1.0000			
12	1	Safety Line 3/8		0.6000	0.5797			
12	2	Lighting power cord		0.6000	0.5797			
12	3	LDF7-50A (1-5/8 FOAM)		9,600g	8.5797			
T2	5	LDF7-58A (1-5/8 FOAM)		0.6000	0.5797			
T2	6	LDF7-50A (1-5/8 FOAM)		0.6000	0.5797			
T2	7	Feedline Ladder (Af)		1.0000	1.0000			
T2	c	Feedline Ladder (Af)		1.0800	t.6000			
T2	9	Feedline Ladder (Af)	260.00 - 265,00	1.0000	1.0000			
Т3	1	Safety Line 3/8	240.00 - 260.00	0.6000	0.6000			
Т3	2	Lighting power cord	240.00 - 260.00	0.6000	0.6000			
13	3	LDF7-50A (1-5/8 FOAM)	240.00 - 260.00	0.6000	0.6000			
13	4	LDF7-50A (t-5/8 FOAM)	240.00 - 255.00	0.6000	0.6000			
Т3	5	LDF7-50A (t-5/8 FOAM)	255.08 - 260.00	8.6080	0,6000			
T3	6	LDF7-50 A (1-5/8 FOAM)	240.00 - 260.08	0.6000	0.6000			
T3	7	Feedline Ladder (Af)	240.00 - 260.00	1.0000	1.0000			
Т3	8	Feedline Ladder (Af)	240.00 - 260.00	1.0000	1.0000			
ТЗ	9	Feedline Ladder (Af)	240,00 - 260.00	1.0000	1.0000			
T4	1	Safety Line 3/8	220,00 - 240,00	0.6000	0.6000			
T4	2	Lighting power cord	220.80 - 240.00	0.6008	0.6000			
T4	3	LDF7-50A (1-5/8 FOAM)	220.00 - 240.00	0.6000	0,6000			
T4	4	LDF7-50A (1-5/8 FOAM)	220.00 - 240.00	0,6000	0.6000			
T4	6	LDF7-50 A (1-5/8 FOAAN)	220,00 - 248,00	0.6000	0.6000			
T-4	7	Feedline Ladder (Af)	220,00 - 240,00	1,0800	1.0000			
T4	. 8	Feedline Ladder (Af)	220,00 -	1.8000	1.0000			

tnxTower	Job 240568	Page 10 of 64
Valment 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazei Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Plione: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Tower Section	Tower Elevation	Face or	Ice Thickness	Az	A,	CAA In Face	C <sub>M</sub> A <sub>2</sub> Out Face	Weight
	fl	Leg	ln	ft²	ft <sup>2</sup>	ft <sup>2</sup>	ft	K
		C		0.000	0.000	167,575	0.000	2.83
T5	220.00-200.00	A	1.805	0.000	0,000	159,383	0.000	2.78
		В		0,000	0.000	169.267	0.000	4,00
		C		0.000	O.DOE	167,353	0.008	2.81
T6	200.00-188.00	A	1.787	0.808	8.800	159.213	0.088	2.68
		B		0.000	0.000	169,021	0,000	3.98
		C		0.000	0.000	167.111	0.000	2.78
T7	180.08-168.BD	Ā B	1.767	0.008	O.BBB	159.026	E.000	2.66
		В		0.000	0.088	168.751	0,008	3,95
		c		0.000	0,000	166.845	0.000	2.76
TE	160.80-140.00	A	1.745	0.008	0.000	158.818	0.088	2.64
		В		0.008	E.800	168.450	8.080	3.92
		C		0.000	0.000	166,549	0.800	2.73
T9	140.00-128.00	A	1,720	0.000	0.000	158,583	0.000	2.61
		В		0.000	0.000	168.110	0.000	3.89
		c		0.000	8,000	166,215	0.088	2.78
TIO	120.88-100.00	A	1.692	0.000	E,000	158.314	0.000	2.58
		В		0.000	0.080	167,721	0.000	3.86
		C		0.008	0.000	165.832	0.000	2.67
Tii	100,00-88.00	A	1.658	0.000	0,000	157.996	0.000	2.54
		В		0.000	0.000	167,261	0.000	3.81
		C		0.000	0.000	165.379	0,000	2.63
Tt2	89.00-60.00	A	1.617	0,000	0.000	157,608	0.080	2.49
		В		0.000	0.000	166.698	0.000	3,76
		C		0.000	0.008	164.826	0.000	2.58
T13	60.00-10.00	A	1.564	0.009	0.000	157,103	0,000	2.44
		В		0.000	0.000	165,967	0.000	3.70
		С		0.000	0.000	164.107	0.000	2.51
T14	40.00-20.00	A	1.486	0.000	8.000	156,369	0.008	2.35
		B		0.000	0.000	164,903	0.008	3.60
		c		0.000	0.000	163.062	0.000	2,42
T15	28.00-0.00	A	t.33t	0.000	0.000	154.914	0.000	2.18
		В		0.000	0.000	162.795	0.000	3.41
		C		8,000	6.000	160.989	0.080	2.24

		F	eed Line	Center o	f Pressui
Section	Elevation	CP <sub>x</sub>	CP <sub>E</sub>	CP <sub>x</sub> Ice	CP <sub>2</sub>
	fl	in	ln	ín	tra
TI	290.00-280.00	2.8308	-1,3642	2.3997	-0.6638
T2	280.00-260.00	0.5133	-1,2398	0.5583	-0.9403
T3	260.00-240.00	0.8221	-0.4092	0.1940	0.1284
T4	240.00-220.00	1.2414	-0.6358	0.2520	0.1633
T5	220.00-200.80	1.4829	-0.7569	0.2752	0.1953
T6	200.00-180.00	1.7342	-0.8830	0.3160	0.2385
77	180,00-160,00	1,9991	-1.0160	0.3587	0.2829
TB	160.00-140.00	2.2423	-1.1380	0.3963	0.3229
T9	140.00-120.00	2,4774	-1.2559	0.4314	0.3605
T10	120.00-100.00	2.7111	-1.3732	0.4638	0.3968
Tit	100.00-00.00	2.9562	-1.4962	8.4989	0.4314
T12	80,00-60,00	3.1735	-1.6052	0.5286	0.4621
T13	60.00-40.00	3,4132	-1.7255	0.5552	0.4809
Tt4	40.00 - 20.00	3.6305	-1.8345	0.5741	0.5065
T15	20,00-0,00	3.83t2	-1.935t	0.3708	0.4977

tnxTower	Job 240568	Page 12 of 64
Valmont 1545 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Tower	Feed Line	Description	FeedLine	K.	K.
Section	Record No.	•	Segment Elev.	No Ice	Ice
T4	9	Feedline Ludder (Af)	248.00 220.00 - 240.00	1.0000	1.8000
T5	1	Safety Line 3/8	200.00 - 220.00	0.6000	0.3863
T5	2	Lighting power cord	200.00 - 220.00	0.6080	0.5863
T5	3	LDF7-50A (t-5/8 FOAM)	200,00 - 220,00	0.6000	0.5863
T5	1	LDF7-30A (1-5/8 FOAM)	200.00 - 220.00	0.6008	e.5863
75	6	LDF7-50A (1-5/8 FOAM)	200.00 - 220.00	0.6000	0.3863
T5	7	Feedline Ladder (AI)	200.00 - 228.00	1,0000	1.0000
T3	8	Feedline Ladder (Af)	200.08 - 220.00	1,0080	1.0000
T5	9	Feedline Ladder (Af)	200.00 - 220.00	1.0000	1.0000
T6	2	Safety Line 3/8 Lighting power cord	180,00 - 208,00 180,00 -	0.6000	0.6000
Т6	3	LDF7-50 A (1-5/8 FO AND	200.00	0.6000	0.6000
Т6	4	LDF7-30A (1-5/8 FDAND	200.00 100.00 -	0.6000	0.6000
Т6	6	LDF7-50A (1-5/8 FOAM)	200.00 180.00 -	0.6000	0.6000
T6	7	Feedline Ladder (Af)	200.00 180.00 -	1.0000	t.0000
Т6	o	Feedline Ladder (Af)	200.00 180.00 -	1.0000	1.0000
Т6	9	Feedline Ladder (Af)	200.00 180,00 - 200,00	1.0000	1.8000
77	t	Safety Line 3/8	160.00 -	0.6000	0.6000
T7	2	Lighting power cord	160.00 -	0,6000	0.6000
17	3	LDF7-50A (t-5/8 FOAM)	168.00 - 180.00	0.6000	0.6000
77	4	LDF7-50A (1-5/8 FDAM)	160,00 -	0.6000	0,6000
77	6	LDF7-50A (1-5/8 FDAM)	160.00 - 180.00	0.6800	0.6000
77	1	Feedline Ladder (Af)	160.00 - 180.00	1.0008	1.0000
17	-	Feedline Ladder (Af)	160,00 - 180,00	1.0000	1,0000
T7 T8	9	Feedline Ladder (Af)	160.00 - 180.00	1,0000	1.0000
TO	2	Safety Line 3/8	140.80 - 160.00	0.6000	0.6000
TB	3	Lighting power cord LDF7-50A (1-5/8 FOAM)	140.90 - 160.00	0.6000	0.6000
TR	4	LDF7-50A (1-5/8 FDAM)	140.00 - 160.00 140.00 -	0.6008	0.6000
TE	6	LDF7-50A (1-5/8 FOAL)	160.00	0.6000	0.6000
TE	7	Feedline Ladder (Af)	160,00 140,00 -	1.0000	1.0080

tnxTower	Job 240568	Page 13 of 64
Valmont 1545 Pidzo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Phymouth, IN Phone: 574-936-4211	Client American Tower Corp.	Designed by SKK

Tower	Feed Line	Description	Feed Line	Κ.	K.
Section	Record No.	Description	Segment Elev.	No Ice	les
Decimin	RELUITANA		160.00	170702	
T8	8	Feedline Ladder (Af)		1.0000	1.0008
18	•	Feedine Lagger (Al)	160.00	1.0000	1.0002
TS	او	Feedline Ladder (Af)		1,8000	1,8000
1 "	"	remine Liner (Al)	160.00	1.0000	1.2000
T9	1	Safety Line 3/8	120.00 -	0.6000	0.6000
	' '	Salety Line 50	140,00	0.0000	0.0000
19	2	Lighting power cord	120.00 -	0,6008	0.6008
	1	anguang pener non	148,88		
l re	3	LDF7-50A(1-5/6FOAM)		0.6800	0,6008
1 "1	- 1		148,80		
19	4	LDF7-58 A (1-5/8 FOAM)	120.00 -	0.6000	0,6008
1 "	1		140.00		
19	6	LDF7-58A (1-5/8 FOAM)	128.00 -	0.6080	8.600g
1 1			148.08		
19	7	Feedline Ladder (Af)	128.00 -	1.0000	1.0000
i 1			140,08		
19	8	Feedline Ledder (Af)		1.0000	1,8000
1 1			140.08		
19	9	Feedline Ladder (AI)	120.80 -	1.0000	1,0000
11			148.80		
T18	1	Sefety Line 3/8	100.80 -	0,6000	8.6000
	اء	*****	120.00	0.6000	0,6000
TIS	2	Lighting power cord	120.00	0.0000	0.6000
I	3	LDF7-50 A (1-5/8 FOAM)	100.80 -	0.6008	0.6000
T10	3	LDF 1-30A (1-3/6 FOAN)	120.00	0.0008	0.0000
T10	4	LDF7-50 A (1-5/1 FOAM)		0.6000	0,6000
1 110	1	LDF /-SUK(1-SEF ORKI)	128.00	0.0000	0,000
T18	б	LDF7-58A (1-5/8 FOAM)		8.6008	0.6008
l ''*'	។	LUT 1-38X (1-3/81 OAKI)	120.08	2,000	0.000
TIS	7	Feedling Ladder (Af)		1,0800	1,8000
I '''	1		128,00	******	
T10	8	Feedling Ladder (Af)	108.88 -	1,0000	1,0000
	1		120.00		
T10	9	Feedline Ladder (Af)	I88.00 -	1,8000	1.0008
			120.08		
T11	1	Safety Line 3/8	80.00 - 100.00	8.6000	8.6000
Tii	2	Lighting power cord	88.00 - 100.08	8.6000	0.6000
T11	3	LDF7-58A (1-5/8 FOAM)		0.6000	8.6000
T11	4	LDF7-50A (I -5/8 FOAM)	80,00 - 188,08	0.6000	8,6000
T11	6	LDF7-58A (1-5/8 FOAM)		0.6000	0,6000
Til	7 8	Feedline Ladder (Af)		1.0000	t.8000
T11	8	Feedline Ladder (Af)		1.0000	1,0000
T11	9	Feedline Ladder (Af)		1.0000	1.0000
T12	Ī	Selety Line 3/8	60.00 - 80.00	0.6000	0.6000
T12	2	Lighting power cord	60.00 - 80.00	0.6800	8,6000
T12	4	LDF7-50A (1-5/8FOAM)	60.00 - 80.00	0.6000	0.6000
T12	6	LDF7-50A(1-5/8FOAM) LDF7-58A(1-5/1FOAM)	60.00 - 40.00	0.6000	8,6000
T12	7	Feedline Ladder (Af)	68,00 - 80.80	1.0000	1,0000
T12	ś	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T12	9	Feedline Ladder (Af)	68.00 - 80.88	1.0000	1.0000
Tia	í	Safety Line 3/8	40,00 - 68,00	0,6000	0,6000
T13	2	Lighting power cord	40.00 - 68.00	0.6808	0.6080
T13	3	LDF7-58 A (1-5/8FOAM)	40.00 - 68.00	0.6000	0.6000
T13	4	LDF7-30 A (1-5/8 FOAM)	40,00 - 60,00	0.6808	0.6000
T13	6	LDF7-50 A (1-5/8 FOAM)	40.80 - 60.00	0,6000	0.6000
T13	7)	Feedline Ladder (Af)	40.00 - 60.00	1,0000	1.0000
T13	8	Feedline Ladder (Af)	40.00 - 68.00	t.0000	1.0000
T13	9	Feedline Ladder (Af)	48,00 - 60.00	1,0880	1.0000
T14	1	Safety Line 3/8	20.00 - 48.00	0.6000	0.6008

tnxTower	Job 240568	Page 15 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Dale 13:31:40 12/10/13
Plymouth, IN Phone: 574-93 6-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section Designation	Area	Area Ice	Self Weight	les Weight	Equiv. Diameter	Equiv. Diameter	Leg Area
Designation		100	n rigin		2-14-14-14-1	Ice	
	(n²	in²	K	K	fri	tn	int
#12ZG -1.75" - 1.00"	2200.6087	5829,6191	0.84	2.29	7.6410	20.2417	7.2158
connHBO-Trans							
(Pirod 229588)							
#12ZG -1.75* - 1.00*	2200.6087	5819,5175	0.24	2.28	7.6410	20,2067	7.2158
canaHBD-Trans							
(Pirod 2295 83)							9.4248
#12ZG -2.00" -	2321,4820	5880,4093	0.99	2.31	8.8607	20.4181	9,4248
0,875"							
connHBD-Trans							
(Pirod 288332) #12ZG -2.25" -	2457,8620	3940.0560	1.17	2.34	8.5315	20.6252	11,9282
0.875" conn. (Pirod	2437,8020	3940.0360	1.17	2.34	0.2313	20.0232	11.5101
208334)							
#12ZG -2.25" -	2457.8620	5926.1285	1.17	2.33	8,5315	20.5768	11.9282
0.875* conn. (Pirod	2437.8020	3926.1263	2.27	2.00	0.5515	20.5704	11.7442
208334)							
#1270 - 2.58* -	2597,2622	5982.1026	1.37	2.35	9.0183	20,7712	I 4.7262
0.175" conn. (Pirod			1.27				
2083353							
#12ZG - 2.50" -	2597,2622	5963.2118	1.37	2.33	9.0183	20.7856	14.7262
0.875" court (Pirod							
208335)							
#12ZG - 2.75" -	2816.7341	6012.0820	1.63	2.35	9.7883	20.8753	17.8187
0.875" conn. (Pirod							
208337)							
#12ZG - 2.75" -	2816.7341	5982.0189	1.63	2.32	9,7803	20.7789	17,8187
0.875" conn. (Pirod							
20 8337)							21.2058
#12ZG -3.00" -	2971,4468	6010,2416	1.87	2.31	10.3175	20.8689	21.2058
0.875" consTrans							
(Pirod 288336)	0071 4160	enna ama	1.87	2.23	10.3175	20.5673	21.205R
#12ZCI -3.00° -	2971.4460	5923.3735	1.87	2.23	10.3173	24.3013	21.2038
8,875" connTrans (Pirod 208338)							
(PIFOd 208338)							

				-
Tower	Pres	sures	s - N	o ice

Section Elevation	z	Κz	qı	Ao	F	A,	Ag	Air	Leg %	C <sub>s</sub> A <sub>s</sub> In	C <sub>A</sub> A <sub>A</sub> Out
A	я		puf	ft <sup>2</sup>	:	r <sub>f</sub> ,	ft²	ft <sup>2</sup>		Face ft <sup>2</sup>	Face ft <sup>2</sup>
T1	285.00	1.578	28	52,396	A	4.625	4.792	4,792	18.89	B.000	0.000
290.00-280.00					В	4.625	4.792		18.89	21,190	0,000
					l c	4,625	4,792		50.89	0.375	0,000
12	270,00	1,56	27	187,580	Ā	7,169	15,000	15,000	67.66	60.968	0.000
208.00-260.00					В	7.169	15,088		67.66	83.020	8.800
				i .	Ιĉ	7,169	15,008		67.66	21.070	0.000
13	250,00	1.535	27	129.283	Ā	7,669	18.574	18.574	78.78	81.200	0.000
260.00-240.00					В	7.669	18.574		70,71	136,480	0.000
		1			c	7.669	18,574		70.78	82.030	0.000
T4	230.00	1,500	27	171.054	Ā	11.36t	22,120	22.120	66.07	81,280	0.00
240.00-220.00					В	11,361	22.120		66.07	154.300	0.000
					Ιċ	11,361	22.120		66.07	82,030	9,000
TS	218.00	1.41	26	222.944	Ā	12.313	25.512	25.512	67.45	81.280	8.000

tnxTower	Jeb 240568	Page 14 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN  Phone: 574-936-4221	Ctlent American Tower Corp.	Designed by SKK

14					
Tower	Feed Line	Description	FeedLine	K,	Κ,
Section	Record No.	•	Segment Elev.	No lee	lca
T14	2	Lighting power cord	20.00 - 40.00	0.6000	6,6000
T14	3	LDF7-58A (1-5/8 FOAM)			0.6000
T14	4	LDF7-58 A (1-5/8 FOAM)	20.00 - 48.00	0.6000	0.6008
T14	6	LDF7-58A (1-5/8 FOAM)		8,6000	0,6000
T14	7	Feedline Ladder (Af)	20.80 - 48.00	1.0808	1.0000
T14	8	Feedline Ladder (Af)	20.88 - 48.88	1.0000	1.0000
T14	9	Feedline Ladder (Af)	20.08 - 48.08	1.0000	1.0008
T15	il	Safety Line 3/8	8.80 - 20.00	8.6800	0.6008
TL5	2	Lighting power sord	B.80 - 20.80	8.6000	0.6000
T15	3	LDF7-50 A (1-5/8 FOAM)		0.6808	8,6000
T15	4	1.DF7-50A (1-5/8 FOAM)	0.00 - 20.08	0.6800	8.6000
T15	6	LDF7-50 A (1-5/8 FOAM)	0.88 - 28.00	8.6000	0.6008
T15	7	Feedline Ladder (Af)	8.08 - 20.00	1.8000	1.0000
T15	i i	Feedline Ladder (Af)	8,08 - 28.00	1,8000	1.0000
T15	اه	Feedline Ladder (Af)	8.88 - 20.08	1.0888	1.8008

Description	Face or Leg	Offici Typs	Offiets: Horz Laterul Ve ti	Azimuth Adjustment	Placement		C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			ft ft ft	•	ft		ſî	ſî²	K
Beacen	A	From Leg	0,80	0.0088	290.08	No Icc	2.40	2.40	0.07
		-	0.88			1/2* Ice	2.67	2.67	0.18
			4.39			1° tcc	2.96	2.96	8.12
eon Extender (4') 803062	A	From Leg	6.80	0.0080	290.80	No Ice	1.11	1.11	0,03
		-	0.00			1/2" Ice	1.32	1.32	8.04
			2.21			l' Icc	I.54	1.53	0.85
1/2° x 4' lightning rod	C	From Log	0,00	0.0000	290.00	No Icc	0.20	0.28	0.01
			6.00			1/2" Icc	0.60	0.60	0.82
			2.00			1º Ice	0.89	0.89	0.02
ATC Loading	c	None		0,0080	285.80	No Ice	115.00	115.00	2.00
	-					1/2" Ice	135.00	135.00	3.00
						1º les	155.80	155.00	4.00
ATC Loading	C	None		0.0088	275.00	No lee	115.00	115.00	2.00
1110 20-11119	-					1/2" Ice	135,00	135.00	3.00
						1º Ice	155.00	155,00	4.00
ATC Loading	C	None		8.0080	265.00	No Ice	115.00	115.00	2.00
ra o coming	-	4.000		-,-300		1/2" lce	135.00	135,00	3.00
						l' Ice	155.0D	155.00	4.00
ATC Loading	С	None		0.0808	255.00	No Ice	115.08	115.00	2.00
ALC LANGUING	-	TACHE		0.000		I/2" Ico	135,00	135.00	3.00
						1" ice	155.08	155.00	4.00

Truss-	Lea	Pro	ne	rties

tnxTower	Jeb 240568	Page 16 sf 64
Valmont 1545 Piden Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymuuh, IN Phone: 574-936-4221 FAX;	Cilent American Tower Corp.	Designed by SKK

Section	r	K <sub>2</sub>	$q_i$	Ao	F	A,	Az	Aue	Leg	CAL	CAL
Elevation					a				96	In	Out
1					c					Face	Face
f I	ft		psf	fi		ft <sup>2</sup>	ft³	ft <sup>2</sup>		P,	
228.88-208.88					В	12.313	25,512		67,45	154.300	0.080
}					C	12313	25.512		67.45	82.830	0.080
76	190,00	1.449	26	262.944	A	13.727	25.512	25.512	65.02	81,288	0.000
208.00-180.80				!	В	13,727	25.512		65.82	154,300	0.000
					C	13.727	25.512		65.02	82,030	B.000
17	170,08	I.415	25	303,361	A	11.332	26.914	26.914	70.37	81.280	8.000
180,00-160,00					В	11.332	26.914	1	70.37	154.300	0.000
					C	11.332	26.914		70.37	82.030	0.000
TB	150.00	1.378	24	343.778	A	11.896	28,486	28.486	7B.54	81.288	8.000
160.08-140.00					В	11.896	26,486	l i	7B.54	154.308	0.000
1					C	11.896	28,486		70.54	82.038	0.000
19	130,08	1.337	24	383,778	A	14,599	28,486	28.486	66.12	81.288	8.800
140,00-120,00					В	14,399	28,486		66.12	154.300	0.080
1					c	14.599	28,486		66.12	82.030	8.880
Tio	110.00	1.291	23	424,196	A	15.375	38,111	30.111	66.20	81.280	8.000
128.00-108.88					В	15,375	30,11t		66.20	154.308	8,800
					c	15,375	30.111		66.20	82.830	8,000
Til	90.00	1.238	22	464.196	l a l	16.198	38.111	30.111	65.02	81.280	0.000
100,00-80,80					В	16.198	30.111		65,82	154.380	8.080
					l c	16.198	30.111		65,82	82.030	0.080
T12	70.00	1.174	21	504.613	I A	17.860	32.655	32.655	65.68	81.280	8.000
80.08-68.08					В	17,860	32.655		65.68	154,308	8.000
					c	17.060	32,655		65,68	82.030	0,008
T13	50.00	1.894	19	544.613	Ā	17,958	32.655	32.655	64.52	\$1.288	0.800
60.00-48.80					В	17,958	32,655		64.52	154,300	8.080
11.00					c	17,958	32,655		64.52	82.030	0.000
T14	30.00	0.982	17	585.830	Ā	18.884	34,449	34,449	64.59	81.280	8.000
40.08-20.80	20.00		•••		n	18.884	34,449		64.59	154.300	0.808
10.00		i .			Č	18,884	34,449		64,59	82,038	8,008
T15 20.00-0.00	10.80	0.85	15	625,030	Ā	22.678	34,449	34,449	60.31	81.280	0,000
	20.20	3.03	. "	1	В	22,678	34,449	- 1.7.2	60,31	154,300	8.008
1				l	č	22.678	34,449	i i	60.31	82.030	0.800

## Tower Pressure - With Ice

 $G_H = 0.85$ 

Section Elevation	2	K <sub>2</sub>	q <sub>t</sub>	1,5	A <sub>0</sub>	F	Ar	Ak	Air;	Leg %	C <sub>A</sub> 4 <sub>A</sub> In	C <sub>A</sub> A <sub>A</sub> Out
f	<sub>ft</sub>		puf	in	ft.t		<sub>fi</sub> z	fr.	fi²		Foca ft <sup>2</sup>	Face ft <sup>1</sup>
TI	285.00	1.578	3	1,8609	55,497	Ā	4.625	19.601	10.995	45.38	0.000	0.000
290.00-288.80				1		В	4.625	19,601	- 1	45.38	44.570	0.000
	i		l Ì	- 1		C	4.625	19.601	- 1	45.38	4.097	0,000
T2	278.80	1.56	3	1,8509	113.670	Α	7.169	40.607	27.339	57,22	I 19.863	0.000
280.00-260.00			1	- 1		В	7,169	48,607	i	57.22	168,961	0.000
			l I			c	7,169	40,607	I	57.22	48.108	E.000
T3	250,08	1.535	3	1.8367	135,413		7.669	44.925	30,839	58.64	159.684	0.000
260.00-248.00			1			В	7.669	44,925		58.64	169,469	0.000
	- 1		1	1		С	7.669	44,925	1	58.64	167.780	0.080
T4	238.00	1.508	3	1.8214	177,133	A	11,361	50.837	34.203	55.12	159,539	0.000
240.00-220.00						Ð	11,361	50.837	- 1	55.12	169.493	0.000
	- 1			- 1		c	11,361	50,837	- 1	55,12	167.575	0.000
TS	218,80	1.48	3	1.8049	228,968	Ā	12.313	82,401	67,505	71.36	159,383	0.000
220.00-280.00	240,00		_ ~}			B	12.313	82.401		71.36	169.267	0.000
	- 1		1 1			c	12.313	82,401	I	71.36	167.353	0,000

tnxTower	Job 240568	Page 17 of 64
Valmont 1545 Pid≈o Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4211 FAX:	Client American Tower Corp.	Designed by SKK

Section Elevation	z	K <sub>z</sub>	q,	fz	10	F	Ar	As	Ave	Leg	C <sub>A</sub> A <sub>A</sub>	C <sub>A</sub> A <sub>A</sub> Out
			1 1		ı	1 -	l i	- 1	- 1		Fore	Face
	ft		psf	tn	ri,		<sub>ft</sub> 2	[ دم	ft l		ft	n2
T6	190.00	1.449	3	1.7870	268,908	A	13.727	83.821	67,468	69.16	159.213	0.00
200,00 180,00			1 1		l 1	ĺВ	13,727	83,821		69.16	169.021	8,04
- 1			1	1		l c	13.727	83.821		69.16	167,111	0.08
T7	170.00	1.415	3	1.7672	309,259	A	11.332	81.525	68,174	73.42	159,026	0.00
120.08-160.00						В	11.332	81,525	1	73.42	168,751	0.00
. 1		1	1			C'	11.332	81.525	1	73.42	166.B45	0.00
78	158.00	1.378	3	1.7452	349.603	A	11.896	82.705	68,865	72.80	158.818	8,0
160.00-140.00			l 1		1	В	11.896	82,705	- 1	72.80	168,450	0.0
- 1	i		1			С	11.896	82,705	1	72.80	165.549	0.0
T9	130.00	1,337	3	1,7204	389,520	A	14.599	\$3.856	68.704	70.35	158,583	0.0
140.00-120.00						В	14.599	\$3,056	- 1	70.35	168.110	0.8
				- 1		C	14.599	83.056	i	70.35	166.215	8.0
TID	110.00	1.291	3	1.6919	429.842	A	15.375	84.217	69.353	69.64	158.314	8,01
120.08-100.00			- 1			В	15.375	84.217		69.64	167,721	0.0
	- 1		- 1	J	1	c	15.375	84,217	1	69.64	165,832	8.0
TII	90.00	1.238	2	1.6583	469.730	A	16.198	84,482	69,134	68.67	157.996	8,00
100.00-80.001		- 1	- 1	- 1	- 1	В	16,198	84,482		68.67	167,261	8,00
- 1		- 1	- 1	- 1	- 1	c	15,198	84,482	- 1	68,67	165.379	8.00
12 80.00-60.00	70.00	1.174	2	1.6171	510.010	Α.	17,060	85.465	69,700	67.98	157,608	8.00
)	1	1	- 1	ì	1	В	17.060	85.465	1	67,98	166,698	8,8
- 1		- 1	i	- 1		c	17,060	85,465		67.98	164.826	0.00
13 60.00-40.00	50.00	1.094	2	1.5636	549.832	A	17.958	85.397	69.352	67.10	157,103	8.00
- 1	ļ	- 1				вΙ	17.95B	85,397	- 1	67.10	165,967	0.00
1	- 1	í	l	ì		c l	17.958	85,397	- 1	67,10	164,107	0.00
14 40.00-20.00	30.00	0.982	2	1.4858	589.989	۸I	18.884	85.712	69.679	66.62	156.369	0,00
	- 1	- 1			1	в	18.884	85.712		66.62	164.903	0.00
	- 1	- 1		1	- 1	Ĉ i	18,884	85,712	- 1	66.62	163,062	0.00
15 28,00-0.00	10.00	0.85	2	1.3312	629,473	A	22,670	83,761	68,672	64.12	154,914	0.00
1			1		- 1	В	22.670	83,761		64.52	162,795	0.00
			- 1	- 1		cl	22,670	83,761		64.52	160,989	0.00

Ī	o	W	e	r	P	re	25	s	u	r	e	•	•	S	e	n	1	c	e

G.,	=	o	85

Section	z	K <sub>2</sub>	q <sub>t</sub>	Ao	F	Ar	Az	Aug	Leg	Call	CAL
Elevation				Į	0				96	In	Out
					٦,					Face	Face
ft	f		psf	ft <sup>2</sup>	8	ft <sup>2</sup>	1,	ft <sup>1</sup>		ft	'n
TI	285.00	1.578	12	52.396	A	4.625	4.792	4.792	50.89	0.000	0.000
290.08-280.00	í			l	В	4.625	4.792		50.89	21.190	0,000
1					c	4.625	4.792		50.89	0.375	8,000
T2	270.00	1.56	12	107.500	A	7,169	15.000	15.000	67.66	60.960	8.000
280.00-260.00					В	7.169	15,000		67,66	83.020	0.000
i i					C	7.169	15,000		67.66	21.070	0,080
13	250.00	1.535	12	129.283	Α.	7.669	18.574	18.574	70,78	\$1.280	8,000
268.00-240.80	J				В	7.669	18,574	- 1	70.78	136,480	0.000
					c	7.669	18.574		70.78	82.030	8,000
T4	230.00	1,508	12	171.054	A	11.361	22,120	22.120	66.07	Z1.290	0.000
240.00-220.00					В	11.361	22,120	- 1	66.07	154.300	0.000
- 1		i			C	11.361	22,120	- 1	66.07	82.030	0.000
T5	210.00	1.46	12	222,944	A	12.313	25.512	25.512	67.45	81,280	0.000
220.00-200.00	- 1	- 1	1		В	12313	25.512		67.45	154.300	0000
ı	- 1	- 1	i		C	12.313	25.512		67,45	82.030	0.000
T6	190.00	1.449	11	262,944	A	13.727	25.512	25.512	65,02	E1,250	0.000

tnxTower	Job 240568	Page 19 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	92	D,	$D_{\mathbf{A}}$	As	F	W	CirL
Elevation	B'eight.	Weight	0						1 -		ĺ	Fece
	_	_	E	1	ł	psf .		ĺ	1	1		1
fl	K_	X.			İ				ית	K	plf	
T8	1.69	4.62	A	0,117	2.895	24	1	1	23.372	4.45	222.32	В
160.08-140,00			В	0.117	2.895		1	1	23.372	l	1	1
			C	8.117	2,895		t	1	23.372	!		ì
T9	1.69	5.32	A	0.112	2.915	24	1	1	26.008	4,48	223.90	В
140.00-120.00			В	0,112	2.915	1	1	l t	26.008			
			C	0.112	2.9t 5		1	1	26.008		i	Į.
T10	1.69	6.01	ΙΑ.	8.t07	2.935	23		1	27,367	4.41	220.52	В
120.00-100.00			В	8.107	2,935		1	1	27.367		l	1
ľ		1	c	0.107	2.935	1 1	1	1	27,367		į.	l
Til	1,69	6.11	A	8.1	2,965	22	1	t	28.090	4.28	214.14	в
100.00-80,00			В	0.1	2.965		1	1	28.090			l
			c	0.t	2,965		1	1	28.090			ĺ
T12 }	1.69	7.02	A	0.099	2.97	21	1	1	29.94t	4.16	288.06	В
80.00-60.08			В	0,099	2.97		1		29.941	l	1	
ļ			c	0.099	2.97		. 1	1	29,941			Į.
T13	1.69	7.13	A	0,093	2.993	19	1	1	30.760	3.93	196.40	В
60.00-40,08			В	0.093	2.993		1	1	30,760			
1	- 1		c	0.093	2.993		1	1	30.760			
T14	1.69	7.96	A	0.091	3	17	1		32,364	3.60	180.08	В
40.00-20.00			В	0.09t	3		1	1	32,364			_
1			C	190.0	3		1	1	32.364			
T15	1.69	8.45	٨	0.091	2.999	15	1	1	36.153	3.26	163.05	В
20,00-0.00	- 1		В	0.091	2.999	ĺ	1	1	36,153			-
- 1	- 1	1	c	0.091	2.999		- 11	1	36,153			
Sum Weight:	22.98	67.24					- 1	OTM	8465,48	58.78		
- 1			1				ĺ		kip-ft			

Section	Add	Self	F	-	C,	9,	D <sub>f</sub>	D <sub>8</sub>	Ar	F	W	CtrL
Elevation	Weight	B'eight	a		1 1			- 1				Face
- 1	- 1		e l			psf	. 1		- 1			
ft	K _	K							fi²	ĸ	<i>plf</i>	ı
Ti	0.12	0,34	A	0.18	2.665	28	0.8	1	6.437	0.72	72.03	c
90,00-280.00			В	0.18	2.565		0.8	1)	6.437			l
- 1	ĺ		C	0.18	2.665	1	6.8	1	6.437			[
T2	0.93	1.01	٨١	0.206	2.575	27	0.8	1	13.768	2.73	136,50	l c
80.00-260.00	i		В	0.206	2.575		0.8	1	13.768	- 1		l
l l			C,	0.206	2.575	,	0.8	t l	13.768			ļ .
73	1.62	1.28	A	0.203	2.5E6	27	8.8	1]	15.358	4.10	204.88	C
60.00-240,00	1		В	0.203	2.5E6	1	0.8	1	15.358			l
			c l	0.203	2.586		0, 8	1	15,358			Ι.
T4	1.69	1.73	^	0.196	2.61	27	0.8	11	19.164	4.47	223.33	С
40.00-220.00	- 1		В	0.196	2.61		0.8	11	19.164			
TS			C	0.196	2.61		0,8	11	19.164			
20,00-200.00	1.69	3.09	4	0.17	2.7	26	0.8	1	20,794	4.52	225,89	C
20.00-200,00	1		B	0.17	2.7	- 1	8.0	: 1	20,794	i		
75	1.69	3,15	7	0.17 8.149	2.774	26	8.0 8.0	: 1	20.794	1		
00.00-180.08	1.05	3.13	ĥ	0.149	2.774	25	0.8	- :1		4.51	225.43	С
00.00.180.08	- 1		c	0.149	2774	l	0.8	:1	21,653	l	- 1	
17	1,69	4.03	الما	0.145	2.861	25		: 1	20.018		217.20	c
80.00-160.00	1.05	4.03	a l	0.126	2.861		8.0 B.E	- :1	20.018	4.35	217.25	L C
-0.00-100.00	l.		c	0.126	2.861	- 1	8.0	: 1	20.018	- 1		

tuxTower	Job 240568	Page 18 of 64
Valinont 1545 Pidea Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAY-	Client American Tower Corp.	Designed by SKK

Section		K <sub>2</sub>	g,	Ao	F	Ar	Az	Aug	Leg	CAL	C444
Elevation		i		Į	1 4				96	In	Out
i i		1 1			c		_			Face	Face
ft	ft		p#f_	ft <sup>2</sup>		fl²	ft <sup>1</sup>	ft <sup>3</sup>		fl²	ft <sup>2</sup>
200.00-180.00		1 1			В	13.727	25.512		65.02	154.300	0.00
i					C.	13.727	25.512		65.02	82.030	0.00
17	170.00	1.415	11	303.361	A	11.332	26,914	26.914	70.37	B1.290	0,0
180,00-160.00					В	11.332	26.914		70.37	154.300	0.0
į		[			[ C	11.332	26,914		70.37	82,030	0.00
TB	150.00	1.378	11	343.778	Λ	11.896	28,486	28.486	70.54	81,280	0.0
160.00-140.00		1 1			В	11.896	28,486		70.54	154.300	8.0
1					C	11,896	28,486		70.54	82.030	0.0
T9 [	130.00	1.337	18	383,778	A	14.599	28.486	28.486	66.12	81,290	8.0
140.00-120.00		!			В	14.599	28,486		66.12	154,300	0.00
- 1					C	14.599	28.486	ı	66.12	82.030	8.0
T10	t10.00	1.291	10	424.196	A	15.375	30.111	30.111	66.20	81.280	0.0
120.00-100.00	- 1	1			В	15,375	30.111		6 6.20	154.308	0.00
1					C	15.375	30.111		66.20	\$2.030	0.0
TH	98.00	1.238	10	464.196	A	16,198	30.111	30.111	65.82	81.290	0.00
100.00-80.80		1	- 1		В	16.19E	30.111	- 1	65.02	154.300	8.00
- 1	- 1	- 1	- 1		C	16.198	30.111	- 1	65.82	82.030	8.0
T12	70.00	1.174	9	504.613	A	17.060	32.655	32.655	65.68	81.280	8.00
80,00-60,00	Į		- I		В	17,060	32.655	ι	65.68	154,300	0.00
	- 1	1	- 1		C	17.060	32.655	- 1	65.68	\$2.030	0.00
T13	50.00	1.094	9	544.613	A	17,95g	32.655	32.655	64.52	81.280	8.00
60.00~40.00		- 1	- 1		В	17.958	32.655	- 1	64.52	154.300	8,00
	1	J			C	17.95B	32.655		64.52	82,030	0.00
T14	30.00	0.982	8	585,030	A	18.884	34.449	34.449	64.59	81.280	0,00
48.80-20.00		i	- 1		В	18.834	34.449	- 1	6459	154,300	8.00
		- 1	- 1	1	c	18.884	34,449	i	64.59	82.030	0.00
F15 20.00-0.00	10.00	0,85	7	625,030	A	22,670	34,449	34.449	60.31	\$1,280	0.00
	- I	- 1	i		В	22.670	34.449		68.31	154.300	0.00
- 1	- 1				сI	22.678	34,449		60.31	82,030	0.00

Tower	Forces	- No Ice	- Wind	Normal	To Face

Section Elevation	Add Weight	Self Weight	F	•	C,	g <sub>t</sub>	D,	D <sub>A</sub>	Ae	F	¥	CtrL
Theyaribu	" PIE	17 Eight	1									Face
ft	K	κ	:			psf			ft³	ĸ	plf	
T1.	0.12	0.34	Ā	0.18	2,665	28	1	i	7.362	0.78	77.85	В
290.00-250.00			В	8.18	2.665		1	1	7.362			
- 1			c	0.18	2.665		1	1	7.362			
T2	8.93	1,01	A	0.206	2.575	27	1.	1	15.202	2.82	140.82	В
280.00-260.00	i		В	0.206	2575		1	1	15.202	ļ		
i	i		c	0.206	2.575		1 [	11	15,202	ĺ		
13	1.62	1.28		8.203	2.586	27	1	11	16.892	4.19	289, 45	В
260.00-240.00			В	8.203	2.586	- 1	1	11	16.892			
- 1	J		c	0.203	2,586		1	1	16.892	ı		
T41	1.69	1.73	A	0.196	2.61	27	1	11	21,436	4.68	230.03	В
240.00-220.00			В	0,196	2.61		- 1	11	21,436			
J			C	0.196	2.61	- 1	11		21,436	1		
T5 1	1,69	3.09	A	0.17	2.7	26	11	1	23,257	4.67	233.26	В
220.00-200.00	1		В	0.17	27	- 1	1	1	23,257			
	I		C	0.17	2.7	- 1	t l	11	23,257	- 1		
T6	1.69	3.15	Ā	0.149	2774	26	11	il	24.399	4.67	233.78	В
200,00-180.00	- 1		В	0.149	2.774	1	11	- 1	24.399			_
	i		c l	0,149	2,774		1	11	24,399		- 1	
T7	1.69	4.03	Ā	8.126	2.861	25	i	1	22,284	4.48	224.13	В
80.00-160.08	- 1		вĺ	8,126	2.86t	-1	1.	il	22.284	- 1	[	
	1	- 1	ēΙ	0,126	2.861	i	il	i	22.284		- 1	

tnxTower	Јоb 240568	Page 20 of 64
Valmant 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13;31;40 12/10/13
Plysioidh, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	$q_{\epsilon}$	Dr	D <sub>a</sub>	As	F	W	Ctr.
Elevation	B'eight	Weight	а	ľ								Fac
n	ĸ	ĸ	:		1	₽₹			ηż	ĸ	plf	ĺ
TE	1,69	4.62	À	0.117	2.895	24	0.8	1	20,993	4.30	215.21	l c
160.00-140.00			В	0.117	2.895		0.8	1	20,993			1 -
- 1	i i		C	0,117	2.895		8.5	1.	20,993			
T9	1.69	5.32	A	0.112	2.915	24	0.8		23,088	4.31	215.37	Ιc
140.00-120.00	- 1		В	0.112	2915		0.8	t	23.0B8			1 -
	i		c	0.112	2.915	1	0.8	1	23,088			ĺ
Tio	1.69	6.01	A	0.107	2.935	23	O.B	1	24.292	4.24	211.79	С
20.00-100.00	- 1		В	0,107	2.935		0.8	1	24.292			
			C	8.107	2.935		8.8	1	24.292			
TII	1.69	6.11	٨	0.1	2.965	22	0.8	t	24.851	4.10	205.24	C
100.00-E0.00	ì		В	0.t	2.965		0.8	1	24.851			
			С	0.1	2.965		2.0	1	24.851			
T12	1.69	7.02	٨	0.099	2.97	21	0.8	1	26.529	3.98	199.15	c
80,00-00.08	1		В	0.099	2.97	1	0.8	1	26,529	į		
i	1		C	0.099	297	1	0.2	1	26,529	i		
T13	1,69	7.13	A	0.093	2.993	19	0,8	1	27.168	3.75	187.59	c
60.00-40.00			В	0.093	2.993		0.8	1	27.168	- 1		
	!		C	8.093	2.993		0.8	1	27, 168	1		
T1-1 40.08-28.00	1.69	7.96	A	0.091	3	17	0.8	1	28,587	3.43	171.74	С
40,08-28,00	- 1		В	0.091	3		0.8	. !!	28,587			
	1.69	1	C		3		0.8	- !!	28.587			_
715 20.00-0.00	1.09	8.45	A	0,09t	2.999	15		:1	31.619	3,09	154.39	С
20.00-0.00	- 1		B	8.091	2.999	ı	0.8	. !!	31.619	ì		
Sum Weight:	22.98	67.24	۲	160'0	2.999	- 1	0.8	OTM	31,619 8179,44	56,60		
men weight:	22.98	01.24				- 1		OIM	8179.44 kip-ft	30.00	- 1	

Tower	Forces	- No lea	- Wind Of	To Face

Section Eleration	Add Wzight	Self Weight	F	•	C,	91	D,	$D_A$	Ae	F	עו	Ctrl. Foce
n	ĸ	ĸ				psf			ſμ	ĸ	plf	
Ti	0.12	0.34	A	0.18	2.665	28	0.85	1	6.568	0.73	73.4E	C
290.00-280.00			В	8.18	2.665		0.85	1	6.668			l
			С	0.18	2.665		0,85	1	6.668			
T2	0.93	1,01	A	0.206	2.575	27	0.85	1	14.126	3.00	150.11	C
280.00-260.00			В	0,206	2.575		0.85	1	14.126			ı
			C	0.206	2.575		čg,0	1	14.126		İ	l
T3	1.62	1.28	A	0.203	2.586	27	0,85	1	15.742	3.85	192.28	C
260.00-240.00			В	0,203	2.586		0.85	1	15,742			l
			c	8.203	2.586		0.85	1	15.742			
T4	1.69	1.73	A	0.196	2.61	27	0.85	1	19.732	4.13	206.41	C
240.00-220.00			В	0.196	2.61		0.85	1	19.732			
			С	0.196	2.61		0.85	1	19.732			
T5	1.69	3.09	A	0.17	2.7	26	0.85	- 1	21.410	4.19	209.49	c
220.00-200.00			В	0.17	2.7	l i	0.85	1	21.410			
í			С	0.17	2.7		0.85	1	21.410			
T6	1.69	3.15	A	0.149	2.774	26	D.E5	1	22.340	4.19	209.64	С
200.00-180.00			В	0,149	2.774		0.85	1	22.340		l i	
1	1 }		C	0.149	2.774	1	0.85	1	22.340			
17	1.69	4.03	A	0.126	2.861	25	0.85	1	29.585	4.03	201.52	С
180.00-160.00			В	0.126	2.861		0,85	1	20.585			
			c	0.126	2861		8.85	1	20,585			

tnxTower	Job 240568	Page 21 of 64
Valmont 1545 Pidzo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	q.	D,	$D_k$	Ar	F	w	Ctrl.
Elevation	Weight	Weight	l a	1	l		[	ľ				Face
	-			1	1	pıf	1	l				1
ft	K	ĸ	6						ft	K	plf	<u></u>
TS	1.69	4.62		0.117	2.895	24	0.85	1	21.588	4.00	199.99	C
160.00-140.00			В	0.117	2.895		0.85	1	21,588		1	ı
		1	С	0.117	2.895	1	0.85	1	21.588		i	ı
T9	1.69	5.32	A	0.t12	2.915	24	0.85	1	23.818	4.02	201.01	l c
140.00-120.00			В	6.112	2.915	l .	0.85	1	23.818			
1			C	0.112	2,915		0.85	1	23.818			
TIO	1.69	6.01	A	0.107	2.935	23	0,85	5	25,660	3.96	198.05	C
120.00-100.00			В	0.107	2.935		0,85	1	25.660			1
			С	0,107	2.935		0.85	1	25.060			
Tli	1.69	6.11	A	0.1	2.965	22	D.85	1	25.661	3.84	192.20	C
100.00+80,00			B	0.1	2,965		0.85	1	25.661			
		7	С	0.1	2,965		0.85	1 1	25.661			
T12	1.69	7.02	A	0.099	2.97	21	0.85	1	27,382	3.74	186.90	С
80.00-60.00			В	0.099	2.97		0.85	1	27.382			
ł			C	0,099	2.97		0.25	1	27.382			1
T13 [	1.69	7.13	٨	0.093	2.993	19		1	28,066	3.53	176.31	C
60.00-40.00			В	0.093	2.993	i I	0.85	1	28.066			
			C	0.093	2.993		0.85	1	28.066		1	
T14	1.69	7.96	A	0.091	3	17	D.85	1	29.531	3:23	161.71	c
40,00-20,00			B	0.091	3		0.85	1	29.531			
			Ç	0.691	3		0,85	l t	29.531			
T15	1.69	8.45	A	0.091	2.999	15	0.85	1	32.752	2.92	146.07	C
20.00-0.00			В	0.091	2.999		0.85	1	32.752			
1			C	0.091	2.999		0,85	1	32.752			
Sum Weight:	22.98	67.24						OTM	7761.04	53.37		
- 1									kio-ft	- 1		

	II Ligita	ii Eigin			1		ŧ					
A	ĸ	E	6			₽ij	l		ft.	k	plf	ĺ
TE	1.69	4.62		0.117	2.895	24	0.85		21,588	4.00	199.99	c
160.00-140.00	1.09	4.02	ĥ	0.117	2.895	-	0.85	;	21,588	1,00		ľ
100.00-140.00			č	0.117	2.895		0.85	1 ;	21.588			ı
T9	1.69	5.32	Ă	0.117 0.112	2.915	24	0.85	1 1	23.818	4,02	201.01	Ιc
140.00-120.00	1.09	3.32	ĥ	6.112	2.915		0.85	1 ;	23,818	7.04	201.01	١ ٦
140.00-120.00			č	0.112	2,915		0.85	,	23.818			
TIO	1.69	6.01	Ă	0.107	2,935	23	0.85	: :	25,660	3.96	198.05	c
120.00-100.00	1.05	0.01	B	0.107	2.935	_	0,85	1 1	25.060	3.50	252.02	ľ
120.00.100.00			č	0,107	2.935		0.85	;	25.060			i
т11	1.69	6.11	Ā	0.107	2.965	22	0.85	;	25.661	3,84	192.20	c
100.00-80.00	1.03	0.11	B	0.1	2,965	-	0.85	l il	25.661	2.01	17220	_
100.00480,00			č	0.1	2,965		0.85	;	25.661			
T12	1.69	7.02	Ă.	0.099	297	21	0,85	;	27,382	3.74	186.90	c
80.00-60.00	1.05	7.02	B	0.039	2.97		0.85	;	27,382	5.,,	******	. ~
BO.DD-00.DG	i		č	0.099	2.97		0.25	;	27.382			l
т13	1.69	7.13	٨	0.093	2.993	19	0.85	i i	28,066	3.53	176.31	l c
60.00-40.00		****	B	0.093	2.993		0.85	- 1	28.066	2,50	1.0.21	_
VV.UD-40.00			c	0.093	2.993		0.85	il	28.066			
T14	1.69	7.96	Ă	0.091	3	17	0.85	- 11	29,531	3:23	161.71	c
40,00-20,00	1.05	1.50	n	0.091	3	• • •	0.85	l il	29.531	1.2	101.71	_
10,00-20,00			č	0.091	3		0,85	l îl	29.531			
T15	1.69	8.45	Ă	0.091	2.999	15	0.85	, i	32.752	2.92	146.07	c
20.00-0.00		0.45	B	0.091	2.999	~	0.85	i i	32.752			
			c	0.091	2.999		0,85	;	32,752			
Sum Weight:	22.98	67.24	٠,	0237			0,45	OTAI	7761.04	53.37		
(, e.g.m.)				1					kip-ft			

Section Elevation	Add Weight	Self Weight	F	•	C,	9:	D,	D <sub>Z</sub>	Ar	F	w	Ctrl. Foce
l l	, i	- 1	6			P4f		1	. 1			
ft	K	K							fi	K	plf	
TI	18.0	1.56	A	0,437	1.996	3	1	1	17.420	0.17	16.77	В
90.00-280.00			В	0.437	1.996		1	1	17.420			
			Ç	0.437	1.996	1	1	1	17.420	- 1		
172	5.74	3.24	A	0.42	2.825	3	1	- 1	33.371	0.57	28.56	Ð
80.00-260,00	i		B	0.42	2.825		1 1	1	33.371	- 1		
	i		C	0.42	2.825		1	3	33.371	- 1		
Т3	9.33	3.72	Α	0.388	2.087	3	1	1	36.030	0.71	35,55	C
60.00-240.00			B	0.388	2.087	- 1	1	- 1	36,030	l i		
1			C	0.388	2.087		1	1	36.030	- 1		
T4 [	9.57	4.81	۸.	0.351	2.169	3	1	3	42.701	0.74	37.17	С
40.00-220,00			В	0.351	2.169	- 1	1	1	42.701			
1			C	0.351	2169	- 1	1	. 1	42.701	- 1		
75	9.51	11.95	A	0.414	2.038	3 [	1	1	65.236	0.82	46.94	C
20.00-200.00			в	0.414	2,038	- 1	1	1	65.236	- 1		
			c	0.414	2.038	1	1	1	65,236	- 1		
T6	9,45	12.18	Ā	0.363	2.142	3	1	1	65.773	0.83	41.41	c
00.00-180.00			в	0.363	2.142	- 1	- 1	1	65,773	- 1		
			c	0.363	2142	- 1	- 1	1	65,773	- 1		
77	9.37	13.26	A	0.3	2.295	3	1	1	60,166	0.80	40.03	C
80,00-160,00			В	0,3	2.295	- 1	- 11	1	60.166	1		
	1		c	0.3	2.295	- 1	1	i	60.166	l l		

tnxTower	Job 240568	Page 23 of 64
Valmont 1543 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Dale 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		c,	q <sub>z</sub>	D,	D <sub>R</sub>	Ar	F	w	Ctrl.
Elevation	Weight	Weight	а									Face
			c	i i		psf						
ft	K	K							ſľ	K	plf	
T8	9.29	14.01	A	0.271	2.377	3	D.8	. 1	58.340	6.78	39.00	В
160.00-140.00			В	0.271	2.377		0.8	` 1	58.340			
		!	С	0.271	2.377		0.8	1	58,340			
19	9.21	15.07	A	0.251	2.435	3	0.8	1	60.281	0.77	38.67	В
140,00-120.00			В	0.251	2.435		0.8	1	60.281			
			C	0.251	2.435		0.8	1	60.281			
TID	9.10	15.92	A	8.232	2.494	3	0.8	1	61.209	0.76	37.87	В
120.00-100.00			В	0.232	2.494		0.8	1	61,209			
			C	0.232	2.494		0.8	1	61.209			
TII	2,98	16.05	A	0.214	2.549	2	0.8	1	61,716	0.73	36.69	В
100.00-80.00			В	0.214	2.549		0.8	1	61.716			
			C.	0.214	2.549		0.8		61.716			
T12	8.83	17.06	A	0.201	2.593	2	8.0	1	62,762	0.70	35.21	B
80.00-60.00			В	0.201	2.593		0.2	1	62,762			
			c	0.201	2.593		0.8	1	62,762			
T13	8.64	17.11	A	0.182	2.637	2	0.2	1	63.254	0.66	33.03	В
60.00-10.00			В	G.188	2.637		0.8	1	63,254			
			C	C.188	2.637		6.2	1	63.254			
T14	8.37	17.90	A 1	0,177	2.674	2	6.8	1	64.038	0.60	29.84	В
40,00-20,00			В	0.177	2,674		0.8	1	64.038			
			C	0,177	2.674		8.0	1	64.038			
T15	7.83	18.24	A	0.169	2.703	2	0.2	1	65.859	0.52	25.99	В
20.00-0.00			В	0.169	2,703		0.8	1	65.859			
		1	c	0.169	2.703		0.8	1	65.859			
Sum Weight:	124.06	18206						OTM	1472.82	10.10		
									kip-ft			

Section	Add	Self	F	ŧ	C,	q <sub>e</sub>	$D_f$	D <sub>8</sub>	Ac	F	w	Ctrl.
Elevation	Weight	Weight	a					1		i i		Foce
- 1	- 1	-	e			psf						
1 1	K	K							ft <sup>2</sup>	K.	plf_	
Ti	0.81	1,56	A	0.437	1.996	3	0.15	1	16.727	0.15	15.22	C
290.00-280,00	- 1		В	0.437	1.996		0.85	1	16.727	1		
- 1	1		c	0.437	1.996		0.85	1	16.727	1		
T2	5.74	3.24	A	0.42	2.025	3	0.85	1	32.296	8.58	28.88	C
280.00-260.00			в	0.42	2.025		0.85	1	32.296	}		
1			c	0.42	2.025		0.85	1	32.296	1		
13	9.33	3.72	A	0.388	2.087	3	0.85	1	34.880	0.71	3 5.35	В
260.00-240,00			В	0.388	2,087		0.85	1	34.880	1		
- 1			С	0.388	2.087		D,85	1	34.880	1	1	
T4 ]	9.57	4,81	١٨	0.351	2.169	3	0.85	6	40.997	0.74	36.84	В
240.00-220.00			в	0.351	2.169		0.85	6	40,997			
- 1			C	0.351	2169		0.85		40.997			
T5 )	9.5t	11,95	A	0.414	2.038	3	0.85	8	63.389	0.81	40.61	В
220,00-200.00			В	0.414	2.038		0.85	6	63.389	1		
- 1			c	0.414	2.838		0.85		63.389	1		
T6 [	9.45	12.18	A	0.363	2.142	3	8.85	1	63.714	0.82	41.01	В
200.00-180.00			В	0.363	2.142		0.85	1	63.714	1		
- 1			ci	0.363	2.142		0.85	1	63.714	1		
17	9.37	13.26	A	0.3	2.295	3	0.85	1	58,466	0.79	39.72	В
180.00-160.00	- 1		В	0.3	2,295		0.85	1	58.466	- 1		
- 1	1		c	6.3	2.295		0.85	. 1	58.466			

tnxTower	Job 240568	Page 22 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Plione: 574-936-4223 FAY:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	9:	$D_{r}$	D <sub>k</sub>	As	F	w	CtrL
Elevatian	Reight	Weight	0	i	l	1	1		i			Face
1	_	-	e		l	₽₽ſ	1		_			ł
ft	K	K		i					ſt²	K	plf	L
T8	9.29	14.01	A	0,271	2.377	3	1	1	60.719	0.79	39.65	C
160,00-140,00			В	0.271	2.377	l	1	1	60.719			,
			C	6.271	2.377	l	1	1 1	60.719			ļ .
T9	9.21	15.07	A	0.251	2.435	3	1	1	63.201	0.79	39.46	C
140,00-120,00			В	0.251	2.435		1	1	63.201			ł
			c	0.251	2.435		1	1	63.201			
TID	9.10	15.92	A	0.232	2.494	3	1	1	64,283	0.77	38.69	C
120.00-100.00			В	0.232	2.494		1	1	64.283			
			l c	0,232	2.494		1	1	64.283	i (		
TII	8.98	16.05	A	0.214	2.549	2	1	1	64.956	0.75	37.54	С
100,00-80.00			В	0.214	2.549		1	1	64.956	1		
- 1			c	0.214	2.549		1	1 :	64.956			
T12	8.83	17,06	A	0,201	2.593	2	1.	1	66.174	0.72	36.07	C
80.00-60.00			В	0,201	2.593		1	1	66.174			
			c	0.201	2.593		1	1	66.174			
T13	8.64	17.11	A	0.188	2.637	2	1	1 1	66.845	0.68	33.89	C
60,00-40,00			В	0.188	2.637		1	1	66,845	}		
l i			С	0.188	2.637		1	1 1	66.845	1		
T14	8,37	17.90	A	0,177	2.674	2	1	1	67.815	0.61	30.67	С
40,00-20.00			В	0.177	2.674		1	1	67.215	1		
	- 1		С	0.177	2.674		1	1	67.815	- 1		
T15	7.83	18.24	A	0,169	2.703	2	1	1.	70.393	0.54	26.85	C
20.00-0.00			В	0, t 69	2.703		1	1 1	70.393	- 1		
	1		c	0.169	2,703		1	i i i	70.393	- 1		
Sum Weight:	124.06	182.06	- 1					DTM	1498.59	10.30		
								1 1	kíp-ft			

11 1		T	ow	er Fo	rces	- Wi	th Ic	e - V	lind 60	To Fac	e	
Section Elevation	Add Weight	Self Weight	F	•	C,	9.	Dr	De	Ae	F	w	Ctri Fac
n I	ĸ	K	:			pıf			ρz	K	plf	
TI	0.81	1.56	A	0.437	1.996	3	8.6	1	16.495	0.16	16.28	1
290.00-280.00			Ð	0.437	1.996		0.8	1	16.495	i		1
- 1			C	0.437	1.996		0.8	1	16.495			1
172	5.74	3.24	A	0.42	2.025	3	0.2	1	31.937	0.56	28.18	C
80.00-260.00	- 1		В	0.42	2.025	1 1	6.2	1	31.937			i
- 1	- 1		C	0.42	2.025		6.2	1	31,937			l
73	9.33	3.72	A	0,388	2.087	3	0.8	1	34.497	0.70	35.14	1
60.00-240.00	1		В	0,388	2.087		0.8	1	34.497			l
- 1	1		С	0.388	2.087		0.8	1 1	34,497			l
T4	9.57	4.81	A	0.351	2.169	3	8.0	1	40.429	0.73	36.55	В
40,00-220,00	l l		В	0.351	2.169		0.8	1	40.429	[		1
ı			C	0.351	2.169		0.8	1 1	40.429	- 1		i
TS	9.51	11.95	A	0.414	2.038	3	0.8	1	62.774	0.81	40.32	13
20.00-200.00			В	0.414	2,038		8.0	1	62.774	i		
- 1			C	0.414	2.038		0.8	1	62.774	- 1		
T6	9.45	12.18	A	0.363	2.142	3	0.8	1	63.028	18.0	40.76	В
00,081-00,00			В	0.363	2.142		6.8	1	63,028	- 1		1
ŀ			C	0.363	2.142		0.8	1	63.028	- 1		
77	9.37	13.26	A	0.3	2.295	3	0.8	1	57.899	0.79	39.44	В
80.00-160.00			В	0.3	2.295	1	0.8	ı	57.899	- 1		
			c	0,3	2.295	1 1	6.8	1	57.299	- 1		1

tnxTower	<sup>Јов</sup> 240568	Page 24 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phore: 574-936-4221 FAX:	American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	g,	D <sub>F</sub>	D <sub>R</sub>	As.	F	w	CtrL
Elevation	Waight	R'eight	4	l	1				!			Face
1	-	-	2	ì		psf			1			
n I	K	κ		l					/r	K	plf	
78	9.29	14.01	A	0.271	2.377	3	0.85	1	58.935	0.79	39.29	В
160.00-140,80			Ð	0.271	2.377		0.85	1	58.935			1
- 1	-		c	0.271	2.377		0.85	1	58.935			
19	9,21	15.07	A	0.251	2.435	3	0.85	1	61.011	0.78	38.99	В
140.00-120.00	1		В	0.251	2.435		0.25	1	61.811			1
- 1	- 1		C	0.251	2.435	l i	0.25	1	61.011			
T10	9.10	15.92	٨	0.232	2.494	3	0.25	1	61,977	0.76	38.20	В
120,00-100,00	1		В	8.232	2.494		0.85	1	61.977			ı
- 1	ì		С	0.232	2.494		0.85	1	61.977			ı
Til	8.98	16.05	A	0.214	2.549	2	0.85	1	62,526	0.74	37.01	В
160.08-80.80	}		В	0,214	2.549		0.85	1	62,526	- 1		ı
1			С	0,214	2.549		0.85	1	62.526	i		ı
T12	8.83	17.06	A	0.201	2.593	2	0.85	1	63.615	0.71	35.53	В
80,00-60,00			Ð	0.201	2.593		0.85	1	63.615			ı
- 1			С	0.201	2.593		0.85	1	63,615			ı
T13	8.64	17.11	A	28 1.0	2.637	2	0.85	1	64.152	0.67	33.35	В
60.00-40.00			В	881.0	2.637	i	0.85	1	64.152			1
1			C	0.188	2.637		0.85	1	64.152			l
T14	8.37	17.90	Α	0.177	2.674	2	0.85	1	64.982	0.60	30.14	В
40.00-20.00			В	0.177	2.674	i	0.85	1	64.982			i
1			C	6.177	2.674		0.85	1	64.982			1
T15	7.83	18.24	Α.	1.169	2.703	2	0.85	i i	66.993	0,53	26.28	В
20.00-0.00			В	0,169	2.783		0.85	l i	66.993			
			C	8.169	2.703		G.85	1	66,993	1		ı
Sum Weight:	t24.06	182.06						DTM	1483.35	10.18		ŀ
~ 1			1			1			kip-ft	1		ı

Section	Add	Self	F	•	С,	$q_t$	D,	Dc	Az	F	w	Ciri
Elevation	R'eight	Weight .	4				- 1		- 1			Fos
ſŧ	ĸ	κ				psf			ρ²	ĸ	plf	
TL	0.12	0.34	A	0,18	2.665	12	1	1	7.362	0.35	34.60	В
90.00-280.00			В	0.18	2.665		1	. 1	7.362	J		
	- 1		c l	0.18	2.665		1	- 1	7.362	1		
172	0.93	1.01	A	0.206	2.575	12	1	1	15.202	1.25	62.59	В
80.00-260.00	- 1		В	0.206	2.575		1	1	15.262			
	- 1		ci	6.206	2.575		1	- 1	15.202	- {		
13	1.62	1.28	A	0,203	2,586	12	1	3	16.892	1.86	93,09	В
60.00-240.00	- 1		В	0.203	2.586		ı	1	16.892	- 1		
1	- 1		c l	0.203	2.586		1	6	16.892	i		
T4 ]	8.69	1.73	A	0.896	2.61	82	1	6	21.436	2.04	102.24	В
40.00-220.00	- 1		В	0.196	2.61		1	1]	21.436	- 1		
- 1	- 1		c	0.196	2.61		1	1	21.436	- 1	i	
T5	8.69	3,09	A	0.17	2.7	E2	1	1	23.257	2.07	103,67	В
20.00-200.00	i		В	0.17	2.7	1	1	6	23.257			
- 1	ı		c	0.17	2.7		1	1	23.257			
T6	1.69	3.65	Α	0.149	2774	11	1	1	24.399	2.08	103.87	В
00.00-180.00			В	0.149	2.774	- 1	1	1	24.399	- 1		
- 1	1		C	0.149	2.774	- 1	1	1	24.399			
77	1.69	4.03	A	0.126	2.861	11	8	1	22.284	1.99	99.61	В
20,00-160,00	- 1		В	0.126	2.861	i	1	1	22.284		- 1	
- 1	ŧ		c l	0.126	2.861	- 1	1)	1	22.284		- 1	

tnxTower	Job 240568	Page 25 of 64
Valmont 1545 Pidea Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, DV Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	9:	D,	$D_{k}$	4	F	- W	Ctrl
Elevation	Il'eight	Weight	a	l	ı	1 1			'		i	Fac
		l	c			puf			l 1			1
ft	K	K							ft <sup>2</sup>	ĸ	plf	
18	1.69	4.62	A	0.117	2.895	11	1	1	23.372	1.98	98.81	В
160.00-140.00			B	0.117	2.895		1	1	23,372		ſ	Į.
			С	0.117	2,895		1 1	1	23.372			ĺ
T9	1.69	5.32	A	6.112	2.915	10	1	1	26.808	1.99	99,51	lв
40.00-126.80			В	0.112	2.915		1	1	25.808			I -
			С	0.112	2.915		1	1	26.008			1
T10	1.69	6.01	Α	6.167	2.935	10	1	1	27,367	1.96	98.01	l B
20,00-100.80			В.	0.187	2.935		1	1	27.367			I -
			C	6.187	2.935	1	1	1	27,367			l
T11	1.69	6.11	A	6.1	2.965	10	1	1	28.090	1.90	95.17	lв
100.00-80.00			B	0,1	2.965	l í	1	1	28.090			
1			C	8.1	2.965	i I	1	1	28.090			l
T12	1.69	7.02	A	8.099	2.97	9	1	11	29,941	1.85	92.47	в
90.00-60.08	i		В	0.099	2.97	1	1	1	29,941			
- 1			C	0.099	2.97		3	1	29,941			
T13	1.69	7.13	A	6.093	2,993	9	1	1	30,760	1.75	87.29	В
60.80-40.08			В	6.893	2.993	1	1	- 1]	30.760			
	- 1		C	0.093	2.993		1	11	30,760	- 1		
T14	1.69	7.96	A	0.091	3	8	1	1	32.364	1.60	80.03	В
40.00-20.00	- 1	1	В	0.091	3	- 1	11	1	32.364	- 1		
í	- 1		C	6.091	3	١ ١	1 [	1	32.364	- 1		
T15	1.69	8.45	٨	6.091	2.999	7	1	- 1	36.153	1.45	72.47	В
20.00-0.00	- {		В	0.091	2.999	- 1	1	- 1	36.153	1		
	ſ	- 1	c	0.091	2.999	Ì	1	t	36,153			
Sum Weight:	22.98	67.24	- 1		- 1		- 1	OTM	3762.43	26.12		
1		- 1	- 1		- 1		ı	- 1	kin-ft		i	

7 5 .	1134	- 7	OW	er Fo	rces	- Se	rvice	e - W	ind 60	To Fac	9	
Section Elevation	Add Weight	Scif Weight	F	e	C,	4	D <sub>f</sub>	D <sub>R</sub>	At	F	w	Ctrl. Face
л	к	ĸ	6			₽ŧf			η²	ĸ İ	plf	
Ti	0.12	8.34	A	0.18	2,665	12	8,0	1	6,437	0.32	32.01	C
290.00-280.08			В	6.18	2.665		8.8	- 1	6.437			
	ı		C	6.18	2.665		8.8	1	6.437	i		
T2	0.93	1.01	Α	8,206	2.575	12	0.8	1	13.768	1.21	60.67	C
280.00-260.08	1		В	0.205	2.575	ı	8,0	1	13.768			
_1			c	0.206	2.575		8.8	- 11	13,768			
13 260.00-240.00	1.62	1.28	<u> </u>	0.203	2.586	12	0.8	11	t 5.35B	1.82	91.06	C
260.00-240.00			В	6.203	2.586		8.8	1	15,358			
T4	1.69		C	0.203	2.586		6.8	1	15.358	- 1		
	1.69	1.73	_ ^ [	0.196	2.61	12	0.8	3.1	19.164	1.99	99.26	c
240.00-220.08	- 1		В	8.196	2.61	- 1	8.8	1	19.164			
TS			c	0,196	2.61		8.8	- 1	19.164			
220.08-200.08	1.69	3.09	<u>^</u>	0.17	2.7	12	0.6	11	20.794	2.81	100.39	С
220.08-200.08	1	- 1	В	0.17	2.7		0.8	3	20.794	i	- 1	
16	1.69	3.15	c	0.17	2.7 2.774	1	6.8	1	20.794			
200.00-180.88	1.69	3.15	â۱	0.149	2.774	11	0.8	- 11	21.653	2.00	100.19	C
28,061-00.00			ا <u>ٿ</u>	0.149			8.8	:/	21.653			
17	1.69	4,03	- 1	8.126	2.774	11	8.0	- !1	21.653			_
88.80-160.00	1.09	4,003	A	0.126	2.861	11	6.8	- 11	20.018	1.93	96.56	C
100.001		1	č	0.126		1		- !!	20.018	- 1	- 1	
1	- 1	ı	- I	U.125	2.861	ı	0.8	11	20.818		- 1	

tn	xTower	+	Jol	•			2	40568			ľ	Page 2	7 of 64
1:	Valmant 545 Pideo Drive		Pr	oject	V-31	x 290	'-#28	1338 H	lazel Gre	en, KY		Pate 13:31:	40 12/10/13
	Plymouth, IN me: 574-936-422 FAX:	1	CI	ienl		Ал	nericar	Towe	r Corp.			Designe	d by SKK
Section Elevation	Add Weight	Self Weight	F a c	•	C,	q <sub>t</sub>	Dr	D <sub>A</sub>	Ac	F	W	Ctrl. Foce	

Section Elevation	Add	Self	F	٠ ا	c,	Q <sub>L</sub>	D,	D <sub>k</sub>	/A=	F	w	CtrL
Elevation	Weight	Weight	4	1				i	1			Foce
А	ĸ	κ		ĺ	ĺ	₽ij			n <sup>2</sup>	ĸ	plf	l
TE	3.69	4.62	A	0.117	2.895	11	0.85	1	21,588	t.78	88.89	C
160.08-140.00			В	0.117	2.895		6.85	l i	21,588			l -
			c	9.117	2,895		0.85	l ŧ	21.588			ı
T9	1.69	5.32	A	8.112	2.915	10	0,85	l i	23.8t 8	1.79	89.34	Ιc
140.00-120.00			В	8.112	2.915		0.85	1	23.818	, ,,,,		-
			c	6.312	2.915		0.85	1	23.8t8			ı
TIG	1,69	6.83	٨	0.107	2.935	10	6.85	1	25.860	t.76	88.62	c
t20.00-100.00			B	9.107	2.935		0.85	1	25,860			
1	1		C	8,187	2,935		0.85	1	25.060			
Tt1	1.69	6.11	A	1.12	2.965	18	8.85	1	25.661	3.7t	85.42	c
100.88-80.88	- 1		В	0.1	2.965		6.85	1	25.66t	-		_
	- 1		C	6.1	2.965		g.85	1	25.661			
T12	1.69	7.02	A	0,099	2.97	9	6.85	1	27.382	1,66	83.07	С
80.08-60,00	- 1		В	0.099	2.97		0,85	1	27,382			-
	- 1		С	0.099	2.97		8.85	t i	27,382			
T13	1.69	7.13	A	8,093	2.993	9	0.85	t t	28.066	1.57	78.36	C
60.80-10.08			В	8.093	2.993		0.85	1	28.066			
			С	0.093	2.993		9.85	1	28.866			
T14	1.69	7.96	A	0,091	3	8	0.85	1	29.531	1.44	71.87	c
40.00-20.00	1		В	0,091	3		0.85	1	29,53t			
- 1			C	0.091	3		0.85	t t	29.531	,		
T15	1.69	8.45	A	190.8	2.999	7	0.85	t	32,752	1.38	64.92	С
20,00-0.00	l	ĺ	В	0.091	2.999	- 1	8.85	1	32.752			
			С	0.091	2,999	- 1	0.85	1	32.752			
Sum Weight:	22.98	67.24			- 1	- 1		OTM	3449,35	23.72		
									kip-ft		- 1	

ection No.	Section Elevation	Wind Azimuth	Directionality	F	1/2	ν.	OTM,	OTM	Torque
342.	ft fi	Azimun	1	ĸ	ĸ	ĸ	ktp-fl	kip-ft	kip-fl
TI	290,00-280.00	0	Wind Normal	0.66	0.00	-0.66	-187.t5	-0.17	8.15
		30	Wind 90	0.73	6.37	-0.64	-181.46	-184.88	8.11
		60	Wind 60	8.72	9.62	-0.36	-102.72	-177.94	0.01
		90	Wind 90	0.73	8.73	0.00	-8.09	-209.59	-0,08
		120	Wind Normal	8.66	8.57	0.33	93.44	-162.17	-0.14
-		150	Wind 90	0.50	0.25	0.43	123.23	-71.36	-0.13
- 1		180	Wind 60	0.60	0.80	0.60	170.37	-0.17	-8.14
		210	Wind 90	0.73	-0.37	0.64	181.28	184,55	-0.11
		240	Wind Normal	0.78	-0.67	6.39	110.85	191.99	-0.02
		270	Wind 90	0.73	-0.73	0.00	-0.09	209.26	80.0
		300	Wind 60	0.60	-0.52	-0.30	-15,32	147.45	0.13
_		330	Wind 90	8.50	-0.25	-0.43	-123.41	7t.03	6.13
T2	250,00-260,00		Wind Normal	2.45	0.00	-2.45	-663.04	-0.17	0.10
- 1		30	Wind 90	2.54	1.27	-2.20]	-593.73	-342.69	-0.04
- 1		60	Wind 60	2.73	2.36	-1.37	-369.02	-638.54	-0.t9
- 1		90	Wind 90	3,00	3,60	0.00	-0.46	-810.78	-0.31
- 1		120	Wind Normal	2.70	2.33	1.35	363.45	-630.47	-0.30
- 1		150	Wind 90	2.30	1.15	2.00	538.44	-311.30	-0.20
- 1		180	Wind 60	2.37	0.00	2.37	638.83	-0.17	-0,10
ı		210	Wind 90	2.51	-1.27	2.20	592.81	342.35	0.04
i		240	Wind Normal	282	-2.44	1.41	379.75	658.37	0.19
- 1		270	Wind 90	3.00	-3.00	0.00	-0.46	810.44	0.31

tnxTower	Job 240568	Page 26 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Add	Self	F		C,	9:	D,	D <sub>k</sub>	Ar	F	1/	Cirl
Elevation	Weight	Weight	a	ĺ		ł	ı	1	ì		l	Face
			F			₽∜	i	l	i .			i i
	X.	<u> </u>							ft	K	plf	L
18	1.69	4.62	۱۸	0.117	2.895	11	0.8	] 1	20.993	1.91	95.65	C
160.00-140.00			В	0.117	2.895		6.8	] 1	20,993	!	!	1
			C	0.117	2.895	Į.	0.8	1	20.993			
19	1.69	5.32	A	6.112	2.915	10	8.0	1	23.088	1.91	95.72	C
40.00-120.00			В	0.112	2.915		8.8	1	23.088			i
	- 1		C	6.112	2.915		6.8	1	23.888			i
Tie	1.69	6.01	Α	0.107	2.935	10	0.8	1	24.292	1.88	94.13	l c
20.00-106.80	i		В	0.187	2.935		8,8	1	24.292			
1			C	0.107	2.935		0.8	1	24.292			ŀ
T31	1.69	6.11	A	6.1	2.965	10	0.8	1	24.851	1.B2	91.22	c
100.08-80.68			В	0.1	2.965		0.8	1 1	24.851			_
- 1	,		c	8.1	2.965		8.0	1 1	24.851			
T12	1,69	7.02	ا ۸ ا	0.099	2.97	9	8.8	1 1	26,529	1.77	88.51	C
88.00-60.00			в	0.099	2.97		6.8	1 1	26.529			
			cl	0.099	2.97		6.8	i	26.529			
T13 1	1.69	7.13	Ι٨Ι	8.093	2.993	9	8.8	1 11	27.168	1.67	83,37	С
60.80-40.00	- 1		в	0,093	2.993	- 1	0.8	l il	27.168			_
- 1	l i		c l	0.093	2.993		8.8	l ıl	27,168	J	- 1	
T14	1.69	7.96	Ā	0.891	3	8	0.8	l il	28.587	1.53	76,33	c
40.00-20.00			B	8.091	3	-	8.8	i ii	28.587		/****	
1			c	0.091	3 1		8.8	il	28.587		1	
T15	1,69	8.45	Ā	0,091	2,999	7	0.8	l il	31,619	1.37	68.62	c
20.00-0.80			в	0.091	2.999	`'I	6.8	l il	31,619			~
	l.	- 1	ēΙ	0.091	2.999	- 1	0.8	;	31,619	ı	ŀ	
Sum Weight:	22.98	67.24	٦ ا	-,071		- 1		OTM	3635.31	25.15	- 1	
		27.27	- 1	- 1	- 1	ļ	- 1		kip-ft	23.13	i	

1 1.77 5	<u> </u>	1	OV	er Fo	rces	- Se	rvic	e - W	ind 90	To Face	•	
Section Elevation	Add B'eight	Self B'eight	F		C,	q <sub>t</sub>	D,	D <sub>a</sub>	At	F	10	Ctri Fac
	ĸ	ĸ	c e			Psf			ft <sup>2</sup>	ĸ	рV	
TI	0.12	0.34	A	0.18	2.665	12	8.85	1	6.668	0.33	32.66	C
290.00-280.00	i		В	0.18	2.665		8.85	1	6.668	- 1		
	- 1		c	0.18	2.665		0.85	1	6.668	- 1		
T2	0.93	1,01	Α (	0.206	2.575	12	0.85	1	14.126	1.33	66.72	С
280.00-260.00	1		В	0.206	2.575	- 1	0.85	1	14.126	- 1		
1	1		c	0,206	2.575	1	8.85	1	14,126	1		
T3	1.62	1.28	Α.	6.203	2.586	12	8.85	1	15.742	1.71	85.46	C
266,80-240.00		- 1	В	6,203	2.586	- 1	0.85	- 1	15,742			
- [	- 1		C	0,203	2.586	- 1	0.85	1	15.742	Į.		
T4	1.69	1.73	A	0,196	2.61	12	0.85	1	19,732	1.83	91.74	С
48,00-220.00			В	0.196	2.61	- 1	8.85	1	19.732	- 1		
			c	0.196	2.61	- 1	0.85	1	19.732	- 1	- 1	
T5	1.69	3.09	Α	0.17	2.7	12	0,85	1	21.418	1.86	93.11	C
20.00-200.00	- 1	- 1	В	0.17	2.7	- 1	6.85	1	23,410	- 1		
			C	0.17	2.7	- 1	0.85	1	23.410	ł		
T6	1.69	3.15	^	0,149	2.774	11	8.85	1	22.340	1.86	93.17	C
00.081-00.00	- 1	1	В	0.149	2.774		8.85	- !	22.348	- 1	- 1	
	1		ςĮ	8.149	2.774		0.85	1	22.348	- 1	- 1	
17	1.69	4.03	A	8.126	2.861	11	0.85	1]	20.585	1.79	89.57	c
80.00-160.00	- 1		В	0,126	2.861	- 1	0.85	- 1	20,585	· · · · · · · · · · · · · · · · · · ·	- 1	
j.	- 1	J	C	0.126	2.861	- 1	0.85	1	20.585	1	i	

tnxTower	Job	240568	Page 28 of 64
Valmant 1545 Pidca Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client	American Tower Corp.	Designed by SKK

Section No.	Section Elevation	Wind	Directionality	F	ν.	ν,	OTM.	OTM,	Torque
No.	ft	Azimuth			x	r i	ktp-ft	kip-ft	ktp-ft
		300	Wind 60	2.61	-2.26	·t 30	-352.71	609.95	
		330	Wind 90	2.30	-1.15	-2.00	-539.36	310.96	i
T3	260.00-240,60	0	Wind Normal	3.61	6.00	-3.61	-903,67	-0.43	C
		30	Wind 90	3.85	1.92	-3,33	-832.81	-481.12	. 0
		60	Wind 60	4.10	3,55	-2.05	-512.44	-887.61	2
		90	Wind 90	3.85	3.85	8.68	-6.23	-961.81	-6
		120	Wind Normal	3.61	3.13	t.81	451.49	-782.83	-8
		158	Wind 90	3.68	1.80	3.12	779.23	-450.46	-6
1		180 210	Wind 60 Wind 98	3.52	0.00	3,52	880.40	-0.43	-6
		240	Wind Normal	3,85 4,19	-1.92 -3.63	3.33 2.09	83 2.35	480.26	-
i		270	Wind 90	3.85	-3.85	6.00	523.38	906,49	-4
		300	Wind 60	3,52	-3.85	-1.76	-0.23 -440.55	960,95 762,21	
		338	Wind 98	3.60	-1.80	-3.12	-779.78	419.59	
T4	248.80-220.00	220	Wind Normal	3.85	0.80	-3.85	-885.21	-0.71	
		30	Wind 90	4.13	2.86	-3,58	-822.66	-475,45	
i		68	Wind 60	4.47	3.87	2.23	-514,04	-890.39	
- 1		90	Wind 90	4.13	4.13	0.00	-0.38	-950,t9	-
- 1		120	Wind Normal	3.85	3,33	1.92	442.03	-766.99	-
		150	Wind 90	18.6	1.90	3.30	75 7.87	-438.49	
- 1		t 80	Wind 68	3.71	0.80	3.71	853.61	-0.71	
ſ		210	Wind 90	4.13	-2.06	3.58	821,89	474.03	
		248	Wind Normal	4.60	-3.98	2.38	528.68	91 5,66	-
		270	Wind 90	4.13	-4.13	0.00	-0.38	918,77	
		300	Wind 60	3.71	-3.22	-1.86	-427.38	738.88	
		330	Wind 90	3.81	-1.90	-3.30	-758.64	437.07	
T5	220.06-206.00	-0	Wind Normal	3,93	8.00	-3.93	-824.91	-0.86	
- 1		38 68	Wind 90	4.19	2.09	-3.63	-762_44	-440,78	
- 1		90	Wind 60 Wind 90	4.52 4.19	3.91 4.19	-2.26 8.00	-474.83	-\$22,48	
- 1		t20	Wind Normal	3.93	3,40	1,96	-8.46	-888.71	-4
- 1		150	Wind 90	3.87	1,94	3.36	411.76	-714.85	-
Į		180	Wind 60	3.71	0.00	3.78	704.16 793.02	-407.68 -0.86	-
1		218	Wind 90	4,19	-2.09	3.63	761.51	439.07	-
- 1		240	Wind Normal	4,67	4.04	2.33	489,38	847.58	
i		270	Wind 90	4.19	-4.19	8.00	-0.46	878,99	- 7
- 1		300	Wind 60	3.78	-3,27	-1.89	-397.21	686,32	
- 1		338	Wind 90	3.87	-1.94	-3,36	-705.09	405.96	
T6	200.00-180.00	o	Wind Normal	3.95	0.00	-3.95	-751.07	-t.01	
1		30	Wind 90	4.19	2.18	+3,63	-690,44	-399,32	
ł		60	Wind 60	4,51	3,90	-2.25	-428.87	-742.88	
1		90	Wind 90	4.19	4.19	0.06	-0.55	-797.63	-4
1		120	Wind Normal	3.95	3.42	1.98	374,72	-650.98	-1
J		150	Wind 90	3.88	1.94	3.36	638.54	-369.99	-4
ļ		180	Wind 60	3.78	8.00	3.78	718.57	-1,61	-
- 1		210 240	Wind 90	4.19	-2.10	3.63	689.35	397,30	-(
- 1		270	Wind Normal Wind 90	4.67	-4.85 -4.19	2.34	4-13, 48	768.07	
- 1	1	300	Wind 60	4.19 3.78	-3.28	0.00	-0,55	795.61	9
- 1	i	330	Wind 90	3.78	-1.94	-1.89 -3.36	-360.16 -639.64	621.76 367.97	
77	120.00-160.00	330	Wind Normal	3.71	0.00	-3.78	-612,46	t.16	0
		30	Wind 90	4.03	2.02	-3.49	-594.0t	-343.75	
- 1		60	Wind 60	4.35	3.76	-3.49	-369.96	-543.73 -640.86	ì
- 1	-	90	Wind 90	4.03	4.63	0.80	-0,63	-686.34	-0
	1	120	Wind Normal	3.78	3.27	1.89	320,29	-557.01	-0
- 1	1	150	Wind 90	3.73	1.86	3.23	548.36	-318.12	- 2
- 1		180	Wind 60	3.64	0.00	3,64	617.83	-1.16	-0
- 1		210	Wind 90	4.03	-2.02	3.49	592.76	341,43	-0
1		240	Wind Normal	4.41	-3.88	2.24	380,39	658.79	-0
- 1									
- 1	í	270 300	Wind 90	4.03	-4.63	0.00	-0.63	684.02	0

tnxTower	Job 240568	Page 29 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Cilent American Tower Corp.	Designed by SKK

Section	Section	Wind	Directionality	F	V.	$V_{\epsilon}$	OTM,	OTM,	Torque
No.	Elevation	Azimuth	· 1	_					
	f		W. 100			K	kip-ft	kip-ft	ktp-ft
T8	160.00-140.88	33B	Wind 90 Wind Normal	3.73 3.76	-1.86 8.08	-3.76	-549,61 -564,36	315.80 -1.31	0.78 0.78
	100.00-140.88	30	Wind 90	4.00	2.00	-3.46	-520.38	-381.30	8,46
		60	Wind 68	4.30	3.73	-2.15	-323.52	-560,44	0.85
		90	Wind 90	4.80	4.08	0.08	-0.71	-681.29	-0.38
		128	Wind Normal	3.76	3.25	1.88	281.12	-489.45	-0.66
		158	Wind 98	3.71	1.85	3.21	480.73	-279.27	+0.78
		188 218	Wind 68 Wind 90	3.62 4.00	0.80 -2.80	3.62 3.46	541.61 518.89	-1.31	-8.68
		248	Wind Normal	4.45	-3.85	2.22	332.77	298.68 576.29	-8,46 -8,85
		278	Wind 90	4.88	-4.88	8.88	-0.71	598.66	0.38
		308	Wind 68	3.62	-3.13	-1.81	-271.87	468.35	0.63
		338	Wind 90	3.71	-1.85	-3.21	-482.14	276.63	0.78
T9	140.00-120,88	0	Wind Normal	3.81	0,80	-3.81	-496.05	-1.46	0.79
		38	Wind 90	4.82	2.81	-3.48	-453.48	-262.78	8,51
		60 90	Wind 68 Wind 90	4.31 4.02	3.73 4.02	-2.15 0.00	-280.77 -0.79	-486.40 -524.09	8.05 -0.42
		120	Wind Narmal	3.81	3.38	1.90	246.84	-430.37	-0.74
		158	Wind 90	3.74	1.87	3.23	419.73	-244.25	+0.86
- 1		188	Wind 60	3.64	0.00	3,64	472.30	-1.46	-0.75
í		218	Wind 90	4.02	-2.81	3,48	451.82	259.85	-0.51
		248	Wind Normal	4.48	-3.88	2.24	290.28	502.68	-0.06
		278	Wind 90	4.82	-4.82	0.88	-8.79	521.17	8.42
		308	Wind 68 Wind 98	3.64 3.74	-3.15 -1.87	-1.82 -3.23	-237.33 -421.31	408.24 241.33	0.71 0,86
TIB	120.80-100.00	330	Wind Normal	3.77	8.80	-3,77	-415.84	-1.61	0.85
•••	120.00-140.00	38	Wind 90	3,96	1.98	-3.43	-378.28	-219.47	8.55
ì		68	Wind 68	4.24	3.67	-2.12	-233,84	-485.12	8,06
		90	Wind 90	3.96	3.96	0.88	-8.87	-437.32	-8,45
		128	Wind Normal	3.77	3.26	1.88	286.22	-360,38	-B.88
		150 150	Wind 90	3.69 3.59	1.84 8.08	3.19	350.25	-204.33	-8.93
- 1		218	Wind 68 Wind 90	3.96	-1.98	3.59 3.43	394.10 376.47	-1.61 216,24	-8.81 -0.55
ı		240	Wind Normal	4.41	-3.82	2.21	241.70	418.53	-0.06
- 1		278	Wind 90	3,96	-3,96	0.08	-0.87	434.10	0.45
- 1		388	Wind 68	3.59	-3.11	-1.80	-198.35	340.44	0.76
]		330	Wind 90	3,69	-1.84	-3.19	-351.99	201.11	8.93
TIL	180.08-80.00	_ B	Wind Normal	3.66	8.88	-3.66	-330,74	-1.76	8.90
- 1		3B	Wind 90 Wind 60	3.84 410	1.92	-3.33 -2.85	-308.56 -185.66	-174.74	0.58 0.86
- 1		90	Wind 90	3.84	3.23	8.88	-0.95	-321.69 -347.72	-0.48
- 1		120	Wind Normal	3.66	3.17	1.83	163,95	-287.37	-0.85
		158	Wind90	3.58	1.79	3.10	278.18	-162.87	-0.99
		122	Wind 60	3.49	8.88	3.49	312.81	-1.76	-8.86
		210	Wind 90	3.84	-1.92	3.33	298.66	171.22	-8.58
- 1		240	Wind Normal	4.28 3.84	-3,71	2.14	191,78	332.85	-8.87
- 1		278 308	Wind 98 Wind 68	3,49	-3.84 -3.02	8.88 -1.74	-0.95 -157.83	344.20 269.96	0.48 0.81
ĺ		338	Wind 90	3.58	-1.79	-3.18	-288.00	159.35	0.99
TI2	80,00-60,80	0	Wind Normal	3,57	0.88	-3,57	-251.26	-1.91	0.95
		38	Wind 90	3.74	1.87	-3.24	-227.64	-132.75	0.61
- 1		60	Wind 60	3,98	3.45	1.99	-140.44	-243,37	8.07
i		90	Wind 90	3.74	3.74	0.80	-8.03	-263.58	-8.58
- 1		120 158	Wind Normal Wind 90	3.57	3.18 1.74	1.79 3.82	124.88	-218.62	-8.89
1		188	Wind 68	3.40	8.08	3.48	236.72	-123.99 -1.91	-1.83 -0.90
- 1	-	218	Wind 90	3.74	-1.87	3.24	225.58	128.92	-0.90
- 1	- 1	248	Wind Normal	4.16	-3.60	2.08	844.61	258.35	-0.07
- 1	ľ	270	Wind 90	3.74	-3.74	0.00	-1.03	259,75	0.50
- 1		388	Wind 60	3.48	-2.91	-1.70	-119,91	203,98	0.84
- 1		338	Wind 90	3.49	-1.74	-3.02	-212.47	120.16	1.83

tnxTower	Jsb 240568	Page 31 of 54
Valmont 1343 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

ction	Section	Wind	Oirectionality	F	ν,	V.	OTM,	OTM,	Torque
No.	Elevation	Azimuth							-
	f		- viii 155 - 1	K	K	<u> </u>	k(p-ft	kip-fl	ktp-ft
TI	290.00-288.88	30	Wind Normal	0.13	8.80	-0.13	-38.08	-1.13	0.8
		68	Wind 90 Wind 60	8.15 8.16	8,88 0,14	-0.13 -0.08	-37.96 -23.58	-22.83 -41,32	0.0
		90	Wind 90	8.15	8.15	0.00	-23,38 -8.38	-41,321 -44,52	-0.0
1		120	Wind Normal	B.13	0.81	0.00	-8.38 88.47	-33.79	-0.0
		150	Wind 90	8.12	0.86	8.10	28.47	-17.79	-8.0. -8.0
		180	Wind 68	0.13	8.88	8.13	35.94	-1.13	-8.83
		210	Wind 90	0.15	-0.88	8.13	37.28	20.56	-8.8
		240	Wind Normal	8.17	-0,15	8.88	23,51	40.25	-8.8
		278	Wind 90	8,15	-0.15	8.08	-0.38	42.26	0.8
		380	Wind 60	8.13	-0.11	-0.06	-18.54	38.32	0.8
		338	Wind 90	8.12	-0.86	-0.10	-29.22	15.52	0.0
172	288.08-260.80	B	Wind Normai	8.46	8.80	-0.46	-127.51	-1.29	0.0
		38	Wind 90	8,51	0.25	-0.44	-128.65	-69.54	0.0
		60	Wind 68	8.56	0.49	-0.28	-78.53	-133.89	-0.03
		90	Wind 90	8.58	0.58	0.00	-2.43	-157.23	-8.03
		120	Wind Normal	0,54	0.46	0.27	69.83	-126.44	-8.0
		158	Wind 90	0.47	8.23	0.41	107.38	-64.69	-0.8-
		188	Wind 68	0,46	0.08	0.46	120.62	-1,29	+0.83
		218	Wind 98	0.51	-0.25	8.44	115.79	66,97	-0,01
1		248	Wind Normai	B.57	-0.49	8.29	74,69	132.28	0.83
		278	Wind 90	8.58	-0.58	8.88	-2.43	154,66	0.0
- 1		388	Wind 60	8.53	-0.45	-0.26	-73.67	122.18	0.0
ı		338	Wind 90	8.47	-0.23	-0.41	-112.24	62.11	0.0
,	260.88-240.00	B	Wind Normal	8.71	8.00	-0.71	-178.37	-217	0.01
		38 60	Wind 90 Wind 60	8.70	8,35	-0.61	-152,30 -87,66	-89.74	0.0
		90	Wind 90	8.70 0.78	8.68 0.78	-0.35 0.88	-0.61	-152.94	0.01
		128	Wind Normal	8.71	0.62	0.88	88.26	-177.32 -156.11	B.B.C
		150	Wind 90	0.71	0.02	0.35	132.46	-90.55	-0.81
		188	Wind 60	0.70	0.88	8.70	175.09	-217	-8,81
- 1		218	Wind 90	0.70	-0.35	0,61	151,07	85.41	-8.81
		240	Wind Normal	8.70	-0.61	8.35	87.46	150.38	-8.81
- 1		278	Wind 90	8.70	-0.70	8.88	-0,61	172.98	-0.01
- 1		300	Wind 60	0,78	-0.61	-0.35	-88.47	150.88	-8.00
- 1		330	Wind 90	0.71	-0.35	-0.61	-153.69	86,21	0.01
- 1	248,00-228,88	"0	Wind Normal	0,74	8.08	-0.74	-t72.09	-3.39	0.02
- 1		30	Wind 90	8.73	8.36	-0.63	-146.22	-87.16	8.02
- 1		60	Wind 60	8.72	0,63	-0.36	-84.22	-147.31	0.82
- 1		90	Wind 90	0.73	0.73	0.88	-1.13	-170.93	0.01
- 1		120	Wind Normal	0.74	8.64	0.37	84.35	-151.45	8.00
- 1		150	Wind 90	0.74	0.37	8.64	1-15,64	-88.13	-8,0
		180	Wind 60	0.73	0.80	0.73	166.99	-3.39	-8.82
- 1		210	Wind 90	0.73	-0.36	8.63	143.97	80,38	-0.82
ı		240	Wind Normal	0.73	-0,64	0.37	83.39	142.99	-0.02
ŀ		278	Wind 90	8.73	-0.73	8.00	-1.13	164.15	-0.01
- [		300	Wind 60	0.73	-0.63	-0.37	-85,19	1.42.20	-0.00
		330	Wind 90	0.74	-0.37	-0.64	-147,98	81.34	0.01
•	220,00-200.00	8	Wind Normal	8.82	8,00	-0.82	-t73.20	-4.09	0.02
		30	Wind 90	0.00	0.40	-0.70	-147.50	-08.52	8.02
- 1		60	Wind 60	8.80	0.69	-0.40	-85,17	-1 19.28	0.02
ı		90	Wind 90	0.10	0.80	0.00	-1.35	-172.95	8.81
Į.		t 28	Wind Normal	0.82	0.71	0.41	84.62	-152.99	0.00
- 1		150	Wind 90	0.01	0.41	0.78	146.36	-09_37	-0.01
- 1		881	Wind 68	8.81 0.80	-0.40	0.70	167.99	-4.09 80.34	-0,02 -0,02
		210	Wind 90						

tnxTower	Job 240568	Page 30 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Dale 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

		*				<del></del>		٠.	
Section	Section	Wind	Directionality	F	V.	V.	OIM,	OTM,	Torque
No.	Elevation	Azimuth		_				1	
	<u>, , , , , , , , , , , , , , , , , , , </u>			E		K	kip-ft	kip-ft	kip-fl
T13	68.00-48.00	8	Wind Normal	3.38	0.88	-3.38	-178,19	-2.06	8.9
i		38	Wind 90	3,53	1.76	-3.85	-153.88	-90.22	0.6
ı		60	Wind 60	3,75	3.25	-1.88	-94.91	-164.52	0.0
		98	Wind 90	3.53	3.53	0.00	-1.11	-178.37	-0.5
		120	Wind Normal	3.38	2.93	1.69	83,42	-148.49	-0.9
		150	Wind 90	3.29	1.65	2.85	141.48	-84.39	-1.0
- 1		180	Wind 68	3.21	8.88	3.21	139.16	-2.06	-8.9
		218	Wind 90	3.53	+1.76	3.85	151.57	86.89	-0.6
- 1		248	Wind Normal	3.93	-3.40	1.96	97.09	168.02	-0.0
		278	Wind 90	3.53	-3.53	0.88	-1.11	174,24	0.5
		388	Wind 60	3.21	-2,78	-1,60	-81.25	136.73	8.8
- 1		338	Wind 90	3.29	-1.65	-2.85	-143.71	80.26	1.0
T14	40.00-20.08	8	Wind Normal	3.11	8,80	-3.11	-94.52	-2.21	0,9
	30	Wind 90	3.23	1.62	-2.88	-85.22	-50.73	0.60	
		60	Wind 68	3.43	2.97	-1.72	-52.72	-91.45	0.8
		90	Wind 90	3.23	3.23	0.00	-1.19	-99.24	-8.4
- 1		120	Wind Normal	3.11	2,69	1.56	45.47	-83.03	-8.8
J		1.58	Wind 90	3.82	1,51	2.62	77.40	-47.59	-1.03
1		180	Wind 68	2.94	0.88	2.94	87.13	-2.21	-0.89
i i		210	Wind 90	3.23	-1.62	2.88	82.84	46.30	-0.61
		240	Wind Normal	3.60	+3.12	1.88	52.83	91.36	-8.8
		278	Wind 90	3,23	-3,23	0.08	-1.19	94.81	8.4
		300	Wind 60	2.91	-2.55	-1.47	-45.35	74.27	0.8
		338	Wind 90	3.82	-1.51	-2.62	-79.78	43.16	1.5
T15	20.88-8.08	8	Wind Normal	2.84	0.88	-2.84	-29.64	-2.37	8,91
i		30	Wind 90	2.92	1.46	-2.53	-26.57	-16.97	8.57
		68	Wind 6B	3,89	2.67	-1.54	-16.71	-29.11	8.80
i		90	Wind 98	2.92	2.92	0.88	-1.27	-31.58	-8.47
- [		128	Wind Normal	2.84	2.46	1.42	12.91	-26.93	-0.85
- 1		158	Wind 98	2.74	1.37	2.37	22.46	-16.87	-0.98
	188	Wind 60	2.65	0.80	2.66	25.36	-2.37	-0.85	
	218	Wind 90	2.92	-1.46	2.53	24.03	12.24	-8.57	
- 1		240	Wind Normal	3.26	-2.82	1.63	1.5.83	25.88	-8.87
- 1	1 1	270	Wind 90	2.92	-2.92	0,88	-1.27	26.85	8.47
- 1		300	Wind 68	2.66	-2.31	-1.33	-1-1.59	20.70	0.88
- 1		330	Wind 90	2.74	-1.37	-2.37	-25.81	11.34	0,98

		Mast Totals - No Ice							
Wind Azimuth	ν.	ν,	OTM,	OTM,	Torque				
	ĸ	K	kip-ft	kip-ft	kip-ft				
0	0.881	-50.12	-7209.38	-19.21	9.5				
30	26.45	-45.82	-6623.24	-3836.95	6.8				
60	49.81	-28.38	-4180.45	-7182.82	0.4				
90	53.37	8.88	-10.73	-7788.25	-5.3				
120	43.62	25.18	3621.17	-6309.85	-9.2				
158	24.48	42.39	6078.39	-3530.15	-18.5				
188	0.88	47,94	6901.81	-19.21	-9.1				
218	-26.45	45.82	6601,79	3798.52	-6.0				
248	-50.90	29.39	4222.81	7312.18	-0.4				
278	-53.37	8.08	-10.73	7741.82	5.3				
388	-41.73	-24.09	-3499.61	6023.71	2.7				
330	-24.48	-\$2.39	-6091.85	3491.72	18.5				

tnxTower	Job 240568	Page 32 of 64
Valmont 1345 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Section	Wind	Directionality	F	ν,	V <sub>a</sub>	OTM,	OTM.	Torque
Na	Elevation fl	Azimuth		κ	κ	ĸ	kip-ft	kip-fl	Mp-fl
		240	Wind Normal	0.81	-0.78	0.41	83.77	143,34	-0
1		278	Wind 90	8.88	-0.88	0.88	-1.35	164.77	-0.
- 1		388	Wind 68	0.81	-0.78	-0,48	-86,02	142.56	-0.
- 1		338	Wind 98	8.81	-0.41	-0.70	-149.85	81.19	. 5,
T6	280.08-180.88	8	Wind Normal	8.83	8.88	-0.83	-158.91	-4.78	8
		30	Wind 90	18.0	8.41	-0.70	-135.19	-81.93	8
		60	Wind 60 Wind 90	8.81	0.78	-0.4B 0.80	-78.12	-137.38	
		120	Wind Normal	8.81 0.83	8.81 8.72	0.41	-1.57 77.10	-159.88 -141.85	8
		150	Wind 90	0.82	0.41	0.71	13 3.39	-82,70	-0
- 1		180	Wind 68	5.81	0.88	0.81	153.88	-4.78	-0
- 1		218	Wind 90	0.81	-0.41	0.70	132.06	72.36	-0
ł		248	Wind Normal	0.82	-0.71	0.41	76.33	138,15	-8
- 1		278	Wind 98	0.81	-0.81	0.00	-1.57	149.51	-8
- 1		380	Wind 68	8.81	-0.78	-0.41	-78.89	129.14	-8
_ I		330	Wind 90	0.82	-0.41	-0.71	-136.52	73.13	
77	188.00-160.80	30	Wind Normal	8,80	8.88	-0.80	-137.96	-5.47	
- 1		58 68	Wind 90 Wind 60	0.79 0.78	0.39 8.68	-0.68 -0.39	-117.59 -68.17	-72.32 -120.43	0
- 1		90	Wind 90	0.72	0.79	0.88	-1.50	-139,18	i
- 1		128	Wind Normal	8.80	0.69	0,48	66.29	-123.39	
- 1		158	Wind 98	8,79	0,48	0.69	113.16	-73.08	-8
i		180	Wind 68	8.79	0.80	0.79	132.29	-5.47	-6
1		218	Wind 90	8.79	-0.39	8.68	114.00	61,38	-8
L		240	Wind Normal	8,79	-0.69	0.40	65,62	111.29	-8
i		270	Wind 90	8.79	-0.79	0.88	-t.80	128.24	-8
		380	Wind 60	8.79	-0.68	-0.39	-68.84	118.65	-6
		330	Wind 90	0.79	-0.40	-0.69	-118.75	62.85	0
18	168,88-140,80		Wind Normal	0.79	80.8	-0.79	-120.98	-6.15	0
		30 68	Wind 90 Wind 60	8.78 0.77	8.39 8.67	-0.67 -0.39	-103.11 -59.95	-64.51 -186.48	0
		90	Wind 90	0.78	8.78	0.08	-2.03	-122.87	8
		120	Wind Normal	0.79	0.69	0.48	57.45	-189.16	ő
1		158	Wind 90	8.79	0.39	0.68	180.85	-65.09	-0
- 1		180	Wind 60	8.78	8,00	8.78	114.98	-6.15	-0
- 1		218	Wind 90	0.78	-0.39	0,67	99,86	52.21	-0
		240	Wind Normal	8.79	-0.68	0.39	56.27	95.87	-0
		270	Wind 90	8.78	-0.78	0.88[	-2.83	110.57	+0
		300	Wind 60	8.78	-0.68	-0.39	-60.53	95.18	-0
_ !		338	Wind 90	0.79	-0.39	-0.68	-104.11	52.79	8
79	148.00-120.00	. 0	Wind Normal	0.79	0.08	-0.79	-184.87	-6.82	0
i		3g 6g	Wind 90 Wind 60	0.77	0.39 0.66	-0.67 -0.38	-89.22 -52.05	-57.82 -93.05	0
- 1		28	Wind 90	0.77	0.55	0.00	-3 2.03	-93.03	0
- 1		120	Wind Normal	8.79	0.77	8.39	49.83	-187.23 -95.67	0
- 1		158	Wind 90	8.78	0.39	0.68	85,53	-57.51	-0
- 1		180	Wind 60	8,77	0.00	0.77	98.27	-6.82	-0
- 1		210	Wind 90	8.77	-0.39	0.67	84.69	43,39	-0
- 1		240	Wind Normal	0,78	-0.68	0.39	48.55	81.19	-8
- 1		278	Wind 90	0.77	-0.77	0.00	-2.27	93.59	-ō
- 1	- 1	300	Wind 60	8.77	-0.67	-0.39	-52.54	88.25	-8
- 1	i	330	Wind 90	0.78	-0.39	-0.60	-90.06	43.87	0
TIO	120.00-100.00	Đ	Wind Normal	8.77	0.00	-0.77	-87.64	-7.48	0.
- 1		30	Wind 90	0.76	0.38	-0.66	-74.68	-49.10	0
1		60	Wind 68	8,75	0.65	-0.38	-43.78	-78.94	8
		90	Wind 90	8.76	0.76	0.88	-2.52	-90.71	0.
		120	Wind Normal	8,77	0.67	0.39	40.05	-81.28	8.
		150	Wind 90 Wind 60	8.76 8.76	0.38	0.66	70.26 8 8.80	-49.49 -7.48	-0. -0.
- 1	i	218	Wind 90	0.76	-0.38	0.76 0.66	69.57	34.14	
1		218	Wind 90 Wind Normal		-0.65	0.66	39.65	65,56	-8. -0.
				0.77					

tnxTower	Job 240568	Page 33 of 64
Valmant 1545 Pidea Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

ection	Section	Wind	Directionality	P	$\nu_s$	ν,	OTM,	OTM,	Torque
No.	Elevation A	A2imuth		ĸ	к	r l	kip-ft	kip-fl	kip-fl
		270	Wind 90	0.76	-0.76	8.00	-2.52	75.76	-0.03
- 1		308	Wind 60	0.76	-0.66	-0.38	-44.17	64.68	-0.0t
- 1		330	Wind 90	0.76	-0.38	-0.66	-75,29	34.54	0.0t
Til	100,80-80,00	0	Wind Normal	0.75	0.00	-0.75	-70.34	-8.12	0.03
		30	Wind 90	0,73	0.37	-0.64	~59.93	-41.12	0.04
		60	Wind 60	8.73	0.63	-0.36	-35.48	-64.77	8.04
		90	Wind 90	0.73	0.73	0.08	-2.77	-74.12	0.03
- 1		120	Wind Normal	0.75	8.65	8.38	31.01	-66.63	8.01
1		150 180	Wind 90 Wind 60	0.74 0.73	0.37 0.88	0.64 8.73	54.92 63.26	-41.43 -8.12	-0.01
- 1		2t0	Wind 90	8,73	-0.37	0.64	51.39	24.88	-0.03 -0.04
- 1		240	Wind Normal	0.74	-0.64	8.37	30.70	49.86	-0.04
- 1		270	Wind 90	0.73	-0.73	8.00	-2.77	57.88	-0.83
- 1		308	Wind 60	0.73	-0.64	-0.37	-35.79	49.87	-0.01
- 1		330	Wind 90	8,74	-0.37	-0.64	-60.47	25.t9	0.01
T12	88,00-60.00	0	Wind Normal	8,72	8.00	-0,72	-53.55	-8.74	0.03
1		30	Wind 90	0.7E	8.35	-0.61	-45.73	-33.39	8.04
ı		60	Wind 60	0.70	8.60	-0.35	-27.46	-51.83	0.04
		90	Wind 90	0.70	0.78	0.00	-3.05	+58,83	0.03
		120 150	Wind Normal Wind 90	0.72 0.71	0.62 8.36	0.36 0.62	22.20 40.84	-52.48 -33.62	8.01 -0.81
		180	Wind 60	0.70	8.00	0.70	46.24	-8.74	-0.83
- 1		210	Wind 90	8.70	-0.35	0.61	39.64	15.90	-0.01
- 1		240	Wind Normal	8.71	-0.62	0.36	21.97	34.60	-0.04
- 1		270	Wind 90	0.78	-0.70	0,00	-3.05	40,54	-0.03
- 1		300	Wind 60	8.78	-0.6t	-0.35	-27.69	33,94	-0.81
- 1		330	Wind 90	0.71	-0.36	-0.62	-46.t3	16.13	8.01
13	80,81-00,83	.0	Wind Normal	8.68	0.00	-0.68	-37.23	-9.34	8.03
- 1		30	Wind 90	B.66	0.33	-0.57	-31,96	-25.86	8.04
- 1		60	Wind 60	0.65	0.57	-0.33	-19.70	-37.68	8.01
- 1		90 120	Wind 90 Wind Normal	8,66 0,68	0.66 8.59	8,00	-3.34 13.61	-42.38	0.83
- 1		t58	Wind 90	8.67	8.33	0.34	25.54	-38.69 -26.01	8.01 -0.81
i		180	Wind 68	0.66	8.80	8,66	29.69	-9.34	-8.83
- 1		218	Wind 90	8.66	-0.33	0.57	25.28	7.18	-0.84
- 1		240	Wind Normal	8,67	-0.58	8,34	13,45	19.75	-0.04
- 1		278	Wind 90	0.66	-0.66	0,00	-3.34	23.71	-0.03
- 1		300	Wind 60	0.66	-0.57	-0.33	-19.85	19.27	-0.0 t
- 1		338	Wind 90	0.67	-0.33	-0.58	-32.22	7.34	8.01
14	48.00-20.08	0	Wind Normal	0.61	8.00	-0.61	-22.87	-9.88	8,03
- 1		30	Wind 90	8.60	0.38	-0.52	-t9.19	-18.84	8.04
- 1		68 90	Wind 68 Wind 90	8.59 0.68	0.51	-0.30 0.80	-12.54	-25.24	8.04
ſ		120	Wind Normal	0.61	0.53	0.31	-3.67 5.53	-27.80 -25.81	8.03 8.81
		150	Wind 90	8.60	0.33	0.52	11.99	-23,81 -18,92	-0.01
		t 80	Wind 60	0.60	8.00	0.60	14.23	-9.88	-8.03
		210	Wind 90	0.60	-0.30	0.52	t1.85	-0.92	-0.84
		240	Wind Normal	8.61	-0,53	0.30	5.45	5.92	-0.04
		278	Wind 90	8.68	-0.68	0.80	-3.67	8.04	-0.83
1		308	Wind 60	8.60	-0,52	-0.30	-t2.62	5.63	-8.81
1		330	Wind 90	8.68	-0.30	-0.52	-19.33	-0.83	8.01
15	20.08-8.00	0	Wind Normal	0.54	0.00	+0.54	-9.47	-10.26	8.03
- 1		30	Wind 90	0.52	0.26	-0.45	-8.61	-12.87	0.03
- 1		68 90	Wind 60 Wind 90	8.52 0.52	0.45	-0.26 0.08	-6.67	-14.72	0.03
- 1	1	t20	Wind Normal	0.54	8.52 0.47	0.08	-4.10 -t.41	-15.47	0.82
- 1	1	130	Wind Normal Wind 90	0.53	0.47	0.45	0.45	-14.92 -12.89	0.81 -0.81
- 1	i	180	Wind 68	0.52	0.00	8.52	1.10	-10,26	-8.02
- 1		210	Wind 90	0.52	-0.26	0.45	0.41	-7,66	-0,03
- 1		240	Wind Normal	8,53	-0.46	0.27	-1.44	-5.65	-0.03
		270	Wind 90	8.52	-0.52	0.00	-4.10	-5.06	-8,02

tnxTower	Job 240568	Page 35 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phona: 574-936-4225 FAX:	Client American Tower Carp.	Designed by SKK

No. T4	Elevation ft 240.08-220.08	#200 150 188 210 240 270 308 330 0 30 60 60	Wind 60 Wind 90 Wind 90 Wind 90 Wind 60 Wind 90 Wind Formail Wind 90 Wind 60 Wind 60	1.82 1.71 1.61 1.60 1.57 1.71 1.86 1.71 1.57	1.58 1.71 1.39 8.88 0.00 -0.85 -1.61	-0.91 8.00 0.88 1.39 1.57 t.48	**************************************	kip-ft -394.73 -427.71 -348.17 -208.45 -0.43	kip-ft 8.0 -0.8 -0.1 -0.1
	240.08-220.08	90 120 150 188 210 240 276 308 330 0	Wind 90 Wind Normel Wind 90 Wind 60 Wind 90 Wind Normal Wind 90 Wind 60 Wind 60 Wind 90	1.71 t.61 1.60 1.57 1.71 1.86 t.71	1.71 1.39 8.88 0.00 -0.85 -1.61	8.00 0.88 1.39 1.57 t.48	-8.23 288.53 346.20 391.16	-427.71 -348.17 -208.45 -0.43	8.0 +0.8 +0.1 +0.1
	240.08-220.08	120 150 188 210 240 270 308 330 0	Wind Normal Wind 90 Wind 60 Wind 90 Wind Normal Wind 90 Wind 60 Wind 60 Wind 90	t.61 1.60 1.57 1.71 1.86 t.71	1.39 8.88 0.00 -0.85 -1.61	0.88 1.39 1.57 t.48	288.53 346.20 391.16	-348,17 -208,45 -0,43	-0.1 -0.1
	240.08-220.08	150 188 210 240 270 308 330 0 30	Wind 90 Wind 60 Wind 90 Wind Normal Wind 90 Wind 60 Wind 90	1.60 1.57 1.71 1.86 t.71	8.88 0.00 -0.85 -1.61	1.39 1.57 t.48	346.20 391.16	-208.45 -0.43	-0.1
	240.08-229.08	188 210 240 270 308 330 0 30	Wind 60 Wind 90 Wind Normal Wind 90 Wind 60 Wind 90	1.57 1.71 1.86 t.71	0.00 -0.85 -1.61	1.57 t.48	391.16	-0.43	
	240.08-229.08	210 240 270 308 330 0 30	Wind 90 Wind Normal Wind 90 Wind 60 Wind 90	1.71 1.86 1.71	-0.85 -1.61	t.48			
	240.08-220.08	240 270 308 330 0 30	Wind Normal Wind 90 Wind 60 Wind 90	1.86 t.71	-1.61				-0.0
	240.08-220.08	270 308 330 0 30	Wind 90 Wind 60 Wind 90	t.71		8.93	232.49	213.21 482.64	-0,0 -0.0
	240.08-220.08	308 330 0 30	Wind 60 Wind 90		-1,71	8.80	-8.23	426,85	8.8
	240.08-220.08	0 30			-1.36	-0.78	-191,93	338.52	0.1
	240,08-220.08	30		1.60	-0.80	-1.39	-346.66	t99.58	0.1
T3			Wind Normal	1.71	0.88	-1.71	-393.64	-0.71	0.t
Т5			Wind 98	1.83	8.92	-1.59	-365.84	-211.70	8.1
Т5			Wind 68	1.99	1.72	-0.99	-228.68	-396,12	0,0
T5		90 120	Wind 98 Wind Normal	1.83 1.71	1.83	0.00	-0.38	-422.78	-0.1
T5		150	Wind Normal Wind 90	1.69	0,85	1.47	196.24 336.62	-341.28 -195.28	-0.1 -0.2
T5		188	Wind 60	1.65	0,03	1.65	379.17	-193.28	-0.1 -0.1
T5		218	Wind 90	1.83	-0.92	t.59	365.87	218.29	-0.1
T5		248	Wind Normal	204	-1.77	1,02	234.76	406.57	-8.0
T5		278	Wind 90	t.83	-1.83	0.00	-0.38	421.28	0.1
T5		388	Wind 60	1.65	-t.43	-0.83	-190.16	328.00	0.1
T5		338	Wind 90	1.69	-0.85	-t.47	-337.39	t93.86	0.3
	220,00-200.08	0	Wind Normal	1.74	8.80	-1.74	-366.88	-0,86	8.7
		30	Wind 90	1.86	0.93	-1.61	339.t2	-t96.38	8.1
		68	Wind 60 Wind 98	2.01	1.74	-1.00	-211.29	-366.03	0.8
		90 120	Wind Normal	1.74	t.86 1.5t	0.00 8,87	-8.46 182.75	-391.90	-0.1 -8.2
		150	Wind 98	1.72	0.86	1,49	312.70	-18t.67	-0.2
- 1		180	Wind 60	1,68	8.00	1.68	352.20	-0.86	-0.2
- 1		218	Wind 90	1,86	-0.93	1.61	338.19	t94.66	-0.1
- 1		248	Wind Normal	2.07	-t.88	1.04	217.24	376.22	-0.0
- 1		270	Wind 90	1.86	-1.86	8.80	-0.46	390.19	8.1
j		300	Wind 68	1.68	-1.45	+0.84	-176.80	384.55	8.2
- 1		330	Wind 98	1,72	-0.86	-1.49	-313.63	179.95	8.2
T6	200.08-180.80	0	Wind Normal	t.76	0.00	-1.76	-334.11	-1.84	0.2
- 1		38	Wind 90	1.86	0.93	-1.61	-307.16	-t78.04	0.1
- 1		68 90	Wind 60 Wind 90	2.00 1.86	1.74	-t,00	-190,91	-330.73	8.0
- 1		t20	Wind Normal	1.76	1.52	0.00	-8.55 166.24	-355.06 -289.89	-0.1 -0.2
- 1		150	Wind 90	1.73	0.86	1,49	283.49	-165.88	-0.2
- 1		tBO	Wind 60	1.68	0.08	1.68	319.06	-1.01	-8.2
- 1		210	Wind 90	1.86	-0.93	1.61	306.07	176.02	-0.1
- 1		248	Wind Normal	2.88	-t.88	1.04	196.80	348.80	-8.0
- 1		270	Wind 90	1.86	-1.86	B.BO	-B.55	353.04	8.1
		300	Wind 60	1.68	-1.46	-0.64	-160.35	275.78	B.2
_ 1		330	Wind 90	1.73	-0.86	-1.49	-284.59	162.98	8.2
17	180.08-168.00	0	Wind Normal	1.68	8.80	-1.68	-285.89	-1.16	8.2
- 1		30 60	Wind 90 Wind 60	1.79	0.90 t.67	-1.55 -0.97	-264.35 -164.77	-153.42	0.1
- 1		90	Wind 90	1.79	1.79	0.00	-164.77	-285,47 -305,69	0,8 -0.1
J		120	Wind Normal	1.68	1.45	8,84	142.00	-248.20	-0.1 -0.2
		150	Wind 90	1.66	8,83	t.44	243.37	-142.83	-8.3
		180	Wind 68	1.62	0.80	t.62	274.24	-1.16	-0.2
		218	Wind 90	1.79	-0.90	1,55	263.10	151.18	-8.1
J		240	Wind Normal	1.99	-1.73	1,00	t68.72	292.15	-0.8
1		278	Wind 90	1.79	-1.79	8.00	-0.63	303.37	0.1
		388	Wind 60	1.62	-1.48				
1						-0.81	-138.86	236.89	
TB		330	Wind 98	1.66	-0,83	-1.44	-244.62	139.71	0.2 8.3
- 1	t60,00-140.08	330 B 30							

tnxTower	Jab 240568	Page 34 of 64
Valmont 1545 Pídeo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymosth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Section	Wind	Directionality	F	V.	V.	OTM,	OTM,	Torque
Ma,	Elevation fl	Az Imsuth		ĸ	ĸ	l r	kip-fl	kip-ft	ktp-fl
		300	Wind 60	8.52	-0.45	-0.26	-6.70	-5,76	+0,01
1	1	330	Wind 90	0.53	-0.26	-0.46	-8.65	-7.64	0.01

	<u> 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908 - 1908</u>	<u> </u>	Mast Totals - With Ice					
Wind Azimah	ν,	ν,	OTM,	OTM,	Tarque			
	ĸ	r l	kip-ft	kip-fl	ktp-ft			
0	0.00	-10.15	-t492.36	-89.11	0.37			
30	5.0t	-8.67	-t289.86	-814.76	8.43			
60	8.66	-5,00	-763.18	-t353.67	0.37			
90	10.89	B.0B	-33.01	-1559.83	B.21			
120	8.86	5.t I	706.39	-1369.78	0.00			
150	5.02	8.69	1217.63	-8t t.17	-8,21			
180	0,88	9.95	1400.58	-89.11	-B.37			
218	-5.01	8.67	1223.84	636.53	-0.43			
248	-8.84	5.to]	709.97	1197.76	-0.37			
270	-18.09	0.80	-33.01	1381.60	-0.21			
300	-8.68	-5.01	-759.52	1169.24	-0.00			
330	-5.02	-8.69	-1283.65	632,94	0.21			

	1000		IV.	last Ve	ctors -	Servi	ce		
Section No.	Section Elevation	Wind Azimuth	Directionality	F	V <sub>3</sub>	ν,	OTM,	OTM,	Тогуна
IVO.	ft ft	AZIMBUN 0			r l	x 1	kip-ft	kip-ft	kip-fl
Tt	290.88-288.00	B	Wind Normal	8.29	0.00	-0.29	-83.23	-0.17	8,0
		38	Wind 90	0.33	0.16	-0.28	-80,70	-46.71	8.0
		60	Wind 68	8.32)	0.28	-0.16	-45.78	-79.tg	0.8
		90	Wind 90	0.33	0.33	0.00	-0.09	-93.24	-0.8
		120	Wind Normal	0.29	8.25	8,t5	41.48	-72.17	-0.8
		t50	Wind 90	8.22	8.t1	8.t9	5 4.72	-3t.81	-0.0
		180	Wind 60	8.27	8.00	8.27	75.67	-0.17	-8.0
		210	Wind 90	8.33	-0.16	0.28	80.52	46.37	-0.8
		240	Wind Normal	8,35	.0E.0÷	0.17	49.22	85.24	-0.8
		270	Wind 90	8.33	-0.33	8.00	-8.09	92.91	8.0
		388	Wind 60	8.27	-0.23	-0.13	-37.97	65.44	0.8
- 1		330	Wind 90	0.22	-0.11	-0.19	-54.90	31.48	0.8
T2	280,08-260,80	B	Wind Normal	1,09	8.00	-1.89	-294.94	-0.t7	0.8
- 1		38	Wind 90	t.t3	8,56	-0.98	-264.13	-152.40	+0,0
- 1		60	Wind 60	t.21	1.85	-0.6t	-164.26	-283,89	+0.8
- 1		90	Wind 90	1.33	1.33	0.88	-0.46	-360.44	-0.1
- 1		t20	Wind Normal	1.20	1.04	0.60	161.28	-280.38	-0.1
- 1		158	Wind 90	1.02	0.51	0,89	239,01	-t38.45	-8,0
- 1		t SB	Wind 60	t.05	0.08	1,85	283.67	-0.17	-0.0
- 1		2t0	Wind 90	1.13	-0.56	0,98	263.22	152.06	0.0
- 1		248	Wind Normal	1.25	-1,88	8,63	t 68.52	292.52	0.0
i		278	Wind 90	1.33	-1.33	0.80	+0.46	368.18	0.1
		308	Wind 60	1.16	-1,80	-0.58	-t57.g2	271.80	0.1
		33B	Wind 90	1.82	-0.5t	-0.89	-239.97	t38.11]	0.8
T3	260.00-248.00	8	Wind Normal	t.6t	8.00	-1.61	-401.76	-0.43	8.t:
		30	Wind 90	1.71	8.85	-1.48	-378.27	-214.07	0,0

tuxTower	Job	240568	Page 36 of 64
Valmont 1545 Pideo Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Phniosth, IN Phone: 574-936-4221 FAX:	Client	American Tower Corp.	Designed by SKK

No.	Section Elevation	B'ind Asimuth	Directionality	F	ν,	ν,	OTM,	OTM,	Torque
140.	Elevation ft	۰		κ	ĸ	ĸ	kip-ft	kip-ft	ktp-ft
		90	Wind 90	1.78	1.78	0.00	-0.71	-267.97	-0.
		120	Wind Normal	1.67	t.45	8.84	124.55	-218.26	-0.
		150	Wind 90	1.65	0.82	1.43	2t 3.26	-124.85	-0.
		180 218	Wind 60 Wind 90	1.61 1.78	0.80 -0.89	t.6t 1,54	248.32 238.22	-1.31	-0. -8.
		240	Wind Normal	1.78	-1.71	0.99	147.51	132.02 255.40	-8.
		270	Wind 90	t.78	-1.78	0.00	-0.71	265.34	0.
- 1		380	Wind 60	1.61	-t.39	-0.80	-121.22	207,43	o.
- 1		338	Wind 90	1.65	-0.82	-1.43	-214.68	122.23	o.
T9	140.08-120.80	0	Wind Normal	1.69	0.00	-1,69	-228,90	-1.46	8
		30	Wind 90	1.79	8.89	-1.55	-201.95	-117.60	C.
- 1		60	Wind 60	1.91	1.66	-0.96	-125.22	-216.99	8.
- 1		90	Wind 90	1.79	1.79	8,00	-0.79	-233.74	-8.
- 1		120	Wind Normal	1.69	1.47	0.85	109.27	-192.09	-8,
- 1		15B	Wind 90	1.66	0.83	1.44	186.11	-t09.37	-8.
. !		188	Wind 60 Wind 90	1.62	0.80	1.62	209.47	-1.46	-8.
- 1		210		1.79	-0.89 -1.72	1.55	200.37	11 4.6B	-0
1		240 270	Wind Normal Wind 90	1,99 1,79	-1.72	1.80 8.80	128.57 -0.79	222.60 230.82	-0
- 1		380	Wind 60	1.62	-1.79 -t.40	-0.81	-t85.92	180.63	0.
- 1		330	Wind 90	1.66	-0.83	-1.44	-187.69	106,44	0.
TIO	120.80-180.08	0.00	Wind Normal	1.67	8.80	-t.67	-184.95	-1.61	8.
٠ ا	120.00-100.00	30	Wind 90	1.76	0.88	-1.52	-168,57	-98.44	8.
- 1		60	Wind 60	1.88	1.63	-0.94	-104.41	-180.95	0.
- 1		90	Wind 90	1.76	1.76	0.80	-0.87	-195.26	-0.
- 1		120	Wind Normal	t.67	t.45	8.84	91.17	-161,03	-0.
!		158	Wind 90	1.54	0.82	t.42	155.18	-91.71	-0.
- 1		188	Wind 60	1.60	8.00	t.60	174.67	-t,6t	-0.
- 1		218	Wind 90	1.76	-0.88	t.52	166.83	95.21	+0.
- 1		248	Wind Normal	t.96	-1.70	0.98	186.94	185.12	-0.
I		270	Wind 90	1,76	-1.76	0.00	-8.87	t92.04	0.
- 1		380	Wind 68	t.68	-t.38	-0.88	-88.64	150.41	8.
ти і		330	Wind 90 Wind Normal	1.64	-0.82 0.00	-1.42 -1.63	-156.92 -147.53	EE.49	8. 8.
111	180.00-80.00	30	Wind 90	1.71	8.85	-1.03	-147.33 -t34.11	-78.64	8
		60	Wind 68	1.62	1.58	10.04	-83.05	-143.95	8.
		90	Wind 90	1.71	1.71	8.00	-8.95	-155,52	-8.
		120	Wind Normal	1.63	1.41	B.B1	72.34	-128.70	-0.
		158	Wind 90	t.59	0.80	1.38	123.07	-73.37	+0.
		180	Wind 60	1.55	0.80	1.55	138.50	-t.76	-0.
		2t0	Wind 98	1.71	-0.85	1.48	13 2.21	75,12	-8.
		240	Wind Normal	1.90	-1,65	8.95	84.71	146.60	-8,
- 1		270	Wind 90	1.71	-t.7t	0.00	-0,95	152.80	ø,
- 1		300	Wind 60	1,55	-t.34	-0.77	-70.68	119.80	0.
		330	Wind 90	t.59	-0.80	-1.38	-124,97	69.84	0.
T12	80.00-60.08	8	Wind Normal	1.59	8.00	-t.59	-112.24	-1.91	0.
- 1		30	Wind 90	1.66	0.83	-1.44	-18 t.75	-68.86	0.
- 1		60	Wind 60	1,77	1.53	-0.89	-62.99	-t09.23	0.
- 1		90	Wind 90	1.66	t.66	0,00	-1.03	-118.21	-0.
- 1		128 150	Wind Normal Wind 90	1.59 1.55	1,38	8,79 1.34	54.57 92.94	-98.23 -56.17	-0. -0.
- 1		188	Wind 68	1.51	0.00	1.51	104.63	-36.17	-0.
- 1		210	Wind 90	1.66	-0.83	1.44	99.68	56.23	-8
- 1		240	Wind Normal	1.65	-1.60	0.92	63,70	110.20	-0.
- 1		270	Wind 96	1.66	-1,66	8.00	-1.03	114.38	0.
- 1		300	Wind 60	1.51	-1.31	-0.75	-53.86	89.60	0.
- 1		330	Wind 90	1.55	0.78	-1.34	-95.00	52.34	o,
T13	60,00-40,00	8	Wind Normal	1.50	0,00	-1.50	-76.26	-2.06	8.
		30	Wind 90	1.57	0.78	-1.36	-68.97	-41.24	0.3
- 1		60	Wind 68	1,67	1,44	-0.B3	-42,80	-74.27	8.0
		90	Wind 90	1.57	1.57	0.00	-1.11	-50,42	-0.3

tnxTower	Job 240568	Page 37 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: \$74-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section No.	Section Elevation	Wind Azinash	Directionality	F	ν,	ν.	отм,	OTM,	Turque
	ft		l	K	ĸ	ĸ	kip-ft	kip-ft	kip-fl
		120	Wind Normal	1.50	1,30	0.75	36.46	-67.14	-0,-
- 1		150	Wind 90	1.46	8.73	1.27	62.26	-38.65	-0.4
- 1		180	Wind 60	1,42	00,8	1.42	70.12	-2,06	-0.4
- 1		210	Wind 90	1.57	-0.78	1.36	66.75	37.12	-0.3
I I		240	Wind Normal	1.75	-1.51	0.87	42.53	73.53	-0.
- 1		270	Wind 90	1.57	-1.57	0.00	-1,11	76.30	0.0
- 1		300	Wind 60	1.42	-1.23	-0.71	-36.73	\$9.62	0.3
- 1		330	Wind 90	1.46	-0.73	-1.27	-64.49	34.53	0.
T14	40.00-20.00	0	Wind Normal	1.38	0.08	-1.38	-12.67	-2.21	O.
		38	Wind 90	1.44	8,72	-1,24	-38.54	-23.78	0.3
		60	Wind 68	1.53	1.32	-0.76	-24.89	-41,88	8,1
		90	Wind 90	1.44	1.44	0,08	-1.19	-45.34	-8.
1		120	Wind Normal	1.38	1.20	0.69	19.55	-38.13	-0.3
- 1		150	Wind 90	1.34	8.67	1.16	33.74	-22.38	-0.
- 1		120	Wind 60	1.31	8,08	1.31	38.06	-2.21	-0.4
- 1		218	Wind 90	1.44	-0.72	1.24	36.15	19.35	-0.3
- 1		248	Wind Normal	1,60	-1.39	0.88	22.82	39.37	-0.1
- 1		270	Wind 90	1,44	-1.44	0.00	-1.19	40.91	0.3
- 1		38B	Wind 60	1.31	-1.13	-0.65	-28.82	31,78	0.3
- 1		330	Wind 90	1.34	-0.67	-1.16	-36.12	17.95	8,-
T15	20.00-8.00	[ 0]	Wind Normal	1.26	8.08	-1.26	-13.88	-2.37	0.4
		30	Wind 98	1.30	8.65	-1,12	-12.52	-8.86	0.2
		60	Wind 68	1.37	1.19	-0.69	-8.14	-14,25	0.0
- 1		90	Wind 90	1.38	1.30	0.88	-1.27	-15,35	-B.;
1		120	Wind Normal	1.26	1.89	0.63	5.03	-13.28	-8.3
- 1		15E	Wind 9E	1.22	8.61	1.85	9.27	-8,45	-8.4
		180	Wind 68	1.18	9.80	t.18	18,56	-2.37	-0.3
		218	Wind 90	1.30	-0.65	1.12	9.97	4.13	-0.3
		248	Wind Normal	1.45	-1.26	0.72	5.97	18.19	-0.5
		278	Wind 90	1.30	-1.30	0.80	-1,27	10.62	9.2
- 1		300	Wind 60	1.18	-1.03	-0.59	-7.19	7.89	0,3
- 1		330	Wind 90	1.22	-0.61	-1.85	-11.82	3.72	8.4

1 17 17	T. Deligiber	1.5%	Ma	st Totals -	Service	1,3
Wind Azimuth	V.	ν.	отм,	OTM <sub>4</sub>	Torque	
4	ĸ	ĸ	kip-ft	ktp-ft	ktp-ft	
0	8.00	-22.28	-3218.09	-19.21	4.25	
30	11.76	-20,36	-2949.62	-1715.98	2,70	
60]	21,78	-t 2.58	-1828.38	-3167.48	0.21	
90	23.72	0,80	-18.73	-3468.56	+2.38	
128	19.39	11.19	1603.45	-2815,85	-4,09	
150	10.EE	t#.84	2691.99	-1579.63	-4.69	
180	8,00	21.31	3861.51	-19.21	-4.06	
218	-11.76	29.36	2928.17	1677.56	-2.70	
248	-22.62	13.06	1970.49	3239,15	-0.22	
270	-23.72	00,⊈	-10.73	3430,14	2.38	
380	-18.55	-t0.71	-1561.34	2666.53	3,90	
330	-10.88	-18.84	-2713.45	1541,28	4.69	

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	Discrete	Appurter	ance Pres	sures - No	Ice Gu = 0.850

tnxTower	Jab	240568	Page 39 of 64
Valmont 1545 Pideo Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client	American Tower Corp.	Designed by SKK

		1/2	" x 4' lightning rod	- Elevation 292 - Fre	om Leg C		
Wind	F.	F,	V.	$\nu_{z}$	·OTM	OTM4	Torque
Azimuth					- 1		-
•	K	K	ĸ	K	kip-ft	kip-fl	ktp-ft
90	0.00	0,00	0.00	0.08	0.02	-1.35	0,1
120	8,00	8.00	8,80	08.0	0.71	-1.17	0.0
158	8.00	0.00	8.80	0.80	1.22	-8.66	0.1
188	0.00	8,00	0,00	₽.90	t.41	0.04	0,0
210	8.00	0.00	-0.88	0.80	1.22	8,73	0.6
240	₽.00	0.00	-0,00	₽.00	8,71	1.24	0.
270	0.00	0.00	-0.88	0.00	8,82	1.42	-0.0
300	0.00	0.00	-0.80	-0.00	-0.67	1.24	-0.
330	R 00	8.00	-0.00	-a on	-1 12	0.73	.n

		-	ATC Loading - E	levation 183 - None	C		
Wind Azimuth	F.	F,	ν.	ν,	OTM,	OTM,	Torque :
	ĸ	ĸ	ĸ	K	kip-fl	kip-ft	kip-ft
0	2,72	0.00	8.80	-2.72	-774.76	8.80	0.
38	2.72	8.00	1.36	-2.35	-670,96	-387.38	0
60	2.72	0.00	2.35	-1.36	-387.38	-670.96	
90	2.72	0.00	2.72	0.00	0.00	-774.76	0
120	2.72	0.00	2.35	1.36	387,38	-670.96	0
158	2.72	8.00	1,36	2.35	670.96	-387,38	0
180	2.72	8,00	8,00	2,72	774.76	80.8	0
218	2.72	0.00	-1,36	2.35	678.96	387,38	8
240	2.72	8.00	-2.35	1.36	387,38	670,96	8
278	2.72	0.00	-2.72	0.00	0.00	774.76	8
380	2,72	0.00	2.35	-1.36	-387.38	670.96	0
220	2 22	0.00	126	224	-670 D6	707.50	

			ATC Loading - I	Elevation 273 - None			
Wind	F.	Fe	ν,	V.	OIM,	OTM,	Torque
Cimuth	1	i			1		
•	ĸ	κ .	K	K	kip-fl	kip-fl	ktp-fl
0	2.70	0.00	0.00	-2.70	-741.97	0.00	0
30	2.70	0.00	1.35	-2.34	-642.57	-378.99	0.
68	2.70	8.00	2.34	-1,35	-378.99	-642,57	0
98	2.70	8,00	2.70	0.00	0.00	-741.97	0
1 20	2.70	0.00	2.34	1.35	370.99	-642.57	0
150	2.70	8.00	1.35	2.34	642.57	-370,99	8
180	2.70	0.00	8.88	2.70	741.97	0,08	Ó
218	2.70	0.00	-1.35	2.34	642.57	378.99	0
248	2.78	0.00	-2.34	1.35	370,99	642.57	0
270	2.70	0.00	-2.70	0.00	0.00	741.97	0
380	2.78	8.00	-2.34	-1.35	-378.99	642,57	ō
220	9.70	2 00	1 24	2.24	612 47	279.00	

			ATC Loading	- Elevation 265 - No	one C		
Wind	F,	F,	V.	ν,	OIM,	OTM,	Torque
Asimuth							•
	K	K	r.	K	kip-fl	ktp-ft	kip-ft
8	2.68	0.00	8.00	-2.68	-709.44	0.00	8,00
30	2.68	8.00	1,34	-2.32	-614.39	-354.72	0.00
60	2.68	0,00	2.32	-1,34	-354.72	-614.39	0.00
90	2.68	0.00	2.68	0.00	0.00		0.00
120		8.00	2.32	1.34	354,72	-614.39	88.0
158	2,68	8.00	1.34	2.32	614,39	-354.72	8,80

tuxTower	Job 240568	Page 38 of 64
Valmont 1543 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221	Client American Tower Corp.	Designed by SKK

.0000 0000.	.07 0. .03 0.	-2.89	292.21	1.586	28	1.11	Side ft <sup>2</sup> 2.40 1.11
.0000 0000.	.03 0.	-2.89	292.21	1.586	28 28	1.11	1.11
.0000		1	1			1	
	.01 -2	in 1.44	202.00				
				1.586	28	8.20	0.20
.0008) :	.00 00.	0.00	285,00	1.578	28	115,00	115,00
.0008	.00 00.			1.566	28	115.00	t15.00
.0008	.00 00.	O 8.88	265,80	1,554	27	115,88	115.00
.0000 2	.00 00.	0 8.00	255.88	1.541	27	115.00	115.00
	.12	1			1		
	.0008 2 .0000 2	.0008 2.00 0.0 .0000 2.00 0.0 Sum 8.12	.0008 2.00 0.00 8.88 .0000 2.00 0.00 8.00 Sum 8.12	.0008 2.00 0.00 8.88 255.80 .0000 2.00 0.00 8.00 255.88 Sum 8.12	.0008 2.00 0.00 8.88 265,80 1.554 .0000 2.00 0.00 8.00 255,88 1.541 Sum 8.12	.000E 2.00 0.00 8.88 265.80 1.554 27 .0000 2.00 0.00 8.00 255.88 1.541 27 Sum 8.12	0008 2.00 0.00 8.88 265.80 1.554 27 115.88 0000 2.00 0.00 8.00 255.88 1.541 27 115.00 Sum 8.12

Discrete	Appurtenance	e Vectors	- No Ice

			Beacon - Elevari	on 294.39 - From La	3.4		
Wind	F.	F <sub>s</sub>	ν,	V.	OTM,	OTM <sub>2</sub>	Torque
Azimuth	i	1	i				
•	K	K	K	K	ktp-ft	kip-ft	kip-ft
0	0.86	8,00	0.00	-0.86	-17,83	0.80	0.
30	0.05	8.03	0.03	-0.85	-14.77	-8.41	-0.
60	0.83	0.85	8.05	-0.83	-8.62	-14.56	-0.
90	0.80	0,06	0.86	8.88	-0.21	-16.82	-0.
120	8.83	0.85	0.85	0.83	8.20	-14.56	-0.
158	0.85	0.03	8.83	0.85	14.35	-8.41	-0.
188	0.86	0.00	8.88	0.86	16.61	0.80	0.
210	0.05	0.03	-0.03	0.85	14.35	8.41	0.
240	0.03	8.05	-0.05	0.83	8.20	14.56	0.
270	0.00	0.06	-0.86	8.00	-0.21	16.82	8,
388	0.03	0.05	-0.85	-0.03	-8.62	14.56	0
330	0.85	0.03	-0.83	-0.85	-14.77	8,41	8

		Веасон	Extender (1') 80306	2 - Elevation 292,21	- From Leg A		
Wind Asimuth	F <sub>4</sub>	F,	ν,	V <sub>4</sub>	OTM.	OTM <sub>4</sub>	Torque
	ĸ	ĸ	K	ĸ	kip-ft	lip-fl	kip-fl
0	0.83	0.00	8,00	-0.03	-7.79	00.0	0,0
30	8.82	8.01	0.83	-0.82	-6.76	-3.85	-0.0
60	0.81	8.02	0.02	-0.81	-3,94	-6,68	-0.1
90	₽.68	0.03	0.03	8.00	-0.09	-7.71	-8.0
128	10.0	0,02	0.02	0.01	3.77	-6.68	-0.6
150	0.82	0.01	0.82	8.82	6.59	-3.85	-0.0
180	0.03	0.00	0.80	0.03	7.62	80.0	0.6
210	0.02	0.01	-0.81	0.02	6.59	3.85	0,0
240	0.01	0.02	-0.82	0.81	3,77	6.68	0.1
270	0.08	0.03	-0.83	0.00	-0.09	7.71	B.1
300	0.03	0.02	-0.02	-0,81	-3.94	6.68	8,0
330	0.02	0.81	-0.81	-0.02	-6.76	3.85	8.0

			1/2" c 4' lightning r	nd - Elevation 292 -	From Leg C						
H'ind	F.	F.	ν,	V.	OIM.	OIM,	Torons				
Azimuth	4cimuth										
	K	ĸ	ĸ	K	kto-ft	kip-ft	kip-fl				
0	0.00	0.00	0.00	-0.00	-1.37	0.84	-0.01				
30	0.00	0.00	0.00	-0.00	-1.18	-8.66	-0.01				
60	8.00	0.00	8 80	080	-0.67	-1 17	0.88				

tnxTower	Job	240568	Pege 40 of 64
Valmont 1543 Pideo Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymnuth IN Phune: 574-936-4221 EAV	Cilent	American Tower Corp.	Designed by SKK

			ATC Loading	- Elevation 263 - No	me C		
B'ind Azimuth	F <sub>4</sub>	F,	V <sub>c</sub>	ν,	OTM <sub>e</sub>	OTM <sub>4</sub>	Tarque
	ĸ	ĸ	κ	ĸ	kip-fl	kip-ft	Hp-fl
188	2.68	0,00	0.00	2.68	709.44	0.00	0.80
218	2.68	9.00	-1.34	2.32	614.39	354.72	8.80
240	2.68	8,00	-2.32	1.34	354.72	614.39	- 8.80
270	2,68	0,00	-2,68	0.00	0.00	709,44	0.00
300	2.68	0.00	<b>-2.3</b> 2	-1.34	-354.72	614.39	80.8
338	2.68	0.00	-1.34	-2.32	-614.39	354,72	08.0

			ATC Loading - E	levation 235 - None	C		
Wind Azimuth	F.	F <sub>e</sub>	ν.	ν,	отм,	отм,	Torque
	K	K	ĸ	ĸ	kip-ft	kip-ft	kip-ft
0	2.66	0.00	8,08	-2.66	-677.16	0.00	0
38	2.66	0.00	1.33	-2.38	-586,44	-338,58	
68	2.66	0.00	2.30	-1.33	-338,58	-586.44	0
98	2.66	₽.00	2.66	8.00	₽.00	-677.16	9
120	2.66	0.00	2.38	t.33	338.58	-586.44	0
150	2,66	0,00	1,33	2.38	586.44	-338.50	0
t80	2.66	8.00	0.88	2.66	677.16	8.00	8
218	2.66	8.00	-1.33	2.30	586.44	338,58	8
240	2.66	0.00	-2.30	1.33	338.58	586.44	0
270	2.66	0.00	-2.66	00,0	0.00	677.16	8
300	2.66	0.80	-2.30	-1.33	-338.50	586.44	0
330	2.66	0.00	-1.33	-2.30	-586.44	338.58	0

## Discrete Appurtenance Totals - No Ice

B'ind	ν.	V.	OTM,	OTM,	Turque
Azimuth					
•	K	K	kip-ft	kip-ft	kip-ft
0	0,00	-10,84	-2929.51	0.84	-0.01
38	5.42	-9.39	-2537.07	-1464.58	-0.13
68	9.39	-5.42	-1464.90	-2536,76	-0.21
90	10.E4	00.00	-0.28	-2929,28	-0.23
120	9.39	5,42	1464.34	-2536,76	-0.20
150	5.42	9.39	2536.52	-1464,5B	-0,11
180	0.80	10.84	2928.96	0.84	18.0
218	-5.42	9.39	2536.52	1464.65	0.13
240	-9.39	5.42	1464.34	2536.83	0.21
270	-10'81	0.00	-0.28	2929.27	8.23
388	-9.39	-5.42	-1464.90	2536.83	0.20
330	-5.42	-9.39	-2537.07	1464.65	0.11

	Discrete	Appurten	ance Pres	sures - Wit	h Ice	$G_H = 0.850$	
_							

Description	Ainting Aziouth	R'eigia	Offiet,	Offict,	,	ζ,	q,	C <sub>A</sub> A <sub>C</sub> Front	C <sub>A</sub> Ac Side	4
1		ĸ	ft	ft I	l n	1	psf	ft²	ft <sup>2</sup>	in
Beacon	0,0000							3,41	3,41	1.8641
Besenn Extender (4')	0,0000	0.07	08,0	-2.09	292.21	1,586	] 3	1.89	1.89	1.0641
803062	i						•	l.	3	i

tnxTower	Jeb 240568	Page 41 of 64
Valuont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, K	Date 13:31:40 12/10/13
Plymouth IN Phone: 374-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Description	Aiming Azimuth	B'eight	Officet,	Offict,	£	K,	92	C <sub>A</sub> A <sub>C</sub> Front	C <sub>s</sub> A <sub>c</sub> Side	te
		K	fl	ß	ft		psf	n ,	ft <sup>2</sup>	tn
1/2" x 4" lightning rod	240.0000	0.04	-2,50	1.44	292.00	1,586	31	1.26	1.25	1.864
ATC Loading	0.0000	5.72	0.00	0.00	285.00	1.578	3	189.44	189,44	1.860
ATC Loading	0,0000	5.71	0.00	0.00	275,00	1.566	3	189.17	189,17	1.854
ATC Loading	0.0000	5,69	0.00	0.00	265,00	1,554	3	188.90	188.90	1.847
ATC Loading	8,0000	5.68	0.00	0.00	255,00	1.541	3	188.61	188.61	1.840
	Sum	23.07	i 1				- 1			

			Beacon - Elevati	on 294.39 - From La	5 A		
Wind Azienth	F.	F,	ν,	V.	OTM,	отм,	Torque
. 1	ĸ	ĸ	ĸ	ĸ	kip-ft	kip-ft	ktp-fl
0	0.01	0.00	0.00	-0.01	-3.12	0.00	0.00
30	0.61	0.00	0.00	-0.01	-2.77	-1.33	-0.01
60	0.00	0.01	0.61	-0.00	-1.80	-2.30	-0.02
90	0.00	0.01	0.01	0.00	-0.47	-2.65	-0.03
120	0.00	10.0	0.01	0.00	0.86	-2.30	-0.02
150	0.01	0.00	0.00	10.0	1.13	-1.33	-0.01
180	0.01	0.00	0.00	10.0	2.18	0.00	0.00
210	0.01	0.00	-0.00	0.01	1.83	1.33	0.01
240	0.00	0.01	-0.01	0.00	0.86	2.30	0.02
270	0.00	0.01	-0.01	0.00	-0.47	2.65	0.03
300	0.00	0.01	-0.81	-0,00	-1.80	2.30	0.02
330	10.0	0.00	-0.00	-0.01	-2.77	1.33	0.01

				2 - Elevation 202.21			
F7nd	F.	F.	ν, ι	$\nu_{\epsilon}$	OTAL	OTM	Torque
Azimuth	.1	l l			1		
	ĸ	K	K	K	kip-ft	kip-ft	kip-ft
0	0.01	0.00	0.00	-0.61	-1.66	0.00	- 0,
30]	0.00	0.00	0.00	-0.00	-1.46	-0.73	-0.5
60	0.00]	0.00	0.00	-0.00	-0.93	-1.26	-0.
90	0.00	0.00	0.00	0.00	-0.20	-t.46	-0.
120	0.00	0.00	0.00	0.00	0.54	-1.26	-0.
150	0.00	0.00	0.00	0.00	1,07	-0.73	-0.
180	0.01	0.00	0.00	10.0	1.27	0.00	O.
210	0,00	0.00	-0.00	0.00	1.07	0.73	0.
240	0.00	0.00	-0.00	0.80	0.54	1,26	0.
270	0,00	0.00	-0.00	0.00	-0,20	1.46	0.
300	0.00	0.00	-0.00	-0.00	-0.93	1,26	0.
330	0.00	0.00	-0.00	-0.00	-1.46	0.73	O.

		,	2"x 4" lighming ro	d - Elevation 292 - Fi	rom Leg C		
Wind Azinuth	F.	F <sub>s</sub>	ν,	ν,	OTM.	отм,	Torque
	K	K	K	T.	kip-fl	kip-fi	kip-fl
0	0.00	0.00	0,00	-0.00	-0.92	0.09	-0
30	0.00	0.00	0.00	-0,00	-0.79	-0.39	-0
60	0.08]	0,00	0.00	-0.00	-0.43	-0.75	0
90	0.00	0.00	0.00	0.00	0.05	-0.88	Ð
120	0.00	0.00	0,00	0.00	0.54	-0.75	0
150	0.00	0.00	0.80	0.00	0.90	-0,39	0

tnxTower	Job 240568	Page 43 of 64
Valmont 1543 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 374-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

	ATC Loading - Elevation 765 - None C										
Wind	F.	F,	V.	$\nu_i$	OTM,	$OTM_s$	Torque				
Azimuth											
	K	K	K	K	kip-ft	kip-ft	kip-ft				
270	0.49	0.00	-0.49	0.00	0.00	129.48	0.00				
300	0.49	0.00	-0.42	-0.24	-64.74		0.00				
330	0.49	0.00	-0.24	-0.42	-112.13	64.74	0.00				

			ATC Loading - E	Irvation 251 - None	c	***************************************	
Wind Astmath	Fe	F,	ν,	ν,	отм,	OTAL.	Torque
•	ĸ	K	K ]	K	ktp-ft	kip-ft	kip-ft
0	0.48	0.00	0.00	-0.48	-123,40	0.00	0,00
30	0.48	0.00	0.24	-0.42	-t05,87	-61.70	0.00
60	9.48	0.00	0,42	-0.24	-61.70	-106.87	0.00
90	0.48	0.00	0.48	0.00	0.00	-123.40	0.00
120	0.48	0.00	0.42	0.24	61.70	-106.87	0,00
150	0.48	0,00	0.24	0.42	106.87	-61.70	0.88
180	0.48	0.00	0.00	0.48	123.40	0.00	0,00
210	0.48	0.00	-0.24	0.42	105.87	61.70	0.88
240	0.48	0.00	-0.42	0.24	61.70	106.87	0.00
270	0.48	0.00	-0.48	00,0	0.00	123.40	0.00
300	0.48	0.00	-0.42	-0.24	-61.70	t06.87	0.00
330	0.48	0.00	-0.24	-0.42	-106.87	61,70	0.00

Discrete Appurtenance Totals - With											
B'ind Azimuth	ν,	ν.	OTM <sub>e</sub>	OTM,	Torque						
	ĸ	r l	kip-ft	kip-ft	ktp-ft						
ol	0.00	-t.98	-536.00	0,09	-0.01						
30	0.99	-1.72	-464.27	-267.60	-0.03						
60	1.72	-0.99	-268.30	-463.56	-0.04						
90	1.98	0.00	-0.61	-535.29	-0.04						
120	1.72	0.99	267,08	-463.56	-0.03						
150	0.99	1.72	463.05	-267,60	-0.01]						
180	0.00]	t.98	534.78	0.09	0.01						
210	-0.99	1.72	463.05	267.79	0.03						
240	-1.72	0,99	267.08	463.75	0.04						
270	-1.98	0.00	-0.61	535.48	0.04						
300	-1.72	-0.99	-268.30	463.75	0.03						
720		4 70	161 22	20120	6.01						

Discrete Appurtenance Pressures - Service $G_{tt} = a.650$										
Description	Aiming Azimuth	B'eight K	Officel,	Offict <u>.</u> A	r fi	κ,	q <sub>1</sub>	CAc Front ft <sup>2</sup>	C <sub>A</sub> A <sub>C</sub> Side fl <sup>3</sup>	
Bescop	0.0000	0.07	0.00	-2.89	294.39	t,589	12	2,40	2.40	
Beacon Extender (4') 803062	0.0000	0.03	0.00	-2.89	292.21	1.586	12	1.11	1.11	
1/2° x 4' lightning rod	240.0000	0.81	-2.50	1.44	292.08	1.586	12	0.20	0.20	
ATC Loading	0.0000	2.80	0,00	0.08	285.00	1.578	12	115.08	115.00	
ATC Loading	0.0000	2.08	0.00	0.00	275.00	1.566	12	115.08	115.00	

tnxTower	Job 240568	Page 42 of 64
Valmont 1545 Phico Drive	Project V-31 x 290' - #281338 Hazef Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 374-936-4221	Client American Tower Corp.	Designed by

		1/2" s 4" lightning rod - Elevation 292 - From Leg C   1/2" s 4" lightning rod - Elevation 292 - From Leg C   1/4" s 4" lightning rod - Elevation 292 - From Leg C   1/4" s 4" lightning rod - Elevation 292 - From Leg C											
Bind	F. F.		V.	V.	V <sub>i</sub> OTM,		Tarque						
Aztantlı	K	к	к	ĸ	kip-ft	Hp-ft	kip-fl						
180	0.00	0.00	0.00	0.00	1.03	0.09	0.01						
210	0.00	0.00	-0.00	0.00	0.90	0.58	0.00						
240	0.00	0.00	-0.00	0.00	0.54	0.94	0.00						
270	0.00	0.00	-0.00	0.00	0.05	1.07	-0.88						
300	0.00	0.00	-0.00	-0.08	-0.43	0.94	-0.01						
330	0.00	0,00	-0.00	-0.00	-0.79	0.58	10.01						

			ATC Loading - i	Terration 285 - None	C		
B'ind Azienah	F.	F <sub>t</sub>	ν,	ν,	отм,	OTM,	Torque
•	K	K	K	ĸ	kip-fl	Mp-ft	ktp-fl
0)	0,50	0.00	0.00	-0.50	-141.80	0.80	0.
30	0.50	0.00	0.25	-0.43	-122.81	-70.90	0.
60	0.50	0,00	0.43	-0.25	-70.90	-122.81	0.
90	0.50	0.00	0.50	0.00	0,00	-141.80	O.
120	0.50	0.00	0.43	0,25	70.90	-122.81	0.
150	8.50	0.00	0.25	0.43	122.81	-70.90	0.
180	0,50	0.00	0,00	0.50	141.80	0.00	0.
210	0.50	0.00	-0.25	0.43	122.81	70.90	0.
240	0.50	0.00	-0.43	0.25	70.90	122.81	0.
270	0.50	0.00	-0.50	0.00	0.00	141,80	6.
300	0,50	0.00	-0.43	-0.25	-70.90	122.81	0.
330	0.50	0.00	-0.25	-0.43	-122.81	70.90	0.

B'ind	F.	F <sub>4</sub>	$\nu_x$	ν,	OTM.	OTM,	Torque
Astouth				1	ŀ		
•	K.	K	K I	K	kip-fl	ktp-fl	kip-ft
0	0.49	0.00	0.00	-0.49	-135.61	0.00	0.0
30	0.49]	0.00}	0.25	-0.43	-117.44	-67.81	0.0
60	0.49	0.00	0.43	-0.25	-67.81	-117.44	0.0
90	0.49	0.00	0.49	0.00	0.00	-135.61	0.0
120	0.49	0.00	0.43	0.25	67.81	-117,44	0.0
150	0.49	8.00	0.25	0.43	117,44	-67.81	0.0
180	0.49	0.00	0.00	0.49	135.61	0.00	0.0
210	0.49	0.00	-0.25	0.43	117.44	67.81	0.0
240	0.49	6,00	-0.43	0.25	67.81	117.44	0.0
270	0.49	0.00	-0.49	0.00	0.00	135.61	0.0
300	0.49	0.00	-0.43	-0.25	-67.81	117,44	0.0
330	0.49	0.00	-0.25	-0.43	-117.44	67.51	0.6

	ATC Loading - Eievation 265 - None C											
Wind Fo	F <sub>o</sub>	F <sub>r</sub>	V.	ν,	OTM,	OTAI,	Тогоне					
•	ĸ	ĸ	ĸ	ĸ	kip-fl	kip-fl	kip-ft					
0	0.49	0.00	0.00	-0.49	-129,48	0.00	0.00					
30	0.49	0.00	0.24	-0.42	-112.13	-64.74	0.01					
60	0.49	0.00	0.42	-0.24	-64.74	-t 12.13	0.0					
90	0.49	0.001	0.49	0.00	0.00	-129.48	0.0					
120	0.49	0,00	0.42	0.241	64.74	-112.13	0.0					
150	0.49	6.00	0.24	0.42	112.13	-64.74	8,0					
180	0.49	0.00	0.00	0.49	129.48	0.00	0.0					
210	0.49	0.00	-0.24	0.42	112.13	64.74	0.0					
240	0.49	0.00	-0.42	0.24	64.74	112.13	0.0					

tnxTower	Job	240568	Page 44 of 64
Valmont 1343 Pideo Drive	Project V-31	x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 374-936-4221 EAY:	Client	American Tower Corp.	Designed by SKK

Description	Ainting Admith	Weight K	Offices,	Offiel <sub>t</sub>	r ft	κ,	g. psf	C <sub>A</sub> Ac Front ft <sup>2</sup>	C <sub>A</sub> Ac Side ft <sup>1</sup>
ATC Loading	0,0000	2.00	0.00	0.00	265.00	1.554	12	115.00	115.00
ATC Loading	0.0000	2,00	0.00	0.00	255.00	t.541	12	115.00	115.00
=	Sum	8.12						- 1	
	Weight:								

* "	5 / 17 Pr	Discr	ete Appu	rtenance	Vectors -	Service	2. 1
			Beacon - Elevatio	n 291.19 - From Le	7.4		
B'ind Azimuth	F.	F,	ν.	ν,	OTM,	OTM,	Torque
9	ĸ	κ	ĸ	K	kip-ft	kip-fi	ktp-ft
0	0.03	0.00	0.00	-0.03	-7,68	0,00	0.0
30	0.02	8.01	10.0	-0.02	-6,68	-3.74	-0.0
60	10.0	0,02	0.02	-0.01	-3.95	-6.47	-0.0
90	0.00	0.03	0.03	0.00	-0.2t	-7,47	-0.0
120	0.01	0.02	0.02	0.01	3.53	-6.47	-0.0
t50	0.02	10.0	0.8t	0.02]	6.26	-3,74	-0.0
180	0.03	0.00	0.00	0,03	7.26	0.00	0.0
210	0.02	0.01	-0.81	0.02	6.26	3.74	0.0
240	0.01	0.02	-0.02	10.0	3.53	6.47	0.0
270	0.00	0.03	-0.03	0.00	+0.21	7.47	0,0
300	10.0	0.02	-0.02	-0.01	-3,95	6.47	0.0
330	0.02	0.01	-0.01	-0.02	-6.68	3,74	0.0

		Beacon	Extender (*) 80396	2 - Elevation 292.21	- From Lag A		
Wind	F <sub>4</sub>	F <sub>s</sub>	V <sub>x</sub>	$\nu_s$	OTM,	OTM <sub>2</sub>	Torque
Asimuth	1						
2	K	K	K	K	kip-fl	ktp-ft	kip-ft
0	0.01	0.00	0,00	-0.01	-3.51	0.00	0.
30	0.01	10.0	0.01	-0.01	-3.05	-1.71	-0.
60	0.01	0.01	0.81	-0.01	-1.20	-2.97	-0.0
90	0.00	0.01	0.01	0.00	-0.09	-3.43	-0.
120	0.01	0.01	0.01	0.01	1.63	-2.97	-0.
150	0.01	0.01	0.01	0.01	2.88	-1.71	-0.
180	0.01	0.00	0.00]	0.01	3.34	6.00	0.
210	10.0	0.01	10.0-	10.0	2.88	1.71	0.
240	0.01	0.01	-0.01	10.0	1.63	2.97	0.
270	0.00	0.01	-0.01	0.00	-0.09	3,43	0.
300	0.01	0.01	-0.01	-0.01	-1.80	2.97	0,6
330	0.01	D 01	.0 01	-0.01	-3.05	171	0.

Wind	F.	E I	V	1/	OTAL	OTM.	Tarque
Azinuth	**		"	"	OING	O I Mag	1 organ
9	ĸ	ĸ	ĸ	K	kip-fl	ktp-ft	ktp-fl
0	0.00	0,00	0,80	-0.00	-0.60	0.04	-0.0
30	0.00	0,00	0.00	-0.00	-0.51	-0,27	-0.0
60	0.00	0.00	0.00	-0,00	-0,29	-0.50	8,0
90	0,00	0.00	0.00	0.00	0.02	-0.58	0.0
t20	0.00	0.00	0.00	0.00	0.33	-0.58	0.0
150	0.00	0.00	0.00	0.00	0.55	-0.27	0.0
100	0.00	0.00	0.00	0.08	0.64	0.04	0,0
210	0.08	0.00	-0.00	0,00	0.55	0.34	0.0
240	0.00	0,00	-0.00	0,00	0.33	0,57	0,0

tnxTower	Job 240568	Page 45 of 64
Valmont 1545 Pi <del>deo</del> Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phora: 574-936-4221 FAX:	Citent American Tower Corp.	Designed by SKK

	• •				• • • •		
			LAT x 4 Rektring r	od - Elevation 202 -	From Lag C		
B'ind Azimuth	F.	F,	P <sub>2</sub>	ν,	on.	one	Torque
L•	Ε			x	kip-ft	kip-fi	kip-ft
270	0,00	0.00	-0.90	0.00	0,02		-0,00
300	0.00	0.00	-0.00	-0.00	-0.29	0.57	-0.81
338	0.00	0.00	-0.00	-0.00	-0.51	0.34	-0.01

			AIC Loading	- Elevation 185 - Non	u C		
R'ind Azimuth	F.	F,	ν,	ν,	опи,	OTAL	Tarque
•	K	Ε .	K	. r	Hp-ft	kip-fi	Ep-fl
0	1.21	0.00	0.00	-1.21	-344.34	0,00	0.0
30]	1.21	0.00	0.60	-1.05	-298,20	-172.17	0.0
60	1.21	0.00	1.05	-0.60	-172.17	-221.20	0.0
90	1.21	0.00	1.21	0.001	0.00	-344.34	0,0
120	1.21	0.00	t.05	0.60	t72.17	-298.20	0.0
t 50	1.21	0.00	0.60	1.05	291.20	-172.17	0.0
i no	1.21	0.00	8.60	1.21	344.34	0.00	0.0
210	1.21	0.00	-0.68	1.05	29 8.20	172.17	0,0
240	1.21	0.00	-1.05	0.60	172.17	291,20	0.0
270	1.21	0.00	-1.21	8,00	0.00	34434	0.0
300	1.21	0.00	-1,05	-0.60	-172.17	291,20	0.0
330	1.21	0.00	-0.60	-1.05	-291.20	172.17	0.0

			ATC Loading . E	Irradion 275 - None	C		
Wind Azimuth	F.	F,	ν,	ν,	OTM,	on.	Torque
· .	L	Χ	x	x	ktp-ft	Hp-ft	ktp-ft
0	1.20	0.00	0.00	-1.20	-329,77	0.00	0,0
30	1.20	0.00	0.60	-1.04	+285.59	-164.88	0.0
60	1.20	0.00	1.04	-0.60	-164.18	-285.59	0.0
90	1.20	0.00	1.20	0.00	0,00	-329.77	0.0
120	1.20	0.00	1.04	0.60	164.88	-285.59	0.
158	t.20	0.00	0.60	1.04	285.59	-164.88	0.1
110	1.20	0.00	8.00	1.20	329.77	0.00	0.1
210	1.20	0.00	-0.68	1.04	285.59	164.81	0.1
2.18	1.20	0.00	-1,04	0.60	164.53	285,59	0.1
270	1.20	0.00	-1.20	0.00	0.00	329.77	0.1
300	1.20	0.00	-1.04	-0.60	-164.88	285.59	0.0
330	1.20	0.00	-0.60	-1.04	-285.19	164.88	0.0

		· ·	ATC Loading - E	Irretton 263 - Nove	C		
Wind Azimuth	F.	F <sub>4</sub>	ν,	· K	оты,	OTM,	Torque
•	x	ĸ	r .		ksp-ft	Hp-ft	kip-ft
0	1.19	0.00	0.00	-1.19	-315,31	0.00	- R.
30	1.19	0.00	0.59	-1.03	-273.06	-157,65	0.1
60	1.19	0.00	1.03	-0,59	-157.65	-273.06	0.1
90	1.19	0,00	1.19	0.00	0.00	-315.31	0,0
t28	t.19	0.00	1.03	0.19	157.65	-273.06	0.0
150	1.19	0.00	0.59	1.03	273.06	-137.65	0.0
110	1.19	0.00	8.00	1.19	315.31	0.00	0.0
210	1,19	0.00	-0.59	1.03	273.06	157.65	0,0
240	1.19	0.00	-1.83	0.59	157.63	273.06	0.0
270	1.19	0.00	-1.19	8,00	0.00	315.31	0.0
300	1.19	0.00	-1.03	-0.19	-157.65	273.06	0.0
330	1.19	0.60	-0.59	·1.03	-273,06	157.65	0.0

tnxTower	Job	Page
Inxtower	240568	47 of 64
Valmont 1345 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4721 FAX:	American Tower Corp.	Designed by SKK

Load	Vertical	Sum of	Short of	Sum of	Sun of	Sum of Torque
Care	Forces	Forces	Forces	Overturning	Overturning	
		x	Z	Moments, Me	Monents, M.	ĺ
	r	Ĩ.	K	ktp-ft	kip-ft	Ltp-ft
Wind 240 deg - No les	THE RESERVE AND ADDRESS.	+60,29	34.11	5686.35	98-18,93	-0.2
Wind 270 deg - No Ice		-64.21	0.00	-11.00	10671.10	5.6
Wind 300 deg - No Ico		-51.11	-29.51	-4964.50	2560.53	0.0
Wind 338 deg - No Ice	Partition of the second	-29.89	-51.78	-862L92	4956.37	10.6
Member Ion	114.82	<b>经验的数据</b>		and the best to be a like to	100000000000000000000000000000000000000	Mark Contract Contract
Total Weight Ico	329.19			-33.62	-19.02	
Wind 0 deg - Ice	ER STATE	0.00	-1213	-2021.36	-89.02	0.3
Wind 30 deg - Ice		6,00	-10.39	-1754.13	-1882.35	0.4
Wind 60 deg - los		18.31	-5.99	-1031.40	-1817.23	8.3
Wind 90 deg - Ice		12.07	0.00	-33.62	-2095.12	0.1
Wind 120 deg - Ice		10.57	6.10	973.47	-1833,34	-0,0
Wind 150 dog - Ice		6.01	10,40	I 680.68	-1078.77	-0.2
Wind 160 deg - 3ce		0.88	11.93	1935.35	-\$9,02	-0.3
Wind 210 dog - Ice		-6.00	10.39	1686.89	904.32	-0.4
Wind 240 dog - Ice		-10.55	6.09	977,06	1661.52	-0.3
Wind 270 dog - los	836 T. 1. 6 T. S	-12.07	0.00	-33.62	1917.08	-0.1
Wind 308 deg - Ice	#318:55 TO	-10,40	-6.00	-1027.82	1632.99	8.0
Wind 330 deg - Ice	F18. 100 (100 (100 (100 (100 (100 (100 (100	-6.01	-10,40	-1747.92	900.73	8.2
Total Weight	91.33			-11.00	-19.18	
Wind 0 deg - Service		0,00	-27.09	-4501.53	0.04	4.2
Wind 35 deg - Service		14.16	-24.53	-4066.64	-2347.61	2.6
Wind 60 deg - Service		25.95	-14.99	-2468.87	+4275.70	0.1
Wind 90 deg - Service	A STATE OF THE STA	21.54	0.00	-0.28	-4751.20	-2.4
Wind 120 dag - Service	\$100 pt	23.56	13.60	2264.84	-3923.27	-4.1
Wind 150 deg - Service		13.29	23.01	3829.91	-2211.32	-4.7
Wind ISO deg - Service		0.00	25.12	4373.84	0.04	-1.0
Wind 218 deg - Service		-14.16	24.53	4065.03	2347,75	-2.6
Wind 248 deg - Service	Control of the	-26.79	15,47	2531.88	4385.86	-0.1
Wind 270 dag - Service		-28.54	0.00	-0.28	4751.27	2.4
Wind 300 deg - Service		-22.72	-13,12	-2201.83	3013.24	3,9
Wind 330 dag - Service		-13.29	-23.01	-3830.46	2211.39	4.7

	Load Combinations	
Comb. Na	Description	
1	Doud Only	
2	I.2 Dead+1.6 Wind 0 deg - No lee	
3	0.9 Dend+1.6 Wind 0 deg - No les	
4	1.2 Dead+1.6 Wind 38 deg - No Ico	
5	0.9 Dead+1.6 Wind 30 deg - No Ice	
	1.2 Dead+1.6 Wind 60 deg - No Ice	
7	0.9 Dend+1.6 Wind 60 dag - No Ice	
	1.2 Dead+1.6 Wind 90 dag - No Jon	
9	0.9 Dead+1.6 Wind 90 deg - No Ice	
to	1.2 Dead+1.6 Wind 120 deg - No Loc	
11	0.9 Dead+1.6 Wind 128 deg - No Ico	
12	1.2 Dead+1.6 Wind 150 deg - No Ico	
13	0.9 Dend+1.6 Wind 150 dog - No loc	
14	1.2 Dead+1.6 Wind 180 deg - No Ice	
15	0.9 Dead+1.6 Wind 180 deg - No Ice	
16	1.2 Dead+1.6 Wind 210 deg - No lea	
17	0.9 Dead+1.6 Wind 218 deg - No Ice	
18	1.2 Dead+1.6 Wind 240 deg - No fee	
19	8.9 Dead+1.6 Wind 240 deg - No Ice	
26	1.2 Dead+1.6 Wind 270 deg - No lec	

tnxTower	. Job	240568	Page 46 of 64
Valmant 1545 Pideo Drice	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Cilent	American Tower Corp.	Designed by SKK

			ATC Loading - E	lenetton 215 - None	C		
Wind Azimuth	F.	. F.	И.	ν,	оты,	OTM,	Torque
	κ	t i	ĸ	r	ktp-ft	Hp-ft	kip-ft
0	1.18	0.00	0.00	-1.15	-300.96	0.00	0.0
30	1.18	0.00	0.19	-1.02	-260.64	-150.48	0.0
60]	1,11	0.00	1.03	-0.59	-150,48	-250.64	8.0
90	1,18	0.00	1.18	0,00	0.00	-300.96	0.0
120	t.18	0.00	1.02	0.59	150.48	-260.64	8.0
150	t.18	0.00	0.59	1.02	260.64	-150,48	0.0
011	1.18	0.00	0.00	1.11	300,96	0.00	0.0
210	1.18	0.00	-0.59	1.02	260.64	150.48	0.0
210	1.18	0.00	-1.82	0.59	150,41	260.64	0.0
270	1.10	0.00	-1.18	0.00	0.00	300.96	0.0
300	1.18	0.00	-1.82	-0.19	-150.41	260.64	0.0
330	1.18	0.00	-0.59	-1.02	-260.64	150.48	0.0

_	Diecroto	Appurtanance	Totale Conde	_

Wind Asimuth	и.	ν,	OTAL	оты,	Torque	
•	π		ktp-ft	Ltp-ft	ktp-fl	
0	0.00	-4.82	-1302.16	0,04	-0.01	
30	2.41	-4.t7	-1127.74	-650,91	-0.06	
60]	4.17	-2.41	-651.22	-1127.43	-0.09	
90	4.82	0.00	-0.21	-1301.85	-0.10	
120	4.17	2.41	650.66	-1127.43	-0.09	
150	2.41	4,17	1127.19	-650.91	-0.05	
160	0.00	4.82	1301.61	8.04	0.01	
210	-241	4.17	1127.19	650,98	0.00	
240	-4.17	2.41	630.66	1127.50	0.05	
270	-4.02	8,00	-0.21	1301.92	0.10	
300	-4,17	-2.41	-651.22	1127.58	0.05	
330	-2.41	-1.t7	-1127,74	650.98	0.05	

## Force Totals

Load Cass	Vertical Forces	Sum of Forces X K	Som of Forces Z K	Sim of Overturning Moments, M., kip-fl	Sum of Overtwining Moments, M, kip-ft	Sum of Torques
Leg Weight	47.24				ALC: NO PERSONAL PROPERTY OF THE PERSON NAMED IN COLUMN TWO PERSON NAMED IN	STATE OF THE PARTY.
Bracing Weight	28.00					100
Total Member Self-Weight	67.24			•11,00	-19.18	10/41/2004
Total Weight	98,33			-11.00	-19.18	
Wind 0 deg - No Ice	BANKETONIC	0.00	-60,96	-1013£\$1	-19.10	9.5
Wind 30 deg - No Joe		31.87	-55,20	-9160.31	-5381.53	5.9
Wind 60 deg - No Ios		5E.48	-33.72	-5565.34	-9639,57	8.2
Wind 90 deg - No les		64.21	0.00	-11.00	-10709.45	-5.6
Wind 120 dog - No Ice		53,88	30.60	5015.51	-23-16.61	-9.3
Wind 158 deg - No Ice		29.89	51.71	\$606.91	-1994.73	-10.6
Vind 188 deg - No Ice		0,00	58.78	9838.77	-19.18	-9.1
Wind 210 deg - No Iou		-31.87	55.20	9138.30	5263.18	-5.9

 ItixTower
 Job
 240568
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 Valmons 1547 Pubs Dirter Plymost IN Project 1913 Pubs 2011 Project 1915 Pubs 2011 Project 1915 Pubs 2011 Project 1915 Pubs 2011 Project 1915 Pubs 2011

Comb	Description	
Na. 21	0.9 Dead+1.6 Wind 270 des - No Ico	
22 23	1.2 Dead+1.6 Wind 300 deg - No Ico	
24	0.9 Dend+1.6 Wind 300 deg - No Ioe 1.2 Dend+1.6 Wind 330 deg - No Ioo	
25	0.9 Dead+1.6 Wind 330 deg - No Ice	
26	1.2 Dead+1.8 fee+1.0 Team	
27	1.2 Dead+1.0 Wind 0 deg+1.0 fee+1.0 Temp	
28	1.2 Dead+1.0 Wind 38 deg+1.0 Jec+1.0 Temp	
29	1.2 Dead+3.0 Wind 68 deg+1.0 Ioc+1.8 Temp	
30	1.2 Dead+1.0 Wind 90 deg+1.0 fee+1.0 Temp	
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	
32	1.2 Dead+1.0 Wlad t50 deg+1.0 les+1.0 Temp	
33	I.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	
34	1.2 Dead+1.0 Wind 218 deg+1.8 Joc+1.0 Temp	
35	1.2 Dead+1.8 Wind 240 dcg+1.0 Ice+1.0 Temp	
36	I.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	
37	1.2 Dead+1.0 Wind 300 deg+1.0 [ce+1.0 Temp	
38	I.2 Dead+1.0 Wind 330 deg+1.0 leg+1.0 Temp	
39	Dead+Wind 0 dag - Service	
40	Dead+Wind 30 dag - Service	
41	Dead+Wind 60 deg - Service	
42	Doud+Wind 90 deg - Service	
43	Dead+Wind 128 deg - Service	
44	Dead+Wind 150 dog - Service	
45	Dead+Wind 100 deg - Service	
46	Dead+Wind 218 deg - Service	
47	Dead+Wind 240 dog - Service	
48	Dead+ Wind 270 deg - Service	
49	Dead+Wind 300 deg - Service	
50	Dead+Wind 330 deg + Service	

B. #	Million and Laborator in	- F
Maximum	Membe	r Horces

			Muximum				
Seztion Na	Elevation ft	Сопронені Туре	Condition	Gov. Load Comb.	Ariai E	Major Axis Moment Hp-fl	Minor Axi Moment ktp-ft
TI	290 - 280	Leg	Max Tension	7	3.25	-0.16	0,09
			Max. Compression	2	-4.57	8.00	-0.23
			Max Mx	18	-431	8,28	-0.16
			Max. hly	2	-4.53	0.01	6.32
			Mex. Vy		I.47	-0.16	-0.07
			Max. Vx	2	-1.41	0.01	0.78
		Diagonat	Max Tension	12	2.45	0.00	8,00
			Max. Compression	24	-2.78	0.00	0.00
			Max. Mx	6	-0.97	0.03	-0.00
			Max. My	12	-2.78	-0.00	0.01
			Max. Vy	30	-0.02	0.02	0.00
			Mex. Vic	12	0.00	-0.00	0.81
		Top Girt	Max Tension	6	0.51	0.00	0.00
			Mex. Compression	2	-0.67	0.00	0.00
			Max. Mx	26	0.08	-0.04	0.00
			Max My	18	0.16	8.00	-0.00
			Max. Vy	26	-0.83	0.00	0.00
			Max. Vx	10	0.60	0.00	0.00
72	230 - 260	Leg	Mex Tension	7	47.79	0.45	-0.27
			Max. Compression	2	-53.10	8.03	2.07
			Max. Mx	20	40.56	1.79	8.26
			Max. My	2	-53.18	0.03	2.07
			Max. Vy		1.43	-1.36	-0.44

tnxTower	Job 240568	Page 49 of 64
Valmont 1545 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section No.	Elevation ft	Component Type	Condition	Gov. Load	Axtal	Major Axis Moment	Minor Axiz Moment
	•	-71		Comb.	K	ktp-ft	kip-ft
			Max Vx	2	-1.50	0.01	1.62
		Diogonal	Max Tension	24	9.63	0.04	0.00
			Max. Compression	12	-9.92	8.00	8.80
			Max. Mx	6	8.51	8.05	00.0
			Max. My	24	-7.85	-0.82	-8.02
			Max. Vy	27	-0.82	0.03	8 0.0
			Max. Vx	24	-0.01	0.00	0.80
T3	260 - 248	Leg	Max Tension	7	114.91	0.58	10.0-
			Max. Compression	2	-124.88	2,59	-8.81
			Max. Mx	1.4 8	68.59	3.85	0.02
			Max. My Max. Vy	14	-4.41 1.93	-0.83 -3.85	2.23
			Max. Vx	14	-1.51	-3,83 -0.03	0.02 2.23
		Diagonal	Max Tension	12	9.14	0.00	8,80
		Diagonas	Max. Compression	12	-9.43	0.00	0.08
			Max Mx	4	4.83	0.85	0.00
			Max. My	22	-7.97	-0.81	-0.01
			Alax, Vy	27	-0.03	0.03	0.00
			Max. Vx	22	0.00	0.88	80.0
T4	248 - 220	Log	Max Tension	7	173.58	-3.37	-0.00
			Max. Compression	2	-187,20	-5.87	-8,02
			Max. Mx	2	-187.28	+5.87	-8.02
			Max. My	8	-5.84	-0.86	2.38
			Max. Vy	2	1.38	3.65	-0.0t
			Max. Vx	4	-0.57	0.86	-1.14
		Diagonal	Max Tention	12	9.59	0.88	0.08
			Max. Compression	12	-9.65	0.00	0.80
			Max. Mr	4	4.12	0.89	-0.00
			Max. My	24	-9.57	-0.85	-0.03
			Max. Vy	28	-0.84	0.05	-0.80
T5			Max. Vx	24	0.81	0.80	0.80
13	220 - 288	Leg	Max Tension	7	216.92	-4.68	-0.01
			Max. Compression Max. Mx	2 2	-233.46	11.81	-0.85
			Max. My	ź	-208.57 -8.63	16.41 -0.28	-0.86
		•	Max. Vy	18	-2.73	-0.26 (6.40	11.31
			Max. Vx	15	-1.57	0.17	-0.02 10.39
		Diogonal	Max Tension	12	9.83	0.88	0.00
		Diogonia	Max. Compression	12	-18.84	8.88	0.00
			Max Mx	2	6.65	0.12	-0.80
			Max. My	31	0.29	0.87	8.01
			Max. Vy	27	-8.05	0.89	0.01
			Max. Vx	31	-0.00	0.08	0.80
T6	200 - 188	Leg	Max Tention	7	267.40	-4.58	18.0-
		-	Max. Compression	2	-289.31	8.77	-0.14
			Max. Mx	2	-260.35	15.74	-0.04
			Max. Ny	8	-10.82	-0,34	11.23
			Max. Vy	18	-1.67	15.72	-0.01
			Max. Vx	8	-1.10	-0.34	11.23
		Diagonal	Max Tension	10	10,64	8.88	0.80
			Max. Compression	12	-10.78	0.88	0.80
			Max. Mx	4	3.13	0.13	0.80
			Max. My	24 ,	-10.40	-0.86	0.04
			Max. Vy	29	0.06	0.88	-0,81
-	100 100		Max. Vx	24	8.01	0.88	0.80
7	180 +168	Leg	Max Tension	7 2	296.12	5.36	-0.01
			Max. Compression		-319.52	22.16	-0.18
			hian hin hian hiv	18	-318.68	22.18	-0.01
					-12.36 -1.62	8,16 22.18	12.43
			Max. Vy	18			-0.01
			Max. Vx	16	-0.79	0.16	12.48

tnxTower	Job 240568	Page 51 of 64
Valiniont 1343 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phore: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section No.	Elevation ft	Component Type	Condition	Gav. Lood	Axial	Major Axis Manent	Minor Ax Moment
	,.	-74-		Comb.	K	kip-ft	ktp-fl
			Max. Compression	12	-18.07	0.08	8.00
			Max. Mx	29	8.71	-0.70	-8.10
			Max. My	27	-8.89	-0.69	8.10
			Max. Vy	29	-0.23	-0.78	-0.18
			Max. Vx	27	18.0	80.0	8.00
T13	60 - 40	Log	Max Tension	7	545,79	-0.06	-8.RR
			Max. Compression	2	-610.55	16.95	+8.13
			Max. Mx	18	-689, 19	16.96	8.80
			Max. My	24	-27.70	-0.78	6.84
			Max. Vv	18	-1.12	16.96	8.08
			Max. Vx	4	-8.39	-0.77	-6.80
		Diagonal	Mex Tension	13	17.86	0.80	0.80
			Max. Compression	2	-19.64	0.88	8.80
			Max. Mx	29	2.25	-8.74	-8.18
			Max. My	27	1.99	-0.73	01.8
			Max. Vy	28	-0.24	-0.74	-0.18
			Max. Vx	28	0.01	0.08	8.00
T14	40 - 20	Leg	Max Tension	7	585.67	-0.53	-0.88
	40 - 20		Max. Compression	ż	-659.36	12.75	-0.12
			Max. Mx	22	575.39	-13.65	-8.15
			Max. My	4	-35.37	-0.76	-17.88
			Max. Vy	22	0.94	-13.63	-0.15
			Max. Vz	4	1.11	-0.76	-17.88
		Diagonal	Max Tension	2	18.48	80.0	0.00
		Diagotas	Max. Compression	12	-18.65	08.0	8.80
			Max. Mr	29	-0.45	-0.87	8.13
			Max. My	28	-3.19	-0.86	8.13
			Max. Vy	29	-0.25	-0.87	8.13
			Max. Vx	28	8.02	0.80	0.88
TIS	20 - 0	Leg	Max Tension	7	618.28		
*13	20-0	Leg	Max. Compression	o)	699.42	-2.47 7.55	-0.00 8.07
			Max. Compression	18	-697.89	7.56	
			Max. Mix	4	-36.52		8.00
			Max. Ny	18	-0.58	-1.11 7.56	-12.61
				4	-8.78		0.88
		D2. 4	Max. Vx Max Tension			-1.11	-12.61
		Diagonal		15	19.71	0.08	8.80
			Max. Compression	2	-22.86	0.00	8.08
			Max. Mx	38	3.28	-0.93	-8.13
			Max. My	31	2.74	-0.93	-0.13
			Max, Vy	30	-0.28	-0.93	-0.13
			Max. Vx	31	-8.82	0.08	8.80

<u> 1 1 3 3</u>		344,171	Maxim	ium Reactic	ns
Lacotina	Condition	Gov. Load Comb,	Vertical K	Hartzonial, X K	Horizoniol, Z K
Leg C	Max. Vert	18	721.75	6231	-35.97
	Max. H.	18	721.75	62.31	-35,97
	Max. H.	7	-636.46	-55.87	32.25
	Alia Vert	7	-636.46	-55.87	32.25
	Min. H.	7	-636.46	-55.87	32.25
	Min. H.	18	721.75	62.31	-35.97
Leg B	Max. Vert	10	723.24	-62.19	-36.25
•	Max. H.	23	-635.34	55.72	32.47
	Max.11.	23	-635.34	55.72	32.47
	Min. Vert	23	-635.34	55.72	32.47

tnxTower	Job 240568	Page 50 of 64
Valmont 1343 Pidzo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Plione: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

lection No.	Elevation ft	Component Type	Condition	Gav. Load	Axiol	Major Axis Moment	Minor Axi. Moment
,,		J. 13ps		Comb.	ĸ	ktp-fl	kip-fl
		Diagonal	Max Tension	23	16.53	0.00	0.00
		D-1-goving	Max. Compression	10	-18.36	0.00	0.88
			Max. Mx	6	16.88	-0.26	-0.02
			Max My	24	-16.46	0.05	0.07
			Max. Vy	29	-0.11	-0.25	-0.85
			Max. Vx	29	-0.01	0.88	8.88
78	160 - 140	Leg	Max Tension	7	346.75	8.88	-0.82
		-	Max. Compression	2	-376,50	22.13	-8.24
			Max. Mx	18	-375,57	22,16	-0.01
			Max. My	8	-15.64	-0.89	12.32
			Max, Vy	18	-1.24	22.16	-0,81
			Max. Vx	18	-0.51	-11.22	11.45
		Diagonal	Max Tension	10	15.30	0.00	0.00
			Max. Compression	12	-16,41	88.0	8.00
			Max, Mx	29	1.72	-0.38	0.86
			Max. My	38	0.98	-0.30	0.86
			Max. Vy	29	-8.12	-0.38	-0.86
	1		Max.Vx	38	0.01	0.00	0.00
19	140 - 120	Leg	Max Tension	7 2	385.45	8.33	-0.01
			Max. Compression	18	-420.86	19.87	-0.17 -8.88
			Max. Mx	18	-419,85	19.1g 0.21	10.68
			Max. My	19	-17.62	19.82	-0.00
			Max, Vy Max, Vx	16	-1.25 -0.68	0.21	10.59
		Diagonal	Max Tension	23	15.84	0.80	0.80
		Diagonal	Max. Compression	18	-17.75	0.88	8.88
			Max Mx	2	12.37	-0.45	0.04
			Max. My	30	0.66	-0.41	8.88
			Max. Vy	29	-8.17	-0.45	-0.88
			Max. Vx	38	0.01	0.88	0.00
118	120 - 108	Leg	Max Tension	7	429.39	5.88	-0.81
			Max. Compression	ż	-472.54	18,57	-0.18
			Max. Mx	18	-471.44	18,68	0.80
			Max. My	4	-21.25	-0.16	-11.66
			Max. Vy	19	-1.47	18.68	0.00
			Max. Vx	16	-0.61	-0.16	11.64
		Diagonal	Max Tension	12	16.07	0.80	0.80
			Max. Compression	12	-17.08	0.80	0.08
			Max. Mx	29	1.30	-0.53	-0.08
			Max. My	27	-0.23	-0.52	0.89
			Max. Vy	29	-0.19	-0.53	-0.88
			Max. Vx	31	-0.01	0.00	0.80
11	188 - 60	Leg	Max Tension	7	468.02	0,78	-0.88
			Max. Compression	2	-517.50	17.71	-0.15
			Max. Mix	18	-516.31	17.74	0.08
			Max My	4	-23.91	0,42	-8.68
			Max, Vy	18	-1.19	17,74	0.00
		- ·	Max. Vx	16	-8.48	0.41	8.67
		Diagonal	Max Tension	12	16.58	0.00	80,0
			Max. Compression	18	-18,23	0.88	0.80
			Max. Mx	29	1.42	-0.59	-0.89
			Max. My	38	18.0	-0.59	0.89
			Max. Vy	29	-0.21	-0.59	-8.89
	80 - 60	•	Max. Vx	38 7	10.8	8.00	88.0
12	e0 - 0U	Leg	Max Tension	2	509.19	1.91 15.18	-8.00 -0.14
			Max. Compression		-566.85		-0.14
			Max. Mx	22 4	581,20	-0.49	-0.15 -12.88
			Max. My	22	-27.88 1.16	-0.49 -15.38	-0.15
			Max. V y	16	-0.72	-15.38 -0.48	12.78
			Max. Vx				

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	Valmont 1545 Pideo Drive	Project	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
	Plymouth, IN Phone: 574-936-4221 FAX:	Client	American Tower Corp.	Designed by SKK

Location	Condition	Gov.	Vertical	Hartzontol, X	Ifortzontol, Z
		Load	K	K	ĸ
		Cont			
	Min. H.	18	723.24	-62.19	-36.25
	Min. H.	18	723.24	-62.19	-36.25
Leg A	Max. Vert	2	723.24	8.38	71.98
-	Max. H.	21	29.96	4,93	2.19
	Max. He	2	723.24	0,38	71.98
	Min. Vert	15	-635.34	-0.27	-61.49
	Min, 14	9	29.96	-4.93	2.19
	Min. He	15	-635.34	-0.27	-61.49

	T	ower Ma	st Reacti	on Summ	ary	
Load Combination	Vertical K	Sheor,	Sheor <sub>e</sub> K	Overturning Moment, M <sub>a</sub> kip-fl	Overturning Moment, M. ktp-ft	Torque
Dead Only	98.33	-0.80	88.8	-18.88	-19.01	-0.80
1.2 Dead+1.6 Wind 8 deg - No	118.80	-0.88	-111.38	-18360.55	-23.28	15.53
0.9 Dead+1.6 Wind 8 deg - No fee	88.50	-8.08	-111.38	-18327.57	-17.47	15.48
1.2 Dead+1.6 Wind 30 deg - No les	118.00	51.36	-88.97	-14921.11	-8632.99	9.07
0.9 Desd+1.6 Wind 38 deg - No log	88.58	51.36	-88.96	-14892.70	-8612,56	9.83
1.2 Dead+1.6 Wind 60 deg - No Ico	118.80	93,44	-53.95	-8957.34	-15514.59	0.40
0.9 Dead+1.6 Wind 68 deg - No fee	86.50	93.44	-53.95	-8939.39	-15483.48	0.41
1.2 Dead+1.6 Wind 90 deg - No fee	118.08	102.73	0.88	-15.81	-17238.61	-9.33
0.9 Dead+1.6 Wind 90 deg - No Ice	88.50	182.73	8.00	-1234	-17203.78	-9.31
1.2 Daad+1.6 Wind 128 deg - No lee	118.00	96,45	55.69	9168.17	-15912.44	-15.26
0.9 Dead+1.6 Wind I 20 deg - No ice	88.50	96.46	55.69	91 48.70	-15888.95	-15.20
1.2 Dead+1.6 Wind 158 deg - No les	118.08	51.36	88.97	14896.87	-8628.9B	-17.86
0.9 Dead+1.6 Wind 158 deg - No les	EE.50	51.36	88,96	14875.81	-8608.76	-16.98
1.2 Dead+1.6 Wind 180 deg - No lee	118.88	-0.88	107.89	17874.73	-23,28	-14.80
0.9 Dead+1.6 Wind 188 deg - No les	88.58	-0.00	107.89	17848.86	-17.45	-14.75
1.2 Dend+1.6 Wind 210 deg - No lee	116.08	-51.36	86.97	14896.95	8582.48	-9.87
0.9 Dead+1.6 Wind 218 deg - No Ice	8F.58	-51.36	88.96	14875.10	8573.89	-9.85
1.2 Dead+1.6 Wind 240 deg - No lee	118.88	-96.45	55.69	9160.28	15866,86	-0.43
8.9 Dead+1.6 Wind 248 deg - No los	88,58	-96.46	55.69	9148.81	15846.21	-0.44
1.2 Dead+1,6 Wind 270 deg - No fee	110.88	-182.73	8.00	-15.82	17192.32	9.33
8.9 Deed+1.6 Wind 270 deg - No lee	80.58	-182.73	0.00	-12.35	17169.12	9.31
1.2 Dead+1.6 Wind 380 deg - No les	110.80	-93.44	-53.95	-8957.46	15460.24	14.56

tnxTower	Job 240568	Page 53 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4227 FAX:	Client American Tower Corp.	Designed by SKK

Load Cambination	Vertical	Shear,	Shear <sub>k</sub>	Overturning Afoment, M.	Overturning Mament, Ma	Torque
Cambrida	K	K	K	kip-fl	kip-fl	ktp-ft
0.9 Dead+1.6 Wind 300 deg -	88.50	-93.44	-53.95	-8939.51	15448.76	14.5
No Ice						
1.2 Dead+1.6 Wind 330 deg -	118.00	-51.36	-88.97	-14921.24	8586.52	17.0
No Ice						
0.9 Dead+1.6 Wind 330 deg -	88,50	-51.36	-88.96	-14892.82	8577.72	16.9
No Ice						
1.2 Dead+1.0 Jee+1.0 Temp	348.85	-0.86	0.00	-36.32	-91.98	-0.0
1.2 Dead+1.0 Wind 0 deg+1.0	348.85	-0.00	-12.28	-2114.46	-94.81	0.4
lce+1.0 Temp					2401	•
1.2 Dead+1.8 Wind 30 deg+t.0	348.85	6.08	-10.53	-1822.65	-1125.95	8.4
Ice+1.0 Temp	5.4.65			-102203	-1140.55	•
1.2 Dead+1.0 Wind 60 deg+t.0	348.85	10.46	-6.04	-1062.45	-1871.51	0.3
Ice+ 1.8 Temp	340.43	10.40	-0.04	-1007-42	-1011.21	0.0
1.2 Dead+1.0 Wind 90 deg+1.0	348.85	12.16	0.00	-36.67	-2157.09	0.0
Ice+1.0 Temp	340.45	14.14	0.00	-30.07	*2171.05	0
1.2 Dead+1.0 Wind 120	348.85	18.63	6.14	1002.23	-1894.23	-0.1
deg+1.0 Ice+1.0 Temp	348.03	10.03	0.14	10022	-1894.23	40.1
1.2 Dead+1.0 Wind 150	348.85	6.08	10.53	1749.32	-1125.95	-0.3
i.z Desartu waa 150 icg+I.O Icc+L.O Temp	348,63	g.ua	10.55	1 749.32	-1125.95	-0.2
1.2 Dead+1.0 Wind 180	348.85	-0.8B	12.87			-8.4
	344.63	-0.88	1287	2814.98	-94.82	-8.4
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 218	348.85					_
	348.85	-6.88	10.53	1749.31	936.31	-0.4
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	348.85	-18.63	614	1002.22	1704.60	-0.3
leg+1.8 Jee+1.0 Temp						
1.2 Dead+1.0 Wind 270	348.85	-12.16	80.0	-36.68	1967.46	-0.1
leg+1.0 lee+1.0 Temp						
1.2 Dead+1.0 Wind 300	348.85	-10.46	-6.04	-1862.46	1681.90	0.1
leg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 338	348.85	-6.88	-10.53	-1822.65	936.33	0.3
leg+1.0 fcc+1.0 Temp						
Dead+ Wind & deg - Service	98.33	-0,80	-30.94	-5102.42	-19.28	4.3
Dead+Wind 30 deg - Service	98.33	14.27	-24.71	-4148.84	-2407.77	2.6
Dead+Wind 60 deg - Service .	98.33	25.95	-14.98	-2492.89	-4317.91	8.1
Ocad+Wind 90 deg - Service	98.33	28.53	0,00	-11,88	-4796.25	-2.5
Dead+Wind I20 deg - Service	98.33	26,79	15.47	2534.60	-4428.51	-4.2
Dead+Wind 150 deg - Service	98.33	14.27	24.71	4125.92	-2487.76	-4.7
Dead+Wind 186 deg - Service	98.33	-8,00	29.97	4952.58	-19,28	-4.1
Dead+Wind 210 deg - Service	98.33	-14.27	24.71	4125.92	2369.20	-2.5
Dead+Wind 240 dcg - Service	98.33	-26.79	15.47	2534.60	4389.96	-0.1
Send+Wind 270 des - Servica	98.33	-28.53	0.00	-11.09	4757.70	2.5
Dead+Wind 380 des - Service	98.33	-25.95	-14.98	-2492.90	4279.36	4.0
Send+Wind 330 deg - Service	99.33	-14.27	-24.71	-4148.05	2369.22	4.7

	مرازية الما		So	lution Su	mmary		r i jandaj je sa i i			
	Sum of Applied Forces Sum of Reactions									
Load Camb	PX K	Pr K	P2 K	PX K	PT K	PZ K	% Error			
1	0.00	-98.33	8,00	0.00	98.33	-0.00	0.801%			
2	-0.88	-L1B.00	-111.38	0.00	\$18.00	111.38	0.00356			
3	8.0B	-88.50	-11138	0.00	88.50	111.38	0.803%			
4	51.36	-118,00	-BB,97	-51.36	118.00	22.97	0.001%			
5	51,36	-88,58	-88.97	-5t.36	88.50	88,96	0,003%			
6	93,44	-118.08	-53,95	-93.44	118.00	53.95	0.001%			
7	93.44	-88.50	-53.95	-93.44	88.50	53.95	0.001%			
8	102,73	-118.00	-0.00	-102.73	118.00	-0.00	0.001%			
9	102.73	-88.50	-0.00	-102.73	85,50	-0,00	9.803%			

	tnx	Tower	Job	2	240568	Page 55 of 64		
		Valinant 1345 Piden Drive		Project V-31 x 290' - #281338 Hazel Green, KY				
ĺ		mauth, IN 574-936-4211 FAX:	Client	America	n Tower Corp.	Designed by SKK		
	13	Yes	12	0.08004911	0.08813541			
	12	Yes	13	100000000	0,00005531			
	13	Yes	12	0.08005229	0.00014627			
	14	Yes	13	10000080.0	0.00005835			
	15	Yes	13	0.80000001	0.00005329			
	16	Yes	13	1 008 0000.0	0.00005533			
	17	Yes	12	0.00005231	0.08014630			
	18	Yes	12	0.00005387	0.00014838			
	19	Yes	12	0.00004810	0.00013540			
	20	Yes	13	0.00008001	0.80005534			
	21	Yes	12	0.00005231	D.00B1463t			
	22	Yes	13	100000001	0.08005836			
	23	Yes	13	0.00000001	0.00005329			
	24	Yes	13	0.00000001	0.00005532			
	25 26	Yes	11 9	0.0000\$230	0.00014678			
	25 27	Yes Yes		8.08000001	0.00009936			
	28		12	1000000000	0.00014417			
	29	Yea Yea	\$2 \$2	1000000001	0.00014684			
	30	Yes	12	10080080,8	0,00014813			
	31	Yes	12	0.0000001	0.00814720			
	32	Yes	12	0.00000001	0.00014511 0.00014227			
	33	Yes	12	10000000.0	0.00013227			
	34	Yes	12	0.00000001	0.08013931			
	35	Yes	12	0.00000001	0.00013567			
	36	Yes	12	0.00000001	0,00013639			
	37	Yes	12	0.00000001	0.00013886			
	38	Yes	12	0.00000001	0.00013448			
	39	Yes	12	10000000.0	0.00814385			
	40	Yes	12	0.80000001	0.0001438			
	41	Yes	12	0.00000001	0.00814909			
	42	Yes	12	0.00000001	0,00814735			
	43	Yes	12	0.00000001	0.00014379			
	44	Yes	12	0.08000001	0.08814723			
	45	Yes	12	10080080.0	0.00014895			
	46	Yes	12	0.0000003	0.08014723			
	47	Yes	12	0.08008003	0.00014373			
	48	Yes	12	0.00000001	0.00014727			
	40		12	0.0000000	- 0001 1045			

		Maximum	Tower	Deflection	s - Service W
Section Na.	Elevation	Harz. Deflection	Gav. Load	Tili	Twist
	ft	ln .	Const.	•	•
TI	290 - 280	14.426	39	0.5114	0.0136
72	288 - 268	13,368	39	0,5092	0.0125
T3	260 - 240	11.138	39	0.4730	0.0896
T4	240 - 220	9.001	39	0.4150	0.8870
T5	220 - 200	7.442	39	0.3495	0.0857
T6	288 - 188	5.878	39	0,3025	0.8846
T7	180 - 160	4,585	39	0.249[	0.0037
TS	160 - 148	3.482	39	0.2039	0,0029
179	140 - 120	2.576	39	0.1759	0.0022
T18	128 - 100	1.844	39	0.1418	0.0019
T11	100 - 28	1.257	39	0.1138	0,8015
T12	80 - 60	0.798	39	0.8856	0,0012
T13	60 - 40	0,452	39	0.0622	0.0009
T14	49 - 20	0.211	43	0.0389	0.0006

tnxTower	Јоb 240568	Page 54 of 64
Volmont 1545 Pidzo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

	Su	Sum of Applied Forces			Sum of Reactions			
Load	PX	PY	PZ	PX	PΥ	PZ	% Erro.	
Camb.	<u> </u>	K	E.	K	ĸ	κ		
10	96.46	-118.08	55.69	-96.45	118.00	-55,69	0.003%	
11	96,46	-88.50	55.69	-96.46	89.50	-55.69	0.003%	
12	51.36	-118.00	88.97	-51.36	t18.00	-88.97	0.001%	
13	5t.36	-88.50	88.97	-51.36	88,50	-88.96	0.003%	
14	0.00	-118.00	107.89	0.00	118.00	-107.89	0.081%	
15	0.80	-88.50	107.89	80.0	89.50	-107.89	0.001%	
16	-5t.36	-118.00	88.97	51.36	118.00	-88.97	0.001%	
17	-5t.36	-98.5B	88,97	51.36	88.50	-88.96	0.80396	
18	-96.46	-118.00	55,69	96,45	118.00	-55.69	0,883%	
19	- <del>9</del> 6.46	-8E,50	55.69	96.46	88.50	-55.69	0.803%	
26	-102.73	-118.00	-0.00	102.73	118.00	-0,80	O.BB1%	
21	-102.73	-88.50	+0.00	102.73	88.50	-0,80	0.00396	
22	-93.44	-118.00	-53.95	93.44	118.00	53.95	0,001%	
23	-93,44	-88,50	-53.95	93,44	88.50	53.95	0.001%	
24	-51.36	-11B.BO	-88.97	5t.36	112.00	88.97	0,801%	
25 26	-51.36	-88,50	-88.97	51.36	88.50	88,96	0,003%	
26	80,0	-348.85	0.00	0.80	348.85	-0.00	0.800%	
27	0.00	-348.85	-12.28	8.80	348.85	12.28	0.000%	
28	6.0#	-348.85	-10.53	-6.08	348.85	10.53	0.000%	
29	10.46	-348.85	-6.04	-10.46	348.85	6.04	0.00054	
30	12.16	-348.85	0.00	-1216	348.85	-0.80	0.000%	
31	10.63	-348.85	6.14	-18.63	348.85	-6.14	0.800%	
32	6.08	-348.85	10,53	-6.08	348.85	-10,53	0.800%	
33	0.00	-348.85	t 2.08	0.06	348.85	-12.07	0,000%	
34	-6.08	-34B.85	10.53	6.88	348.85	-10.53	0.000%	
35	-10.63	-348.85	6.14	10.63	348.85	-6.14	0.000%	
36	-12.16	-348.85	0,00	12.16	348.85	-0.08	0.00096	
37	-10,46	-348.85	-6.04	10.46	348.85	6.04	0.80016	
38	-6,01	-348.85	-18.53	6.88	348.85	10,53	8,000%	
39	0,80	-98.33	-30.94	98.0	98.33	30,94	0.80192	
40	14.27	-98.33	-24.71	-14.27	98.33	24.71	0.001%	
41	25.95	-98.33	-14.99	-25.95	98.33	14.98	0.001%	
42	28.54	-98.33	0.00	-28.53	98.33	-0.08	0.081%	
43	26.79	-98.33	15.47	-26.79	98.33	-15.47	0.801%	
44	14.27	-98.33	24,71	-14.27	98.33	-24.71	0.80196	
45	0.00	-98.33	29.97	6.00	98.33	-29.97	0.08194	
46	-14.27	-98.33	24.71	14.27	98.33	-24.71	0.08196	
47	-26.79	-98.33	15.47	26.79	98.33	-15.47	0.081%	
48	-28.54	-98.33	0,80	28,53	98.33	-0.80	0.001%	
49	-25.95	-98.33	-14.99	25.95	98.33	14.98	0.881%	
50	-14.27	-99.33	-24.71	14.27	98.33	24.71	0.801%	

		Non-Li	near Conve	rgence Results
Load Combination	Canverged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.08000001	0.00014358
2	Yes	12	0.00005388	0.0001 4848
3	Yes	12	0.00004811	0.80013542
4	Yes	13	8.80000001	8,00005534
5	Yes	12	0.00005231	8.00014633
6	Yes	13	10000008	0.00005836
7	Yes	13	1,000,000,0	0.00005330
1	Yes	13	1,000,000,0	0.00005534
9	Yes	12	0.00005231	0.00014632
10	Yes	12	E 0000 530 E	0.08014819

tnxTower	Job 240568	Page 56 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymnuh, IN Phone: 574-936-4227 FAX:	Client American Tower Corp.	Designed by SKK

Section No.	Elevatian	Horz. Deflection	Gov. Load	Titt	Twist
	fl	in	Camb.	•	
T15	20 - 0	0.055	43	0.0193	0.0083

	Critical Deflect	ions and	Radius c	of Curvat	ure - Ser	vice Wind
Elevation	Appurtenance	Gov.	Deflection	Tili	Twist	Radius of
	**	Load	•			Curvature
ſ		Comb.	fn		•	ft
290,00	Bescott	39	14.426	0.5114	0.0136	38445
285.00	ATC Loading	39	13,897	0.5112	0.0131	38445
275.00	ATC Loading	39	12810	0.5039	0.0119	35016
265.00	ATC Loading	39	11.692	0.4851	0.0104	49851
255.00	ATC Loading	39	10.596	0.4599	0.0888	16508

		Maximum	Tower	Deflection	s - Design Win	d
Section No.	Elevatian	Harz. Deflection	Gon, Load	Tilt	Twist	
	ft	in	Camb.		•	
Tt	290 - 280	51.855	2	1.8361	0,0492	
12	280 - 260	48.026	2	1.8298	0,0454	
T3	260 - 240	48.0.44	2	1.7000	0.0347	
T4	240 - 220	32,722	2	1,4922	0.0252	
T5	220 - 200	26.757	2	1.2564	0.0204	
T6	200 - 180	21.137	2	1.8874	0.0166	
T7	180 - 160	16.489	2	0,8953	0.0131	
TE	160 - 140	12.524	2	0.7512	0.0102	
T9	I4B - 120	9.266	2	0,63 25	0.0010	
TtO	128 - 100	6.633	2	0,5899	0.0066	
TII	180 - 80	4.523	2	0.4091	0.0054	
T12	8B - 60	2.871	2	0.3078	8,8042	
T13	60 - 40	1.627	2	0.2237	0.8031	
T14	40 - 28	0.768	10	0.1401	0.0028	
T15	20 - 0	0.201	iō	0.8693	O.D089	

	Critical Deflec	tions and	Radius	of Curva	ture - Des	ign Wind
Elevation	Appurtenance	Gov.	Deflection	Tilt	Twist	Radius of
		Load				Curvature
ft		Comb.	in	•	•	fi
290.80	Beacon	2	51.855	1.8361	0.0492	10745
285.80	ATC Loading	2	49.954	1.8359	0.0474	18745
275.00	ATC Londing	2	46.05L	1.8104	0.0430	9888
265.00	ATC Loading	2	42,035	1.7433	0.0376	14078
255.88	ATC Loading	2	38.098	1.6533	0.0328	4613

tnxTower	Јоб 240568	Page 57 of 64
Valmant * c. 1545 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 374-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Na.	Elevation A	Component Type	Bolt Grade	Bolt Size in	Number Of Balts	Maximum Load per Balt K	Allowable Load K	Ratio Load Allowable	Allowable Ratto	Criterio
Ti	290	Leg	A325N	0.7500	4	0.81	29.82	0.027	1	Bolt Tension
		Diagonal	A325N	0.7500	1	2.78	10.44	0.267	1	Member Bearing
		Top Girt	A325N	0.7500	1	0.51	10.77	0.048	1	Member Bearing
T2	280	Leg	A3 25N	0.7500	6	7,96	29.82	0.267	1	Bolt Tension
		Diagonal	A325N	0.7500	1	9.63	1436	0.671	1	Gusset Bearing
T3	260	Leg	A325N	0.7500		1436	29.82	0.482 V	1	Balt Tension
		Diagonal	A325N	0.7500	1	9,43	15.66	0.602	1	Member Bearing
T4	248	Leg	A325N	1.0088	6	28.92	53.01	0.345	1	Bolt Tention
		Diagonal	A325N	0.7500	1	9.65	15.66	0.616	1	Member Bearing
T5	228	Leg	A325N	1.0088	6	36.15	53.01	8.682	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9.83	15.83	0.621	1	Member Bearing
T6	200	Leg	A325N	1.0022	6	44,57	53.01	0.841	1	Bolt Tension
		Diagonal	A325N	1.0006	1	10,64	15.83	0.672	1	Member Bearing
T7	180	Leg	A325N	1,0000	12	24.68	53.61	0.465	1	Bolt Tension
		Diagonal	A325N	8,8758	1	16,53	31.32	0.528	1	Member Bearing
T8	160	Leg	A325N	1,0020	12	28.96	53.01	0.545	1	Balt Tension
		Diogonal	A325N	0.8750	ı	15.30	31.32	0.488	1	Member Bearing
T9	148	Leg	A325N	0800.1	12	32.12	53.01	0.606	1	<b>Bolt Tension</b>
		Diagonal	A325N	0.8750	1	15.84	41.76	8.379	1	Alember Bearing
T10	320	Leg	A325N	1.0000	12	35.72	53.01	0.675	1	Bols Tension
		Diagonal	A325N	0.8750	1	16.07	41.76	0.385	1	Member Bearing
111	102	Leg	A325N	1.0082	12	39.00	53.01	0.736	1	Bolt Tension
		Disgonal	A325N	0.8750	1	16.58	41.76	0.397	1	Member Bearing
Г12	80	Leg	A325N	1.0000	12	42.43	53.01	0.800	1	Bolt Tensian
		Disgonal	A325N	2,8750	1	17.22	41.76	0.412	1	Member Bearing
113	60	Leg	A325N	1.0000	12	45,48	53,81	0.858	1	Bolt Tension
		Diagonal	A325N	2,2750	1	17.86	41.76	B.428	1	Member Bearing
14	40	Leg	A325N	1,2580	12	48.81	82.83	0.589	1	Bolt Tension
		Diagonal	A325N	0.8750	1	18,48	41.76	0.442	1	Member Bearing
15	20	Leg	F1554-10	1.2500	12	51.52	86.29	0.597	1	Balt Tension

tnxTower	Job 240568	Page 59 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281 338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Phone: 574-936-4221 FAX:	Cileat American Tower Corp.	Designed by SKK

Compression Checks

Section No.	Elevation fl	Diagonal Size	L A	KI/r	¢₽₄ K	A In <sup>2</sup>	V.	ψν. K	Stress Rotie
TB	160 - 140	0.5	1.38	92.4	536,77	0.1963	1.84	4.71	8,391
<b>T9</b>	140 - 120	0.5	1.38	92.4	536.77	0.1963	1.25	4.71	0.265
TIO	120 - 180	0.5	t.36	91.6	66 2.68	0.1963	1.47	4.75	0.311
TII	t20 - 80	0.5	1.36	91.6	662,68	0.1963	1.19	4.75	0.252
T12	80 - 60	8.625	1.35	72.6	801,84	0.3868	t.16	8.74	0.133
T13	68 - 40	0.625	1.35	72.6	\$01.84	0.3868	1.12	8.74	0.128
T14	40 - 20	8.625	1.34	72.0	954.26	0.3868	1.16	8.78	0.146
T15	28 - 0	0.625	t.34	72.0	954.26	0.3068	0.75	10.97	8.012

		Diago	nal De	sign l	Data (	Comp	ression	)	
Section No.	Elevation	Stre	L	L <sub>u</sub>	ΚVr	A	₽.	φP <sub>2</sub>	Ratio P.
	fl		ſ	fl		in2	K	K	₽.
Ti	290 - 288	L2x2x1/8	5,75	2.69	90.8 K=1.12	0.4844	-2.78	9.97	0.279
T2	280 - 260	L2x2x3/16	7.17	3.48	107.6 K≈1.04	0.7150	-9.92	12.59	0.787
T3	268 - 248	L2x2x3/16	8.11	4.67	123.9 K=1.00	0.7150	-8.92	t0_33	0.864
T4	240 - 220	1.2 1/2x2 1/2x3/16	9.60	4.80	117.2 K=1.81	0.9020	-9.65	14.17	183.0
T5	220 - 208	L3x3x3/16	t265	6.43	129.5 K=1.08	1.0902	-18,84	14.54	8.746
Tó	200 - 188	L3x3x3/16	14.10	7.14	1-13.8 K~1.00	1.0900	-10.66	11.92	0.895
<b>T7</b>	188 - 160	2L3x3x3/16	22.66	11.95	152.8 K≈t.88	2.1888	-18.36	21.10	8.870
TE	160 - 148	2L3x3x3/16	23.79	12.45	159.1 K≈1.00	2.1808	-16.41	19.45	0.844
T9	140 - 120	2L3 1/2x3 1/2x1/4	25,03	13.82	143.2 K=1.00	3.3750	-17.75	37,20	0,477
TIO	120 - 100	2L3 1/2x3 1/2x1/4	26.36	13,65	150.t K=1.00	3.3750	-17.08	33,85	8.505
Tł1	100 - 80	2L3 1/2x3 1/2x1/4	27,77	14.33	157.5 K~1.00	3.3758	-18.23	30.72	0.593
T12	80 - 68	2L3 1/2x3 1/2x1/4	29.25	15.04	165.4 K=1.00	3.3758	-18.07	27.86	0.649
T13	60 - 40	2L3 1/2x3 1/2x1/4	38,78	15.80	173.7 K=1.08	3,3758	-19.64	25.27	8.777
T14	40 - 20	2L3 1/2x3 1/2x1/4	32.37	16.58	182.3 K=1.00	3.3750	-18.65	22.95	0.813
T15	20 - 0	2L4x4x1/4	34.01	17.38	166.9	3.8800	-22.06	31.48	8.701

taxTower	Job	Page
mxiower	240568	58 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth, IN Plume: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

		Ley	Dear	III Da	La (CO	mpies	sion)		
Va.	Elevation	Stre	L	L	ΚVr	1	P.	φP,	Ratio P
	ſ		ft	fl		in <sup>2</sup>	K	K.	éP.
Ti	290 - 280	P- 2.50* - 0.75* conn10* -C-(Pirod 226172)	18.00	4.79	60.7 K=1.90	1.7040	-4.57	58.58	0.078
T2	286 - 260	P- 4.00"- 0.75" conn20" -C-Trans-6B-4B-(Pirod 226184)	20.00	6,67	53.0 K=1.00	3.1741	-53.18	116.32	0,4571
T3	260 - 240	P- 5.00*- 0.75* connTrans-20*-C-(Pirod 226280)	20.03	6,68	42.7 K∞1.00	4.2999	-124,80	169,37	0,737 1
T4	240 - 228	P- 6.00"- 0.75" connHBD-Trans-28' -C-(Pirod 229377)	20.83	6.68	35.7 K≈1.80	5.5813	-187.20	228.83	0.8181
TS	220 - 200	#12ZG -1.75" - 1.08" connHBD-Trans (Pirod 229588)	20.03	10.02	30.4 K=1.00	7.2158	-233,46	303.46	0.769
T6	200 - 180	#12ZG -1.75" - 1.08" conn1IBD-Trans (Pirod 229588)	20.03	10.02	30.4 K≈1.00	7.2158	-289.31	303.46	1.953 °
T7	180-160	#12ZG -2.00" - 6.875" connHBD-Trans (Pirod 288332)	20.03	20,83	48.8 K=1.60	9.4248	-319.51	356.29	0.897
TS	160 - 148	#12ZG -2.25* - 0.875* conn. (Pirod 208334)	20.03	28.83	48.8 K≃1.00	11.9282	-376.50	451.15	0.835 1
T9	140 - 120	#12ZG -2.25" - 8,875" conn. (Pirod 20833-1)	20.03	28.03	48.8 K=1.00	11.9282	-420.86	451.15	0.933 1
TIO	120 - 180	#12ZCI - 2.50" - 0.875" coan, (Pirod 208335)	20.63	20.03	48.7 K≈1.00	14.7262	-472.54	557.27	0.848 t
TII	100 - 30	#12ZG - 2.50" - 8.875" conn. (Pirod 208335)	28.83	20.03	48.7 K=1.00	14.7262	-517.58	557.27	0.929 1
T12	80 - 60	#12ZG - 2.75" - 8.875" conn. (Pirod 208337)	28,63	28.83	48.6 K≃1.00	17.8187	-566.86	674.68	6.840 °
T13	60 - 40	#12ZG - 2.75" - 0.875" conn. (Pirod 208337)	20.03	20.03	48.6 K~1.00	17.8187	-610.55	674.68	0.905 1
T14	40 - 28	#12ZG -3.00* - 0.875* connTrans (Pirod 208336)	20.03	20.03	48.5 K~1.00	21.2057	-659.36	803.44	0.821 1
T15	20 - 0	#12ZG -3.00" - 0.875" connTrans (Pirod 208338)	20.63	20.03	48.5 K=1.00	21.2057	-699,42	E03.44	0.871

 $<sup>^{1}</sup>P_{*}$  /  $_{\phi}P_{*}$  controls

			Truss-	Leg C	lagon	al Data	1		
Section No.	Elevation ft	Diogonal Size	L <sub>4</sub>	ΚVr	¢₽₄ K	A H	v. K	ψν, K	Stress Ratio
T5	220 - 200	0.5	1,40	94.1	324.71	8.1963	2.73	4.63	0.590
T6	200 - 180	0.5	1.40	94.1	324,71	0.1963	1.67	4.63	0.362
T7	180 - 160	0.5	1.39	93.2	424.12	0.1963	1,62	4.67	0.347

tnxTower	Job 240568	Page 60 of 64
Valmont 1545 Pideo Drive	Project V-31 x 290° - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymouth IN Phone: 574-936-4221 FAX:	Cilent American Tower Corp.	Designed by SKK

Section	Elevation	She	L	L,	ΚVr	A	P.	<b>∮</b> P <b>₄</b>	Ratia
Na.	fl		ß	ft		frt <sup>3</sup>	ĸ	ĸ	dP.
				***************************************	K=1.00	~~~~	***************************************		V

¹ P . / ♦P, controls

	Top Girt Design Data (Compression)								
Section No.	Elevation	Size	L	L,	KI/r	A	P.	<b>♦</b> P <b>•</b>	Ratio
	Л		ſ	A.		in	K	K	ĕ₽.
Ti	290 - 280	L2x2x3/16	5.00	4.47	136.1 K=1.00	0.7150	-0.67	8.72	0.876

<sup>1</sup> P. / 4P. controls

## Tension Checks

Section No.	Elevation	Size	L	L,	KUr	A	P.	<b>φ</b> P•	Ratio P.
	ft		fl	fl		tn²	κ	ĸ	φP.
TI	290 - 280	P- 2.50" - 0.75" conn10" -C-(Pirod 226172)	10,80	4,79	68.7	1.7848	3,25	76,68	0.042
T2	280 - 260	P- 4.00"- 0.75" conn20" -C-Trans-6B-4B-(Pirod 226184)	20.08	6.67	53.0	3.1741	47.79	142.83	0.335
T3	268 - 240	P- 5.00"- 8.75" consTrans-20" -C-(Pirod 226280)	20.83	6.68	42.7	4.2999	114.91	193.49	0.594 1
T4	240 - 226	P- 6.00"- 0.75" connHBD-Trans-28' -C-(Pirod 229377)	20.03	6.68	35.7	5.5813	173.50	251.16	0,691
T5	220 - 200	#12ZG -t.75" - 1.80" connHBD-Trans (Pirod 229588)	20.83	10,82	30.4	7.2158	216.92	324.71	0.568
TG	208 - 188	#12ZG-t.75"-t.88" connHBD-Trans (Pirod 229588)	20.03	t0.82	30.4	7.2158	267.48	324.71	8.823 <sup>1</sup>
<b>T7</b>	180 - 168	#12ZG -2.00" - 0.875" connHBD-Trans (Pirod 288332)	20.03	20.03	48,8	9.4248	296.12	424.12	0.698 1
TS	160 - 140	#12ZCI -2.25" - 0.875" conn. (Pirod 208334)	20.03	20.83	48.8	11.9282	346.75	536.77	0.646 1
T9	140 - 120	#12ZG -2.25* - 0.875* conn. (Pirod 208334)	20.83	20,03	48.8	11.9282	385.45	536.77	0.718 1
T10	120 - 100	#12ZO - 250" - 0.875" conn. (Pirod 208335)	28.03	26.03	48,7	14.7262	429.39	662.68	0.648

Γ	tnxTower	Job 240568	Page 61 of 64
l	Valimont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13;31:40 12/10/13
l	Physioich, IN Phone: 574-936-4221	Client American Tower Corp.	Designed by SKK

	*							-	
Section No.	Elevation	Size	L	L.,	K1/r	А	P <sub>4</sub>	<b>♦</b> ₽ <b>,</b>	Ratio P.
	ft		ft	ft		in <sup>2</sup>	K	K	<b>6₽.</b>
Til	188 - 80	#12ZG - 2.50" - 0.875" conn. (Pirod 208335)	20.03	20.03	48.7	14.7262	468.01	662.68	0.706
<b>T</b> 12	80 ~ 60	#12ZG - 2.75" - 0.875" conn. (Pirod 288337)	20.03	20.03	48.6	17.8187	509.19	201.24	0.635 ا
T13	68 - 48	#122G - 2.75" - 0.875" conn. (Pirod 208337)	20.03	20,03	48.6	17.8187	545.79	881.84	8.681
T14	40 - 28	#12ZG -3.00" - 0.875" connTrans (Pirod 208336)	20.03	20.03	48.5	25.2857	525.67	954.26	8.614° مما
T15	20 - 8	#122G -3.00" - 0.875" connTrans (Pirod 208338)	20.03	20.03	48,5	21.2057	618.28	954.26	0.648 *

<sup>&</sup>lt;sup>1</sup> P <sub>\*</sub> / ∮P<sub>\*</sub> controls

4. 1	9		Truss-	Leg C	iagon	al Data	1	1 11 1	
Section No.	Elevation A	Diagonal Size	L <sub>i</sub>	ΚVr	φ₽ <b>.</b> Κ	A ir <sup>2</sup>	V.	ψν. Κ	Stress Ratio
T5	220 - 208	0,5	1.40	94.1	324.71	0.1963	2.73	4.63	0.590
T6	200 - 180	8.5	1.40	94.1	324.71	0.1963	1.67	4.63	0.362
T7	180 - 168	0.5	1.39	93.2	424.12	0,1963	1.62	4.67	0.3.17
TS	160 - 140	8.5	1,38	92.4	536,77	0.1963	1.84	4.71	0.391
T9	140 - 120	0.5	1.38	92.4	536.77	8.1963	1.25	4.71	0.265
T58	120 - 100	- 0.5	1.36	91.6	662.6B	0.1963	1.47	4.75	8.311
T11	100 - 80	0.5	1.36	91.6	662.68	0.1963	1.19	4.75	8.252
T12	80 - 60	0,625	1.35	72.6	801.84	0.3062	1,16	8.74	0.133
Ti3	68 - 40	0.625	1.35	72.6	\$91.84	0.3068	1.12	8.74	0.128
T14	40 - 20	0.625	1.34	72.0	954.26	0.3068	1.16	8.78	0.146
T15	20-0	8,625	1.34	72.0	934.26	0.3068	6.75	10.97	0.082

	1197 117	Dia	gonal I	Desig	n Dat	a (Ten:	sion)		3 300
Section	Elevation	Size	L	L	K1/r	A	P <sub>a</sub>	<i>фP</i> .	Ratia
No.	ft		ft	ft		In <sup>2</sup>	ĸ	K	- P.
TI	290 - 288	L2x2x1/8	5.75	2.69	55.1	0.2813	2.45	52.23	0.200

	tnxTower	Job 240568	Page 63 of 64
١	Valmont 1545 Pideo Drive	Project V-31 x 290' - #281338 Hezel Green, K'	Date 13:31:40 12/10/13
١	Plymouth, IN Phone: 574-936-4221 FAX:	Client American Tower Corp.	Designed by SKK

Section	Elevation	Component	Site	Critical	P	aP <sub>allow</sub>	%	Poss
Na.	ft	Type		Element	K	K	Capacity	Foil
T2	280 - 260	Leg	P- 4,00"- 0,75" conn20"	21	-53.18	516.32	45.7	Pars
			-C-Trans-6B-4B-(Pirod 226184)					_
T3	268 - 248	Leg	P- 5.00*- 8.75* connTrans-20*	42	-124.80	169.37	73.7	Pass
		_	-C-(Pirod 226208)					
T4	248 - 228	Leg	P-6.00*- 0.75*	63	-187.20	228,83	81.8	Pass
			consHBD-Trans-20' -C-(Pired 229377)					
T5	220 - 288		#127() -1.75" - 1.08"	84	-233.46	303.46	76.9	Pxss
15	220 - 288	Leg	conn-HBD-Trans (Pirod	8-1	-233.40	303,40	16.9	1,111
			229588)					
Т6	208 - 180	Leg	#12ZG -1.75" + 1.00"	99	-289.31	303.46	95.3	Pass
	200 - 140		connHBD-Trans (Pirod					
			229588)					
77	188 - 160	Leg	#12ZG -2.00" - 0.875"	114	-319.51	356.29	89.7	Part
			connHBD-Trans (Pirod					
			208332)					
TE	160 - 140	Leg	#12ZG -2.25* - 0.875* conn.	123	<b>-376.5</b> 0	451.15	83.5	Patt
			(Pirod 208334)					
T9	140 - 120	Leg	#12ZG -2.25" - 0.875" conn.	132	-420.86	451.15	93.3	Pxss
			(Pirod 208334)			*		_
Tio	128 - 188	Leg	#12ZG - 2.50" - 0.875" conn.	141	-472.54	557.27	84.8	Pau
		_	(Pirod 208335)					_
TH	100 - 80	Leg	#12ZG - 2.58" - 8.875" conn.	150	-517.50	557.27	92.9	Part
T12	80 - 68		(Pirod 208335) #12ZG - 2.75" - 0.875" conn.	159	-566.86	674.68	84.6	Pass
712	80 - 68	Leg	(Pirod 288337)	159	•300.40	574.68	84.0	1'411
T13	60 - 40	Leg	#12ZG - 2.75* - 8.875" conn.	168	-618.55	674.68	90.5	Pass
113	00 - 40	Leg	(Pirod 208337)	104	-010.33	374.00	20.3	1.434
T14	40 - 20	Leg	#12ZG -3.00" - 8.875"	177	-659.36	803,44	82.1	Pass
114	40 - 20	Leg	connTrans (Pirod 208336)	.,,	-433.50	503.44		
T15	20 - 0	Leg	#12ZG -3.00" - 0.875"	185	-699.42	803.44	87.1	Pass
•••			congTrans (Pirod 208338)					
Ti	290 - 280	Diagonal	L2x2x1/8	10	-2.78	9.97	27.9	Past
72	288 - 260	Diagonal	L2x2x3/16	24	9.92	12.59	78.7	Pass
13	260 - 240	Diagonal	L2x2x3/16	45	-8.92	10.33	86,4	Pass
T4	248 - 220	Disgonal	L2 1/2x2 1/2x3/16	66	-9.65	14.17	68.1	Pass
T5	228 - 200	Disgonal	L3x3x3/16	87	-10,84	14.54	74.6	Pass
T6	200 - 180	Diagonal	L3x3x3/16	103	-18.66	11.92	09.5	Pass
77	188 - 160	Diagonal	21.3x3x3/16	117	-18.36	21.10	87.0	Pass
Tg	160 - 140	Diagonal	2L3x3x3/16	126	-16.41	19.45	84.4	Pass
T9	148 - 128	Diagonal	2L3 1/2x3 1/2x1/4	135	-17.75	37.20	47.7	Patt
TIG	128 - 100	Disgonal	2L3 1/2x3 1/2x1/4	144	-17.08	33.85	58.5	Pass
Til	100 - 80	Diagonal	2L3 1/2x3 1/2x1/4	153	-18.23	30.72	59.3	Pan
T12	80 - 68	Diagonal	2L3 1/2x3 1/2x1/4	162	-18.07	27.86	64.9	Patt
T13	60 - 43	Disgonal	2L3 1/2x3 1/2x1/4	172	-19.64	25.27 22.95	77.7 81.3	Pxss
T14	48 - 28	Disgonal	2L3 1/2x3 1/2x1/4	180 190	-18.65 -22.06	22.95 31.48	70.1	Pass
T15	20 + 8	Diagonal	2L4x4x1/4	4	-22.00 -8.67	8.72	70.1	Poss
TI	290 - 288	Top Girt	L2x2x3/16	•	-6.07	a.72	Summary	1,011
						Leg (T6)	95.3	Pass
						Diagonal	89.5	Pass
						(T6)	65.3	2 411
						Ton Girt	7.6	Pass

tnxTower	Job 240568	Page 62 of 64
Valmont 1545 Pideo Drive	V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Plymoidh IN Phone: 574-936-4221	Citent American Tower Corp.	Designed by SKK

Section No.	Elevation	Size	L	L,	Kl/r	A	P.,	φP <sub>a</sub>	Ratio P.
Nu	ft		ft	ft		فهما	ĸ	K	δP.
T2	280 - 260	L2x2x3/16	7.17	3.40	69.7	0.4132	9.63	17.97	0.536
T3	268 - 240	1.7×7×3/16	7,66	3.65	78.6	0.4132	9.14	17.97	8,508
T4	248 - 220	L2 1/2x2 1/2x3/16	9,60	4.80	76.9	0.5535	9.59	24.08	مرا 0.398 مرا
T5	228 - 200	1.3x3x3/16	12.65	6.43	84.7	0.6593	9.83	28.68	0.343
T6	200 - 180	1,3x3x3/16	14.10	7.14	93.7	0.6593	18.64	28.68	0.371
T7	160 - 160	21.3 x3x3/16	22.66	11.95	155.2	1.3537	16.53	58.89	0.281
TS	160 - 540	2L3x3x3/16	23,79	12.45	161.5	1.3537	15.38	58.89	0.260
<b>T9</b>	140 - 120	2L3 1/2x3 5/2x1/4	25.03	13,02	145.2	2.1563	15.84	93.80	0.169
T10	120 - 100	2L3 1/2x3 1/2x1/4	26,36	13.65	152.1	2.1563	16.07	93.80	0.171
T11	108 - 88	2L3 1/2x3 1/2x1/4	27.77	1433	159.6	2.1563	16.58	93,80	0,177
T12	20 - 60	2L3 1/2x3 1/2x1/4	29.25	15.04	167,5	2.1563	17.22	93.88	0.184°
T13	60 - 40	2L3 1/2x3 1/2x1/4	30,78	15.60	175.8	2.1563	17.86	93.88	6.190
T14	40 - 20	2L3 1/2x3 1/2x1/4	32.37	16.58	184,3	2.1563	18.48	93.80	0.197
T15	20 - 0	2L4x4x1/4	34.01	17.38	168.7	2.5350	19.71	110.27	0,179

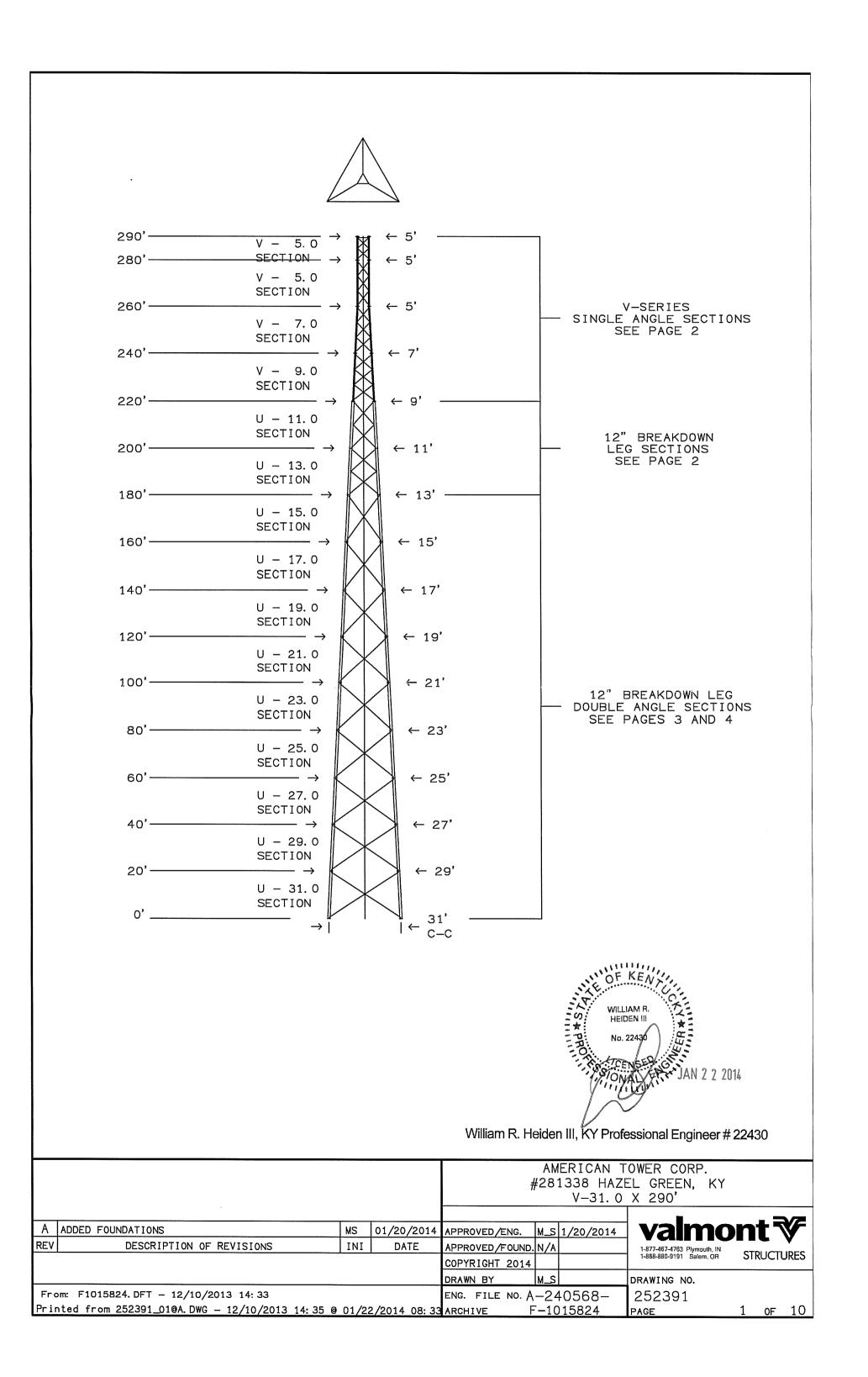
<sup>1</sup> P. / \$P. controls

		То	p Girt E	Desig	n Data	a (Tens	ion)	·	
Section No.	Elevation	Size	L	L,	ΚVr	1	P.	φP <sub>a</sub>	Ratio P.
1100	ft		ft	A		in <sup>2</sup>	K	K	iP.
Ti	290 - 280	L2x2x3/16	5.00	4.47	92.6	0.4132	0.51	17.97	0.0291

<sup>1</sup> P. / \$P. controls

			Section Cap	acity T	able				
Section No.	Elevation ft	Casiponera Type	Size	Critical Element	P K	oP <sub>eller</sub> K	% Copacity	Pass Foil	
Ti	290 - 288	Leg	P-2.50* - 0.75* conn18*	3	-4.57	58.58	7.8	Pett	

tnxTower	Job 240568	Page 64 of 64
Valmont 1545 Pidco Drive	Project V-31 x 290' - #281338 Hazel Green, KY	Date 13:31:40 12/10/13
Program Versi & 19/7/2011 File://1 = 2xles/2405 & 19/7/2012 FAX:	1/5HRP01/FileRoom/Documents/240/240568 ATC #281338 Hazel Orece, KY V-x290' American Tower Corp.	rdbefiligherribyver SKK



	V-SERIES LEG SECTION DATA 220' - 290' ELEVATION																			
	SECTION LEG							DIAGONAL BRACE						HOR						
"	LENGTH	NGTH * NOM WALL GRAD				CL	IMBING	NON	N-CLIMB	CONNECT	BOLT+	PART	r NUMBER	**	AN	GLE	CONNEC	T BOLT	CENTER	
#	LENGIN	WEIGHT	SIZE	WALL		QTY	PART#	QTY	PART#	DIAM	LENGTH	#1	#2	#3	FACE	THICK	DIAM	LENGTH	SPACER	QTY
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 <b>*</b>	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.

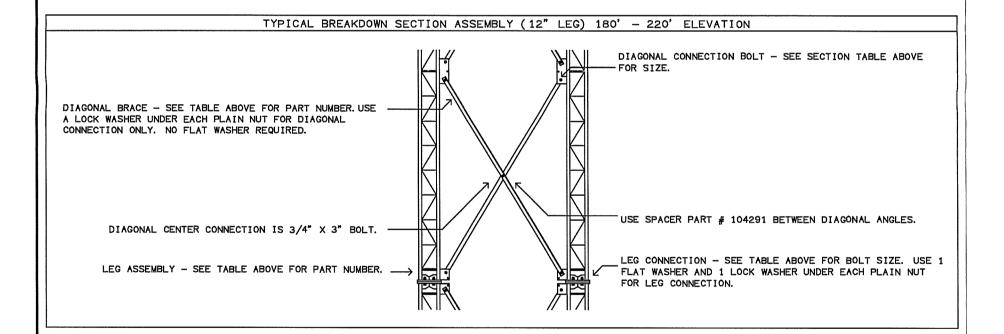
** PANELS ARE NUMBERED BEGINNING AT THE TOP OF THE SECTION	ON
--	----

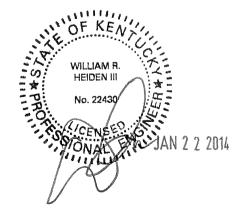
NUMBER.

HORIZONTAL DATA	TYPICAL V-SERIES	SECTION ASSEMBLY 220'	- 290' ELEVATION
HORIZ IN HORIZ HT SEC# PART# 290 V- 5.0 227584	HORIZONTALS AS REQUIRED. SEE TABLE TO LEFT FOR ELEVATION AND PART #.		
	DIAGONAL BRACE - SEE TABLE ABOVE FOR PART NUMBER.		DIAGONAL CONNECTION BOLT - SEE SECTION TABLE ABOVE FOR SIZE.
	DIAGONAL CENTER CONNECTION - 5/8" X 2-1/4" BOLT	11 1	DIAGONAL CENTER SPACER - SEE TABLE ABOVE FOR PART NUMBER.

BREAKDOWN SECTION DATA (12" LEG) 180' - 220' ELEVATION												
SEC	SECTION				BOT DIAG							CONNECT
#	LENGTH	SIZE	PART#	PART#	PART#	FACE	THICK	WEIGHT	DIAM	LENGTH	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"
CON	* 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.											

LEG ASSEMBLY - SEE TABLE ABOVE FOR PART





LEG CONNECTION - SEE TABLE ABOVE FOR BOLT

SIZE.

	7		1338 HAZ	TOWER CORP. ZEL GREEN, KY X 290'			
	APPROVED/ENG. APPROVED/FOUND. COPYRIGHT 2014	N/A	1/20/2014	Valmo 1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR		<b>t</b> s	•
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BREAKDOWN SECTION LEG DATA (12" LEG WITH DOUBLE ANGLES) O' - 180' ELEVATION

	S	SECTION	:	LEG		LEG CONNECT @ BOTTOM+				
#	MODEL	LENGTH	WEIGHT*	SIZE	PART #	DIAM	LENGTH #			
9	U-15. 0	20'	3953#	2 "	208332	1"	4-3/4" 12			
8	U-17. 0	20'	4615#	2- 1/4 "	208334	1"	4-3/4" 12			
7	U-19. 0	20'	5330#	2- 1/4 "	208334	1"	4-3/4" 12			
6	U-21. 0	20'	6016#	2- 1/2 "	208335	1"	4-3/4" 12			
5	U-23. 0	20'	6119#	2- 1/2 "	208335	1"	4-3/4" 12			
4	U-25. 0	20'	7007#	2- 3/4 "	208337	1"	4-3/4" 12			
3	U-27. 0	20'	7120#	2- 3/4 "	208337	1"	4-3/4" 12			
2	U-29. 0	20'	8229#	3 "	208336	1-1/4"	5" 12			
1	U-31. 0	20'	8349#	3 "	208338					

- \* 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) O' - 180' ELEVATION													
В	REAKDOWN	SECTIO	ON DIAG	ONAL DA	ATA (12	LEG	WITH D	OUBLE A	NGLES)	0' -	- 180' E	ELEVATI	ON.
	SECTION	DI	AGONAL	PART #	DIAG	ANGLE	DIAG END BOLT		DIAG CE		CENTER PLATE	SPACE	R
#	MODEL	UPPER	LOWER	LONG	FACE	THICK	DIAM	LENGTH	DIAM	LENGTH	PART #	PART #	#*
9	U-15. 0	215272	215276	215357	3 <b>"</b>	3/16"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	5
8	U-17. 0	215280	215284	215361	<b>ື</b> ອ	3/16"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	6
7	U-19. 0	215289	215293	215365	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	7
6	U-21. 0	215296	215300	215369	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
5	U-23. 0	215304	215308	215373	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
4	U-25. 0	215312	215316	215377	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
3	U-27. 0	215320	215324	215380	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
2	U-29. 0	215327	215330	215383	3-1/2"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	8
1	U-31. 0	215334	215337	215387	4"	1/4"	7/8"	2-1/2"	5/8"	2-1/4"	211833	104291	9
*	QUANTITY	' IS PER	PANEL	PER FAC	E. USE	1 LOCK	WASHER	UNDER E	ACH PLA	IN NUT.			

WILLIAM R.
HEIDEN III
No. 22430

VOICENSE OF JAN 2 2 2014

William R. Heiden III, KY Professional Engineer # 22430

ŧ			OWER CORP. EL GREEN, KY X 290'	
APPROVED/FOUND.		1/20/2014	Valmo  1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR	nt 🍑
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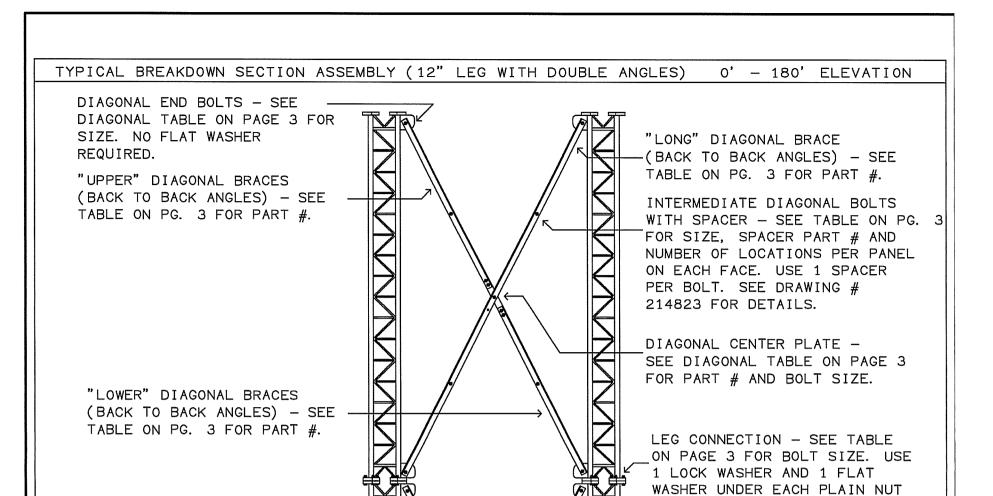
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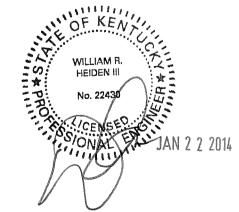
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## ATTENTION ERECTOR:

- 1. 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 RESPONSIBILTY OF THE TOWER CONTRACTOR TO ENSURE BREAKDOWN LEGS AND ANGLES ARE NOT DAMAGED DURING THE TOWER ASSEMBLY AND ERECTION.
- 2. 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 RESPONSIBILTY OF THE TOWER CONTRACTOR TO ENSURE BREAKDOWN LEGS AND ANGLES ARE NOT DAMAGED DURING THE TOWER ASSEMBLY AND ERECTION.



FOR LEG CONNECTION.

	7			OWER CORP. EL GREEN, KY X 290'			
	APPROVED/ENG. APPROVED/FOUND. COPYRIGHT 2014	N/A	1/20/2014	Valmo 1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR		<b>t</b> 7	•
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### GENERAL NOTES

- 1. TOWER DESIGN CONFORMS TO STANDARD TIA-222-G UTILIZING AN 90 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF II, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH NO ICE. TOWER DESIGN CONFORMS TO STANDARD TIA-222-G UTILIZING AN 30 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF 11, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH .75" RADIAL ICE.

  TOWER MEETS THE REQUIREMENTS OF THE 2011 OHIO BUILDING CODE UTILIZING AN 115 MPH 3-SEC GUST BASIC WIND SPEED WITH A STRUCTURE CLASS OF 11, TOPOGRAPHIC CATEGORY OF 1 AND EXPOSURE C CRITERIA WITH NO ICE PER ANSI/TIA-222-G.
- NO TWIST AND SWAY LIMITATIONS SPECIFIED OR USED FOR THIS TOWER.
- 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
- BASE REACTIONS PER TIA-222-G FOR 90 MPH BASIC WIND SPEED WITH NO ICE (REACTIONS INCLUDE TIA-222-G LOAD FACTORS): TOTAL WEIGHT = 118.0 KIPS. MAXIMUM COMPRESSION = 723.0 KIPS PER LEG. MOMENT = 18361.0 KIP-FT. MAXIMUM UPLIFT = 636.0 KIPS PER LEG. MAXIMUM SHEAR = 111.0 KIPS TOTAL.
- 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 = 349.0 KIPS. MOMENT = 2157.0 KIP-FT. MAXIMUM SHEAR = 12.0 KIPS TOTAL.
- FINISH: ALL BOLTS ARE GALVANIZED IN ACCORDANCE WITH ASTMA153 (HOT DIPPED) OR ASTM B695 CLASS 50 (MECHANICAL). ALL OTHER STRUCTURAL MATERIALS ARE GALVANIZED IN ACCORDANCE WITH ASTM123.
- 7. ANTENNAS: 285'-135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES.
  275'-135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES.
  265'-135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES.
  255'-135 SQ. FT. AREA WITH 3,000# WITH ICE/115 SQ. FT. AREA WITH 2,000# NO ICE AND (18) 1-5/8" LINES.
  NOTE: (A) ELEVATIONS ARE TO THE BOTTOM OF THE ANTENNAS EXCEPT FOR MICROWAVE DISHES, WHICH ARE TO THE CENTERLINE. (B) ALL TRANSMISSION LINES
  - MUST BE PLACED ON PIROD SUPPLIED LINE BRACKETS.
- 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.
- MIN. WELDS 5/16" UNLESS OTHERWISE SPECIFIED. ALL WELDING TO CONFORM TO AWS D1.1 SPECIFICATIONS .
- 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.
- ALL BOLTS AND NUTS MUST BE IN PLACE BEFORE THE ADJOINING SECTIONS ARE INSTALLED.
- 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 ASSEMBLIESTHAT USE PIN LOCK NUTS WITH ZINC RICH COLD GALVANIZING COMPOUND AFTER FINAL TIGHTNENING.
- 14. TIA-222-G GROUNDING FOR TOWER.
- 15. TOWER LIGHTING SUPPLIED BY OTHERS.

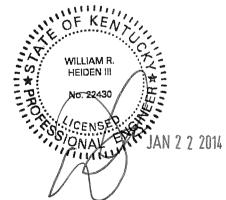
S HEIDEN III No. 2242 JAN 2 2 2014

William R. Heiden III, KY Professional Engineer # 22430

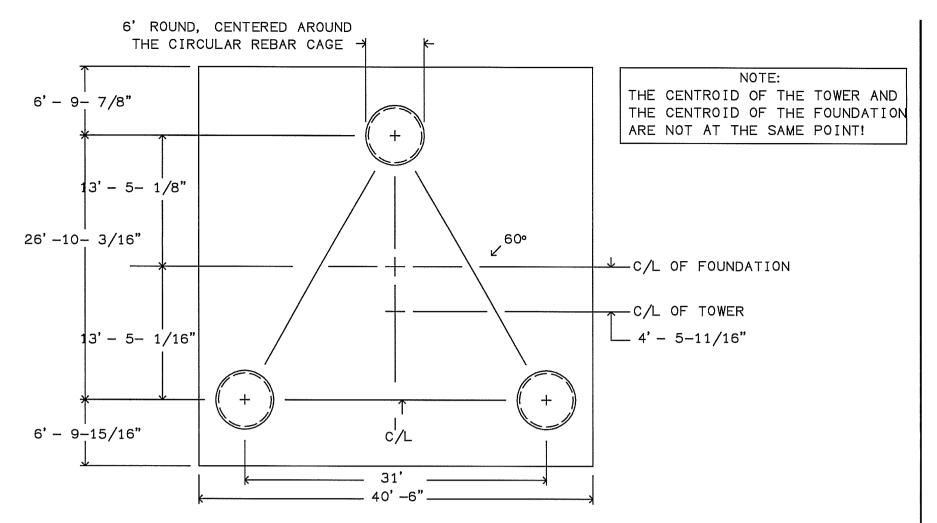
AMERICAN TOWER CORP. #281338 HAZEL GREEN. KY V-31. 0 X 290' ADDED FOUNDATIONS MS 01/20/2014 M\_S 1/20/2014 APPROVED/ENG. REV DESCRIPTION OF REVISIONS INI DATE APPROVED/FOUND.N/A **STRUCTURES** COPYRIGHT 2014 DRAWN BY DRAWING NO. From: F1015824. DFT - 01/20/2014 10: 15 ENG. FILE NO. A-240568-252391 Printed from 252391\_05@A. DWG - 01/20/2014 10: 19 @ 01/22/2014 08: 33 ARCHIVE F-1015824 PAGE of 10

## FOUNDATION NOTES

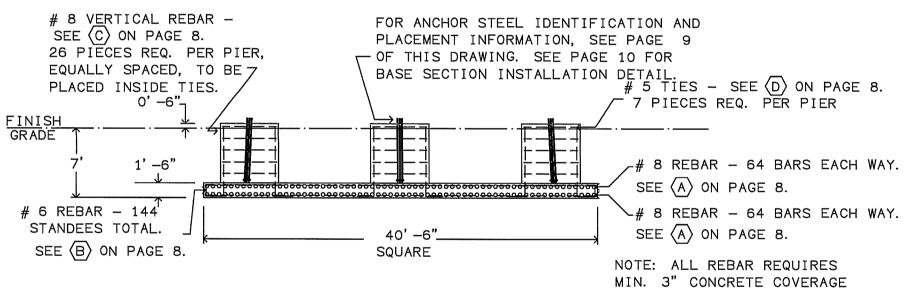
- 1. ULTIMATE SOIL PRESSURE ASSUMED TO BE 5000 PSF. ULTIMATE PASSIVE PRESSURE ASSUMED TO BE 500 LB PCF. THE PURCHASER & OWNER/CONTRACTOR MUST VERIFY THAT THE ACTUAL SITE SOIL PARAMETERS MEET OR EXCEED THE ASSUMED SOIL PARAMETERS PER THIS NOTE AND/OR SHOULD OBTAIN A SOIL REPORT TO DETERMINE THE SOIL CONDITIONS AT THE SITE. FOUNDATION DESIGN MODIFICATIONS MAY BE REQUIRED IN THE EVENT THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE FOR THE ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED.
- 2. CONCRETE TO BE 4000 PSI 6 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 OFNO MORE THAN 12" THICK. FILL MATERIALS SHOULD BE CLEAN AND FREE OF ORGANIC AND FROZEN MATERIALS OR ANY OTHER DELETERIOUS MATERIALS. COMPACT FILL TO 97% 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. IN THE ABSENCE OF A GEOTECHNICAL REPORT, THE FOLLOWING PRESUMPTIVE SOIL PARAMETERS WERE USED: AN ULTIMATE BEARING PRESSURE OF 5000 PSF, A COHESION OF 1000 PSF, A SOIL UNIT WEIGHT OF 110 PCF, AN ANGLE OF INTERNAL FRICTION OF 0 DEGREES AND NO GROUNDWATER ENCOUNTERED. THESE SOIL PARAMETERS ARE IN COMPLIANCE WITH THE REQUIREMENTS OF ANSI/TIA-222-G-2005 AND CAN BE FOUND IN ANNEX F OF THIS STANDARD.
- 8. ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL.



				AMERICAN TOWER CORP. #281338 HAZEL GREEN, KY V-31.0 X 290'					
A REV	ADDED FOUNDATIONS  DESCRIPTION OF REVISIONS	MS		APPROVED/ENG. APPROVED/FOUND. COPYRIGHT 2014		1/20/2014	Valmo  1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR	nt <sup>5</sup>	•
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NOTE: THE FOUNDATIONS DEPICTED ON THIS DRAWING WERE DESIGNED PER ASSUMED SOIL PARAMETERS. ALTHOUGH IT IS OUR EXPECTATION THAT THE SOIL WILL EXHIBIT SUFFICIENT STRENGTH TO COMPLY WITH THE ASSUMED STRENGTHS, IT IS POSSIBLE THAT THE SOIL MAY NOT EXHIBIT THE REQUIRED STRENGTHS. THEREFORE, IT IS HIGHLY RECOMMENDED THAT THE ASSUMED PROPERTIES BE CONFIRMED BY A GEOTECHNICAL ENGINEER VIA A SOIL REPORT OR AN ON-SITE INSPECTION DURING INSTALLATION.



# TOWER FOUNDATION

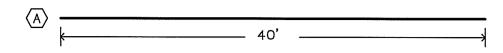
110. O CUBIC YARDS CONCRETE REQUIRED

FOR INSTALLATION SPECIFICATIONS AND
ADDITIONAL INFORMATION, SEE PAGE 6

OF THIS DRAWING.



				AMERICAN TOWER CORP. #281338 HAZEL GREEN, KY V-31.0 X 290'				
A REV	ADDED FOUNDATIONS  DESCRIPTION OF REVISIONS	MS		APPROVED/ENG.  APPROVED/FOUND.  COPYRIGHT 2014	M_:	5 1/20/2014 5 1/20/2014		nt 🍑 STRUCTURES
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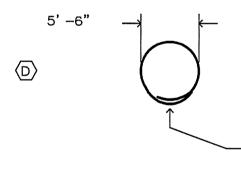
# 8 REBAR - 256 PIECES REQ. TOTAL APPROX WT = 106.8# EACH, 27341# TOTAL

B 8" 1'-1"

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

# 6 REBAR - 144 PIECES REQUIRED TOTAL TYPE 26 STANDEE PLACED BETWEEN REBAR GRIDS ON NOMINAL 4' SPACING THROUGHOUT APPROX UNBENT LENGTH = 4' - 5 - 7/8" APPROX WT = 6.7# EACH, 965# TOTAL

4" RAD. 
$$\longrightarrow$$
 # 8 REBAR - 78 PIECES REQUIRED TOTAL APPROX UNBENT LENGTH = 8' - 7- 3/8" APPROX WT = 23.0# EACH, 1794# TOTAL

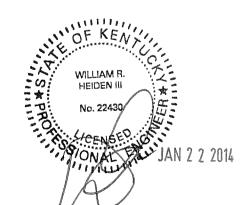


# 5 REBAR - 21 PIECES REQUIRED TOTAL APPROX UNBENT LENGTH = 19' - 2- 1/2" APPROX WT = 20.0# EACH, 420# TOTAL

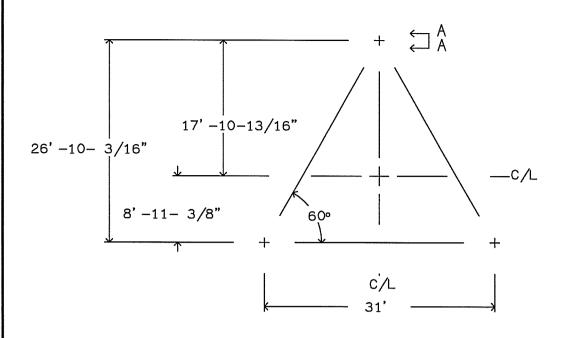
LAP DIMENSION: 1'-11- 1/8"
PLACE CIRCULAR TIES SO THAT LAPS ON
ADJACENT TIES ARE 180 DEGREES APART.
PLACE ONE TIE AT TOP OF PAD AND TWO
TIES AT TOP OF PIER REBAR. EQUALLY
SPACE REMAINING TIES ALONG PIER.

# REBAR DETAIL

TOTAL APPROX REBAR WEIGHT = 30520# REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.



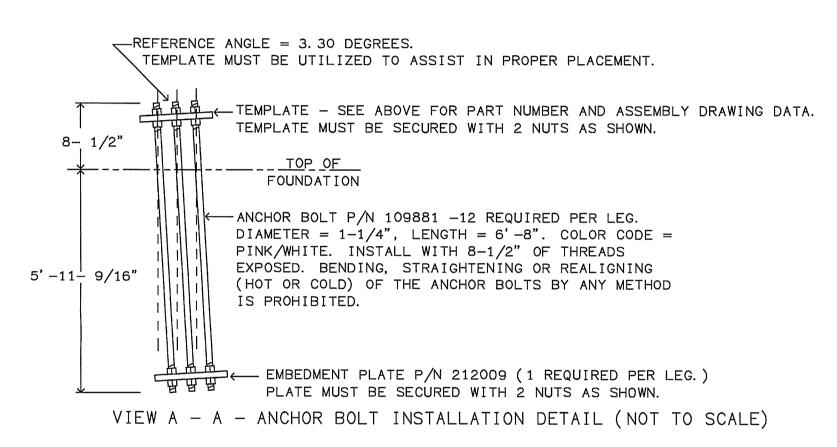
			 AMERICAN TOWER CORP. #281338 HAZEL GREEN, KY V-31.0 X 290'						
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TOWER ANCHOR STEEL PLACEMENT - TOP VIEW

TEMPLATE ASSEMBLY P/N 216166 INCLUDES CORNER PLATE P/N 211904, 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.

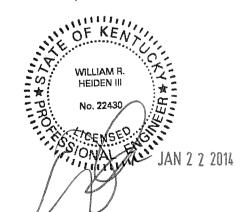


## ATTENTION CONTRACTOR INSTALLING THE ANCHOR BOLTS!

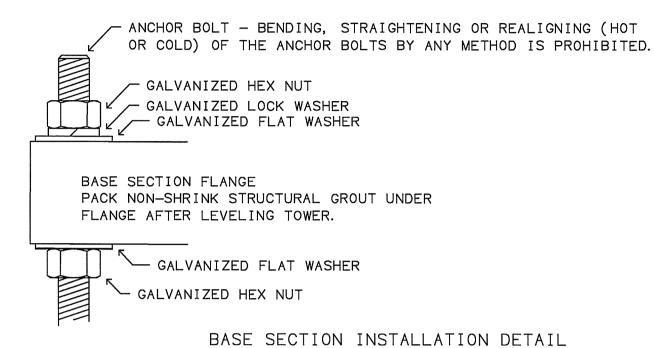
1-1/4" DIAMETER ANCHOR BOLTS FOR TAPERED TOWER.

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!!



				AMERICAN TOWER CORP. #281338 HAZEL GREEN, KY V-31.0 X 290'					
A REV	ADDED FOUNDATIONS  DESCRIPTION OF REVISIONS	MS		APPROVED/ENG. APPROVED/FOUND. COPYRIGHT 2014		1/20/2014 1/20/2014	Valmo  1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR	nt <sup>=</sup> STRUCT	•
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WILLIAM R.
HEIDEN III
No. 22430

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JAN 2 2 2014

			AMERICAN TOWER CORP. #281338 HAZEL GREEN, KY V-31.0 X 290'					
A REV	ADDED FOUNDATIONS  DESCRIPTION OF REVISIONS	MS	APPROVED/ENG. APPROVED/FOUND. COPYRIGHT 2014	M_S	1/20/2014 1/20/2014	Valmo  1-877-467-4763 Plymouth, IN 1-888-880-9191 Salem, OR	nt 🍑	
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## **UNIT BASE FOUNDATION SUMMARY**

## ATC Hazel Green, KY

V-	31.0	290
Α-	240568	

V 2.1

Foundation Dimensions						
Pad width, W:	40.5	ft				
Depth, D:	7.0	ft				
Ext. above grade, E:	0.5	ft				
Pier diameter, d <sub>i</sub> :	6.0	ft				
Pad thickness, T:	1.50	ft				
Depth neglected, N:	7.0	ft				
Volume, V₀:	109.97	су				

64	bars *
8	
26	verticals
8	5.5' cage
7	ties
K	w/ overlap
	26

<sup>\*</sup> Rebar to be equally spaced, both ways, top & bottom

\* Use standaes to support top rebar above bottom rabar in mat

Soil Information Per:				
Assumed as Clay Per TIA-222-G Annex F.				

Soil Parameters		
Soll unit weight, γ:	110	pcf
Uitimate Bearing, B <sub>c</sub> :	5.000	ksf
Cohesion, C <sub>a</sub>	1,000	ksf
Friction angle; φ	- 0.0	degrees
Ult. Passive P., P <sub>p</sub> :	0.396	pcf
Base sliding, μ:	0.20	
Seismlc Zone;	1	
Water at:	none	ft

Anchor Steel Selection				
Part Number, P/N:	109881	Dia = 1.25*		

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

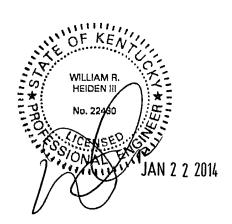
Backfill Compaction				
Lift thickness;	12	in		
Compaction:	97	%		
Standard Proctor:	ASTM	D698		

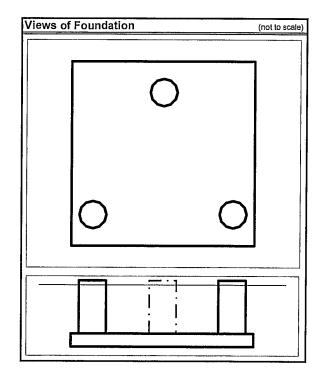
Tower design conforms to the following:

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

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

Foundation Loadi	ng				
Load Case 1					
	200				
Load Case 2		stress r	atio: 99.0%	mark up: 1	1.0%
Shear (total), S:	111.00	kips	x 1.01 =	112.11	kips
Moment, M:	18361.00	ft-kips	x 1.01 =	18544.61 1	ft-kips
Compression/Leg, C:	723.00	kips	x 1.01 =	730,23	kips
Uplift/Leg, U:	638.00	kips	x 1.01 =	642,38 I	kips
Tower Weight, Wt:	118.00	kips	=	118.00	kips





### Additional Notes:

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

## **FOUNDATION NOTES**

- 1 IN THE ABSENCE OF A GEOTECHNICAL REPORT, THE FOLLOWING PRESUMPTIVE SOIL PARAMETERS WERE USED: AN ULTIMATE BEARING PRESSURE OF 5000 PSF, A COHESION OF 1000 PSF, A SOIL UNIT WEIGHT OF 110 PCF, AN ANGLE OF INTERNAL FRICTION OF 0 DEGREES AND NO GROUNDWATER ENCOUNTERED. THESE SOIL PARAMETERS ARE IN COMPLIANCE WITH THE REQUIREMENTS OF ANSI/TIA-222-G-2005 AND CAN BE FOUND IN ANNEX F OF THIS STANDARD.
- 2 ANY SOFT OR UNSTABLE SUBGRADE SOILS DETECTED DURING THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH COMPACTED FILL.

ATC Hazel Green, KY						•	/- 31.0 - 240568	290 3			V 2.1
Reactions	stress ratio	99.0%	mark up:	1.0%		Soii pe	r: Assumed	as Clay Per 1	TIA-222-G A	nnex F.	
Shear, S:	111.00 kips	x 1.01 =	112.11	dps							
Moment, M: 183	361,00 ft-kips	x 1.01 =	18544 <u>.</u> 61 f	t-kips							
Compression / leg, C:	723.00 kips	x 1.01 =	730.23	kips							
Uplift / leg, U;	336,00 kips	x 1.01 =	642.36 }	dps			Uitim	ate bearing:	5.000	ksf	
Tower weight, Wt:	118,00 kips	=	118.00	kips			l	Jitimate Pp:	0.396	kcf	
		Loa	d Case 2 :	= 0.9*D +	· 1.0*Dg	+ 1.6*W	0				<u>.</u>
Physical Parameters:											
Concrete volume:			3 * (di² / 4 * 1	π) * (D + E	- T)			V =	110.0	су	
Concrete weight:	W <sub>c</sub> =							W <sub>c</sub> =	445.4	kips	
Soil weight:			(W <sup>2</sup> - 3 * (di <sup>2</sup>	' / 4 * π)) *	Y			W <sub>s</sub> =	941.0	kips	
Total welght:	P =	Wc + Ws	s + Wt					P=	1504.43	kips	
Passive Pressure:  Pp coefficient:	K <sub>p</sub> =	TAN(45	+ φ / 2)²					K <sub>p</sub> =	1.000		
,	r		N + 2 * Co *	√(Kp)				P <sub>pn</sub> ≔	2.770	ksf	
	F		(D - T) + 2 * (					P <sub>pt</sub> =	2.605	ksf	
			D + 2 * Co *					P <sub>ob</sub> =	2.770	ksf	
	•		) - T), Ppt, Pp					P <sub>ptop</sub> =	2.8	ksf	
			Ppb) / 2	•				Pp' =	2,770	ksf	
Shear area:	T <sub>pp</sub> =		· F-//					T <sub>pp</sub> =	0.0	ft	
		Tpp * W						A <sub>pp</sub> =	0.00	ft <sup>2</sup>	
Shear Capacity: φr = 0,75			p + µ * P) * q	r				S <sub>actual</sub> =	225.665	kips	
φ: - 0,70			Check	S <sub>actual</sub> =	225.66	kips	>=	S =	112.11	kips	ОК
Overturning Moment Resi											
Wt of soil wedge:			TAN(φ)) / 2 *	W*Y				W <sub>sw</sub> =	0.0	kips	
Dist. from leg to edge:		•	66 * w') / 2					0 =	6.827	ft	
Additional offset of Wt:		•	.866 * w' + O)	-W/2				O <sub>a</sub> =	4.474	ft	
Resisting moments:			2 - Wt * Oa					M <sub>rwt</sub> =	29936.74	ft-kips	
	•		p*(D - N)/3					M <sub>rp</sub> =	0.00	ft-kips	
			N + D * TAN(					M <sub>rsw</sub> =	0.00	ft-kips	
Total resisting; φr = 0.75	M <sub>rt</sub> =	(Mrwt + N	Mrp + Mrsw) '	' фг				M <sub>rt</sub> =	22452.56	ft-kips	
Totat overturning:	M <sub>o</sub> =	M + S * (			00450.50	F 11		M <sub>o</sub> =	19385.44	ft-kips	014
atalo			Check	IVI <sub>rt</sub> =	22452.56	п-кірѕ	>=	M <sub>a</sub> =	19385.44	ft-kips	OK
Bearing Resistance due to Area of mat:	Pressure Distribut area =							area =	1640.3	ft²	
	SM =							area =	11071.7	ft <sup>3</sup>	
Section modulus:			# #1# . 1##=\					SM = P' =			
Factored total weight:			* (Wc + Ws)						1365.8	kip	
Pressure exerted:	•		+ Mo / SM					P <sub>pos</sub> =	2.584	ksf	
Note	: The stress resulta		-Mo/SM Twithin the	kern. Bea	ring area	has been a	adiusted bei	P <sub>neg</sub> =	-0.918	ksf	
Load eccentricity:		Mo / P'			-		•	e <sub>c</sub> =	14.19	ft	
•	_		3 * W * (W / 2	- ec))				P <sub>adj</sub> =	3.7	ksf	
Adj, applied pressure:	•		>= 0, Ppos, P					q <sub>a</sub> =	3.712	ksf	
$\varphi r = 0.75$	ча	, (, ,,og	Check	q <sub>a</sub> =	3.712	ksf	<=	B <sub>c</sub> * opr=	3.750	ksf	ОК
Concrete Shear Strength: One way beam action at d <sub>1</sub> from	m lower			***************************************							
		т сс -	dh n / 3					4 -	14 500	in	
Effective depth:		T - cc - c						d <sub>c</sub> =	14.500	in kof	
Factored Intensity:	·-	C / area		VALL or =				q <sub>s</sub> =	0.445	ksf	
Required shear: φs = 0.75 [ACt 9.3.2.	.3]		di / 2 - dc) *	vv/φs				V <sub>n1</sub> =	62.95	kips	
Available shear: [ACt 12.2.4]	V <sub>c1</sub> = 2	2 * √(F'c)	* W * dc					V <sub>c1</sub> =	891.38	kips	
			Check	·		kins	>=	V., =	62 95	kins	OK

V<sub>c1</sub> = 891.38 kips

V<sub>n1</sub> =

62.95

kips

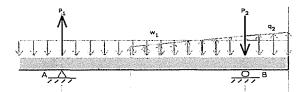
ОК

Check

	D- 481	· •					-	00.05		
Perimeter:	Po = (di + dc	•	d=\2 * ' ·	,			Pa =	22,65	ft	
Required shear: φs = 0.75 [ACI 9.3.2.3]		* (area - (di +	dc)**π/4	·)			V <sub>n2</sub> =	949.42	kips	
Avaitable shear: [ACl 12.2.2]	$V_{c2} = 4 * \sqrt{(F')}$	c) * Po * dc					V <sub>c2</sub> =	996.84	kips	
		Check	V <sub>c2</sub> =	996.84	kips	>=	V <sub>n2</sub> =	949,42	kips	ок
Column Compression Capacity:	_									
Compression reaction: φc = 0.65 [ACI 9.3.2.2]	$P_{c} = \varphi c * 0.8$	F'c * (di² / 4	* π)				P <sub>c</sub> =	8468.7	kips	
		Check	P <sub>c</sub> =	8468.73	kips	>=	C =	730.23	kips	ok
Pler Reinforcement:									. 2	***************************************
Cross-sectional area:	$A_g = di^2 * \pi /$						A <sub>g</sub> =	4071.50	in²	
Min. area of steel (pier):	$A_{st_c} = Ag * 0.0$	105					$A_{st_c} =$	20.36	in <sup>2</sup>	
[ACI 10.9.1] & [ACI 10.8.4]										
Cage circle:	$d_a = di - 2 * a$	CC					d <sub>o</sub> =	66.00	in	
Rebar:	s_c = 8				d <sub>b_c</sub> =	1	in . 2			
	m_c = 26				$A_{b\_c} =$	0.79	in <sup>2</sup>		. 2	
	$A_{s_c} = Ab_c * 0$				3		A <sub>s_c</sub> =	20.54	in <sup>2</sup>	
		Check	A <sub>s_c</sub> =	20.54	in <sup>2</sup>	>=	A <sub>st_c</sub> =	20.36	in <sup>2</sup>	ок
Actual moment:	$M_{max} = (D - T +$	E) * S / 2					M <sub>max</sub> =	336.33	ft-kips	
Pier moment capacity:	M <sub>allow</sub> per Maxmo	omnt.xis (see atta					M <sub>allow</sub> =	452.85	ft-kips	
		Check	M <sub>allow</sub> ≃	452.85	ft-kips	>=	M <sub>max</sub> =	336.33	ft-kips	ok
Bar separation:	$B_{s_c} = (do * \pi)$	/ m_c - db_c					B <sub>s_c</sub> =	6.97	in	
	*	Check	11	>=	B <sub>s_c</sub> =	6.97	in	>=	4.5"	ок
(artical Bahar Davalar mant Land	~									
Vertical Rebar Development Leng Reinforcement location:	$\psi_{t_{-0}}$ = if the space	o under the re	har > 12 in	1 1156 1 3	۱۱ مورر معلم		$\psi_{t,c} =$	1.3		
[ACI 12.2.4]	Pt_6 if the space	oc unger me re		, 450 1.0,	C:00 43C 1.0		Y LC	1.0		
Epoxy coating:	$\psi_{e_c}$ = if epoxy-c	oated bars are	not used,	use 1.0; b	ut if epoxy-coa	ated	ψ <sub>e_c</sub> =	1.0		
[ACI 12.2.4]		sed, then if Ba								
Max term:	$\psi_t \psi_{\bullet,c} = \text{the produc}$	ct of wt & we,	need not be	e taken iar	ger than 1.7		$\psi_{i}\psi_{e_{c}} =$	1.3		
[ACI 12.2.4]							7			
Reinforcement size:	$\psi_{s_{c}}$ = if the bar s									
	YS_C II III Das	size is 6 or les	s, then use	0.8, else	use 1.0		$\psi_{s_c} =$	1		
[ACI 12.2.4]	Ps_c it the bas	size is 6 or les	s, then use	0.8, else	use 1.0		$\psi_{s_c} =$	1		
[ACI 12.2.4] Light weight concrete: [ACI 12.2.4]	$\lambda_{c} = \text{if lightwise}$						ψ <sub>s_c</sub> = λ <sub>_c</sub> =	1.0		
Light weight concrete: [ACI 12.2.4] Spacing/cover:	$\lambda_{e} = \text{if lightwieg}$		used, 1.3,	else use 1	1.0	stace			in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars:	$\lambda_{e} = \text{if lightwieg}$	ght concrete is	used, 1.3, ar spacing	else use 1	1.0	stace	λ_c =	1.0	in in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term:	$\lambda_{c} = \text{if lightwise}$ $c_{c} \text{ the smalle}$	ght concrete is or of: half the b	used, 1.3, ar spacing	else use 1	1.0	stace	c_c = λ_c =	1.0 3.50		
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement:	$\lambda_{c} = \text{if lightwice}$ $c_{c} \text{ the smalle}$ $k_{t_{c}} = 0 \text{ in } (p)$	ght concrete is or of: half the b oer simplification of, (c_c + ktr_c	used, 1.3, ar spacing	else use 1	1.0	stace	λ_c = c_c = k <sub>tr_c</sub> =	1.0 3.50 0		
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile):	$\lambda_{\_c} = \text{if lightwise}$ $c_{\_c}$ the smalle $k_{tr\_c} = 0 \text{ in } (p$ $c_{\_c'} = MIN(2.8)$	ght concrete is or of: half the b eer simplification of, (c_c + ktr_c Mallow	used, 1.3, ar spacing on) ) / db_c)	else use 1	I.O ocrete edge di		λ_c = c_σ = k <sub>tr_c</sub> = c_σ' =	1.0 3.50 0 2.500		
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length:	$\lambda_{\_c} = \text{if lightwise}$ $c_{\_c}$ the smalle $k_{V\_c} = 0 \text{ in } (p$ $c_{\_c}' = \text{MIN}(2.9)$ $R_c = \text{Mmax}/p$	ight concrete is or of: half the b or simplification of, (c_c + ktr_c Mallow $(Fy / \sqrt{(F'c)}) * (q)$	used, 1.3, ar spacing on) ) / db_c)	else use 1	I.O ocrete edge di		$\lambda_{-c} = c_{-c} = k_{tr_{-c}} = c_{-c}' = R_{-c} = 0$	1.0 3.50 0 2.500 0.74	in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1]	$\lambda_{\_c}$ = if lightwise $c_{\_c}$ the smalle $k_{tr\_c}$ = 0 in (p $c_{\_c}$ ' = MIN( 2.5 $R_c$ = Mmax / $L_{dt\_c}$ = (3 / 40) * $L_{d_r}$ = 12 inches	ght concrete is or of: half the b er simplification for (c_c + ktr_c Mallow (Fy / \( (F'c) ) * (4)	used, 1.3, ar spacing on) ) / db_c) ottpe_c * ws_	else use 1	I.O ocrete edge di		$\lambda_{c} = c_{0} = c_{0} = k_{tr_{c}} = c_{0}' = R_{0} = L_{d_{c}min} = L_{d_{c}min} = c_{0}$	1.0 3.50 0 2.500 0.74 27.48 12.0	in in in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development length:	$\lambda_{\_c}$ = if lightwise $c_{\_c}$ the smalle $k_{tr\_c}$ = 0 in (p $c_{\_c}$ '= MIN( 2.8 $R_c$ = Mmax / $L_{dt\_c}$ = (3 / 40) * $L_{dt\_min}$ = 12 inches $L_{dt\_c}$ = MAX( Lot_c = MAX( Lot_c)	ght concrete is or of: half the b er simplification for c_c + ktr_c Mallow (Fy / √(F'c)) * (4) es d_min, Ldt'_c )	used, 1.3, ar spacing on) ) / db_c)  otupe_c * ws	else use 1	I.O ocrete edge di		\( \lambda_c = \) \( \cdot \lambda_c = \) \( \cdot \lambda_c = \) \( \cdot \lambda_c = \) \( \cdot \lambda_{-c} = \) \( \cdot \lambda_{-min} = \) \( \cdot \lambda_{-min} = \) \( \cdot \lambda_{-c} = \)	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48	in in in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1]	$\lambda_{-c}$ = if lightwise $\lambda_{-c}$ = or the smalle $\lambda_{tr_{-c}}$ = 0 in (p $\lambda_{-c}$ = MIN( 2.5 $\lambda_{-c}$ = Mmax / $\lambda_{-c}$ = (3 / 40) • $\lambda_{-c}$ = 12 inches $\lambda_{-c}$ = MAX( $\lambda_{-c}$ = 0.02 • di	ght concrete is or of: half the b er simplification for (c_c + ktr_c) Mallow (Fy / √(F'c)) * (4) es d_min, Ldt'_c) b_c * Fy * R_c	used, 1.3, ar spacing on) of db_c) olithe_c * ws.	else use 1	I.O ocrete edge di		A_c =  C_o =  k <sub>tr_c</sub> =  C_o' =  R_o =  L_d'_c =  L_d_min =  L_d_c =  L_d_c =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09	in in in in In	
Light weight concrele: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]	$\lambda_{c}$ = if lightwise $\lambda_{c}$ = or the smalle $\lambda_{t-c}$ = 0 in (p) $\lambda_{c}$ = MIN( 2.8 $\lambda_{c}$ = Mmax / $\lambda_{d-c}$ = (3 / 40) $\lambda_{d-c}$ = 12 inches $\lambda_{d-c}$ = MAX( $\lambda_{d-c}$ = 0.02 $\lambda_{d-c}$ = 0.02 $\lambda_{d-c}$	ght concrete is or of: half the b er simplification for (c_c + ktr_c Mallow (Fy / √(F'c)) * (q es d_min, Ldt'_c) b_c * Fy * R_c d d_c * Fy * R_c d d_c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d c * Fy * R_c d d d d c * Fy * R_c d d d d d d d d d d d d d d d d d d d	used, 1.3, ar spacing on) ) / db_c) ottpe_c * ψs. / √(F'c)	else use 1	I.O ocrete edge di		A_c =  C_o =  K <sub>tr_c</sub> =  C_o' =  R_o =  L_d'_c =  L_d_min =  L_dc_c =  L_dc_c =  L_dc_c =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09	in in in in in in in in	
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Light weight concrele: [ACI 12.2.4] Spacing/cover. [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (fensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]	$\lambda_{c}$ = if lightwise $\lambda_{c}$ = or the smalle $\lambda_{t-c}$ = 0 in (p) $\lambda_{c}$ = MIN( 2.8 $\lambda_{c}$ = Mmax / $\lambda_{d-c}$ = (3 / 40) $\lambda_{d-c}$ = 12 inches $\lambda_{d-c}$ = MAX( $\lambda_{d-c}$ = 0.02 $\lambda_{d-c}$ = 0.02 $\lambda_{d-c}$	ght concrete is or of: half the b er simplification of, (c_c + ktr_c Mallow (Fy / √(F'c)) * (4) es d_min, Ldt'_c) b_c * Fy * R_c I db_c * Fy * R Ldc'_c, Ldc''_	used, 1.3, ar spacing on) ) / db_c) ottpe_c * ψs. / √(F'c)	else use 1 or the con	I.O ocrete edge di		A_c =  C_o =  K <sub>tr_c</sub> =  C_o' =  R_o =  L_d'_c =  L_d_min =  L_dc_c =  L_dc_c =  L_dc_c =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09	in in in in in in in in	
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (lensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]	$\lambda_{\_c}$ = if lightwise $\lambda_{\_c}$ = or the smaller $\lambda_{t^-c}$ = 0 in (p) $\lambda_{t^-c}$ = 0	ght concrete is or of: half the b er simplification of, (c_c + ktr_c Mallow (Fy / √(F'c)) * (4) es d_min, Ldt'_c) b_c * Fy * R_c I db_c * Fy * R Ldc'_c, Ldc''_	used, 1.3, ar spacing on) ) / db_c) ottpe_c * ψs. / √(F'c)	else use 1	I.O ocrete edge di		A_c =  C_c =  K <sub>tr_c</sub> =  C_o' =  R_o =  L_{dt_c} =  L_{d_min} =  L_{dc_c} =  L_{dc_c} =  L_{dc_c} =  L_{dc_c} =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09	in in in in in in in in in	ОК
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (lensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]	$\lambda_{c}$ = if lightwise $\lambda_{c}$ = 0 in (p $\lambda_{c}$	ght concrete is or of: half the b er simplification for (c_c + ktr_c  Mallow  (Fy / √(F'c)) * (u) es d_min, Ldt'_c) b_c * Fy * R_c  db_c * Fy * R  Ldc'_c, Ldc''_ E - Cc	used, 1.3, ar spacing on) ) / db_c)  / √(F'c) _c c)	else use 1 or the con	I.O Icrete edge di: !_c/c_c') * db_	c	A_c =  C_o =  K <sub>tr_c</sub> =  C_o' =  R_o =  L_{d_min} =  L_{d_c} =  L_	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09 13.37 14.09 69.0	in in in in in in in in in in in in in i	OK OK
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.2] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]	$\lambda_{\_c}$ = if lightwise $\lambda_{\_c}$ = or the smaller $\lambda_{t^-c}$ = 0 in (p) $\lambda_{t^-c}$ = 0	ght concrete is or of: half the b er simplification for (c_c + ktr_c  Mallow (Fy / √(F'c)) * (q  ss d_min, Ldt'_c) b_c * Fy * R_c  db_c * Fy * R  Ldc'_c, Ldc'_ E - Cc  Check	used, 1.3, ar spacing on) ) / db_c)  / √(F'c) _c _c _t _v=	else use for the condition of the condition $a = a + b$ or the condition	I.O crete edge dis c.c/c_c') * db_ in	c >=	A_c =  C_o =  Ktr_c =  C_o' =  R_o =  L_d_c =  L_d_min =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =  L_d_c =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09 13.37 14.09 69.0 27.5	in in in in in in in in in in in in in	~
Light weight concrete: [ACI 12.2.4] Spacing/cover: [ACI 12.2.4] Transverse bars: [ACI 12.2.3] Max term: [ACI 12.2.3] Excess reinforcement: [ACI 12.2.5] Development (tensile): [ACI 12.2.1] Minimum length: [ACI 12.2.1] Development (comp.): [ACI 12.3.2]  Development itength: Length available in pler:	$\lambda_{c}$ = if lightwise $\lambda_{c}$ = 0 in (p $\lambda_{c}$	ght concrete is or of: half the b er simplification for (c_c + ktr_c  Mallow (Fy / √(F'c)) * (q  ss d_min, Ldt'_c) b_c * Fy * R_c  db_c * Fy * R  Ldc'_c, Ldc'_ E - Cc  Check	used, 1.3, ar spacing on) ) / db_c)  / √(F'c) _c _c _t _v=	else use for the condition of the condition $a = a + b$ or the condition	I.O crete edge dis c.c/c_c') * db_ in	c >=	A_c =  C_o =  Ktr_c =  C_o' =  R_c =  L_d'_c =  L_d_min =  L_dt_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =  L_de_c =	1.0 3.50 0 2.500 0.74 27.48 12.0 27.48 14.09 69.0 27.5 14.1	in in in in in in in in in in in in in i	~

Vertical Rebar Hook Ending:												
Bar size & clear cover: [ACI 12.5.3]	$\alpha_h$	if the bar s	size <= 11 a	nd side cc >=	2.5", us	e 0.7,	else use	1.0	$\psi_{\mathrm{t_h}}$ =	0.7		
Epoxy coating: [ACI 12.5.2]	$\beta_h$	if epoxy-co	oated bars a	are used, use	1.2, else	use 1	1.0		$\psi_{\mathrm{e}_{\mathtt{h}}}$ =	1.0		
Light weight concrete: [ACI 12.5.2]	$\lambda_{h}$	if lightwieg	jht concrete	is used, 1.3,	else use	1.0			λ_h =	1.0		
Development (hook): [ACI 12.5.2]	L <sub>dh</sub> '	= 0.02 * ψ	t_h * ψe_h `	*λ_h * Fy / √(	F'c) * db	_c			L <sub>dh</sub> ' =	13.3	in	
Minimum tength: [ACI 12.5.1]	L <sub>dh_min</sub>	the larger	of: 8 * db or	6 in					L <sub>dh_min</sub> =	8.0	in	
Development length:	$L_{dh}$	= MAX( Lo	dh_min, Ldh	')					L <sub>dh</sub> =	13.3	in	
			Check	L <sub>vp</sub> =	15.0	in		>=	L <sub>dh</sub> =	13.3	in	ок
Hook tall length:	$L_{h\_{tail}}$	12 * db be	eyond the be	nd radius					L <sub>h_tail</sub> =	16.0	in	
Length available in pad:	L <sub>h_pad</sub>	= (W - w* -	- di) / 2						L <sub>h_pad</sub> =	21	in	
			Check	L <sub>h_pad</sub> =	21.0	in		>=	L <sub>dh_tail</sub> =	16.0	in	ок
<u>Pier Ties:</u>												
Minimum size: [ACI 7.10.5.1]	S_t_min	=IF(s_c <=	= 10, 3, 4)						s_t_min =	3		
z factor:	z =	0.5 if the s	seismic zone	e 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 [ACI 7.10.5.2] & [ACI 21.3.3.2]	B <sub>s_t_max1</sub>	= 8 / z * db	b_c						B <sub>s_t_max1</sub> =	16	in	
per tle size [ACI 7.10.5.2] & [ACI 21.3.3.2]	B <sub>s_t_max2</sub>	= 24 / z * c	db_t						$B_{s\_t\_max2} =$	24	in	
per pier diameter [ACI 7.10.5.2] & [ACI 21.3.3.2]	B <sub>s_t_max3</sub>	= di / (4 * 2	Z²)						B <sub>s_t_max3</sub> =	72	in	
per seismic zone [ACI 7.10,5.2] & [ACI 21,3,3.2]	B <sub>s_t_max4</sub>	= 12" in ac	ctive seismic	c zones, else	18"				B <sub>s_t_max4</sub> =	18	in	
	B <sub>s_t_max</sub>	= MIN( Bs	_t_max1, B	s_t_max2, Bs	_t_max3	B, Bs_	t_max4)		B <sub>s_t_max</sub> =	16	in	
	m_t_min	= (D - T +	E) / Bs_t_m	nax + 2					m_t_min =	6.5		
			Check	m_t =	7.0			>=	m_t_min =	6.5		OK
Anchor Steel:					***************************************		***************************************		***************************************			
A/S parameters:	Pas =	109881					L <sub>as</sub> =	80	in			
	d <sub>as</sub> =	1.25	in				Eas =	71.50	in			
Development available:	$L_{\sf das}$	per Anchor	Bolts (see atta	ached)					L <sub>das</sub> =	46.50	in	
Required development:	L <sub>das_min</sub>	per Anchor	Bolts (see atta	eched)					L <sub>das_min</sub> ≔	27.48	in	
			Check	L <sub>das</sub> =	46,50	in		>=	L <sub>das_min</sub> =	27.48	in	ок
To bottom rebar grid:	E <sub>as_max</sub>	=D + E - c	c - 2 * db_p						E <sub>as_max</sub> ⇔	85	in	
			Check	E <sub>as</sub> =	71.50	in		<=	E <sub>as_max</sub> =	85.00	in	ОК
To lop rebar grid:	rebar @	= D + E - 7	T + cc						rebar @	75.00	in	
	_		Check	75 + 6 in	>=		E <sub>as</sub> =	71.50	in or	<=	75 in	ок
Min. cage dia;	đ <sub>a min</sub>	per ancstee	el,xts (see attac	ched)					d <sub>o_min</sub> ≔	36.20	in	

#### Pad Reactions:



MDSolids Geometry Input (Option 1)					
Total Beam Length:	$B_{L2_1} = W$		B <sub>L2_1</sub> =	40.5	ft
Location of Left Support:	$S_{12_1} = 0$		S <sub>L2_1</sub> =	6.827	ft
Location of Right Support:	$S_{R2_1} = W-O$		S <sub>R2_1</sub> =	33.87	ft
MDSolids Geometry Input (Option 2)					
Total Beam Length:	B <sub>L2_2</sub> =W		B <sub>L2_2</sub> =	40.5	ft
Location of Left Support:	S <sub>L2_2</sub> ≃(W - w\)	/ 2	S <sub>L2_2</sub> =	4.75	ft
Location of Right Support:	S <sub>R2_2</sub> =S <sub>L1_2</sub> + W	vi.	S <sub>R2_2</sub> =	35.75	ft
MDSolids Loed Input (Option 1 & Option 2)					
Uplift:	P <sub>2_1</sub> =U		P <sub>2_1</sub> =	842,4	kips
Compression;	P <sub>2_2</sub> =C		P <sub>2_2</sub> =	730.23	kips
Weight of Overburden:	w <sub>2_1</sub> =0.9 * (W	$(_{a} + W_{a}) / W$	W <sub>2_1</sub> =	30.81	kif
(Distributed)		Applied over the beam starti	ng at 0' and endi	ng at W=40.5f	t.
Distributed Soil Pressure:	q <sub>2_2L</sub> =0		q <sub>2_2L</sub> =	0.00	kif
(Linearly Increasing)	q <sub>2_2R</sub> =q <sub>a</sub> * W		q <sub>2_2R</sub> =	150.34	kif
		This linearly increasing load is ap	plied from e=14.∶	19ft to W=40.5	ift.
MDSolids Design Result					
Option 1:	M <sub>max2_1</sub> ≃M <sub>max2_1</sub>	(Max. Moment calculated from MDsolids for Option 1)	M <sub>max2_1</sub> ≔	2483.00	ft*kips
Option 2:	M <sub>max2_2</sub> =M <sub>max2_2</sub>	(Max. Moment calculated from MDsolids for Option 2)	M <sub>max2_2</sub> =	1247.00	ft*klps
Max moment:	M <sub>maxp</sub> =Max(Мп	nax2_1,Mmax2_2)	M <sub>maxp</sub> =	2483.00	ft*kips
Required moment: φt = 0,9 (ACl 9.3.2.1)	M <sub>n</sub> = Mmaxp	/ φt	M <sub>n</sub> =	2758,89	ft*kips

Pad Reinforcement:		
	$\beta =  F(F'c \le 4000, 0.85,  F(F'c \ge 8000, 0.65, 0.85 - (F'c - 4000) \cdot 0.05))$ $\beta = 0.85$	
Effective width:	$W_e = w' * 0.866 + di$ $W_e = 32.846$ ft	
	$A_{st_p}' = Mn / (0.9 * Fy * dc)$ $A_{st_p}' = 42.282 in^2$	
	a <sub>o</sub> = Ast p'*Fy/(β*F'c*We) a <sub>o</sub> = 1.89 in	
Required steel:	$A_{st,p,st} = Mn / (Fy * (dc - ap / 2)) * (W / We)$ $A_{st,p,st} = 50.198 \text{ in}^2$	
Shrinkage:	$\rho_{\rm sh} = \text{IF}(\text{Fy} >= 60000, 0.0018, 0.002)$ $\rho_{\rm sh} = 0.0018$	
	$A_{\text{st p sh}} = \text{psh} * W * T / 2$ $A_{\text{st p sh}} = 7.873 \text{ in}^2$	
	$A_{st p} = MAX(Ast p st, Ast p sh)$ $A_{st p} = MAX(Ast p st, Ast p sh)$ $A_{st p} = 50.198 \text{ in}^2$	
Rebar:	$S_{p} = 8$ Equally spaced, top and $d_{bp} = 1$ in	
Rebai.		
	3	
		ok
Bar separation:	$B_{s_p} = (W - 2 \cdot cc - db_p) / (m_p - 1) - db_p$ $B_{s_p} = 6.60$ in	
	Check 11 >= $B_{s_p}$ = 6.60 in >= 4.5"	ok
Pad Development Length:		
Reinforcement localion:	$\psi_{\rm t,p}$ = if the space under the rebar > 12 in, use 1.3, else use 1.0 $\psi_{\rm t,p}$ = 1	
¡AC! 12.2.4]	, Ch. 1, 11:1 abuse 11:11:11:11:11:11:11:11:11:11:11:11:11:	
Epoxy coaling:	$\psi_{\rm e,p}$ = if epoxy-coated bars are not used, use 1.0; but if epoxy-coated $\psi_{\rm e,p}$ = 1.0	
¡ACI 12.2.4]	bars are used, then if Bs < 6 * db or cc < 3 * db, use 1.5, else 1.2	
Max term:	$\psi_t \psi_{e,p}$ = the product of $\psi_t$ & $\psi_e$ , need not be taken larger than 1.7 $\psi_t \psi_{e,p}$ = 1	
[ACI 12.2.4]		
ReInforcement size:	$\psi_{\text{s.p}}$ = if the bar size is 6 or less, then use 0.8, else use 1.0 $\psi_{\text{s.p}}$ = 1	
[ACI 12.2.4]		
Light weight concrete:	$\lambda_p$ = if lightwieght concrete is used, 1.3, else use 1.0 $\lambda_p$ = 1.0	
[ACI 12.2.4]		
Spacing/cover: [ACl 12.2.4]	$c_p = the smaller of: half the bar spacing or the concrete edge distace c_p = 3.50 in$	
[ACI 12.2.4] Transverse bars:	$k_{tr.p} = 0$ in (per simplification) $k_{tr.p} = 0$ in	
[ACI 12.2.3]	να_p = ο πε (per simplification)	
Max term:	$c_p' = MIN(2.5, (c_p + ktr_p) / db_p)$ $c_p' = 2.500$	
[ACI 12.2.3]	-p	
Excess reinforcement:	$R_p = Ast_p / As_p$ $R_p = 0.99$	
[ACI 12.2.5]	•	
Development (tensile):	$L_d = (3/40) * (Fy / \sqrt{(Fc)}) * \psi t \psi e_p * \psi s_p * \lambda_p * R_p * db_p / c_p'   L_{dp'} = 28.3   in$	
[ACI 12.2.2]		
Minimum length:	$L_{d_{min}} = 12 \text{ inches}$ L <sub>d_min</sub> = 12.0 in	
[ACI 12.2.1]	1 MW/11 / 1110	
Development length:	$L_{dp} = MAX(Ld_{min}, Ldp') \qquad \qquad L_{dp} = 28.3  \text{in}$	
Length available in pad:	$L_{pad} = (W / 2 - W / 2) - cc$ $L_{pad} = 54.0$ in	
	Check $L_{pad} = 54.00$ in $>= L_{dp} = 28.26$ in	ок

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

Load	ding		
(negative for	compressi	on)	
Axial load =	642.36	kips	

Found	ation	
Concrete		
Pier diameter =	6.00	ft
Pier area =	4071.5	in^2
Reinforcement		
Clear cover =	3.00	in
Cage diameter =	5.42	ft
Bar size =	8	
Bar diameter =	1.000	in
Bar area =	0.785	in^2
Number of bars =	26	

Material Strengths	3	
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	

(per ACI 10.3.6.2)

OK

#### Minimum Area of Steel

Required area of steel = 20.36 in^2 Actual area of steel = 20.42 in^2 Bar spacing = 6.97 in

#### **Axial Loading**

Load factor = 1.00

Reduction factor = 0.65575 (per ACI 9.3.1 & 2)

Factored axial load = 979.58 kips

#### Neutral Axis

Distance from extreme edge to neutral axis = 3.23 i

Equivalent compression zone factor = 0.85 (per ACI 10.2.7.3)

ΟK

Distance from extreme edge to

Equivalent compression zone factor = 2.74 in Distance from centroid to neutral axis = 32.77 in

#### Compression Zone

Area of steel in compression zone = 0.00 in^2

Angle from centroid of pier to intersection of

equivalent compression zone and edge of pier = 22.52 deg
Area of concrete in compression = 50.85 in^2

Sum of the forces in concrete =

Area of concrete in compression = 50.85 ir Force in concrete = 0.85 \* f'c \* Acc = 172.89 k

Force in concrete = 0.85 \* f c \* Acc = 172.89 kips

Total reinforcement forces = -1152.48 kips

Factored axial load = 979.58 kips Force in concrete = -172.89 kips

0.00

#### Maximum Moment

First moment of the concrete area in compression about the centoid = 1747.05 in^3

kips

Distance between centroid of concrete in compression and centroid of pier = 34.36 in

Moment of concrete in compression = 5939.97 in-kips

Total reinforcement moment = 2347.01 in-kips

Nominal moment strength of column = 8286.98 in-kips

Factored moment strength of column = 5434.16 in-kips 452.85 ft-kips

Maximum allowable moment of the pier = 452.85 ft-kips

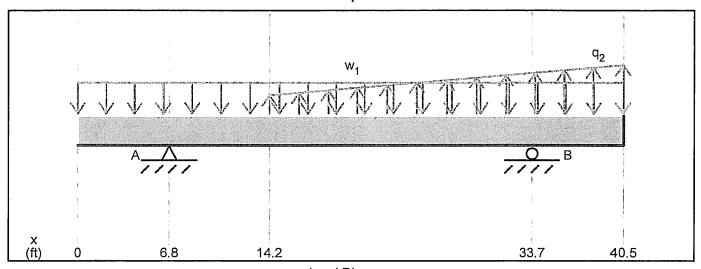
#### Individual Bars

			Distance			Area of		
	Angle	Distance	to	Distance to		steel in		
	from first	to	neutral	equivalent		compressi	Axial	
Bar	bar	centroid	axis	comp. zone	Strain	оп	force	Moment
				•	Ottain			
#	(deg)	(in)	(in)	(in)		(in^2)	(kips)	(in-kips)
1	0.00	0.00	-32.77	-33,26	-0.03045		-47.12	0,00
2	13.85	7.78	-24.99	-25.48	-0.02322	0.00	-47.12	-366.52
3	27.69	15.10	-17.67	-18.15	-0.01641	0.00	-47.12	-711.74
4	41.54	21.55	-11.22	-11.70	-0.01042	0.00	-47.12	-1015.59
5	55.38	26.75	-6.02	-6,51	-0.0056	0.00	-47.12	-1260.42
6	69.23	30,39	-2.38	-2.87	-0.00221	0.00	-47.12	-1432.00
7	83.08	32.26	-0.51	-0.99	-0.00047	0.00	-10.75	-346.85
8	96.92	32.26	-0.51	-0.99	-0.00047	0.00	-10.75	-346.85
9	110.77	30.39	-2.38	-2.87	-0.00221	0.00	-47.12	-1432.00
10	124.62	26.75	-6.02	-6.51	-0.0056	0.00	-47.12	-1260.42
11	138.46	21.55	-11.22	-11.70	-0.01042	0.00	-47.12	-1015.59
12	152.31	15.10	-17.67	-18.15	-0.01641	0.00	-47.12	-711.74
13	166.15	7.78	-24.99	-25.48	-0.02322	0.00	-47.12	-366.52
14	180.00	0.00	-32.77	-33.26	-0.03045	0.00	-47.12	0.00
15	193.85	-7.78	-40.55	-41.03	-0.03767	0.00	-47.12	366.52
16	207.69	-15.10	-47.87	-48.36	-0.04448	0.00	-47.12	711.74
17	221.54	-21.55	-54.32	-54.81	-0.05047	0.00	-47.12	1015.59
18	235.38	-26.75	-59.52	-60.00	-0.0553	0.00	-47.12	1260.42
19	249.23	-30.39	-63.16	-63.64	-0.05868	0.00	-47.12	1432.00
20	263.08	-32.26	-65.03	-65.52	-0.06042	0.00	-47.12	1520.36
21	276.92	-32.26	-65.03	-65.52	-0.06042	0.00	-47.12	1520,36
22	290,77	-30.39	-63.16	-63.64	-0.05868	0.00	-47.12	1432.00
23	304.62	-26.75	-59.52	-60.00	-0.0553	0.00	-47.12	1260.42
24	318.46	-21.55	-54.32	-54.81	-0.05047	0.00	-47.12	1015.59
25	332.31	-15.10	-47.87	-48.36	-0.04448	0.00	-47.12	711.74
26	346.15	-7.78	-40.55	-41.03	-0.03767	0.00	-47.12	366.52

	DEVELOPM	ENT LEN	GTH (	CHECK OF PIER REINFORCEMENT	
Foundation:	Pier diameter = Cage diameter = Rebar size = Number of bars = Clear spacing = Are there hooks? Check Compression?		ft ft in.	Cover between side of pier and cage = Cover between top of pier and cage = Compressive strength of concrete = Rebar yield strength =	3.00 in. 3.00 in. 4000 psi 60000 psi
Anchor Steel: Anchor Plate:	Part number: Embedment length = Bolt Diameter = Part number:	71.5 1.25" <b>1</b>	7	Actual Bending Moment = Allowable Bending Moment = Excess Reinforcement Ratio =	336.33 ft-kips 452.85 ft-kips 0.743
Required deve Required deve	Plate width =  lent length (compression) = elopment length (tension) = elopment length (tension) = lable development length =	999.00 37.00 27.48 46.500	in. in.	(reduced)	
The length available	in the pier for the developm	ent of the	vertic	al reinforcement exceeds the required length (ACI 3	318-02, section 12.2).

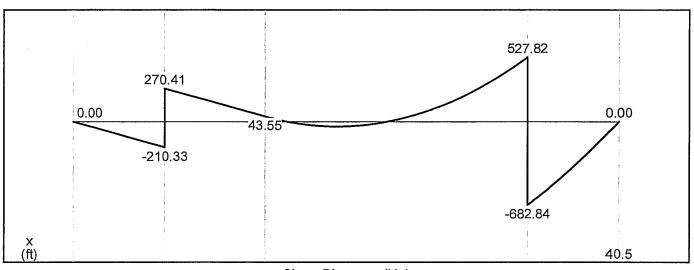
Foundation:	Pier diameter =	6.0	ft	Cover between side of pier and cage =	3.00 in.
	Cage diameter =	5.5	ft	Minimum cover between A/S and cage =	3.00 in.
Anchor Steel:	Part number:	109881		Angle of anchor steel in foundation =	3.3 degrees
	Embedment length =	71.5	in.		
Anchor Plate:	Part number:	212009			
	Largest plate width =	22.00	in.		
	Bolt Diameter =	1.25	in.		
	Minimum cage diameter =	36.20	in.		
	Actual cage diameter =	66	in.		
		OK			

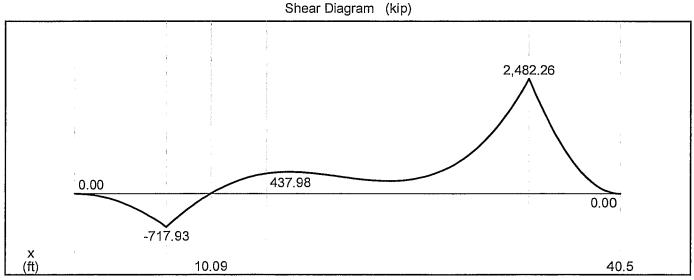
#### LC2- Option 1



 $w_1 = 30.81 \text{ kip/ft (down)}$  $q_2 = 0.0 \text{ to } 150.34 \text{ kip/ft (up)}$  Load Diagram

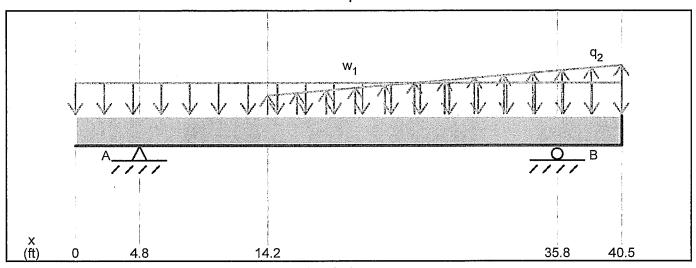
 $A_y = 480.74 \text{ kip (up)}$  $B_y = 1,210.66 \text{ kip (down)}$ 



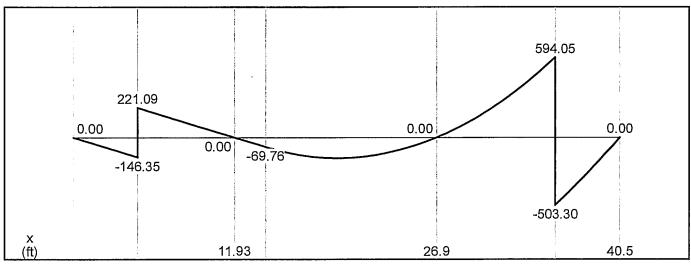


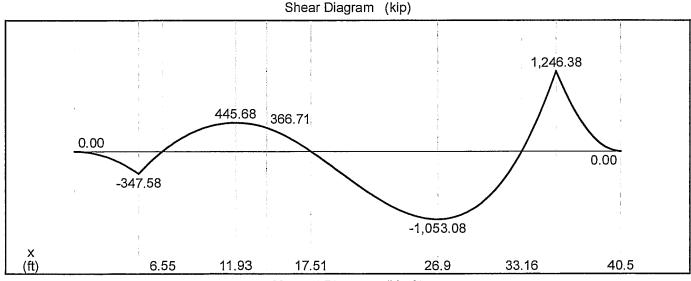
Moment Diagram (kip-ft)

#### LC2- Option 2

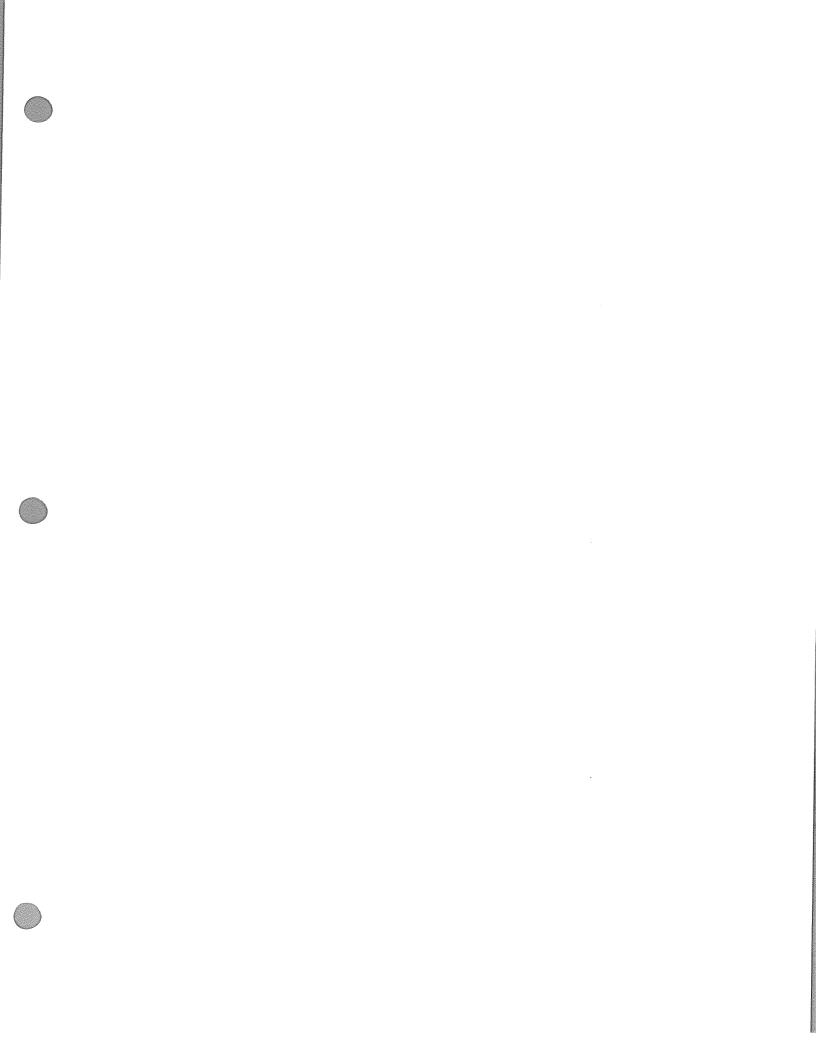


 $w_1 = 30.81 \text{ kip/ft (down)}$  $q_2 = 0.0 \text{ to } 150.34 \text{ kip/ft (up)}$  Load Diagram  $A_y = 367.44 \; \text{kip (up)} \\ B_y = 1,097.35 \; \text{kip (down)}$ 



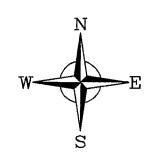


Moment Diagram (kip-ft)

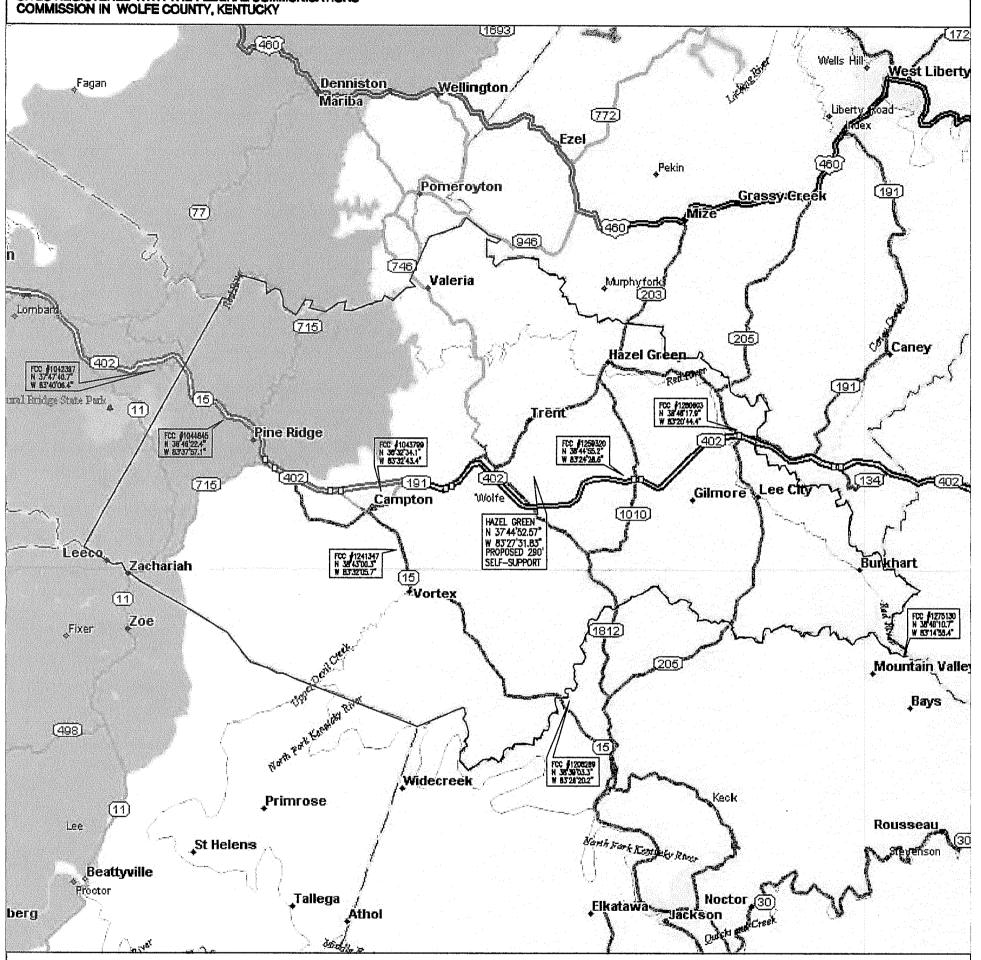


# EXHIBIT D COMPETING UTILITIES, CORPORATIONS, OR PERSONS LIST AND MAP OF LIKE FACILITIES IN VICINITY

### WOLFE COUNTY, KENTUCKY AT&T SITE NAME: HAZEL GREEN TOWER LOCATION EXHIBIT



TOWERS DEPICTED ARE ALL KNOWN CONSTRUCTED TOWER SITES REGISTERED WITH THE FEDERAL COMMUNICATIONS COMMISSION IN WOLFE COUNTY KENTICKY



7.5 MINUTE U.S.G.B. QUADRANGLE MAP (NOT TO SCALE)

SEPTEMBER, 06 2013 FSTAN PROJECT NO. 13-8698

Registration # Status | File # Owner Name |
1043789 | Constructed | A0798341 | New Cingular Wireless PCS, LLC |
1044845 | Constructed | A0868422 | Constructed | A0868422 | Constructed | A0868445 |
1276130 | Constructed | A0868425 | Constructed | A0868426 | Constructed | A0868426 | Constructed | A0868427 | Constructed | A0868427 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed | A0868428 | Constructed |



F.S. Land Company T. Alan Neal Company

Land Surveyors and Consulting Engineers

P.O. Box 17546 2313/2315 Crittenden Drive, Louisville, KY. 40217 Phane: (502) 635-5866 (502) 636-5111 Fax: (502) 636-5263





FCC Home | Search | Updates | E-Filing | Initiatives | For Consumers | Find People



#### **Universal Licensing System**

FCC > WTB > ULS > Online Systems > License Search

FCC Site Map

License Search

? HELP

#### **Search Results**

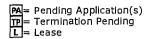
Q New Search Q Refine Search Printable Page 📥 Query Download 💠 Map License

**Specified Search** 

State = Kentucky
County = WOLFE
Radio Service = AW, CL, CW, WU
Status = Active

Matches 1-35 (of 35)

CH



#### Page 1

		Call Sign/Lease ID	Name	FRN	Radio Service	Status	Expiration Date		
	1	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 PA	KNLH256	Cellco Partnership	0003290673	CW	Active	04/28/2017		
	5 PA	KNLH398	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017		
	6 PA	KNLH399	Powertel Memphis Licenses, Inc.	0001832807	CW	Active	04/28/2017		
	7	L000008141	GTE Mobilnet of Florence, Alabama Incorporated	0001573518	WU	Active	06/13/2019		
	8	L000008142	Topeka Cellular Telephone Company, Inc.	0005068713	WU	Active	06/13/2019		
	9	L000008150	Tuscaloosa Cellular Partnership	0001573104	WU	Active	06/13/2019		
	10	L000008155	Kentucky RSA No. 1 Partnership	0001836709	WU	Active	06/13/2019		
	11	L000008156	Missouri RSA 2 Limited Partnership	0019468784	WU	Active	06/13/2019		
	12	L000008157	Missouri RSA 4 Limited Partnership	0019468800	WU	Active	06/13/2019		
	13	L000008169	St. Joseph CellTelCo	0005005541	WU	Active	06/13/2019		
	14	L000008489	Illinois RSA 6 and 7 Limited Partnership	0002842334	WU	Active	06/13/2019		
	15	L000008492	Alltel Central Arkansas Cellular Limited Partnership	0001722008	WU	Active	06/13/2019		
	16	L000008494	Alltel Communications Wireless, Inc.	0020532149	WU	Active	06/13/2019		
	17	L000008505	Arkansas RSA #2 (Searcy County) Cellular Limited Partnership	0004989638	AW	Active	06/13/2019		
	18	L000008506	Arkansas RSA #2 (Searcy County) Cellular Limited Partnership	0004989638	WU	Active	06/13/2019		
	19	L000008543	Missouri RSA #15 Limited Partnership	0002533610	AW	Active	06/13/2019		
	20	L000008544	Missouri RSA #15 Limited Partnership	0002533610	WU	Active	06/13/2019		
	21	L000008574	Northwest Arkansas RSA Limited Partnership	0001837178	WU	Active	06/13/2019		
	22	L000008622	Southern Indiana RSA Limited Partnership	0001837269	AW	Active	06/13/2019		
	23	L000008624	Southern Indiana RSA Limited Partnership	0001837269	WU	Active	06/13/2019		
	24	L000010763	East Kentucky Network, LLC d/b/a Appalachian Wireless	0001786607	WU	Active	06/13/2019		
	25	<u>WPOI255</u>	NEW CINGULAR WIRELESS PCS, LLC	0003291192	CW	Active	06/23/2015		
	26	WOCS428	Cellco Partnership	0003290673	CW	Active	05/13/2015		
	27 PA	WQCX683	T-Mobile License LLC	0001565449	CW	Active	06/20/2015		
	28 PA	<u>WODI527</u>	Cricket License Company, LLC	0018402123	CW	Active	09/06/2015		
	29 PA	WQGA718 L	Cellco Partnership	0003290673	AW	Active	11/29/2021		
	30	<u>W Q GA823</u>	New Cingular Wireless PCS, LLC	0003291192	AW	Active	11/29/2021		
	21	MUCABAU	Colleg Partnership	חחחפספהדפ	۸۱۸۱	Activo	11/20/2021		
H	n·//wireles	//wireless? for a myl lisAnn/l lis Search/results isn							

2/7/2014 License Search - Search Results

71	UPCADQ VV	Celico Fatthership	UUUJZ3UU/J AW	ACTIVE	11/52/5051
32 PA	<u>WQGB377</u>	T-Mobile License LLC	0001565449 AW	Active	11/29/2021
33 PA	WQGD755	Cricket License Company, LLC	0018402123 AW	Active	12/18/2021
34 PA	WQJQ692 L	Cellco Partnership	0003290673 WU	Active	06/13/2019
35 PA	WQSL582	T-Mobile License LLC	0001565449 AW	Active	04/30/2022

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

Page 1

ULS Glossary - FAQ - Online Help - Technical Support - Licensing Support

ULS Online Systems CORES - ULS Online Filing - License Search - Application Search - Archive License Search

About ULS Privacy Statement - About ULS - ULS Home

Basic Search By Call Sign ▼ = SEARCH

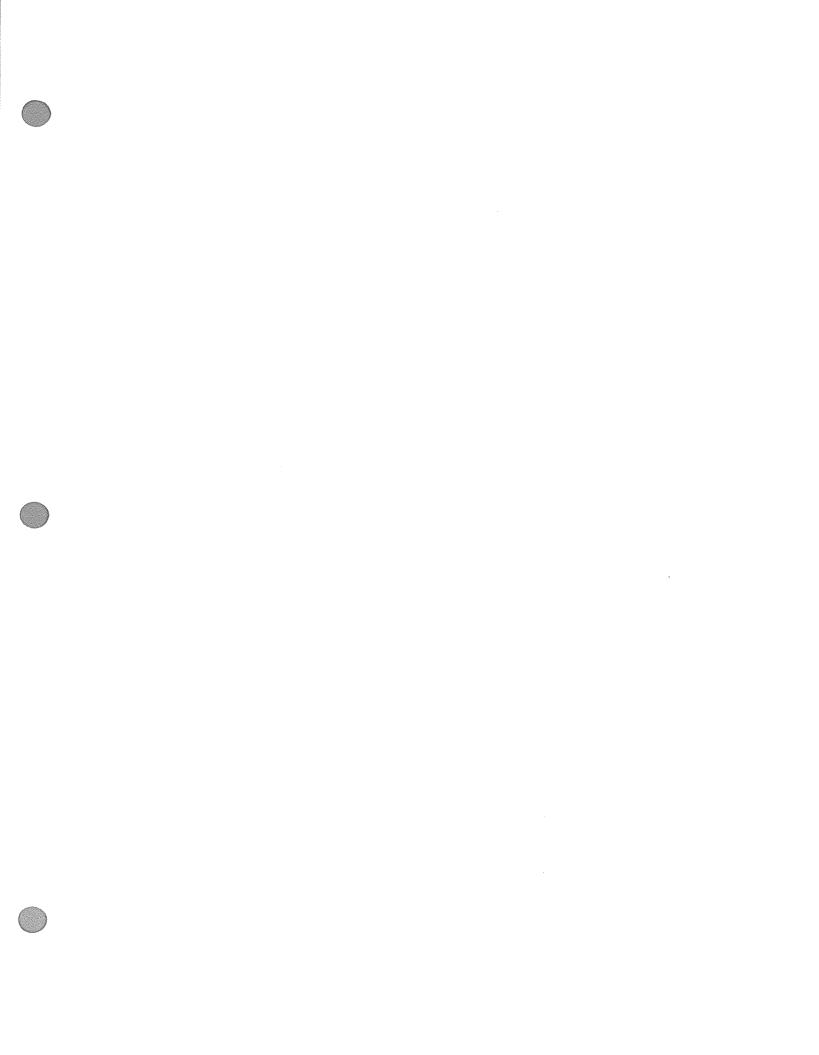
FCC | Wireless | ULS | CORES

Help | Tech Support

Phone: 1-877-480-3201

TTY: 1-717-338-2824 Submit Help Request

Federal Communications Commission 445 12th Street SW Washington, DC 20554



## EXHIBIT E CO-LOCATION REPORT

#### 2/28/2014

Kentucky Public Service Commission P.O. Box 615 211 Sower Boulevard Frankfort, Kentucky 40602-0615

RE: Alternate Site Analysis Report

Application for a Communications Facility

Applicant: AT&T Mobility

Site Location: Buchanan Fork Road, Campton, KY 41301

Site Name: Hazel Green

#### 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.

#### **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 an area of Wolfe County near Campton, 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 3/4 mile from the search ring center coordinates (37.745722 N, -83.471379 W). A copy of the Search Ring for this site is attached as Exhibit A. The area contains large rural residential parcels and large forested parcels located near the Bert Combs Mountain Parkway.

**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 are no existing FCC-registered or other such structures within the search ring, or within 1 mile outside of the search 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 selected site is located in an unincorporated portion of Wolfe County, and there is no applicable zoning district.

Step 5: Preliminary Inspection and Assessment of Suitable Parcels. Once suitable 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.

**Step 6: Candidate Evaluation and Selection.** After the preliminary site assessments were performed, the site development team evaluated potential locations based on the availability of ground space, topography, applicable environmental conditions, construction feasibility and the potential impact of the facility on neighboring properties. The owners of parcel 081-00-00-002.01 were interested in leasing ground space, and a site location on these parcels was confirmed to satisfy AT&T's radio frequency service objectives by AT&T's radio frequency engineer. Other suitable parcels may be available, but none are considered more suitable than the selected candidate.

**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, the selected site candidate satisfied the above criteria.

**Step 8: Application**. Once a lease is obtained and all site due diligence is completed, AT&T Mobility prepared and filed the accompanying uniform application 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, the property meets the radio frequency site design objective and provides appropriate separation from other properties in the area.

Sincerely,

Brian Ramirez

Site Acquisition Agent PBM Wireless Services

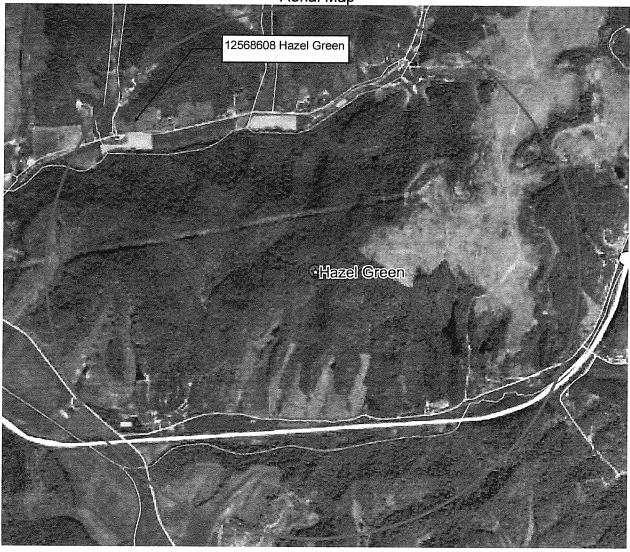
13714 Smokey Ridge Overlook

Carmel, Indiana 46033

(317) 225-6075

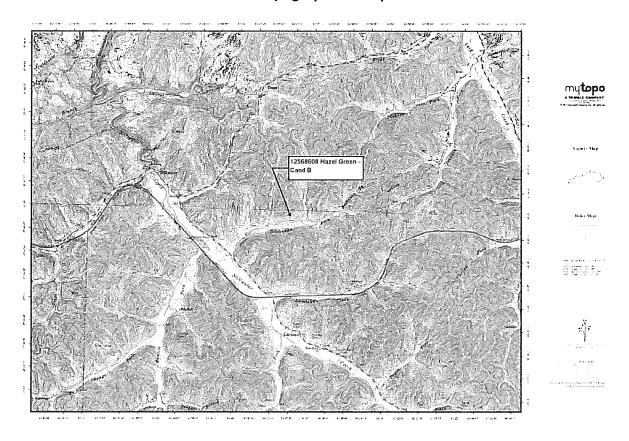
Exhibit A





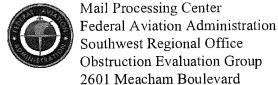
#### **EXHIBIT B**

### Topographical Map





### EXHIBIT F FAA



Fort Worth, TX 76193

Issued Date: 01/27/2014

FAA / FCC Department American Towers, LLC 10 Presidential Way Woburn, MA 01801

#### \*\* 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 HAZEL GREEN KY (281338)

Location: CAMPTON, KY

Latitude: 37-44-52.57N NAD 83

Longitude: 83-27-31.83W

Heights: 997 feet site elevation (SE)

299 feet above ground level (AGL) 1296 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 prio	r to start of construction	on (7460-2, Part I)	
X	Within 5 days after	the construction reache	es its greatest heigh	t (7460-2, Part II)

This determination expires on 07/27/2015 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 2014-ASO-255-OE.

Signature Control No: 205237955-206606249 (DNE)

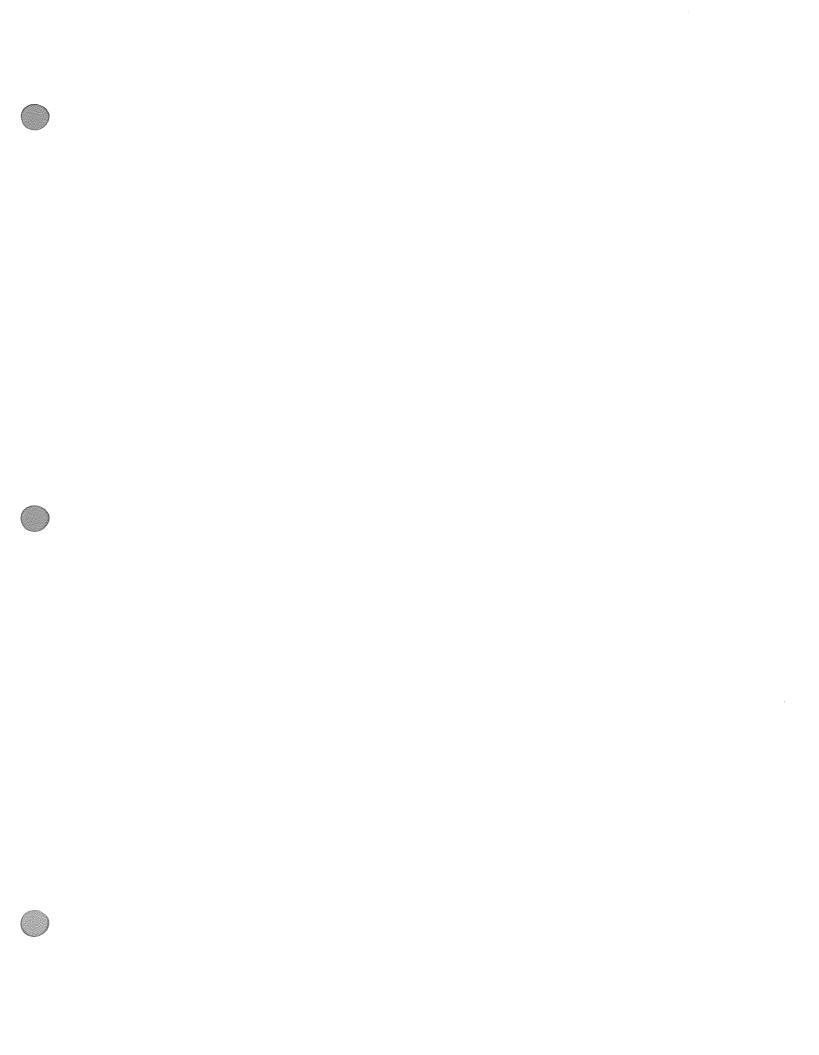
Carole Bernacchi Technician

Attachment(s)
Frequency Data

cc: FCC

#### Frequency Data for ASN 2014-ASO-255-OE

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



## EXHIBIT G KENTUCKY AIRPORT ZONING COMMISSION



#### KENTUCKY TRANSPORTATION CABINET

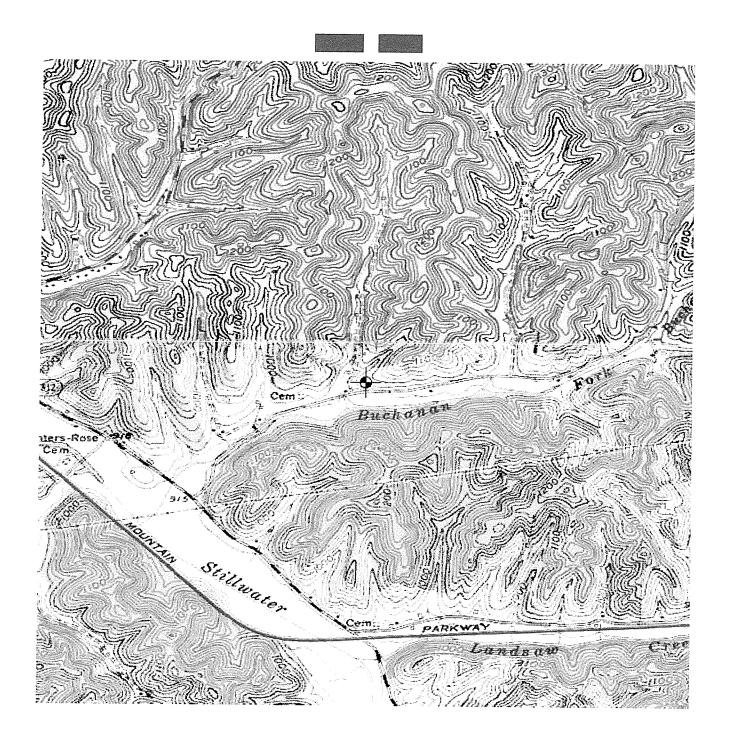
TC 56-50 Rev. 07/2010 Page 2 of 2

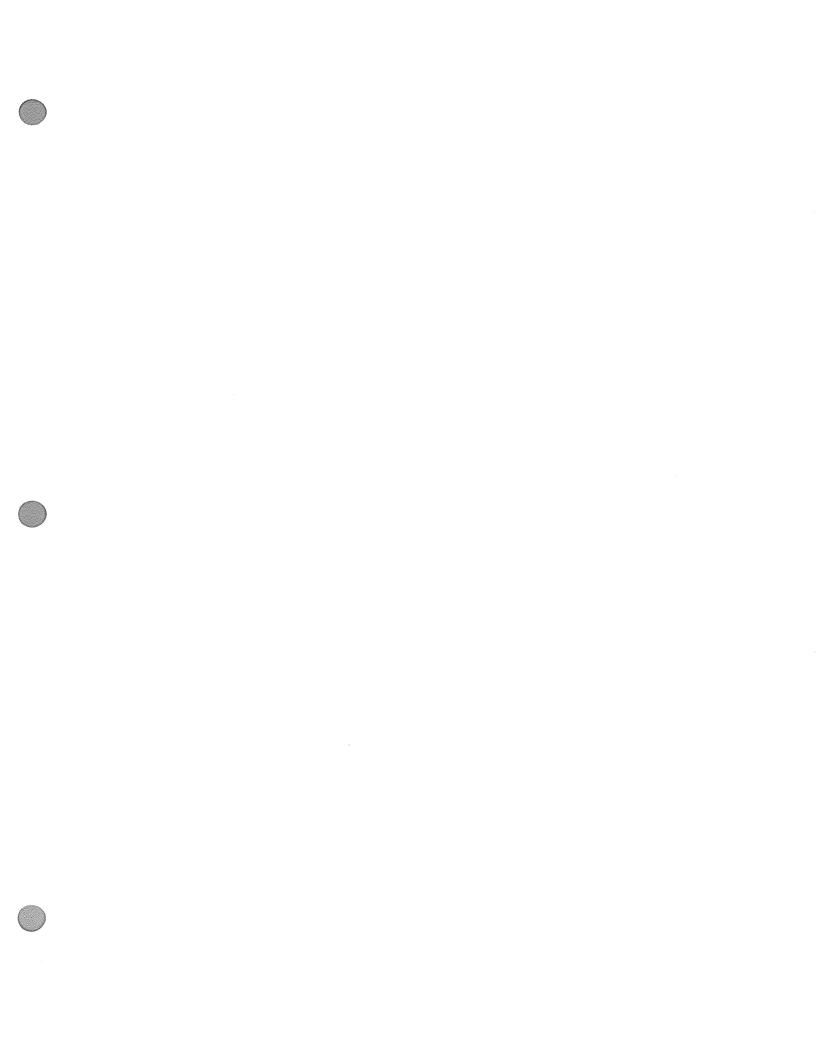
#### **KENTUCKY AIRPORT ZONING COMMISSION**

#### APPLICATION FOR PERMIT TO CONSTRUCT OR ALTER A STRUCTURE

APPLICANT (name)	F	PHONE	FAX	KY AERONAUTICAI	STUDY#	
American Towers, Inc	(	781) 926-7126				
ADDRESS (street)		CITY		STATE	ZIP	
10 Presidential Way		Noburn		MA	01801	
APPLICANT'S REPRESEN	NTATIVE (name)	PHONE	FAX			
ADDRESS (street)		CITY		STATE	ZIP	
APPLICATION FOR	New Construction	on Alteration Existing		WORK SCHEDULE		
		orary (months	days )	Start End		
TYPE Crane	Building	MARKING/PAINTIN	G/LIGHTING PREFEI	RRED	/	
Antenna Tower		Red Lights & Pai	ed Lights & Paint White- medium intensity White- high intensity			
Power Line W	ater Tank			Dual- red & high intensity white		
Landfill Ot	her	Other	•			
LATITUDE	l	ONGITUDE.	<u>, , , , , , , , , , , , , , , , , , , </u>	DATUM NAD	83 NAD27	
37 <sup>0</sup> 44'52.57"	8	33 <sup>0</sup> 27'31.83"		Other	-	
NEAREST KENTUCKY	P	NEAREST KENTUCK	Y PUBLIC USE OR M	ILITARY AIRPORT		
City CAMPTON County	WOLFE					
SITE ELEVATION (AMSL	, feet)	TOTAL STRUCTURE	HEIGHT (AGL, feet)	CURRENT (FAA aeronautical study #)		
997		299		2014-ASO-255-OE		
OVERALL HEIGHT (site	elevation plus tota	l structure height, feet)		PREVIOUS (FAA aeronautical study #)		
1296	•	3 /,	•	·	• •	
DISTANCE (from neares	t Kentucky public	PREVIOUS (KY aero	nautical study #)			
_						
DIRECTION (from neare	st Kentucky public	use or Military air	port to structure)			
DESCRIPTION OF LOCA	TION (Attach USG	S 7.5 minute quadro	angle map or an airp	ort layout drawing	with the precise site	
marked and any certifie	d survey.)	·			·	
Please see map			•			
DESCRIPTION OF PROP	OSAL					
Proposed tower						
FAA Form 7460-1 (Has t	the "Notice of Con	struction or Alterat	ion" been filed with	the Federal Aviation	Administration?)	
No Yes, when?	01/10/2014		•		·	
CERTIFICATION (I hereb	y certify that all th	ne above entries, m	ade by me, are true,	complete, and corre	ect to the best of	
<b>CERTIFICATION</b> (I hereby certify that all the above entries, made by me, are true, complete, and correct to the best of my knowledge and belief.)						
PENALITIES (Persons failing to comply with KRS 183.861 to 183.990 and 602 KAR 050 are liable for fines and/or						
imprisonment as set forth in KRS 183.990(3). Noncompliance with FAA regulations may result in further penalties.)						
NAME	TITLE	SIGNATURE	Dignally signed by state kitler  Discretarie Miller, de American Towers.	DATE	ancanter terre al frata della comma di Million anno della della comma di Million di Comma di Million di Comma di	
Katie Miller	Compliance	Kati	Diffee mediate Make, perametrican Towers, from use RAFTOC Compilares. Inc. use RAFTOC Compilares. Cells Date: 2014-01-10 17:01-52-05'00'	01/10/2014		
	<u> </u>	Chairnaran		L		
COMMISSION ACTION		Chairperson, KAZC Administrator, KAZC				
<u></u>		Auministrate	JI, NALC			
Approved	SIGNATURE			DATE		
Disapproved						

OE/AAA Mapping Page 1 of 1





## EXHIBIT H GEOTECHNICAL REPORT



#### GEOTECHNICAL ENGINEERING STUDY

Proposed Hazel Green Tower N37° 44' 52.57" W83° 27' 31.83" 84 Garry Sparks Drive, Campton, Wolfe County, Kentucky Project No. 13-8776

FStan Land Surveyors & Consulting Engineers 933 South 3<sup>rd</sup> Street Louisville, KY 40203 Phone: (502) 636-5111 Fax: (502) 636-5263

#### **Prepared For:**

Ms. Kathie Taylor American Tower Corporation 10 Presidential Way Woburn, MA 01801

Date: January 23, 2014



#### Land Surveyors and Consulting Engineers Formerly F.S. Land & T. Alan Neal Companies

January 23, 2014

Ms. Kathie Taylor American Tower Corporation 10 Presidential Way Woburn, MA 01801

Re: Geotechnical Engineering Study

Proposed 290-foot Self-support Tower with 9 foot Lighting Arrestor

American Tower Corporation Site Name: Hazel Green

N37° 44' 52.57" W83° 27' 31.83"

84 Garry Sparks Drive, Campton, Wolfe County, Kentucky

FStan Project No. 13-8776; AT&T NSB No. 143953; ATC No. 281338

Dear Ms. Taylor:

Transmitted herewith is our geotechnical engineering report for the referenced project. This report contains our findings, an engineering interpretation of these findings with respect to the available project characteristics, and recommendations to aid design and construction of the tower foundations.

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding this report, please contact our office.

Cordially,

Elizabeth W. Stuber, P.E.

Geotechnical Engineer

Kentucky License No.: 21636

Copies submitted: (3) Ms. Kathie Taylor

#### LETTER OF TRANSMITTAL

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#### **APPENDIX**

BORING LOCATION PLAN GEOTECHNICAL BORING LOG SOIL SAMPLE CLASSIFICATION

# GEOTECHNICAL ENGINEERING INVESTIGATION Proposed 290-foot Self-support Tower with 9 foot Lighting Arrestor

American Tower Corporation Site Name: Hazel Green N37° 44' 52.57" W83° 27' 31.83"

84 Garry Sparks Drive, Campton, Wolfe County, Kentucky FStan Project No. 13-8776; AT&T NSB No. 143953; ATC No. 281338

#### 1. PURPOSE AND SCOPE

The purpose of this study was to determine the general subsurface conditions at the site of the proposed tower by drilling three soil test borings and to evaluate this data with respect to foundation concept and design for the proposed tower. Also included is an evaluation of the site with respect to potential construction problems and recommendations dealing with quality control during construction.

#### 2. PROJECT CHARACTERISTICS

American Tower Corporation is proposing to construct a 290 feet tall self-support communications tower with a 9 foot lighting arrestor on property owned by Billie Adams located at N37° 44' 52.57"/W83° 27' 31.83", 84 Garry Sparks Drive, Campton, Wolfe County, Kentucky. The proposed lease area will be 100 feet x 100 feet with an access road winding from the site west and south to Buchanan Fork Road. The site is located near the top of a slope and is currently an undeveloped field in a rural area outside of town. Both surface and underground mining are common in far eastern Kentucky. A limited investigation of the area using information provided on the Kentucky Geological Survey website did not indicate that either type of mining has taken place on the Adams property. The topographical site relief within the lease area is about 9 feet. The elevation of the site is approximately 474 feet msl. Surface water runoff is directed by the topography toward the north. A detailed evaluation of long-term slope stability was beyond the scope of this study. The proposed tower location is shown on the Boring Location Plan in the Appendix.

Preliminary information provided us indicates that this project will consist of constructing a self-support communications tower 290 feet tall with a 9 foot lightning arrestor. We have assumed the following structural information:

- Compression = 450 kips
- Uplift (each leg) = 300 kips
- Total shear = 45 kips

The development will also include a small equipment shelter near the base of the tower. The wall and floor loads for the shelter are assumed to be less than 4 kip/ln.ft. and 200 lbs/sq.ft., respectively.

#### 3. SUBSURFACE CONDITIONS

The subsurface conditions were explored by drilling three test borings at the base of the proposed tower that was staked in the field by the project surveyor. The Geotechnical Soil Test Boring Logs, which are included in the Appendix, describes the materials and conditions encountered. A sheet defining the terms and symbols used on the boring log is also included in the Appendix. The general subsurface conditions disclosed by the test borings are discussed in the following paragraphs.

Only a thin veneer of topsoil was encountered at the existing ground surface. Below the topsoil, the borings encountered silty clay (CL) of low plasticity. At about 3.5 feet, the boring encountered highly weathered siltstone with some sandstone to the auger refusals between 13 and 15 feet. The SPT N-values in the clayey soils ranged from 7 to 9 blows per foot indicating a medium stiff consistency. Auger refusal is defined as the depth at which the boring can no longer be advanced using the current drilling method.

The refusal material was cored from 15 to 25 feet below the ground surface in Boring 1. Sandstone that was hard, moderately weathered, thin bedded and fine to course grained was encountered. A siltstone layer was encountered from about 18 to 19.5 feet. The recovery of the rock core was 93 percent and the RQD value was 77 percent. These values generally represent good to excellent quality rock from a foundation support viewpoint.

Observations made at the completion of soil drilling operations indicated the borings to be dry. It must be noted, however, that short-term water readings in test borings are not necessarily a reliable indication of the actual groundwater level. Furthermore, it must be emphasized that the groundwater level is not stationary, but will fluctuate seasonally.

Based on the limited subsurface conditions encountered at the site and using Table 1615.1.1 of the 2002 Kentucky Building Code, the site class is considered "B". Seismic design requirements for telecommunication towers are given in section 1622 of the code. A detailed seismic study was beyond the scope of this report.

#### 4. FOUNDATION DESIGN RECOMMENDATIONS

The following design recommendations are based on the previously described project information, the subsurface conditions encountered in our borings, the results of our laboratory testing, empirical correlations for the soil types encountered, our analyses, and our experience. If there is any change in the project criteria or structure location, you should retain us to review our recommendations so that we can determine if any modifications are required. The findings of such a review can then be presented in a supplemental report or addendum.

We recommend FStan be retained to review the near-final project plans and specifications, pertaining to the geotechnical aspects of the project, prior to bidding and construction. We recommend this review to check that our assumptions and evaluations are appropriate based on the current project information provided to us, and to check that our foundation and earthwork recommendations were properly interpreted and implemented.

#### 4.1 Tower

Our findings indicate that the proposed self-support tower can be supported on drilled piers or on a common mat foundation.

#### 4.1.1. Drilled Piers

Drilled piers that bear in the highly weathered siltstone below a depth of about 5 feet can be designed for a net allowable end bearing pressure of 20,000 pounds per square foot (psf). This can be increased to 40,000 psf for piers bearing in the sandstone bedrock below about 15 feet. The following table summarizes the recommended values for use in analyzing lateral and frictional resistance for the various strata encountered at the test boring. It is important to note that these values are estimated based on the standard penetration test results and soil types, and were not directly measured. The values provided for undrained shear strength and total unit weight are ultimate values and appropriate factors of safety should be used in conjunction with these values. If the piers will bear deeper than about 25 feet, a deeper boring should be drilled to determine the nature of the deeper material.

Depth Below	Undrained	Angle of	Total Unit	Allowable Passive	Allowable		
Ground	Shear	Internal	Weight,	Soil Pressure,	Side Friction,		
Surface, feet	Strength,	Friction,	pcf	psf/one foot of depth	psf		
	psf	Ø, degrees					
0 – 5	1,000	0	120	750 + 40D	200		
5 – 15	10,000	0	135	7,500 + 45(D-5)	3000		
15 - 25	20,000	0	135	15,000 + 45(D-15)	5000		

Note: D = Depth below ground surface (in feet) to point at which the passive pressure is calculated.

It is important that the drilled piers be installed by an experienced, competent drilled pier contractor who will be responsible for properly installing the piers in accordance with industry standards and generally accepted methods, without causing deterioration of the subgrade. The recommendations contained herein relate only to the soil-pier interaction and do not account for the structural design of the piers.

#### 4.1.2. Mat Foundation

As an alternative, the tower could be supported on a common mat foundation bearing at a depth of at least 3.5 feet in the highly weathered siltstone. A net allowable bearing pressure of up to 4,000 pounds per square foot may be used. These values may be increased by 30 percent for the maximum edge pressure under transient loads. A friction value of 0.30 may be used between the concrete and the underlying siltstone. The passive pressures given for the drilled pier foundation may be used to resist lateral forces.

It is important that the mat be designed with an adequate factor of safety with regard to overturning under the maximum design wind load.

#### 4.2. Equipment Building

The equipment building may be supported on shallow spread footings bearing in the shallow weathered siltstone or silty clay and designed for a net allowable soil pressure of 2,500 pounds per square foot. The footings should be at least ten inches wide. If the footings bear on soil they should bear at a depth of at least 36 inches to minimize the effects of frost action. All existing topsoil or soft natural soil should be removed beneath footings.

The floor slab for the new equipment building may be subgrade supported on a properly prepared subgrade. The slab should be designed and adequately reinforced to resist the loads proposed. The exposed subgrade should be carefully inspected by probing and testing as needed. Any organic material still in place, frozen or excessively soft soil and other undesirable materials should be removed.

Once the subgrade has been properly prepared and evaluated, fill may be placed to attain the desired final grade. Any non-organic, naturally occurring, non-expansive soils can be used for structural fill, including those encountered on this site, pending evaluation by the geotechnical engineer.

All engineered fill should be compacted to a dry density of at least 98 percent of the standard Proctor maximum dry density (ASTM D698). The compaction should be accomplished by placing the fill in about eight inch loose lifts and mechanically compacting each lift to at least the specified density. Field tests should be performed on each lift as necessary to insure that adequate compaction is being achieved.

#### 4.3. Drainage and Groundwater Considerations

Good site drainage must be provided. Surface run-off water should be drained away from the shelter building and not allowed to pond. It is recommended that all foundation concrete be placed the same day the excavation is made.

At the time of this investigation, groundwater was not encountered. Therefore, no special provisions regarding groundwater control are considered necessary for the proposed structures.

#### 5. GENERAL CONSTRUCTION PROCEDURES AND RECOMMENDATIONS

It is possible that variations in subsurface conditions will be encountered during construction. Although only minor variations that can be readily evaluated and adjusted for during construction are anticipated, it is recommended the geotechnical engineer or a qualified representative be retained to perform continuous inspection and review during construction of the soils-related phases of the work. This will permit correlation between the test boring data and the actual soil conditions encountered during construction.

#### 5.1 Drilled Piers

The following recommendations are recommended for drilled pier construction:

- Clean the foundation bearing area so it is nearly level or suitably benched and is free of ponded water or loose material.
- Make provisions for ground water removal from the drilled shaft excavation. While the borings were dry prior to rock coring and significant seepage is not anticipated, the drilled pier contractor should have pumps on hand to remove water in the event seepage into the drilled pier is encountered.

- Specify concrete slumps ranging from 4 to 7 inches for the drilled shaft construction. These slumps are recommended to fill irregularities along the sides and bottom of the drilled hole, displace water as it is placed, and permit placement of reinforcing cages into the fluid concrete.
- Retain the geotechnical engineer to observe foundation excavations after the bottom of the hole is leveled, cleaned of any mud or extraneous material, and dewatered.
- Install a temporary protective steel casing to prevent sidewall collapse, prevent excessive mud and water intrusion, and to allow workers to safely enter, clean and inspect the drilled shaft.
- Clean the socket "face" prior to concrete placements. Cleaning will require hand cleaning or washing if a mud smear forms on the face of the rock. The geotechnical engineer should approve the rock socket surface prior to concrete placement.
- The protective steel casing may be extracted as the concrete is placed provided a sufficient head of concrete is maintained inside the steel casing to prevent soil or water intrusion into the newly placed concrete.
- Direct the concrete placement into the drilled hole through a centering chute to reduce side flow or segregation.

#### 5.2 Fill Compaction

All engineered fill placed adjacent to and above the tower foundation should be compacted to a dry density of at least 95 percent of the standard Proctor maximum dry density (ASTM D-698). This minimum compaction requirement should be increased to 98 percent for any fill placed below the tower foundation bearing elevation. Any fill placed beneath the tower foundation should be limited to well-graded sand and gravel or crushed stone. The compaction should be accomplished by placing the fill in about 8 inch (or less) loose lifts and mechanically compacting each lift to at least the specified minimum dry density. Field density tests should be performed on

each lift as necessary to insure that adequate moisture conditioning and compaction is being achieved.

Compaction by flooding is not considered acceptable. This method will generally not achieve the desired compaction and the large quantities of water will tend to soften the foundation soils.

#### 5.3 Construction Dewatering

There is a slight risk that groundwater may be encountered during drilled pier excavation. It is anticipated that any such seepage can be handled by conventional dewatering methods such as pumping from sumps. Dewatering of drilled pier excavations that extend below the groundwater level may be more difficult since pumping directly from the excavations could cause a deterioration of the bottom of the excavation. If the pier excavations are not dewatered, concrete should be placed by the tremie method.

#### **6 FIELD INVESTIGATION**

Three soil test borings were drilled based on the tower center location established in the field by the project surveyor. Split-spoon samples were obtained by the Standard Penetration Test (SPT) procedure (ASTM D1586) in the test boring. The borings encountered auger refusal between 13 and 15 feet below the existing ground surface. A sample of the refusal material was cored in Boring 1 from 15 to 25 feet below the ground surface. The split-spoon samples were inspected and visually classified by a geotechnical engineer. Representative portions of the soil samples were sealed in glass jars and returned to our laboratory.

The boring logs are included in the Appendix along with a sheet defining the terms and symbols used on the logs and an explanation of the Standard Penetration Test (SPT) procedure. The logs present visual descriptions of the soil strata encountered, Unified System soil classifications, groundwater observations, sampling information, laboratory test results, and other pertinent field data and observations.

#### 7 WARRANTY AND LIMITATIONS OF STUDY

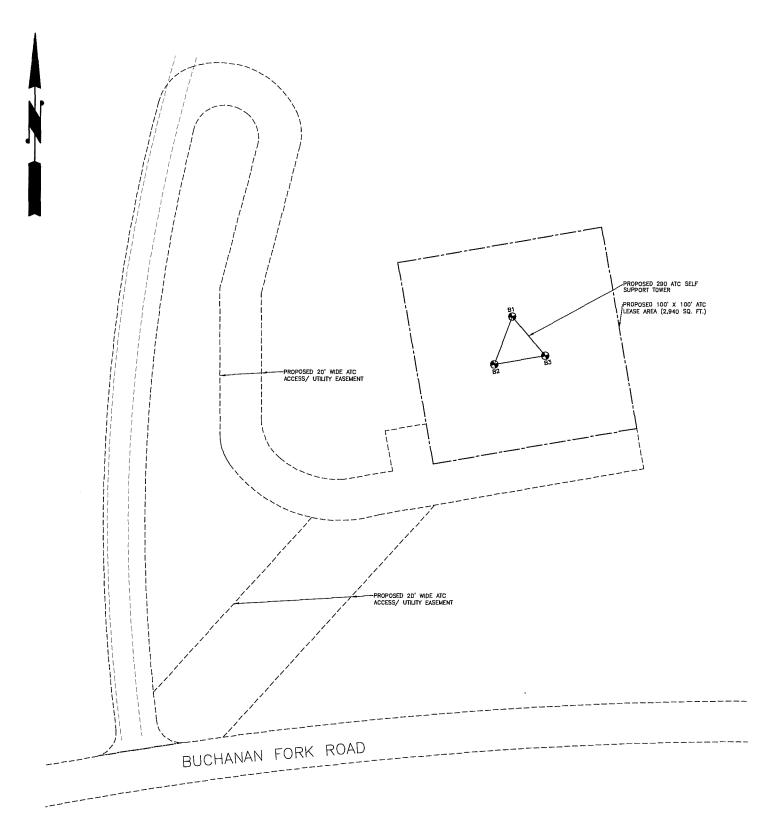
Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either express or implied. FStan is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

A geotechnical study is inherently limited since the engineering recommendations are developed from information obtained from test borings, which depict subsurface conditions only at the specific locations, times and depths shown on the log. Soil conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soil conditions to change from those described in this report.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the geotechnical engineer or a representative is therefore considered necessary to verify the subsurface conditions and to check that the soils connected construction phases are properly completed. If significant variations or changes are in evidence, it may then be necessary to reevaluate the recommendations of this report. Furthermore, if the project characteristics are altered significantly from those discussed in this report, if the project information contained in this report is incorrect, or if additional information becomes available, a review must be made by this office to determine if any modification in the recommendations will be required.

#### **APPENDIX**

BORING LOCATION PLAN
GEOTECHNICAL BORING LOG
SOIL SAMPLE CLASSIFICATION



### BORING LOCATION

# **BORING LOCATION PLAN**

SITE NAME: HAZEL GREEN
PROPOSED 290' SELF-SUPPORT TOWER
W/ 9' LIGHTING ARRESTOR

**NOT TO SCALE** 

FSTAN PROJECT #:

13-8776

DATE:

01-23-14



Formerly F.S. Land & T. Alan Neal Company

Land Surveyors and Consuiting Engineers 2540 Ridgemor Court, Suite 102 Louisville, KY 40299

Phone: (502) 635-5866 (502) 636-5111 Fax: (502) 638-5263



GEOTECHNICAL BORING LOG 13-8776.GPJ FSTAN.GDT 1/24/14

F.S. Tan Land Consulting Engineers P.O. Box 17546 Louisville, KY 40217 502-636-5111 502-636-5263

# Geotechnical Boring Log

Boring No: **B-1** 

										bonng No		
Client:	Ame	erican Tower Corporation	F	Project Number: 13-8776								
Project: Proposed Hazel Green Tower					Drilling Firm: Hoosier Drilling							
Location: N37° 44' 52.57" / W83° 27' 31.83"					t Ma	nager: [	3eth	Stu	ber			
Date Started: 1/21/2014					Depti	n of Bori	ng:	25 f	<u>t</u>			
Date Completed: 1/21/2014					on ro	ods		·				
Boring Method: HSA-Manual Hammer					at c	completion	on					
Surface Elevation: NA					VA h	ours afte	er co	ompl	etior	]		
Depth 🖁 Material Description Sc			Depth Scale ft		Туре	Sample I	Rec.	PP	W	Remarks		
3.5-	- - - - - - - - - - - - - - - - - - -	SILTY CLAY (CL) - medium stiff, moist, tan-brown mottled  SILTSTONE - very highly weathered, tan-gray mottled with black nodes		1 2	ss	3-4-5 10-25-35	100	tsf	%			
	× × × × × × × × × × × × × × × × × × ×	- with brown to dar brown, highly weathered sandstone	5	3	SS	50 50	17					
15.0-	× × × × × × × × × × × × × × × × × × ×	SANDSTONE - hard, moderately weathered, thin	10	5	ss	50	17					
		bedded with a siltstone layer from about 18 to 19.5 feet., gray to dark gray, fine to coarse.	20	6	RC		93			RQD = 77 percent		
25.0—		Bottom of Boring at 25 ft	25	-								
			30· - - -	- - - - - - - - -								



F.S. Tan Land Consulting Engineers P.O. Box 17546 Louisville, KY 40217 502-636-5111 502-636-5263

## Geotechnical Boring Log

Boring No: **B-2** 

									Boring No: D-Z			
Client: Ame	erican Tower Corporation		Projec	t Nu	mber: 1	3-87	76					
Project: Proposed Hazel Green Tower					Drilling Firm: Hoosier Drilling							
Location: N37° 44' 52.57" / W83° 27' 31.83"					Project Manager: Beth Stuber							
Date Started: 1/21/2014					Total Depth of Boring: 13 ft							
Date Completed: 1/21/2014					ods							
Boring Method: HSA-Manual Hammer					completi	on_						
Surface Ele	vation: NA		ŅA	NA h	ours aft	er co	omp	letio	1			
Layer Depth Depth Material Description			th e No	. Туре	Sample Blows	Remarks						
3.5 ×× ×× ×× ×× ×× ×× ×× ××	SILTY CLAY (CL) - medium stiff, moist, tan-brown motiled  SILTSTONE - very highly weathered, tan-gray mottled with black nodes  - with brown to dar brown, highly weathered sandstone		1 2 53	ss ss	3-4-3 20-19-27 50	100	tsf	%				
3.5	Bottom of Boring at 13 ft	10 18 20 28	. . . . . . . . . . . . . . . .	ss	50	17						



F.S. Tan Land Consulting Engineers P.O. Box 17546 Louisville, KY 40217 502-636-5111 502-636-5263

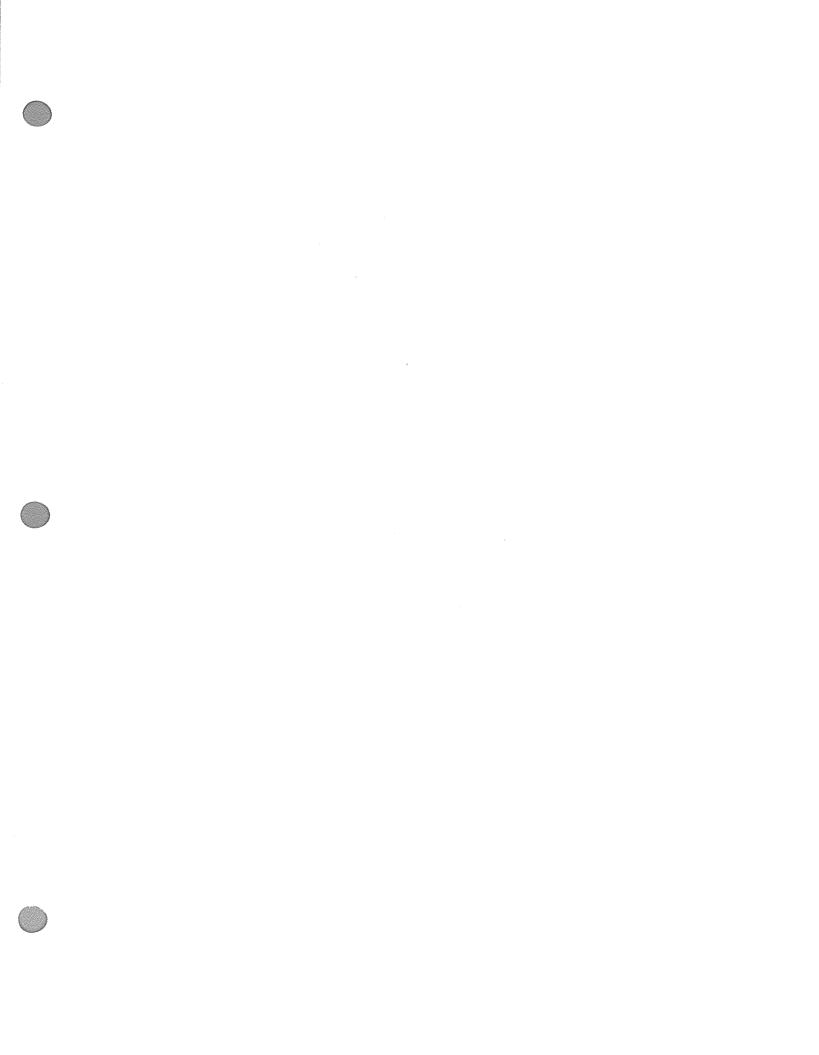
# Geotechnical Boring Log

Boring No: **B-3** 

											Boring No: D-3	
Client: American Tower Corporation Project Nu								3-87	76			
Project: Proposed Hazel Green Tower					Drilling Firm: Hoosier Drilling							
Location: N37° 44' 52.57" / W83° 27' 31.83"					ject	Mai	nager: I	3eth	Stu	ber		
Date Started: 1/21/2014					al D	epth	of Bori	ng:	13 f	t		
Date C	ompl	eted: 1/21/2014		N	IA c	n ro	ds					
Boring	Meth	nod: HSA-Manual Hammer		D	RY	at c	ompleti	on				
Surface		vation: NA		N	IA N	IA h	ours aft	er co	omp	letio	n	
Layer Depth of t 9 Material Description S			De <sub>l</sub> Sca	ale ŀ	No.	Туре	Sample	Data Rec. %	PP tsf	W %	Remarks	
3.5—		SILTY CLAY (CL) - medium stiff, moist, tan-brown mottled			1	ss	4-4-4	100	toi	70		
	× × × × × × × × × × ×	SILTSTONE - very highly weathered, tan-gray mottled with black nodes		5	2	SS	23-29-31	100				
	X X X X X X X X X X X X X X X X X X X	- with brown to dar brown, highly weathered sandstone			3	SS	50	6				
	××××××××××××××××××××××××××××××××××××××			10	4	SS	50	11				
13.0	* * * >	Bottom of Boring at 13 ft		15-								
				20 —								
				25 -								
				30 -								
				=							Dogo 1 o	

# SOIL CLASSIFICATION CHART

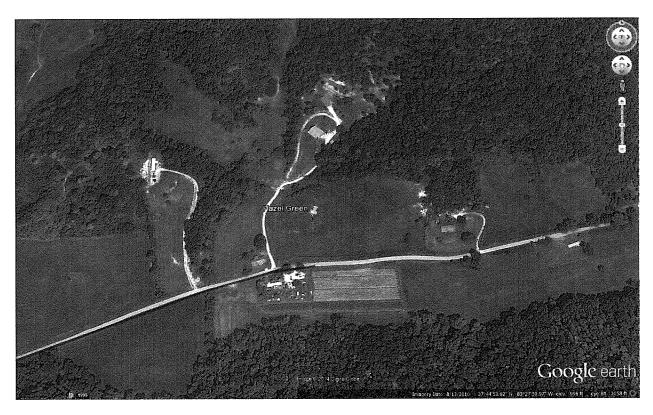
B.A	IONE	SYMI	BOLS	TYPICAL		
141	AJOR DIVIS		GRAPH	LETTER	DESCRIPTIONS	
	GRAVEL AND	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVELSAND MIXTURES, LITTLE OR NO FINES	
,	GRAVELLY SOILS	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
COARSE GRAINED SOILS	MORE THAN 50% OF COARSE FRACTION	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
MORE THAN 50% OF MATERIAL IS	SAND AND	CLEAN SANDS		sw	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
LARGER THAN NO. 200 SIEVE SIZE	SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
	MORE THAN 50% OF COARSE FRACTION	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES	
	PASSING ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		sc	CLAYEY SANDS, SAND - CLAY MIXTURES	
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		СН	INORGANIC CLAYS OF HIGH PLASTICITY	
,				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIG	HLY ORGANIC SC	DILS 4	5 46 47 46 47 47 47 7 5 45 47 48		PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	



# EXHIBIT I DIRECTIONS TO WCF SITE

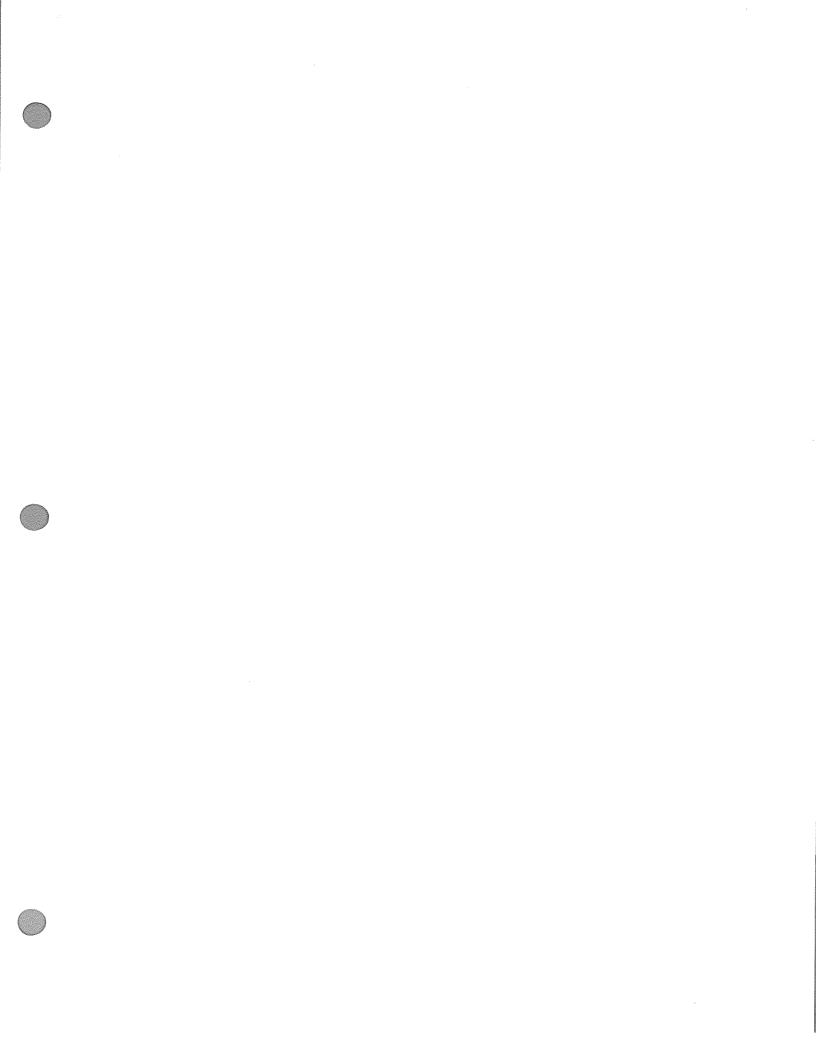
#### **Driving Directions to Proposed Tower Site at Hazel Green**

- 1. Beginning at the Wolfe County Courthouse, located at 10 Court Street, Campton, Kentucky 41301, travel south on Marion Street toward Main Street and go approximately 187 feet.
- 2. Take the first left onto KY-191/Main Street, continue to follow KY-191 and go approximately 1.1 miles.
- 3. Take a slight right to stay on KY-191 and go approximately 3.5 miles.
- 4. Take a slight right onto County Road 1812 and go approximately 1.0 miles.
- 5. Take the first left onto Buchanan Fork Road and go approximately 0.7 miles.
- 6. The proposed site is on the left at 84 Garry Sparks Drive, Campton, KY 41301.
- 7. The site coordinates are
  - a. North 37 deg 44' 52.57"
  - b. West 83 deg 27' 31.83"



Prepared by: Joseph C. Ernwine 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 AND DEED TO SITE PARCEL

#### LEASE AGREEMENT

THIS LEASE AGREEMENT ("Agreement") is made effective as of the date of the latter signature hereof (the "Execution Date") and is by and between Landlord and American Tower.

#### RECITALS

A. WHEREAS, Landlord is the owner of that certain parcel of land (the "Property") located in the County of Wolfe, State of Kentucky, as more particularly described on Exhibit A;

B. WHEREAS, Landlord desires to grant to American Tower an option to lease from Landlord a portion of the Property (the "Compound"), together with easements for ingress and egress and the installation and maintenance of utilities (the "Easement" and together with the Compound, the "Site") both being approximately located as shown on Exhibit B; and

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained, and other good and valuable consideration, the receipt, adequacy and sufficiency of all of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. Business and Defined Terms. For the purposes of this Agreement, the following capitalized terms have the meanings set forth in this paragraph 1.

(a) American Tower: American Towers LLC, a Delaware limited

liability company d/b/a Delaware American

Towers LLC

(b) Notice Address of American Tower: American Towers LLC

c/o American Tower Corporation

10 Presidential Way Woburn, MA 01801 Attn: Land Management

with a copy to: American Towers LLC

c/o American Tower Corporation

116 Huntington Ave. Boston, MA 02116 Attn: Law Department

(c) Landlord: Billye C. Adams, a single person

(d) Notice Address of Landlord: P.O. Box 517

Campton, KY 41301

- (e) Initial Option Period: One (1) year.
- Renewal Option Period(s): One (1) period of One (1) year. **(f)**
- Option Period: The Initial Option Period and any Renewal Option Period(s) (g)

- (h) Option Consideration (Initial Option Period):
- (i) Option Extension Consideration (Renewal Option Period(s)):
- (j) Commencement Date: The date specified in the written notice by American Tower to Landlord exercising the Option constitutes the Commencement Date of the Term.
- (k) Initial Term: Five (5) years, commencing on the Commencement Date and continuing until midnight of the day immediately prior to the fifth anniversary of the Commencement Date.
- (1) Renewal Terms: Each of the five (5) successive periods of five (5) years each, with the first Renewal Term commencing upon the expiration of the Initial Term and each subsequent Renewal Term commencing upon the expiration of the immediately preceding Renewal Term.
  - (m) Term: The Initial Term with any and all Renewal Terms
  - (n) Rent: The monthly amount of
- (o) Increase Amount: Rent will increase at the commencement of each Renewal Term by an amount equal to from the previous five year period.
  - (p) Increase Date: The first date of each Renewal Term.

#### 2. Option to Lease.

- (a) <u>Grant of Option</u>. Landlord hereby gives and grants to American Tower and its assigns, an exclusive and irrevocable option to lease the Site during the Initial Option Period (the "Option").
- (b) <u>Extension of Option</u>. The Initial Option Period will automatically be extended for each Renewal Option Period unless American Tower provides Landlord written notice of its intent not to extend the Option.
- (c) <u>Consideration for Option</u>. Option Consideration is due and payable in full within 30 days of the Execution Date and American Tower will pay Landlord any Option Extension Consideration within 30 days of the commencement of any Renewal Option Period.

#### (d) Option Period Inspections and Investigations.

- (i) During the Option Period, Landlord will provide American Tower with any keys or access codes necessary for access to the Property.
- (ii) During the Option Period, American Tower and its officers, agents, employees and independent contractors may enter upon the Property to perform or cause to be performed test borings of the soil, environmental audits, engineering studies and to conduct a metes and bounds survey of the Site and/or the Property (the "Survey"), provided that American Tower will not unreasonably interfere with Landlord's use of the Property in conducting these activities. At American Tower's discretion, the legal description of the Site as shown on the Survey may replace Exhibit B of this Agreement and be added as Exhibit B of the Memorandum of Lease.
- (iii) American Tower may not begin any construction activities on the Site during the Option Period other than those activities described in, or related to, this paragraph 2(d).

(e) <u>Exercise of Option</u>. American Tower may, in its sole discretion, exercise the Option by delivery of written notice to Landlord at any time during the Option Period. If American Tower exercises the Option then Landlord will lease the Site to American Tower subject to the terms and conditions of this Agreement. If American Tower does not exercise the Option, this Agreement will terminate.

#### 3. Term.

- (a) <u>Initial Term</u>. The Initial Term is as provided in paragraph 1(k).
- (b) Renewal Terms. American Tower will have the right to extend this Agreement for each of the Renewal Terms. Each Renewal Term will be on the same terms and conditions provided in this Agreement except that Rent will escalate as provided in paragraph 4(b). This Agreement will automatically be renewed for each successive Renewal Term unless American Tower notifies Landlord in writing of American Tower's intention not to renew the Agreement at any time prior to the expiration of the Initial Term or the Renewal Term which is then in effect.

#### 4. <u>Consideration</u>.

- (a) American Tower will pay its first installment of Rent within thirty (30) days of the Commencement Date. Thereafter, Rent is due and payable in advance on the first day of each calendar month to Landlord at Landlord's Notice Address. Rent will be prorated for any partial months, including, the month in which the Commencement Date occurs.
  - (b) On the Increase Date, the Rent will increase by the Increase Amount.
- (c) In the event American Tower makes an overpayment of Rent or any other fees or charges to Landlord during the Term of this Agreement, American Tower may, but will not be required, to treat any such overpayment amount as prepaid Rent and apply such amount as a credit against future Rent due to Landlord.
- (d) American Tower will not be required to remit the payment of Rent to more than two recipients at any given time.

#### 5. <u>Use.</u>

- (a) American Tower will be permitted to use the Site for the purpose of constructing, maintaining, removing, replacing, securing and operating a communications facility, including, but not limited to, the construction or installation and maintenance of a telecommunications tower (the "Tower"), structural tower base(s), guy anchors, guy wires, communications equipment, one or more buildings or equipment cabinets, radio transmitting and receiving antennas, personal property and related improvements and facilities on the Compound (collectively, the "Tower Facilities"), to facilitate the use of the Site as a site for the transmission and receipt of communication signals including, but not limited to, voice, data and internet transmissions and for any other uses which are incidental to the transmission and receipt of communication signals (the "Intended Use").
- (b) American Tower, at its sole discretion, will have the right, without prior notice or the consent of Landlord, to license or sublease all or a portion of the Site or the Tower Facilities to other parties (each, a "Collocator" and collectively, the "Collocators"). The Collocators will be entitled to modify the Tower Facilities and to erect additional improvements on the Compound including but not limited to antennas, dishes, cabling, additional buildings or shelters ancillary to the Intended Use. The Collocators will be entitled to all rights of ingress and egress to the Site and the right to install utilities on the Site that American Tower has under this Agreement.

#### 6. Tower Facilities.

(a) American Tower will have the right, at American Tower's sole cost and expense, to erect the Tower Facilities which will be the exclusive property of American Tower throughout the Term as well as upon the expiration or termination of this Agreement.

- (b) Landlord grants American Tower a non-exclusive easement in, over, across and through the Property and other real property owned by Landlord contiguous to the Site as may be reasonably required for construction, installation, maintenance, and operation of the Tower Facilities including: (i) access to the Site for construction machinery and equipment, (ii) storage of construction materials and equipment during construction of the Tower Facilities, and (iii) use of a staging area for construction, installation and removal of equipment. Notwithstanding the foregoing, if American Tower's construction equipment causes any damages to the Access Easement, as more particularly depicted in Exhibit B of this Agreement, American Tower shall be responsible to repair such damages within 90 days after the completion of the construction of Tower Facilities.
- (c) American Tower may, at its sole expense, use any and all appropriate means of restricting access to the Compound or the Tower Facilities, including, without limitation, construction of a fence and may install and maintain identifying signs or other signs required by any governmental authority on or about the Site, including any access road to the Site.
- (d) American Tower will maintain the Compound, including the Tower Facilities, in a reasonable condition throughout the Term. American Tower is not responsible for reasonable wear and tear or damage from casualty and condemnation. Landlord grants American Tower the right to clear all trees, undergrowth, or other obstructions and to trim, cut, and keep trimmed all tree limbs which may interfere with or fall upon the Tower Facilities or the Site. American Tower will remove all of the aboveground portions of the Tower Facilities within 180 days following the expiration or termination of this Agreement.
- (e) If the Tower is a guyed tower, Landlord grants American Tower an easement in, over, across and through the Property or any other real property owned by Landlord as may be necessary to American Tower during the Term of this Agreement for the installation, maintenance, alteration, removal, relocation and replacement of and access to guy wires and guy wire anchors which may be required by American Tower at its sole discretion and located outside of the Site.

#### 7. Utilities.

- (a) American Tower will have the right to install utilities, at American Tower's expense, and to improve present utilities on the Property and the Site. American Tower will have the right to permanently place utilities on (or to bring utilities across or under) the Site to service the Compound and the Tower Facilities.
- (b) If utilities necessary to serve the equipment of American Tower or the equipment of any Collocator cannot be located within the Site, Landlord agrees to allow the installation of utilities on the Property or other real property owned by Landlord without requiring additional compensation from American Tower or any Collocator. Landlord will, upon American Tower's request, execute a separate recordable written easement or lease to the utility company providing such service evidencing this right.
  - (c) American Tower and the Collocators each may install backup generator(s).

#### 8. Access

- (a) In the event that the Site loses access to a public right of way during the Term, Landlord and American Tower will amend this Agreement, at no imposed cost to either party, to provide access to a public way by: (i) amending the location of the Easement; or (ii) granting an additional easement to American Tower.
- (b) To the extent damage (including wear and tear caused by normal usage) to the Easement or any other route contemplated hereunder intended to provide American Tower with access to the Site and the Tower Facilities is caused by Landlord or Landlord's tenants, licensees, invites or agents, Landlord will repair the damage at its own expense.
- (c) Landlord will maintain access to the Compound from a public way in a free and open condition so that no interference is caused to American Tower by Landlord or lessees, licensees, invitees or agents of Landlord. In the event that American Tower's or any Collocator's access to the Compound is impeded or denied by Landlord or Landlord's lessees, licensees, invitees or agents, without waiving any other rights that it may have at law or in equity, American Tower may at its sole discretion deduct from Rent due under this Agreement an amount equal to the per day for each day that such access is impeded or denied.
- 9. Representations and Warranties of Landlord. Landlord represents and warrants to American Tower's successors and assigns:
  - (a) Landlord has the full right, power, and authority to execute this Agreement;
- (b) There are no pending or threatened administrative actions, including bankruptcy or insolvency proceedings under state or federal law, suits, claims or causes of action against Landlord or which may otherwise affect the Property;
- (c) The Property is not presently subject to an option, lease or other contract which may adversely affect Landlord's ability to fulfill its obligations under this Agreement, and the execution of this Agreement by Landlord will not cause a breach or an event of default of any other agreement to which Landlord is a party. Landlord agrees that it will not grant an option or enter into any contract or agreement which will have any adverse effect on the Intended Use or American Tower's rights under this Agreement;
- (d) No licenses, rights of use, covenants, restrictions, easements, servitudes, subdivision rules or regulations, or any other encumbrances relating to the Property prohibit or will interfere with the Intended Use;
- (e) Landlord has good and marketable fee simple title to the Site, the Property and any other property across which Landlord may grant an easement to American Tower or any Collocator, free and clear of all liens and encumbrances. Landlord covenants that American Tower will have the quiet enjoyment of the Compound during the term of this Agreement. If Landlord fails to keep the Site free and clear of any liens and encumbrances, American Tower will have the right, but not the obligation, to satisfy any such lien or encumbrance and to deduct the full amount paid by American Tower on Landlord's behalf from future installments of Rent;
- (f) American Tower will at all times during this Agreement enjoy ingress, egress, and access from the Site 24 hours a day, 7 days a week, to an open and improved public road which is adequate to service the Site and the Tower Facilities; and
- (g) These representations and warranties of Landlord survive the termination or expiration of this Agreement.

- 10. <u>Interference.</u> Landlord will not use, nor will Landlord permit its tenants, licensees, invitees or agents to use any portion of the Property in any way which interferes with the Intended Use, including, but not limited to, any use on the Property or surrounding property that causes electronic or physical obstruction or degradation of the communications signals from the Tower Facilities ("Interference"). Interference will be deemed a material breach of this Agreement by Landlord and Landlord will have the responsibility to terminate Interference immediately upon written notice from American Tower. Notwithstanding anything in this Agreement to the contrary, if the Interference does not cease or is not rectified as soon as possible, but in no event longer than 24 hours after American Tower's written notice to Landlord, Landlord acknowledges that continuing Interference will cause irreparable injury to American Tower, and American Tower will have the right; in addition to any other rights that it may have at law or in equity, to bring action to enjoin the Interference.
- 11. <u>Termination</u>. This Agreement may be terminated, without any penalty or further liability upon written notice as follows:
- (a) By either party upon a default of any covenant or term of this Agreement by the other party which is not cured within 60 days of receipt of written notice of default (without, however, limiting any other rights available to the parties in law or equity); provided, that if the defaulting party commences efforts to cure the default within such period and diligently pursues such cure, the non-defaulting party may not terminate this Agreement as a result of that default.
- (b) Upon 30 days' written notice by American Tower to Landlord if American Tower is unable to obtain, maintain, renew or reinstate any agreement, easement, permit, certificates, license, variance, zoning approval, or any other approval which may be required from any federal, state or local authority necessary to the construction and operation of the Tower Facilities or to the Intended Use (collectively, the "Approvals"); or
- (c) Upon 30 days' written notice from American Tower to Landlord if the Site is or becomes unsuitable, in American Tower's sole, but reasonable judgment for use as a wireless communications facility by American Tower or by American Tower's licensee(s) or sublessee(s).
- (d) In the event of termination by American Tower or Landlord pursuant to this provision, American Tower shall be relieved of all further liability hereunder.

#### 12. Taxes.

(a) American Tower will pay any personal property taxes assessed on or attributable to the Tower Facilities. American Tower will reimburse Landlord for any increase to Landlord's real property taxes that are directly attributable to American Tower's Site and/or Tower Facilities upon receipt of the following: (1) a copy of Landlord's tax bill; (2) proof of payment; and (3) written documentation from the assessor of the amount attributable to American Tower. American Tower shall have no obligation to reimburse Landlord for any taxes paid by Landlord unless Landlord requests reimbursement within 12 months of the date said taxes were originally due. Additionally, as a condition precedent to Landlord having the right to receive reimbursement, Landlord shall, within 3 days of receipt of any notice from the taxing authority of any assessment or reassessment, provide American Tower with a copy of said notice. American Tower shall have the right to appeal any assessment or reassessment relating to the Site or Tower Facilities and Landlord shall either (i) designate American Tower as its attorney-in-fact as required to effect standing with the taxing authority, or (ii) join American Tower in its appeal.

(b) Landlord will pay when due all real property taxes and all other fees and assessments attributable to the Property, Compound and Easement. If Landlord fails to pay when due any taxes affecting the Property or the Site, American Tower will have the right, but not the obligation, to pay such taxes and either: (i) deduct the full amount of the taxes paid by American Tower on Landlord's behalf from future installments of Rent, or (ii) collect such taxes by any lawful means.

#### 13. Environmental Compliance.

#### (a) Landlord represents and warrants that:

- (i) No Hazardous Materials have been used, generated, stored or disposed of, on, under or about the Property in violation of any applicable law, regulation or administrative order (collectively, "*Environmental Laws*") by either Landlord or to Landlord's knowledge, any third party; and
- (ii) To Landlord's knowledge, no third party been permitted to use, generate, store or dispose of any Hazardous Materials on, under, about or within the Property in violation of any Environmental Laws.
- (b) Landlord will not, and will not permit any third party to use, generate, store or dispose of any Hazardous Materials on, under, about or within the Property in violation of any Environmental Laws.
- (c) American Tower agrees that it will not use, generate, store or dispose of any Hazardous Material on, under, about or within the Site in violation of any applicable laws, regulations or administrative orders.
- (d) The term "Hazardous Materials" means any: contaminants, oils, asbestos, PCBs, hazardous substances or wastes as defined by federal, state or local environmental laws, regulations or administrative orders or other materials the removal of which is required or the maintenance of which is prohibited or regulated by any federal, state or local government authority having jurisdiction over the Property.

#### 14. <u>Indemnification</u>.

#### (a) General.

- (i) Landlord, its heirs, grantees, successors, and assigns will exonerate, hold harmless, indemnify, and defend American Tower from any claims, obligations, liabilities, costs, demands, damages, expenses, suits or causes of action, including costs and reasonable attorney's fees, which may arise out of: (A) any injury to or death of any person; (B) any damage to property, if such injury, death or damage arises out of or is attributable to or results from the acts or omissions of Landlord, or Landlord's principals, employees, invitees, agents or independent contractors; or (C) any breach of any representation or warranty made by Landlord in this Agreement.
- (ii) American Tower, its grantees, successors, and assigns will exonerate, hold harmless, indemnify, and defend Landlord from any claims, obligations, liabilities, costs, demands, damages, expenses, suits or causes of action, including costs and reasonable attorney's fees, which may arise out of: (A) any injury to or death of any person; (B) any damage to property, if such injury, death or damage arises out of or is attributable to or results from the negligent acts or omissions of American Tower, or American Tower's employees, agents or

independent contractors; or (C) any breach of any representation or warranty made by American Tower in this Agreement.

#### (b) Environmental Matters.

- Landlord, its heirs, grantees, successors, and assigns will indemnify, defend, (i) reimburse and hold harmless American Tower from and against any and all damages arising from the presence of Hazardous Materials upon, about or beneath the Property or migrating to or from the Property or arising in any manner whatsoever out of the violation of any Environmental Laws, which-conditions-exist-or-existed-prior-to-or-at-the-time-of-the-execution-of-this-Agreement-or which may occur at any time in the future through no fault of American Tower. Notwithstanding the obligation of Landlord to indemnify American Tower pursuant to this Agreement, Landlord will, upon demand of American Tower, and at Landlord's sole cost and expense, promptly take all actions to remediate the Property which are required by any federal, state or local governmental agency or political subdivision or which are reasonably necessary to mitigate environmental damages or to allow full economic use of the Site, which remediation is necessitated from the presence upon, about or beneath the Property of a Hazardous Material. Such actions include but not be limited to the investigation of the environmental condition of the Property, the preparation of any feasibility studies, reports or remedial plans, and the performance of any cleanup, remediation, containment, operation, maintenance, monitoring or actions necessary to restore the Property to the condition existing prior to the introduction of such Hazardous Material upon, about or beneath the Property notwithstanding any lesser standard of remediation allowable under applicable law or governmental policies.
- (ii) American Tower, its grantees, successors, and assigns will indemnify, defend, reimburse and hold harmless Landlord from and against environmental damages caused by the presence of Hazardous Materials on the Compound in violation of any Environmental Laws and arising solely as the result of American Tower's activities after the execution of this Agreement.

#### 15. Right of First Refusal; Sale of Property.

- (a) During the Term, prior to selling the Site or any portion of or interest in the Property or the Site, including but not limited to a leasehold interest or easement, or otherwise transfer Landlord's interest in Rent, and prior to assigning the Rent or any portion of Rent to a third party, Landlord shall notify American Tower in writing of the sale price and terms offered by a third party (the "Offer"), together with a copy of the Offer. American Tower will have the right of first refusal to purchase the real property interest or Rent or portion of Rent being sold by Landlord to such third party on the same financial terms of the Offer. American Tower will exercise its right of first refusal within 30 days of receipt of Landlord's notice and if American Tower does not provide notice within 30 days, American Tower will be deemed to have not exercise its right of first refusal. If American Tower does not exercise its right of first refusal, section 15(b) of this Agreement will control the terms of the sale.
- (b) Landlord may sell the Property or a portion thereof to a third party, provided: (i) the sale is made subject to the terms of this Agreement; and (ii) if the sale does not include the assignment of Landlord's full interest in this Agreement the purchaser must agree to perform, without requiring compensation from American Tower or any Collocator, any obligation of the Landlord under this Agreement, including Landlord's obligation to cooperate with American Tower as provided hereunder, which obligation Landlord would no longer have the legal right or ability to perform following the sale without requiring compensation from American Tower or any Collocator to be paid to such purchaser.

#### 16. Assignment.

(a) Any sublease, license or assignment of this Agreement that is entered into by Landlord or American Tower is subject to the provisions of this Agreement.

- (b) Landlord may assign this Agreement in its entirety to any third party in conjunction with a sale of the Property in accordance with Paragraph 15 of this Agreement. Landlord will not otherwise assign less than Landlord's full interest in this Agreement without the prior written consent of American Tower.
- (c) American Tower may assign this Agreement without prior notice to or the consent of Landlord. Upon assignment, American Tower shall be relieved of all liabilities and obligations hereunder and Landlord shall look solely to the assignee for performance under this Agreement and all obligations hereunder.
- (d) American Tower may mortgage or grant a security interest in this Agreement and the Tower Facilities, and may assign this Agreement and the Tower Facilities to any such mortgagees or holders of security interests including their successors and assigns (collectively, "Secured Parties"). If requested by American Tower, Landlord will execute such consent to such financing as may reasonably be required by Secured Parties. In addition, if requested by American Tower, Landlord agrees to notify American Tower and American Tower's Secured Parties simultaneously of any default by American Tower and to give Secured Parties the same right to cure any default as American Tower. If a termination, disaffirmance or rejection of the Agreement by American Tower pursuant to any laws (including any bankruptcy or insolvency laws) occurs, or if Landlord will terminate this Agreement for any reason, Landlord will give to Secured Parties prompt notice thereof and Secured Parties will have the right to enter upon the Compound during a 30-day period commencing upon Secured Parties' receipt of such notice for the purpose of removing any Tower Facilities. Landlord acknowledges that Secured Parties are third-party beneficiaries of this Agreement.
- Condemnation. If a condemning authority takes all of the Site, or a portion sufficient in American Tower's sole judgment, to render the Site unsuitable for the Intended Use, this Agreement will terminate as of the date the title vests in the condemning authority. Landlord and American Tower will share in the condemnation proceeds in proportion to the values of their respective interests in the Site (which for American Tower includes, where applicable, the value of the Tower Facilities, moving expenses, prepaid rent and business dislocation expenses). If a condemning authority takes less than the entire Site such that the Site remains suitable for American Tower's Intended Use, the Rent payable under this Agreement will be reduced automatically by such percentage as the area so condemned bears to the Site as of the date the title vests in the condemning authority. A sale of all or part of the Site to a purchaser with the power of eminent domain in the face of the exercise of eminent domain power will be treated as a taking by condemnation for the purposes of this paragraph.
- 18. <u>Insurance.</u> American Tower will purchase and maintain in full force and effect throughout the Option Period and the Term such general liability and property damage policies as American Tower may deem necessary. Said policy of general liability insurance will at a minimum provide a combined single limit of \$1,000,000.

#### 19. Waiver of Damages.

(a) In the event that American Tower does not exercise its Option: (i) Landlord's sole compensation and damages will be fixed and liquidated to the sums paid by American Tower to Landlord as consideration for the Option; and (ii) Landlord expressly waives any other remedies it may have for a breach of this Agreement including specific performance and damages for breach of contract.

(b) Neither Landlord nor American Tower will be responsible or liable to the other party for any loss or damage arising from any claim to the extent attributable to any acts of omissions of other licensees or tower users occupying the Tower Facilities or vandalism or for any structural or power failures or destruction or damage to the Tower Facilities except to the extent caused by the negligence or willful misconduct of such party.

- (c) EXCEPT AS SPECIFICALLY PROVIDED IN THIS AGREEMENT, IN NO EVENT WILL LANDLORD OR AMERICAN TOWER BE LIABLE TO THE OTHER FOR, AND AMERICAN TOWER AND LANDLORD EACH HEREBY WAIVE THE RIGHT TO RECOVER INCIDENTAL, —CONSEQUENTIAL (INCLUDING, BUT—NOT—LIMITED—TO, LOST—PROFITS, LOSS—OF—USE—OR—LOSS OF BUSINESS OPPORTUNITY), PUNITIVE, EXEMPLARY AND SIMILAR DAMAGES.
  - 20. <u>Confidentiality</u>. Landlord will not disclose to any third party the Rent payable by American Tower under this Agreement and will treat such information as confidential, except that Landlord may disclose such information to prospective buyers, prospective or existing lenders, Landlord's affiliates and attorneys, or as may be required by law or as may be necessary for the enforcement of Landlord's rights under the Agreement.

#### 21. Subordination Agreements.

- (a) If the Site is encumbered by a mortgage or deed of trust, within 30 days of receipt of a written request from American Tower, Landlord agrees to execute and obtain the execution by its lender of a non-disturbance and attornment agreement in the form provided by American Tower, to the effect that American Tower and American Tower's sublessees and licensees will not be disturbed in their occupancy and use of the Site by any foreclosure or to provide information regarding the mortgage to American Tower.
- (b) Should a subordination, non-disturbance and attornment agreement be requested by Landlord or a lender working with Landlord on a loan to be secured by the Property and entered into subsequent to the Execution Date, American Tower will use good faith efforts to provide Landlord or Landlord's lender with American Tower's form subordination, non-disturbance and attornment agreement executed by American Tower within 30 days of such request.
- 22. Notices. All notices or demands by or from American Tower to Landlord, or Landlord to American Tower, required under this Agreement will be in writing and sent (United States mail postage pre-paid, certified with return receipt requested or by reputable national overnight carrier service, transmit prepaid) to the other party at the addresses set forth in paragraph 1 of this Agreement or to such other addresses as the parties may, from time to time, designate consistent with this paragraph 22, with such new notice address being effective 30 days after receipt by the other party. Notices will be deemed to have been given upon either receipt or rejection.

#### 23. Further Acts.

- (a) Within 15 days after receipt of a written request from American Tower, Landlord will execute any document necessary or useful to protect American Tower's rights under this Agreement or to facilitate the Intended Use including documents related to title, zoning and other Approvals, and will otherwise cooperate with American Tower in its exercise of its rights under this Agreement.
- (b) American Tower will be entitled to liquidated damages for the revenue lost by American Tower as a result of any delay caused by Landlord's unwillingness to execute a document or to take any other action deemed necessary by American Tower to protect American Tower's leasehold rights or to

facilitate the Intended Use. As the actual amount of such lost revenue is difficult to determine, the parties agree that American Tower may deduct the amount of per day from future installments of Rent for any delay to American Tower caused by Landlord's failure or unwillingness to act, such amount being an estimate of American Tower's lost revenue. American Tower's right to collect such liquidated damages will in no way affect American Tower's right to pursue any and all other legal and equitable rights and remedies permitted under applicable laws.

24. Memorandum of Lease. Simultaneously with the execution of this Agreement, the parties will enter into the Memorandum of Lease attached to this Agreement as Exhibit C which American Tower may record in the public records of the county of the Property.—Landlord acknowledges and agrees that after Landlord signs the Memorandum of Lease but before American Tower records it, American Tower may add both: (a) a reference to the recording granting Landlord its interest in the Property; and (b) a legal description of the Site as Exhibit B. Landlord agrees to execute and return to American Tower a recordable Amended Memorandum of Lease in form supplied by American Tower if: (i) the information included in the Memorandum of Lease changes, or (ii) if it becomes clear that such information is incorrect or incomplete or if this Agreement is amended.

#### 25. Miscellaneous.

- (a) This Agreement runs with the Property and is binding upon and will inure to the benefit of the parties, their respective heirs, successors, personal representatives and assigns.
- (b) American Tower may at American Tower's sole cost and expense procure an abstract of title or a commitment to issue a policy of title insurance (collectively "Title") on the Property.
- (c) Landlord hereby waives any and all lien rights it may have, statutory or otherwise, in and to the Tower Facilities or any portion thereof, regardless of whether or not same is deemed real or personal property under applicable laws.
- (d) The substantially prevailing party in any litigation arising hereunder is entitled to its reasonable attorney's fees and court costs, including appeals, if any.
- (e) Each party agrees to furnish to the other, within 30 days after request, such estoppel information as the other may reasonably request.
- (f) This Agreement constitutes the entire agreement and understanding of Landlord and American Tower with respect to the subject matter of this Agreement, and supersedes all offers, negotiations and other agreements. There are no representations or understandings of any kind not stated in this Agreement. Any amendments to this Agreement must be in writing and executed and delivered by Landlord and American Tower.
- (g) If either Landlord or American Tower is represented by a real estate broker in this transaction, that party is fully responsible for any fees due such broker and will hold the other party harmless from any claims for commission by such broker.
- (h) The Agreement will be construed in accordance with the laws of the state in which the Site is situated.
- (i) If any term of the Agreement is found to be void or invalid, the remainder of this Agreement will continue in full force and effect.

- (j) American Tower may obtain title insurance on its interest in the Site, and Landlord will cooperate by executing any documentation required by the title insurance company.
- (k) This Agreement may be executed in two or more counterparts, all of which are considered one and the same agreement and become effective when one or more counterparts have been signed by each of the parties, it being understood that all parties need not sign the same counterpart.
- (1) Landlord will not, during the Option Period or the Term, enter into any other lease, license, or other agreement for the same or similar purpose as the Intended Use, on or adjacent to the Property.
- (m) Failure or delay on the part of either party to exercise any right, power or privilege hereunder will not operate as a waiver thereof and waiver of breach of any provision hereof under any circumstances will not constitute a waiver of any subsequent breach.
- (n) The parties agree that irreparable damage would occur if any of the provisions of this Agreement were not performed in accordance with their specified terms or were otherwise breached. Therefore, the parties agree the parties will be entitled to an injunction(s) in any court in the state in which the Site is located to prevent breaches of the provisions of this Agreement and to enforce specifically the terms and provisions of the Agreement, this being in addition to any other remedy to which the parties are entitled at law or in equity.
- (o) Each party executing this Agreement acknowledges that it has full power and authority to do so and that the person executing on its behalf has the authority to bind the party.
- (p) The parties agree that a scanned or electronically reproduced copy or image of this Agreement will be deemed an original and may be introduced or submitted in any action or proceeding as competent evidence of the execution, terms and existence hereof notwithstanding the failure or inability to produce or tender an original, executed counterpart of this Agreement and without the requirement that the unavailability of such original, executed counterpart of this Agreement first be proven.

[SIGNATURES APPEAR ON NEXT PAGE]

IN WITNESS WHEREOF, Landlord and American Tower have each executed this Agreement as of the respective dates written below.

LANDLORD:

Billye C. Adams, a single person

Name: Billye C. Adams

Date:

Acknowledgement

STATE OF KENTUCKY

COUNTY OF WOLFE

I, a Notary Public of the County and State aforesaid, certify that Billye C. Adams, a single person, came before me this day and acknowledged the execution of the foregoing instrument.

Witness my hand and official stamp or seal, this 315t day of

[Affix Notary Seal]

Notary Public

My commission expires:

9/25/16

Site Number: 281338

## AMERICAN TOWER: American Towers LLC, a Delaware limited liability company, d/b/a Delaware American Towers LLC Name: Shawn Lanier Title: Vice President Legal Date: Acknowledgement COMMONWEALTH OF MASSACHUSETTS ) ss: COUNTY OF MIDDLESEX 2014 the undersigned notary public, On the 4th day of Fel personally appeared Share Lenik personally appeared Share Zentile, proved to me through satisfactory evidence of identification, which were <u>personally known</u>, to be the person who name is signed on the preceding or attached document, and acknowledged that he/she signed it voluntarily for its stated purpose, as \_ American Towers LLC, d/b/a Delaware American Towers LLC, before me.

DANIEL A POWERS
Notary Public
Commonwealth of Massachusetts
My Commission Expires
October 23, 2020

Notary Public

My Commission Expires:

The following exhibits are attached to this Agreement and incorporated into this Agreement:

Description or Depiction of Property Description or Depiction of Site Memorandum of Lease Exhibit A Exhibit B

Exhibit C

#### EXHIBIT A

#### DESCRIPTION OR DEPICTION OF PROPERTY

The Property is described and/or depicted as follows:

Parent Parcel:

#### TRACT 1

That certain tract or parest of land lying and being in Walle County, Kentucky, and on the waters of the Buchanan Fork of Stillwater Creek and bounded and described as follows:

Beginning of a Market steel post at the corner of Wilde Profitt land line and North side of Buchanan Fork County Road; thence running in a straight line North to a large marked beech tree standing on top of the ridge; thence going East along the Profitt land line to the corner of Billie Adams and Wilde Profitt land lines thence continuing along the Adams line to a marked big twin hickory tree; thence in a Northwesterly direction over the hill to a marked tree at the forks of Rockhouse Stream; thence turning west and running with the stream to the intersection of Rockhouse Stream and Stillhouse Creek; thence turning South with Stillhouse Creek to Buchanan Fork County Road; thence going East along the North of the County Road to the place of beginning.

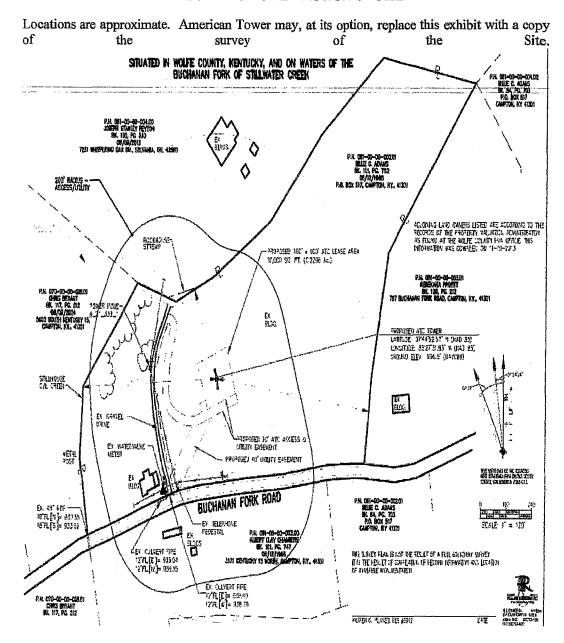
Excepted out of the property is twelve (12) foot acess road to the Albert Chambers property. The road was established by previous land owners.

Parcel I.D. MUNGER: 521-00-55-062.61

Site Name: Hazel Green KY Site Number: 281338

### **EXHIBIT** B

### DESCRIPTION OR DEPICTION OF SITE



Site Name: Hazel Green KY Site Number: 281338

### **EXHIBIT C**

### MEMORANDUM OF LEASE

[see following pages]

DB10/162

## RECEIVED

JUN 1 2 1998
WOLFE COUNTY CLERK
S. KENNETH LINDON

#### GENERAL WARRANTY DEED

THIS DEED OF CONVEYANCE, by and between Wilda Chambers Profitt, widow, of 780 Buchanan Fork Road, Campton, Kentucky, 41301; and Albert Clay Chambers and Linda Chambers, his wife, of 255 Townsend-Drake Road, Campton, Kentucky, 41301, parties of the first part, and Billie H. Chambers Adams, of P.O. Box 10, Campton, Kentucky, 41301, party of the second part.

WITNESSETH: That said parties of the first part, for and in consideration of a division of jointly owned property, the sufficiency of which is being acknowledged, do hereby give, grant, and convey unto the party of the second part, her heirs and assigns, all of their undivided two-thirds (2/3rds) interest in and to the following described property, to-wit:

A certain tract or parcel of land lying and being in Wolfe County, Kentucky, and on the waters of the Buchanan Fork of Stillwater Creek and bounded and described as follows:

Beginning at a marked steel post at the corner of Wilda Profitt land line and North side of Buchanan Fork County Road; thence running in a straight line North to a large marked beech tree standing on top of the ridge; thence going East along the Profitt land line to the corner of Billye Adams and Wilda Profitt land lines; thence continuing along the Adams line to a marked big twin hickory tree; thence in a Northwesterly direction over the hill to a marked tree at the forks of Rockhouse Stream; thence turning west and running with the stream to the intersection of Rockhouse Stream and Stillhouse Creek; thence turning South with Stillhouse Creek to Buchanan Fork County Road; thence going East along the North of the County Road to the place of beginning.

Excepted out of this property is a twelve (12) foot access road to the Albert Chambers property. The road was established by previous land owners.

Being all of first parties' undivided two-thirds (2/3rds) interest in a part of the same land conveyed to Daisy Chambers from Kate Rose, and others, by deed dated March 23, 1939, and of record in Deed Book 51, page 513; and being all of first parties' undivided two-thirds (2/3rds) interest in all of the same land conveyed to Daisy M. Chambers from Robert Rothman, and others, by deed dated March 21, 1940, and of record in Deed Book 52, page 421. First parties obtained title by devise from Daisy Marvin Chambers, see Will Book 5, page 87. Both instruments are of record in the Wolfe County Clerk's Office.

TO HAVE AND TO HOLD, the same together with all the appurtenances thereunto belonging unto the party of the second part, her heirs and assigns forever, with covenant of general warranty.

This instrument prepared by

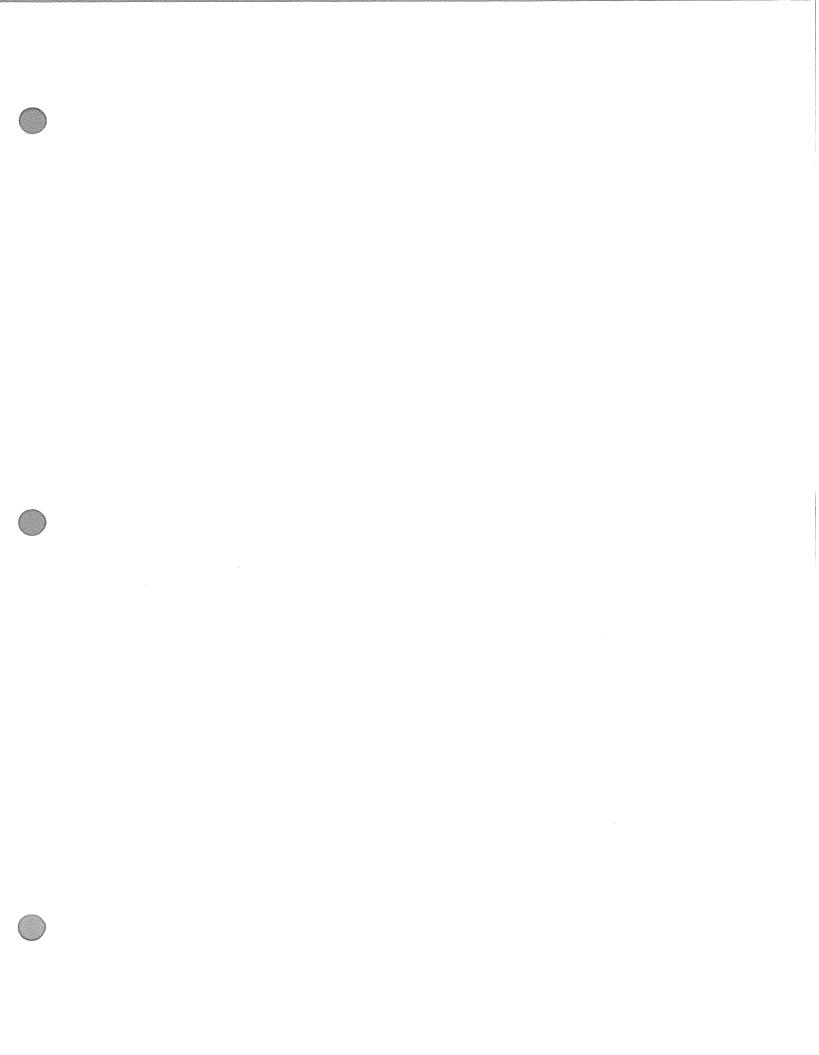
ATTORNEY AT LAW P.O. BOX 297

CAMPTON, KY 41301

WILDA CHAMBERS PROFITT

LBERT CLAY CHAMBERS

LINDA CHAMBERS



# **EXHIBIT K NOTIFICATION LISTING**

### **Hazel Green Landowner Notice List**

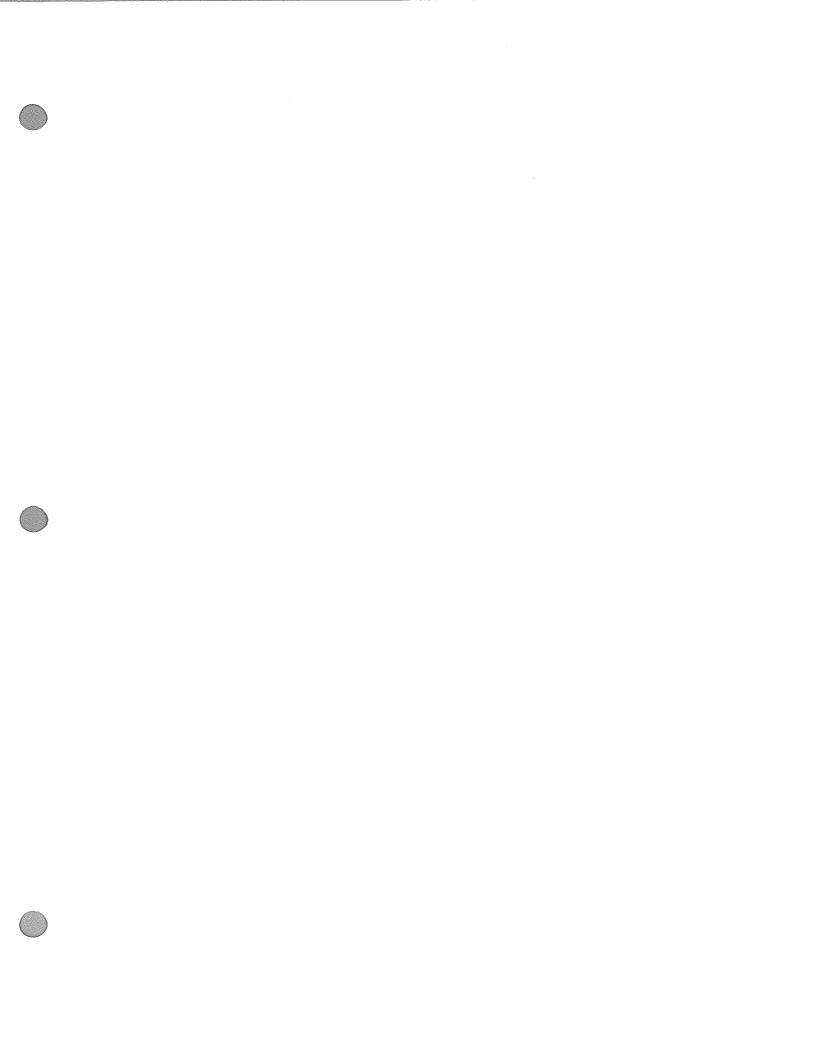
Billye C. Adams P.O. Box 517 Campton, KY 41301

Joseph Stanley Peyton 7231 Whispering Oak Drive Sylvania, OH 43560

Chris Bryant 5900 South Kentucky 15 Campton, KY 41301

Albert Clay Chambers 255 Townsend-Drake Road Campton, KY 41301

Rebekaha Profitt 797 Buchanan Fork Road Campton, KY 41301



## 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: HAZEL GREEN

Dear Landowner:

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility and American Towers LLC, a Delaware limited liability company d/b/a Delaware American Towers have filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 84 Garry Sparks Drive, Campton, KY 41301 (37°44′52.57" North latitude, 83°27′31.83" West longitude). The proposed facility will include a 290-foot tall antenna tower, plus a 9-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 Wolfe 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 2014-00044 in any correspondence sent in connection with this matter.

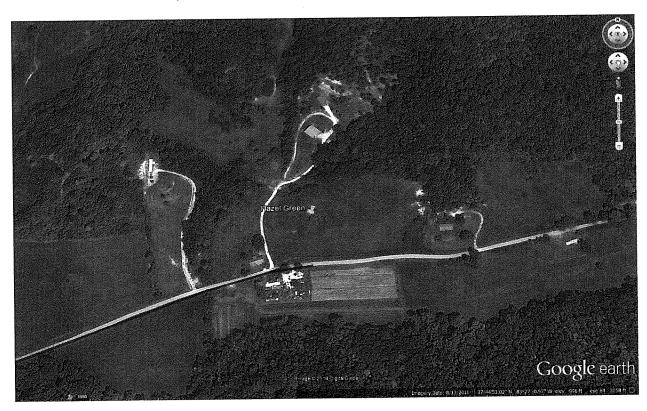
We have attached a map showing the site location for the proposed tower. AT&T Mobility's radio frequency engineers assisted in selecting the proposed site for the facility, and they have determined it is the proper location and elevation needed to provide quality service to wireless customers in the 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

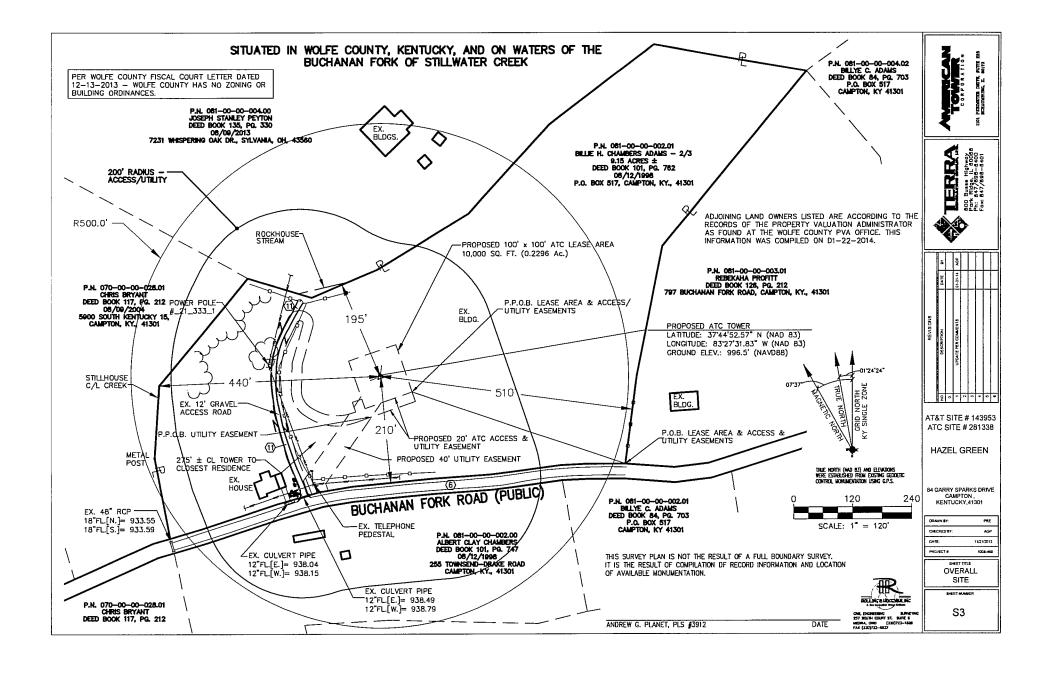
### **Driving Directions to Proposed Tower Site at Hazel Green**

- Beginning at the Wolfe County Courthouse, located at 10 Court Street, Campton, Kentucky 41301, travel south on Marion Street toward Main Street and go approximately 187 feet.
- 2. Take the first left onto KY-191/Main Street, continue to follow KY-191 and go approximately 1.1 miles.
- 3. Take a slight right to stay on KY-191 and go approximately 3.5 miles.
- 4. Take a slight right onto County Road 1812 and go approximately 1.0 miles.
- 5. Take the first left onto Buchanan Fork Road and go approximately 0.7 miles.
- 6. The proposed site is on the left at 84 Garry Sparks Drive, Campton, KY 41301.
- 7. The site coordinates are
  - a. North 37 deg 44' 52.57"
  - b. West 83 deg 27' 31.83"



Prepared by: Joseph C. Ernwine 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 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. Dennis Brooks
Wolfe County Judge Executive
10 Court Street
P.O. Box 429
Campton, KY 41301

RE: Notice of Proposal to Construct Wireless Communications Facility

Kentucky Public Service Commission Docket No. 2014-00044

Site Name: Hazel Green

### Dear Judge Brooks:

New Cingular Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Mobility and American Towers LLC, a Delaware limited liability company d/b/a Delaware American Towers have filed an application with the Kentucky Public Service Commission ("PSC") to construct a new wireless communications facility on a site located at 84 Garry Sparks Drive, Campton, KY 41301 (37°44'52.57" North latitude, 83°27'31.83" West longitude). The proposed facility will include a 290-foot tall antenna tower, plus a 9-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 2014-00044 in any correspondence sent in connection with this matter.

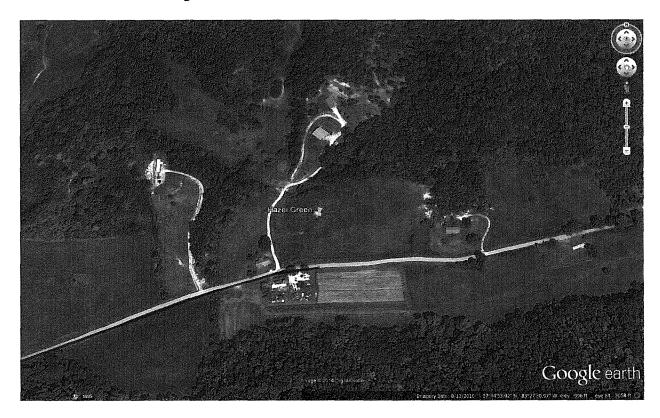
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Sincerely,

David A. Pike Attorney for AT&T Mobility enclosures

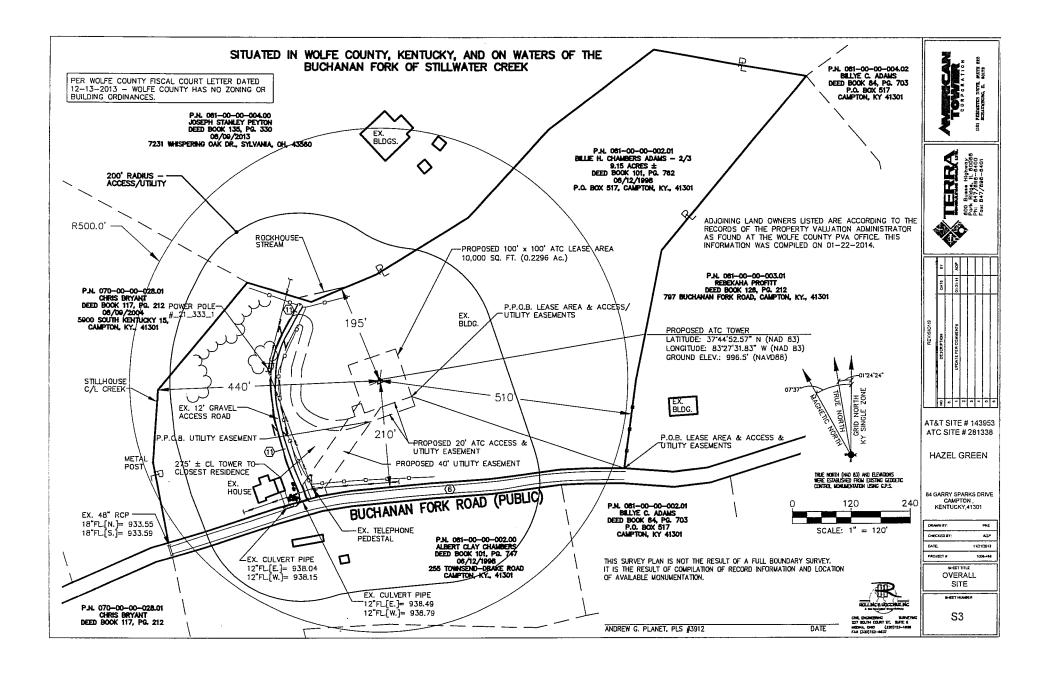
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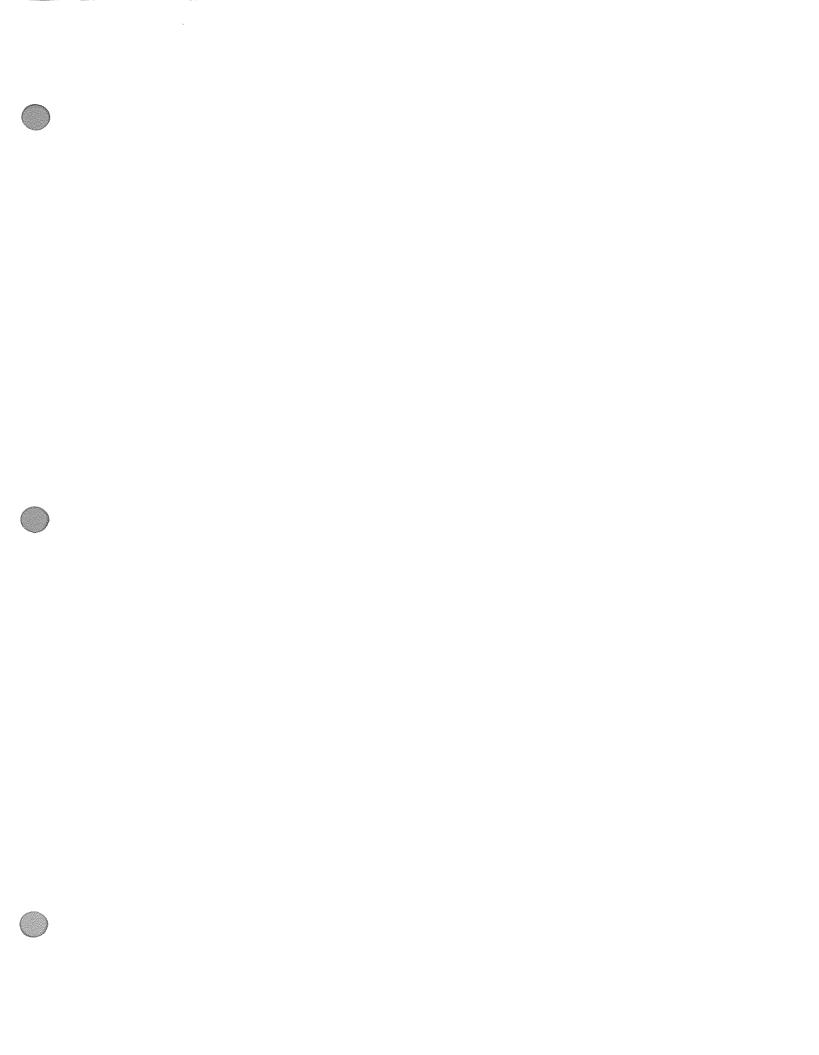
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Prepared by: Joseph C. Ernwine Pike Legal Group PLLC 1578 Highway 44 East, Suite 6 P.O. Box 369 Shepherdsville, KY 40165-3069

Telephone: 502-955-4400 or 800-516-4293





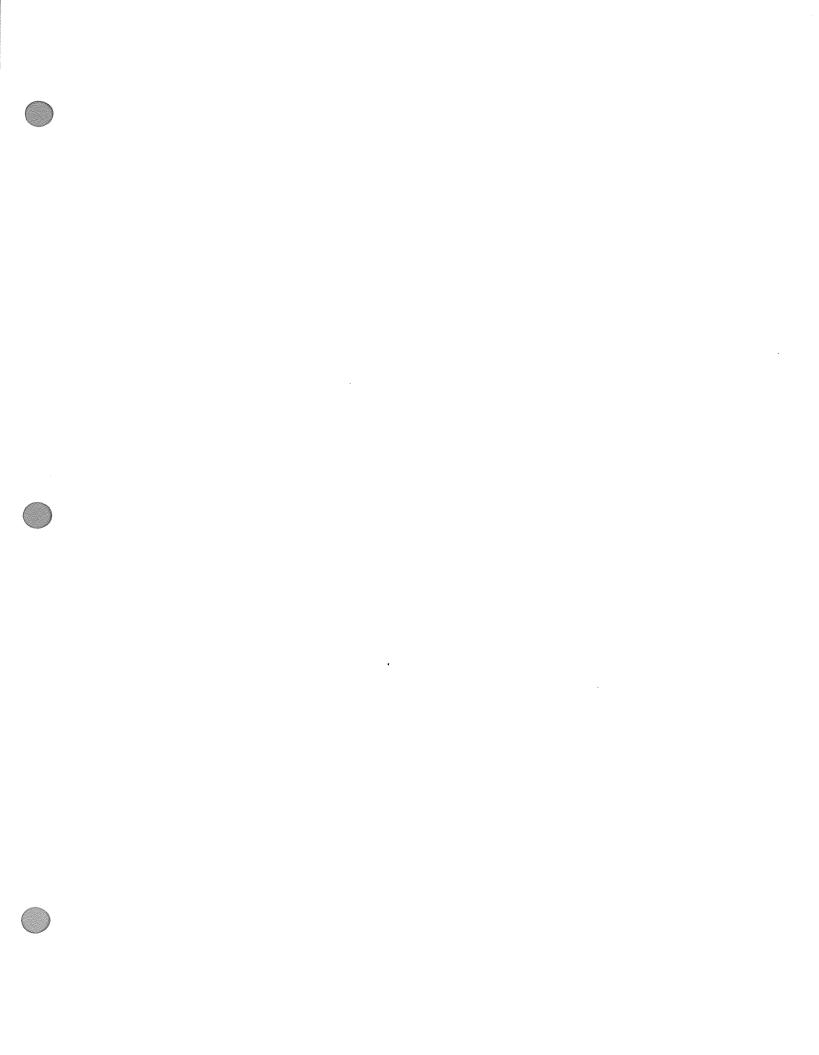
## EXHIBIT N COPY OF POSTED NOTICES

## SITE NAME: HAZEL GREEN 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. 2014-00044 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. 2014-00044 in your correspondence.



## EXHIBIT O COPY OF RADIO FREQUENCY DESIGN SEARCH AREA

