B

Type

[redacted]

Plans

BLD13-3469

Permit Number

14100

Street Number

BODEGA HWY

Street Name

TWI

Community Code

026-130-016

APN

PRMD County of Sonoma

S.C. Repro 3/10

COUNTY OF SONOMA - PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

2550 Ventura Avenue, Santa Rosa, CA 95403 (707) 565-1900 FAX (707) 565-1103

Please Print Your Name: Julie Epshteyn, Forza Telecom for AT&T | **Date Applied:** July 31st, 2013

INFORMATION WITHIN HEAVY LINE TO BE COMPLETED BY APPLICANT

SITE LOCATION INFORMATION - PRINT CLEARLY

Site Address: 14100 Bodega Highway	City: Bodega, CA		ZIP: 94923
Cross-Street: Freestone Valley Ford Rd.	APN: 026-130-016	Project Phone #: 925 951-7091	Project Fax #: 925 407-8263
Directions: please see plans	Email address: julie@forzatelecom.com	Unit #	Lot #
Describe Project: modification to existing AT&T monopole	Living Area: NA; Garage: NA; Decks: NA	Contract Price: $35,000	

OWNER NAME AND ADDRESS

Name: Adeline Blasi
Mailing Address: 400 Pleasant Avenue
City: Santa Rosa State: CA ZIP: 95403
Day Ph: ( ) Fax: ( )

APPLICANT NAME AND ADDRESS

Name: Julie Epshteyn, Forza Telecom for AT&T
Mailing Address: 1330 N. Broadway Suite 202
City: Walnut Creek State: CA ZIP: 94596
Day Ph: 925 951-7091 Fax: 925 407-8263

CONTRACTOR INFORMATION

Company Name: ~~TBD~~ MP NEXLEVEL OF CA. INC
Address: 4025 NELSON
City: CONCORD State: CA ZIP: 94512
Day Ph: 707 337 8791 Fax: ( )

OTHER PERSONS (ARCHITECT, ENGINEER, ETC.)

Name: Bechtel Communications
Address: 2430 Camino Ramon #240
City: San Ramon State: CA ZIP: 94583
Day Ph: ( ) Fax: ( )
License No: 81603 Exp. Date:

WORKER'S COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

☐ I have and will maintain a certificate of consent to self-insure for worker's compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☐ I have and will maintain worker's compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My worker's compensation insurance carrier and policy number are:

Carrier XL SPECIALTY INS CO. Policy No. CWD7709267

(This section need not be completed if the permit is for one hundred dollars ($100) or less).

☐ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the worker's compensation laws of California, and agree that if I should become subject to the worker's compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

Exp. Date: 8/31/14 Applicant: Michael Spencer

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

CONSTRUCTION LENDING DECLARATION

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued. (Sec. 3097, Civ. C.).

Lenders Name NA
Lenders Address NA

BR, VOH

OWNER-BUILDER DECLARATION

I hereby affirm under penalty of perjury that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5, Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractor's License Law (Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).):

☐ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his or her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he or she did not build or improve for the purpose of sale.).

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law.).

☐ I am exempt under Sec. _____, B & P.C. for this reason _____

By my signature below I acknowledge that, except for my personal residence in which I must have resided for at least one year prior to completion of the improvements covered by this permit, I cannot legally sell a structure that I have built as an owner-builder if it has not been constructed in its entirety by licensed contractors. I understand that a copy of the applicable law, Section 7044 of the Business and Professions Code, is available upon request when this application is submitted or at the following website: http://www.leginfo.ca.gov/calaw.html.

July 31st, 2013 Date — JEpshteyn Signature of Property Owner or Authorized Agent

LICENSED CONTRACTOR'S DECLARATION

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

Lic. Class C-7 C-10 Lic. No. 907019
Exp. Date 8/31/13 Contractor Michael Spencer

ASBESTOS DECLARATION

Written asbestos notification pursuant to Part 61 of Title 40 of the Code of Federal Regulations is required when asbestos exists in buildings, or portions thereof, undergoing demolition. I hereby declare that demolition authorized by this permit is from construction that (☐ does) (☒ does not) contain asbestos, or that ☐ no demolition is authorized by this permit.

I certify that I have read this application and affirm under penalty of perjury that the above information is correct. I agree to comply with all local Ordinances and State laws relating to building construction. I hereby authorize representatives of the County of Sonoma to enter upon the above-mentioned property for inspection purposes. If, after making the Certificate of Exemption for the Worker's Compensation provision of the Labor Code I should become subject to such provisions, I will forthwith comply. In the event I do not comply with the Workman's Compensation law, this permit shall be deemed revoked.

JEpshteyn Michael Spencer
PERMITTEE SIGNATURE

1330 N. Broadway #202 Walnut Creek, CA
ADDRESS CITY ZIP

☐ Contractor ☐ Owner ☐ Other Licensed Professional

THIS PERMIT SHALL EXPIRE IN THREE(3) YEARS FROM DATE FEES ARE PAID UNLESS OTHERWISE NOTED BY CODE ENFORCEMENT

FOR DEPARTMENT USE

Zoning LEA B6-160ac 2 SR | File No. UPE13-0024 | Acres 273.73
Existing Use/Structures SFD, Telecom Facility
Proposed Use/Structures Modify (e) telecom facility and add antennas
Zoning Min. Yard Requirements: Front 30 Left 10 Right 10 Back 20
NOTE: Fire Safe Standards require all parcels greater than 1 Acre to have a min. 30' setback unless mitigated. ☐ Mitigation Required ☐ Address subject to change

Approval for Permit Issuance: By: Scott D. Humpreys Date: 9/4/13
Approval for Occupancy: By: _____ Date: _____

Conditions: _____

Sewer Connection: ☐ Available ☐ Fees Paid
Approved by: _____ Date: _____

Road Encroachment: ☐ Fees Paid
Approved by: _____ Date: _____

Septic System Permit/Clearance # _____
Approved by: _____ Date: 09/04/2013

Flood Zone: ☐ Yes ☐ No 100 Year Flood Elevation: _____
Site Review _____
Drainage Review: Approved by: _____ Date: 4 Sep 13
Fire: Approved by: _____ Date: _____

Code Enforcement Violation ☐ Yes ☐ No Violation # _____
This permit is limited to _____ days.

Work Authorized: ~~Cell Site Modification~~ add antennas & Eq. cabinets

PLANS ON ROLL

☒ Plans Approved ☐ No Plans Subject to Field Inspection

Post FIRM	Alquist Priolo Report Available
Pre FIRM	Geotechnical report Available

Plancheck Cleared By	Date:	Type of Construction	Occupancy	No. of Stories	No. of Bedrooms
	10/18/13	VB	U		

Permit Cleared for Issuance By	Date:	Auto. Fire Sprinkler Req'd	No of Units	Certificate of Occupancy
	10-18-13	NO		

Machine Space for Permit Fee

PAYMENT REC'D
$ _____
NOV - 5 2013
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT
COUNTY OF SONOMA

Distribution: White - File Canary - Applicant Blue - Assessor Cardstock - Inspector

JOB ADDRESS: 14100 Bodega Hwy TWI
PERMIT NUMBER: BLD13 3469
INSPECTION AREA: 7

cmuller s:\handouts\cas\CIS-007.cdr Revised: 01/29/2009

131) SPECIAL INSPECTION REQUIRED	☐ YES	☒ NO	IF YES, SEE ADDITIONAL SHEET

INSPECTION RECORD	DATE	NAME	REMARKS
101) ROUGH GRADING			
103) FOUNDATION	1/17/14		
FORMS/SETBACK			
FOOTING			
WALLS			
106) ~~U/F~~ GROUND #	1/17/14		
104) CAISSONS/PIERS			
105) SLAB			
107) UNDERGROUND UTILITIES			
110) MASONRY			
109) RETAINING WALLS			
113) FIREPLACE			
FOOTING			
HEARTH/PROTECTION			
THROAT			
114) CHIMNEY			
120) UNDERFLOOR/UNDERSLAB			
115) HYDRONICS			
116) U/F ELECTRICAL			
117) U/F MECHANICAL			
118) U/F PLUMBING			
119) U/F FRAMING			
139) U/F INSULATION			
126) SHEAR WALLS			
☐ INTERIOR ☐ EXTERIOR			
127) DIAPHRAGMS			
☐ ROOF ☐ FLOOR			
134) SIDING/SHEATHING			
125) HOLD DOWNS			
132) CLOSE-IN			
122) ROUGH ELECTRICAL			
123) ROUGH MECHANICAL			
124) ROUGH PLUMBING			
128) ROUGH FRAME			
160) SMOKE DETECTORS			
139) INSULATION			
142) WALLBOARD			
143) FIREWALLS			
135) STUCCO/PLASTER			
☐ LATH ☐ SCRATCH			
137) ROOFING			
130) TUB/SHOWER PAN			
162) FIRE DAMPERS/DOORS			
164) SUSPENDED CEILING			
☐ ROUGH ELEC. ☐ ROUGH MECH.			
165) EXITING - RAMPS/STAIRS			
163) HANDRAILS/GUARDRAILS			
CORRIDORS/DOORS			
166) ACCESSIBILITY COMPLIANCE			
144) WATER TANKS			
☐ SLAB ☐ WALLS			
170) TEMPORARY OCCUPANCY			
171) TEMPORARY ELECTRICAL			
172) TEMPORARY GAS			
174) ELECTRIC METER AUTHORIZATION			
152) PANEL BOARDS/SERVICE			
189) SEPTIC ELECTRIC FINAL			
175) GAS METER AUTHORIZATION			
153) GAS PRESSURE TEST			
HOUSE YARD			
190) MANUF. HOME FOUNDATION			
191) MANUF. HOME INSTALLATION			
CONTINUITY			
STAIRS/SKIRTS			
RIDGE BOLTING			
193) MANUF. HOME COND. FINAL			
SWIMMING POOLS			
194) PRE-GUNITE			
195) PRE-DECK			
196) PRE-PLASTER/FENCE			
197) VINYL/FIBERGLASS POOL EXCAVATION			
102) GRADING FINAL	6/5/14	BT	
176) ELECTRICAL FINAL			
177) MECHANICAL FINAL			
178) PLUMBING FINAL			
199) FINAL	6/6/14	BT	
OCCUPANCY (OK TO OCCUPY)			

650) SUSMP INSPECTION		
651) NPDES EROSION COMPLIANCE		
652) NPDES SEDIMENT COMPLIANCE		
653) NPDES DOCS/SWPPP		
FIRE INSPECTION REQUIRED ☐ Yes ☒ No	DATE	NAME
759) KNOX BOX		
760) PROPANE TANK HOLD DOWNS		
770) SPRINKLER FINAL		
771) ABOVEGROUND HYDROSTATIC		
772) UNDERGROUND HYDROSTATIC		
773) UNDERGROUND FLUSH		
774) THRUST BLOCKS		
775) PIPE WELD		
776) HYDRANTS/APPLIANCES		
777) PUMP ACCEPTANCE		
778) WATER SUPPLY/TANK		
779) ALARM SYSTEM		
780) HOOD & DUCT SYSTEM		
781) ABOVEGROUND TANK/DISPENSER		
198) FIRE FINAL		

CLEARANCES:

FIRE ☐ Local ☐ County

HEALTH DEPARTMENT

ZONING

SANITATION

PLAN RETENTION REQUIRED? ☐ Yes ☐ No

PERMIT # BLD13-3469

sennis CIS-008.cdr Rev. 04/15/04

SITE EVALUATION SHEET

Address 14100 Bodega Hwy **PC#** 13-3469

Inspector 14100 Bodega Hwy **Date** 9-17-13

The proposed construction appears to be located in: Sebastopol

Flood Hazard:	[ ] FIRM Flood Zone (ASFH) BFE = _____ft. NAVD. Lowest finish floor at 12 above BFE = _____ft. NAVD. [ ] Design for moving water is recommended Section _____ is _____Ft/sec Section _____ is _____ Ft/sec [ ] Area subject to flooding (not on adopted FIRM). [ ] Project is on flood zone major damage list. [ ] Flood Prone Urban Area defined by Ordinance #4906.	[ ] Portions of property in flood zone but project site not in flood zone. [ ] Building is in FIRM Floodway. [ ] Main building on site is Post-FIRM. [ ] Sensitive drainage area, review by drainage section recommended. [ ] Appears to be a "substantial improvement" (40%), therefore flood regulations apply. [ ] Located inside the *Laguna de Santa Rosa* below elevation of 75 ft (Ordinance #4906).
Geo-technical:	[ ] Area of suspected slides, slumps, earth flow, or soil creep. (a) [ ] Area of previous fill placement. (g) [ ] Area of suspected expansive soil. (c) [ ] Area without sufficient slope setback as set forth in UBC Section 1806. (b) [ ] Area subject to possible liquefaction. (e) [ ] Area of suspected soft, compressible, or organic soil with low bearing capacity. **Soils Investigation:**	[ ] Area without recommended setback from stream (Drainage Division recommendations). [ ] Area of high moisture content in soil. (f) [ ] Area subject to high erosion (water or wind). [ ] Area of soft soil due to past deep ripping or cultivation below minimum foundation depth. (h) [ ] Area within 1000 feet of a solid waste disposal site. [ ] Non exempt structure per tech bulletin B-28. **Required [ ] Included [ ] Available [ ] Not Required [ ]**
Geologic:	[ ] Located in the Alquist-Priolo Special Studies Zone.	[ ] Geologic report required (see CGS Publication 42).
Seismic:	Seismic Design Category (SDC) D [ ] ~~E [ ]~~	[ ] Pictures available in S Drive
General:	[ ] Building addition will affect the required light and ventilation in an existing room. [ ] Existing electric meter must be replaced. [ ] Existing gas meter must be replaced. Slope is _____	[ ] Indications of existing substandard conditions that are not addressed by the proposed construction. [ ] Indications of past work done without a permit. [ ] Grading permit required for road, driveway, or site preparation. [ ] Site is likely to be acceptable for conventional construction methods.
Wind:	Exposure "B" Exposure "C" Exposure "D"	N.S.C. Air Pollution Control District.....[ ] Yes [ ] No

No problems

CHANGES TO FINAL APPROVED PLANS

Plans Examiner P. MARQUEZ Permit# BLD13-3469

Address: 14100 Bodega Hwy

	Original SqFt	**Final** SqFt		Original SqFt	**Final** SqFt
SFD			Decks		
Garage			Storage		
Porch			Misc		

Cell Site

One set of the original plans have been retained and are included in this package. **All revised plans that include any of the following** should be routed to the Planner who is assigned the project or who did the initial review for clearance prior to permit issuance. Should the Planner be out on leave, the cubicle planner will be contacted to conduct the second review.

☐ Projects with discretionary permits including design review approvals and use permits. **Note:** Only changes to the exterior or the footprint of the building require a second review.

☐ Projects located in one of the special zoning designations:

BR Biotic Resources **SD** Scenic Design

CC Coastal Combining **SR** Scenic Resources

Note: Only changes to the exterior or the footprint of the building require a second review.

☐ The relocation of a structure so it is not entirely within the building envelope (the building envelope should have been identified on the original plans)

☐ A change which impacts the zoning setbacks (the minimum setbacks should have been clearly identified on the permit application)

☐ Increased square footage of a second unit or guest house

☐ An increase in height over 35 feet for residential use unless more restrictive as conditioned by the subdivision (the maximum height should have been clearly identified on the permit application)

☐ A change to include the addition of a kitchen

If Planning does not review the revised plans based on the above criteria, the Plans Examiner will remove the original site plan sheet with the planning approval stamp and staple the sheet to the file copy of the approved revised plans. The Plans Examiner will check the box below.

☒ **Original Submittal. Plan Check approved.**

☐ **Changes to the final plans <u>do not</u> require a second planning review. Plan Check approved.**

☐ **Call in addition to the applicant:** _____

☐ **Other:** _____

Date: **March 22, 2013**

Robert Anslow
Crown Castle
5350 North 48th Street Suite 305
Chandler, AZ 85226

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
919-755-1012

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CCL00912
	Carrier Site Name:	BLASI PROPERTY
Crown Castle Designation:	**Crown Castle BU Number:**	827753
	Crown Castle Site Name:	SF-Mp Blasi Property
	Crown Castle JDE Job Number:	227315
	Crown Castle Work Order Number:	536345
	Crown Castle Application Number:	178975 Rev. 9
Engineering Firm Designation:	**FDH Engineering, Inc. Project Number:**	1318641400
Site Data:	**14100 BODEGA HWY, Bodega, Sonoma County, CA**	
	Latitude *38° 21' 19.811"*, Longitude *-122° 55' 48.781"*	
	62.5 Foot - Monopole Tower	

THESE ATTACHMENTS ARE PART OF THE APPROVED PLANS. DO NOT REMOVE THEM *
OCT 18 2013
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT
BUILDING PLAN CHECK
PERMIT # 13-3407

Dear Robert Anslow,

FDH Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 530243, in accordance with application 178975, revision 9.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA-222-G standard and 2010 California Building Code based upon a wind speed of 85 mph 3-second gust, exposure category C with topographic category 1 and crest height of 0 feet.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *FDH Engineering, Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

William G Price II, EI
Project Engineer

Reviewed by:

Christopher G. Ply, PE, SE
Vice President
CA PE License No. 72814

03/22/2013

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 62.5 ft Monopole tower designed by Diamond Services in February of 2003. The original design code and wind speed are unknown.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 85 mph with no ice, and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
53.0	53.0	3	kathrein	800 10764 K w/ Mount Pipe	1 2	3/8 3/4	-
		6	kathrein	860 10148			
47.0	47.0	1	crown mounts	Side Arm Mount [SO 102-3]	-	-	
		3	kathrein	742 264 w/ Mount Pipe			
		3	kathrein	800 10764 K w/ Mount Pipe			
43.0	43.0	1	crown mounts	Pipe Mount [PM 601-3]			
		3	ericsson	RRUS 11			
		1	raycap	DC6-48-60-18-8F			
39.0	39.0	1	crown mounts	Pipe Mount [PM 601-3]			
		3	ericsson	RRUS 11			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
62.0	62.0	2	decibel	DB961DD90T2E-M w/ Mount Pipe	24	7/8	1
		4	ems wireless	RR65-19-00DP w/ Mount Pipe			
		12	remec	G20045A1			
53.0	53.0	3	kathrein	742 264 w/ Mount Pipe	1	1/2	2
		3	ericsson	KRY 112 89/4	12	7/8	1
		3	kathrein	742 264 w/ Mount Pipe			
		6	kathrein	860 10025			
		1	crown mounts	Side Arm Mount [SO 102-3]			
47.0	47.0	6	ericsson	KRY 112 71/2	12	7/8	3
		6	kathrein	860 10025			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
40.0	40.0	1	andrew	HP4-102	1	1/2	1
		1	crown mounts	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment
2) Existing Equipment To Be Removed; Not Considered In This Analysis
3) Existing Equipment Relocated From El. 53'; Considered In This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Brown & Mills, Inc.	3516441	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Diamond Services	3672566	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Diamond Services	3672575	CCISITES
4-SITE PLAN/CONSTRUCTION DRAWING OF COMPOUND	Diamond Services	3516440	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Existing base plate grout was not considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Engineering, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	65 - 55.5	Pole	P2x.218 (2.38 OD)	1	-0.708	47.863	85.8	Pass
L2	55.5 - 2.5	Pole	P20x.375	2	-8.970	749.093	59.1	Pass
							Summary	
						Pole (L1)	85.8	Pass
						RATING =	85.8	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.3	Pass
1	Base Plate	0	38.1	Pass
1	Base Foundation	0	63.6	Pass
1	Base Foundation Soil Interaction	0	7.7	Pass

Structure Rating (max from all components) =	85.8%

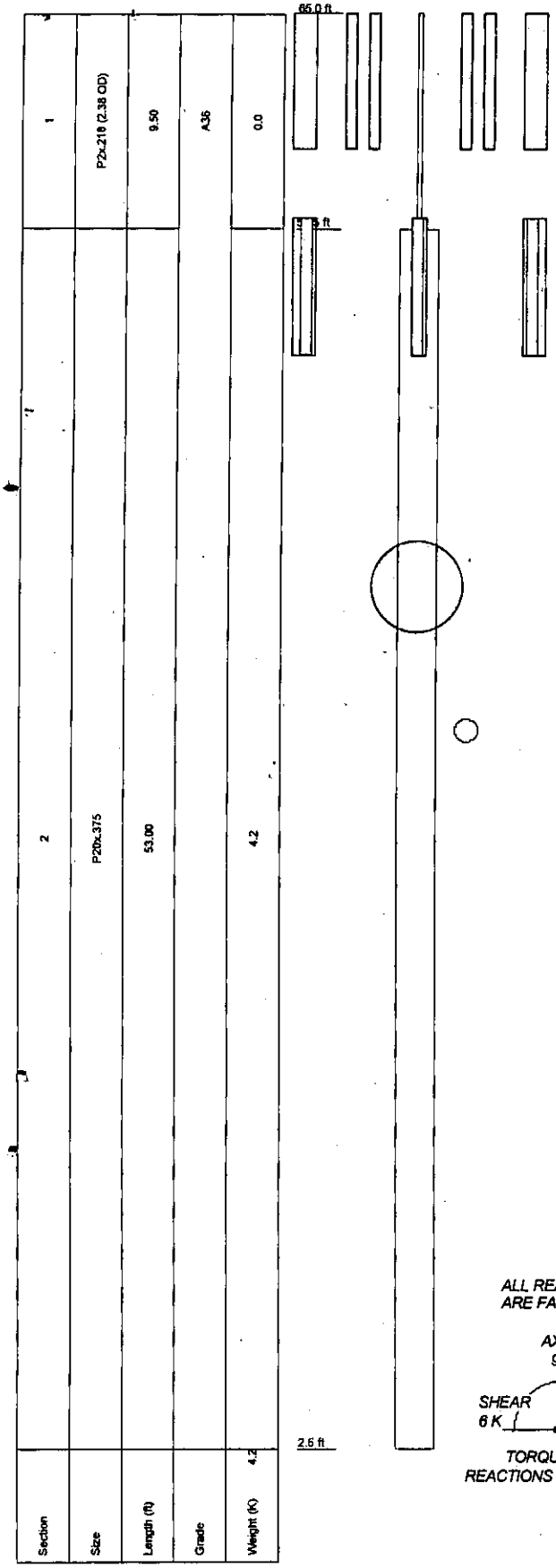
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loading. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



ALL REACTIONS ARE FACTORED

AXIAL 9 K

SHEAR 6 K

MOMENT 230 kip-ft

TORQUE 1 kip-ft

REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) OB961DD90T2E-M w/ Mount Pipe	62	742 264 w/ Mount Pipe	47
(4) G20045A1	62	800 10764 K w/ Mount Pipe	47
(2) RR65-19-00DP w/ Mount Pipe	62	(2) KRY 112 71/2	47
(4) G20045A1	62	(2) 860 10025	47
(2) RR65-19-00DP w/ Mount Pipe	62	742 264 w/ Mount Pipe	47
(4) G20045A1	62	800 10764 K w/ Mount Pipe	47
20' x 9.5' Concealment Cylinder	60.25	(2) KRY 112 71/2	47
Side Arm Mount [SO 102-3]	53	(2) 860 10025	47
KRY 112 89/4	53	742 264 w/ Mount Pipe	47
742 264 w/ Mount Pipe	53	800 10764 K w/ Mount Pipe	47
(2) 860 10025	53	(2) KRY 112 71/2	47
800 10764 K w/ Mount Pipe	53	(2) 860 10025	47
(2) 860 10148	53	Pipe Mount [PM 601-3]	43
KRY 112 89/4	53	RRUS 11	43
742 264 w/ Mount Pipe	53	RRUS 11	43
(2) 860 10025	53	RRUS 11	43
800 10764 K w/ Mount Pipe	53	DC6-48-60-18-8F	43
(2) 860 10148	53	Pipe Mount [PM 601-1]	40
742 264 w/ Mount Pipe	53	HP4-102	40
(2) 860 10025	53	RRUS 11	39
800 10764 K w/ Mount Pipe	53	RRUS 11	39
(2) 860 10148	53	RRUS 11	39
KRY 112 89/4	53	Pipe Mount [PM 601-3]	39
Side Arm Mount [SO 102-3]	47		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Sonoma County, California.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 85 mph basic wind in accordance with the TIA-222-G Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 85.8%

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: 919-755-1012
FAX: 919-755-1031
Tower Analysis

Job: SF436 Blasi Property, 827753			
Project: 1318641400			
Client: Crown Castle	Drawn by: William Price		App'd:
Code: TIA-222-G	Date: 03/22/13		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

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

Tower is located in Sonoma County, California.
Basic wind speed of 85 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination				

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	65.00-55.50	9.50	P2x.218 (2.38 OD)	A36 (36 ksi)	
L2	55.50-2.50	53.00	P20x.375	A36 (36 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 65.00-55.50				1	0	1		
L2 55.50-2.50				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	Surface Af (CaAa)	65.00 - 2.50	1	1	0.000 0.000	0.3750	1.1800	0.22
****									
AVA5-50(7/8")	C	Surface Ar (CaAa)	54.00 - 2.50	12	6	-0.350 -0.100	1.1020		0.30
AVA5-50(7/8")	C	Surface Ar (CaAa)	47.00 - 2.50	12	6	0.150 0.400	1.1020		0.30
WR-VG86ST-BRD(3/4)	C	Surface Ar (CaAa)	54.00 - 2.50	2	2	0.400 0.430	0.7740		0.59
FB-L98B-002-100000(3/8")	C	Surface Ar (CaAa)	54.00 - 2.50	1	1	0.440 0.440	0.3937		0.06

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
****								
LDF4-50A(1/2")	A	No	Inside Pole	40.00 - 2.50	1	No Ice	0.00	0.15
LDF5-50A(7/8")	A	No	Inside Pole	62.00 - 2.50	24	No Ice	0.00	0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	65.00-55.50	A	0.000	0.000	0.594	0.000	0.054
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	55.50-2.50	A	0.000	0.000	3.313	0.000	0.437
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	73.475	0.000	0.409

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	65.00-55.50	-0.2804	-0.1619	-0.2804	-0.1619
L2	55.50-2.50	-0.1862	1.0180	-0.1862	1.0180

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	55.50 - 65.00	1.0000	1.0000
L2	1	Safety Line 3/8	2.50 - 55.50	1.0000	1.0000
L2	6	AVA5-50(7/8")	2.50 - 54.00	1.0000	1.0000
L2	7	AVA5-50(7/8")	2.50 - 47.00	1.0000	1.0000
L2	9	WR-VG86ST-BRD(3/4)	2.50 - 54.00	1.0000	1.0000
L2	10	FB-L98B-002-100000(3/8")	2.50 - 54.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20" x 9.5' Concealment Cylinder	C	None		0.0000	60.25	No Ice	12.67	12.67	0.100
****									
(2) DB961DD90T2E-M w/ Mount Pipe	A	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	5.98	6.88	0.038
(4) G20045A1	A	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	0.75	0.48	0.013
(2) RR65-19-00DP w/ Mount Pipe	B	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	6.10	4.41	0.042
(4) G20045A1	B	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	0.75	0.48	0.013
(2) RR65-19-00DP w/ Mount Pipe	C	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	6.10	4.41	0.042
(4) G20045A1	C	From Leg	0.50 0.00 0.00	0.0000	62.00	No Ice	0.75	0.48	0.013
****									
Side Arm Mount [SO 102-3]	C	None		0.0000	53.00	No Ice	3.00	3.00	0.081
KRY 112 89/4	A	From Leg	2.00 0.00	0.0000	53.00	No Ice	0.65	0.42	0.015

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
742 264 w/ Mount Pipe	A	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	5.42	4.19	0.056
(2) 860 10025	A	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
800 10764 K w/ Mount Pipe	A	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	6.57	4.72	0.061
(2) 860 10148	A	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
KRY 112 89/4	B	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.65	0.42	0.015
742 264 w/ Mount Pipe	B	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	5.42	4.19	0.056
(2) 860 10025	B	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
800 10764 K w/ Mount Pipe	B	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	6.57	4.72	0.061
(2) 860 10148	B	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
742 264 w/ Mount Pipe	C	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	5.42	4.19	0.056
(2) 860 10025	C	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
800 10764 K w/ Mount Pipe	C	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	6.57	4.72	0.061
(2) 860 10148	C	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.16	0.14	0.001
KRY 112 89/4	C	From Leg	0.00 2.00 0.00 0.00	0.0000	53.00	No Ice	0.65	0.42	0.015
****									
Side Arm Mount [SO 102-3]	C	None		0.0000	47.00	No Ice	3.00	3.00	0.081
742 264 w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	5.42	4.19	0.056
800 10764 K w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	6.57	4.72	0.061
(2) KRY 112 71/2	A	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.68	0.51	0.013
(2) 860 10025	A	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.16	0.14	0.001

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
742 264 w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	5.42	4.19	0.056
800 10764 K w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	6.57	4.72	0.061
(2) KRY 112 71/2	B	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.68	0.51	0.013
(2) 860 10025	B	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.16	0.14	0.001
742 264 w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	5.42	4.19	0.056
800 10764 K w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	6.57	4.72	0.061
(2) KRY 112 71/2	C	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.68	0.51	0.013
(2) 860 10025	C	From Leg	2.00 0.00 0.00	0.0000	47.00	No Ice	0.16	0.14	0.001
****									
Pipe Mount [PM 601-3]	C	None		0.0000	43.00	No Ice	4.39	4.39	0.195
RRUS 11	A	From Leg	2.00 0.00 0.00	0.0000	43.00	No Ice	3.25	1.37	0.051
RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	43.00	No Ice	3.25	1.37	0.051
RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	43.00	No Ice	3.25	1.37	0.051
DC6-48-60-18-8F	C	From Leg	2.00 0.00 0.00	0.0000	43.00	No Ice	2.57	4.32	0.019
****									
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	40.00	No Ice	3.00	0.90	0.065
****									
Pipe Mount [PM 601-3]	C	None		0.0000	39.00	No Ice	4.39	4.39	0.195
RRUS 11	A	From Leg	2.00 0.00 0.00	0.0000	39.00	No Ice	3.25	1.37	0.051
RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	39.00	No Ice	3.25	1.37	0.051
RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	39.00	No Ice	3.25	1.37	0.051

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)		Aperture Area (ft^2)	Weight (K)
HP4-102	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		40.00	4.00	No Ice	12.57	0.079

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft^2)	Face	A_F (ft^2)	A_R (ft^2)	A_{leg} (ft^2)	Leg %	C_AA_A In Face (ft^2)	C_AA_A Out Face (ft^2)
L1 65.00-55.50	60.25	1.138	20	1.880	A	0.000	0.000	0.000	0.00	0.594	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 55.50-2.50	30.37	0.985	17	88.333	A	0.000	88.333	88.333	100.00	3.313	0.000
					B	0.000	88.333		100.00	0.000	0.000
					C	0.000	88.333		100.00	73.475	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft^2)	Face	A_F (ft^2)	A_R (ft^2)	A_{leg} (ft^2)	Leg %	C_AA_A In Face (ft^2)	C_AA_A Out Face (ft^2)
L1 65.00-55.50	60.25	1.138	9	1.880	A	0.000	0.000	0.000	0.00	0.594	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 55.50-2.50	30.37	0.985	7	88.333	A	0.000	88.333	88.333	100.00	3.313	0.000
					B	0.000	88.333		100.00	0.000	0.000
					C	0.000	88.333		100.00	73.475	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation (ft)	Add Weight (K)	Self Weight (K)	Face	e	C_F	q_z (psf)	D_F	D_R	A_E (ft^2)	F (K)	w (plf)	Ctrl. Face
L1	0.054	0.048	A	0	1.2	20	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			
			C	0	1.2		1	1	0.000			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L2 55.50-2.50	0.846	4.170	A	1	0.646	17	1	1	88.333	1.055	19.91	A
			B	1	0.613		1	1	88.333			
			C	1	0.6		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	29.404 kip-ft	1.055		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.054	0.048	A	0	1.2	20	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			
			C	0	1.2		1	1	0.000			
L2 55.50-2.50	0.846	4.170	A	1	0.6	17	1	1	88.333	1.055	19.91	B
			B	1	0.646		1	1	88.333			
			C	1	0.613		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	29.404 kip-ft	1.055		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.054	0.048	A	0	1.2	20	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			
			C	0	1.2		1	1	0.000			
L2 55.50-2.50	0.846	4.170	A	1	0.6	17	1	1	88.333	1.220	23.01	C
			B	1	0.677		1	1	88.333			
			C	1	0.747		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	33.995 kip-ft	1.220		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.054	0.048	A	0	1.2	9	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0	1.2		1	1	0.000			
L2 55.50-2.50	0.846	4.170	A	1	0.646	7	1	1	88.333	0.470	8.87	A
			B	1	0.613		1	1	88.333			
			C	1	0.6		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	13.109 kip-ft	0.470		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.054	0.048	A	0	1.2	9	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			
			C	0	1.2		1	1	0.000			
L2 55.50-2.50	0.846	4.170	A	1	0.6	7	1	1	88.333	0.470	8.87	B
			B	1	0.646		1	1	88.333			
			C	1	0.613		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	13.109 kip-ft	0.470		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.054	0.048	A	0	1.2	9	1	1	0.000	0.000	0.00	C
65.00-55.50			B	0	1.2		1	1	0.000			
			C	0	1.2		1	1	0.000			
L2 55.50-2.50	0.846	4.170	A	1	0.6	7	1	1	88.333	0.544	10.26	C
			B	1	0.677		1	1	88.333			
			C	1	0.747		1	1	88.333			
Sum Weight:	0.900	4.217						OTM	15.156 kip-ft	0.544		

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
20" x 9.5' Concealment Cylinder	0.0000	0.100	0.00	0.00	60.25	1.138	20	12.67	12.67

tnxTower	Job: SF436 Blasi Property, 827753	Page: 9 of 17
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: 919-755-1012 FAX: 919-755-1031	Project: 1318641400	Date: 16:25:26 03/22/13
	Client: Crown Castle	Designed by: William Price

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
DB961DD90T2E-M w/ Mount Pipe	0.0000	0.076	0.00	-0.60	62.00	1.144	20	11.95	13.75
G20045A1	0.0000	0.052	0.00	-0.60	62.00	1.144	20	2.99	1.92
RR65-19-00DP w/ Mount Pipe	120.0000	0.084	0.52	0.30	62.00	1.144	20	12.21	8.82
G20045A1	120.0000	0.052	0.52	0.30	62.00	1.144	20	2.99	1.92
RR65-19-00DP w/ Mount Pipe	240.0000	0.084	-0.52	0.30	62.00	1.144	20	12.21	8.82
G20045A1	240.0000	0.052	-0.52	0.30	62.00	1.144	20	2.99	1.92
Side Arm Mount [SO 102-3]	0.0000	0.081	0.00	0.00	53.00	1.107	19	3.00	3.00
KRY 112 89/4	0.0000	0.015	0.00	-2.83	53.00	1.107	19	0.65	0.42
742 264 w/ Mount Pipe	0.0000	0.056	0.00	-2.83	53.00	1.107	19	5.42	4.19
860 10025	0.0000	0.002	0.00	-2.83	53.00	1.107	19	0.33	0.27
800 10764 K w/ Mount Pipe	0.0000	0.061	0.00	-2.83	53.00	1.107	19	6.57	4.72
860 10148	0.0000	0.002	0.00	-2.83	53.00	1.107	19	0.33	0.27
KRY 112 89/4	120.0000	0.015	2.45	1.42	53.00	1.107	19	0.65	0.42
742 264 w/ Mount Pipe	120.0000	0.056	2.45	1.42	53.00	1.107	19	5.42	4.19
860 10025	120.0000	0.002	2.45	1.42	53.00	1.107	19	0.33	0.27
800 10764 K w/ Mount Pipe	120.0000	0.061	2.45	1.42	53.00	1.107	19	6.57	4.72
860 10148	120.0000	0.002	2.45	1.42	53.00	1.107	19	0.33	0.27
742 264 w/ Mount Pipe	240.0000	0.056	-2.45	1.42	53.00	1.107	19	5.42	4.19
860 10025	240.0000	0.002	-2.45	1.42	53.00	1.107	19	0.33	0.27
800 10764 K w/ Mount Pipe	240.0000	0.061	-2.45	1.42	53.00	1.107	19	6.57	4.72
860 10148	240.0000	0.002	-2.45	1.42	53.00	1.107	19	0.33	0.27
KRY 112 89/4	240.0000	0.015	-2.45	1.42	53.00	1.107	19	0.65	0.42
Side Arm Mount [SO 102-3]	0.0000	0.081	0.00	0.00	47.00	1.080	19	3.00	3.00
742 264 w/ Mount Pipe	0.0000	0.056	0.00	-2.83	47.00	1.080	19	5.42	4.19
800 10764 K w/ Mount Pipe	0.0000	0.061	0.00	-2.83	47.00	1.080	19	6.57	4.72
KRY 112 71/2	0.0000	0.026	0.00	-2.83	47.00	1.080	19	1.36	1.02
860 10025	0.0000	0.002	0.00	-2.83	47.00	1.080	19	0.33	0.27
742 264 w/ Mount Pipe	120.0000	0.056	2.45	1.42	47.00	1.080	19	5.42	4.19
800 10764 K w/ Mount Pipe	120.0000	0.061	2.45	1.42	47.00	1.080	19	6.57	4.72
KRY 112 71/2	120.0000	0.026	2.45	1.42	47.00	1.080	19	1.36	1.02
860 10025	120.0000	0.002	2.45	1.42	47.00	1.080	19	0.33	0.27
742 264 w/ Mount Pipe	240.0000	0.056	-2.45	1.42	47.00	1.080	19	5.42	4.19
800 10764 K w/ Mount Pipe	240.0000	0.061	-2.45	1.42	47.00	1.080	19	6.57	4.72
KRY 112 71/2	240.0000	0.026	-2.45	1.42	47.00	1.080	19	1.36	1.02
860 10025	240.0000	0.002	-2.45	1.42	47.00	1.080	19	0.33	0.27
Pipe Mount [PM 601-3]	0.0000	0.195	0.00	0.00	43.00	1.060	19	4.39	4.39
RRUS 11	0.0000	0.051	0.00	-2.83	43.00	1.060	19	3.25	1.37
RRUS 11	120.0000	0.051	2.45	1.42	43.00	1.060	19	3.25	1.37
RRUS 11	240.0000	0.051	-2.45	1.42	43.00	1.060	19	3.25	1.37
DC6-48-60-18-8F	240.0000	0.019	-2.45	1.42	43.00	1.060	19	2.57	4.32
Pipe Mount [PM 601-1]	0.0000	0.065	0.00	-1.33	40.00	1.044	18	3.00	0.90
Pipe Mount [PM 601-3]	0.0000	0.195	0.00	0.00	39.00	1.038	18	4.39	4.39
RRUS 11	0.0000	0.051	0.00	-2.83	39.00	1.038	18	3.25	1.37
RRUS 11	120.0000	0.051	2.45	1.42	39.00	1.038	18	3.25	1.37
RRUS 11	240.0000	0.051	-2.45	1.42	39.00	1.038	18	3.25	1.37
	Sum Weight:	2.285							

tnxTower	Job: SF436 Blasi Property, 827753	Page: 10 of 17
FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: 919-755-1012 FAX: 919-755-1031	Project: 1318641400	Date: 16:25:26 03/22/13
	Client: Crown Castle	Designed by: William Price

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight K	Offset$_x$ ft	Offset$_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20" x 9.5' Concealment Cylinder	0.0000	0.100	0.00	0.00	60.25	1.138	9	12.67	12.67
DB961DD90T2E-M w/ Mount Pipe	0.0000	0.076	0.00	-0.60	62.00	1.144	9	11.95	13.75
G20045A1	0.0000	0.052	0.00	-0.60	62.00	1.144	9	2.99	1.92
RR65-19-00DP w/ Mount Pipe	120.0000	0.084	0.52	0.30	62.00	1.144	9	12.21	8.82
G20045A1	120.0000	0.052	0.52	0.30	62.00	1.144	9	2.99	1.92
RR65-19-00DP w/ Mount Pipe	240.0000	0.084	-0.52	0.30	62.00	1.144	9	12.21	8.82
G20045A1	240.0000	0.052	-0.52	0.30	62.00	1.144	9	2.99	1.92
Side Arm Mount [SO 102-3]	0.0000	0.081	0.00	0.00	53.00	1.107	9	3.00	3.00
KRY 112 89/4	0.0000	0.015	0.00	-2.83	53.00	1.107	9	0.65	0.42
742 264 w/ Mount Pipe	0.0000	0.056	0.00	-2.83	53.00	1.107	9	5.42	4.19
860 10025	0.0000	0.002	0.00	-2.83	53.00	1.107	9	0.33	0.27
800 10764 K w/ Mount Pipe	0.0000	0.061	0.00	-2.83	53.00	1.107	9	6.57	4.72
860 10148	0.0000	0.002	0.00	-2.83	53.00	1.107	9	0.33	0.27
KRY 112 89/4	120.0000	0.015	2.45	1.42	53.00	1.107	9	0.65	0.42
742 264 w/ Mount Pipe	120.0000	0.056	2.45	1.42	53.00	1.107	9	5.42	4.19
860 10025	120.0000	0.002	2.45	1.42	53.00	1.107	9	0.33	0.27
800 10764 K w/ Mount Pipe	120.0000	0.061	2.45	1.42	53.00	1.107	9	6.57	4.72
860 10148	120.0000	0.002	2.45	1.42	53.00	1.107	9	0.33	0.27
742 264 w/ Mount Pipe	240.0000	0.056	-2.45	1.42	53.00	1.107	9	5.42	4.19
860 10025	240.0000	0.002	-2.45	1.42	53.00	1.107	9	0.33	0.27
800 10764 K w/ Mount Pipe	240.0000	0.061	-2.45	1.42	53.00	1.107	9	6.57	4.72
860 10148	240.0000	0.002	-2.45	1.42	53.00	1.107	9	0.33	0.27
KRY 112 89/4	240.0000	0.015	-2.45	1.42	53.00	1.107	9	0.65	0.42
Side Arm Mount [SO 102-3]	0.0000	0.081	0.00	0.00	47.00	1.080	8	3.00	3.00
742 264 w/ Mount Pipe	0.0000	0.056	0.00	-2.83	47.00	1.080	8	5.42	4.19
800 10764 K w/ Mount Pipe	0.0000	0.061	0.00	-2.83	47.00	1.080	8	6.57	4.72
KRY 112 71/2	0.0000	0.026	0.00	-2.83	47.00	1.080	8	1.36	1.02
860 10025	0.0000	0.002	0.00	-2.83	47.00	1.080	8	0.33	0.27
742 264 w/ Mount Pipe	120.0000	0.056	2.45	1.42	47.00	1.080	8	5.42	4.19
800 10764 K w/ Mount Pipe	120.0000	0.061	2.45	1.42	47.00	1.080	8	6.57	4.72
KRY 112 71/2	120.0000	0.026	2.45	1.42	47.00	1.080	8	1.36	1.02
860 10025	120.0000	0.002	2.45	1.42	47.00	1.080	8	0.33	0.27
742 264 w/ Mount Pipe	240.0000	0.056	-2.45	1.42	47.00	1.080	8	5.42	4.19
800 10764 K w/ Mount Pipe	240.0000	0.061	-2.45	1.42	47.00	1.080	8	6.57	4.72
KRY 112 71/2	240.0000	0.026	-2.45	1.42	47.00	1.080	8	1.36	1.02
860 10025	240.0000	0.002	-2.45	1.42	47.00	1.080	8	0.33	0.27
Pipe Mount [PM 601-3]	0.0000	0.195	0.00	0.00	43.00	1.060	8	4.39	4.39
RRUS 11	0.0000	0.051	0.00	-2.83	43.00	1.060	8	3.25	1.37
RRUS 11	120.0000	0.051	2.45	1.42	43.00	1.060	8	3.25	1.37
RRUS 11	240.0000	0.051	-2.45	1.42	43.00	1.060	8	3.25	1.37
DC6-48-60-18-8F	240.0000	0.019	-2.45	1.42	43.00	1.060	8	2.57	4.32
Pipe Mount [PM 601-1]	0.0000	0.065	0.00	-1.33	40.00	1.044	8	3.00	0.90
Pipe Mount [PM 601-3]	0.0000	0.195	0.00	0.00	39.00	1.038	8	4.39	4.39
RRUS 11	0.0000	0.051	0.00	-2.83	39.00	1.038	8	3.25	1.37
RRUS 11	120.0000	0.051	2.45	1.42	39.00	1.038	8	3.25	1.37
RRUS 11	240.0000	0.051	-2.45	1.42	39.00	1.038	8	3.25	1.37

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
	Sum Weight:	2.285							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
40.00	HP4-102	0.0000	0.079	0.00	-1.83	1.044	12.57	18
		Sum Weight:	0.079					

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
40.00	HP4-102	0.0000	0.079	0.00	-1.83	1.044	12.57	8
		Sum Weight:	0.079					

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	4.217					
Bracing Weight	0.000					
Total Member Self-Weight	4.217			0.113	0.104	
Total Weight	7.481			0.113	0.104	
Wind 0 deg - No Ice		-0.012	-3.363	-136.000	0.607	-0.174
Wind 30 deg - No Ice		1.558	-2.926	-118.249	-63.276	-0.257
Wind 60 deg - No Ice		2.763	-1.733	-69.729	-111.943	-0.330
Wind 90 deg - No Ice		3.447	-0.015	-0.424	-136.807	-0.314
Wind 120 deg - No Ice		2.805	1.841	73.810	-113.084	-0.009
Wind 150 deg - No Ice		1.657	3.111	124.414	-66.448	0.132
Wind 180 deg - No Ice		0.012	3.425	138.566	-0.399	0.174
Wind 210 deg - No Ice		-1.573	2.990	120.890	64.041	0.169
Wind 240 deg - No Ice		-2.745	1.792	72.184	111.482	0.183
Wind 270 deg - No Ice		-3.447	-0.040	-1.429	137.015	0.314
Wind 300 deg - No Ice	-2.822	-2.822	-1.781	-71.355	113.961	0.156
Wind 330 deg - No Ice		-1.642	-3.047	-121.773	66.099	-0.044
Total Weight	7.481			0.113	0.104	
Wind 0 deg - Service		-0.006	-1.499	-60.882	0.271	-0.077
Wind 30 deg - Service		0.695	-1.304	-52.968	-28.209	-0.114
Wind 60 deg - Service		1.232	-0.772	-31.337	-49.906	-0.147
Wind 90 deg - Service		1.537	-0.007	-0.439	-60.991	-0.140
Wind 120 deg - Service		1.250	0.821	32.656	-50.415	-0.004
Wind 150 deg - Service		0.739	1.387	55.216	-29.624	0.059
Wind 180 deg - Service		0.006	1.527	61.525	-0.178	0.077
Wind 210 deg - Service		-0.701	1.333	53.645	28.551	0.075

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 240 deg - Service		-1.224	0.799	31.931	49.701	0.082
Wind 270 deg - Service		-1.537	-0.018	-0.888	61.085	0.140
Wind 300 deg - Service		-1.258	-0.794	-32.062	50.806	0.070
Wind 330 deg - Service		-0.732	-1.358	-54.539	29.468	-0.020

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	Dead+Wind 0 deg - Service
27	Dead+Wind 30 deg - Service
28	Dead+Wind 60 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 120 deg - Service
31	Dead+Wind 150 deg - Service
32	Dead+Wind 180 deg - Service
33	Dead+Wind 210 deg - Service
34	Dead+Wind 240 deg - Service
35	Dead+Wind 270 deg - Service
36	Dead+Wind 300 deg - Service
37	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	65 - 55.5	Pole	Max Tension	31	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	6	-0.709	-1.995	1.149
			Max. Mx	20	-0.709	2.308	-0.005
			Max. My	14	-0.708	0.000	-2.315
			Max. Vy	20	-0.481	0.307	-0.006
			Max. Vx	14	0.481	0.000	-0.313
			Max. Torque	20			0.000
L2	55.5 - 2.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-8.971	-182.501	113.686
			Max. Mx	20	-8.971	223.251	2.373
			Max. My	14	-8.970	-0.691	-225.780
			Max. Vy	20	-5.526	223.251	2.373
			Max. Vx	14	5.492	-0.691	-225.780
			Max. Torque	6			0.529

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	6	8.978	-4.421	2.772
	Max. H_x	21	6.733	5.515	0.064
	Max. H_z	3	6.733	0.020	5.380
	Max. M_x	2	221.698	0.020	5.380
	Max. M_z	8	222.995	-5.515	0.025
	Max. Torsion	6	0.529	-4.421	2.772
	Min. Vert	13	6.733	-2.651	-4.977
	Min. H_x	9	6.733	-5.515	0.025
	Min. H_z	15	6.733	-0.020	-5.480
	Min. M_x	14	-225.780	-0.020	-5.480
	Min. M_z	20	-223.251	5.515	0.064
	Min. Torsion	20	-0.504	5.515	0.064

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	7.481	0.000	-0.000	0.113	0.104	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	8.978	-0.020	-5.380	-221.698	0.946	-0.277
0.9 Dead+1.6 Wind 0 deg - No Ice	6.733	-0.020	-5.380	-220.695	0.910	-0.277
1.2 Dead+1.6 Wind 30 deg - No Ice	8.978	2.493	-4.681	-192.768	-103.180	-0.412
0.9 Dead+1.6 Wind 30 deg - No Ice	6.733	2.493	-4.681	-191.900	-102.726	-0.412
1.2 Dead+1.6 Wind 60 deg - No Ice	8.978	4.421	-2.772	-113.686	-182.501	-0.529
0.9 Dead+1.6 Wind 60 deg - No Ice	6.733	4.421	-2.772	-113.189	-181.675	-0.529
1.2 Dead+1.6 Wind 90 deg - No Ice	8.978	5.515	-0.025	-0.735	-222.995	-0.504
0.9 Dead+1.6 Wind 90 deg - No	6.733	5.515	-0.025	-0.767	-221.987	-0.503

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.6 Wind 120 deg - No Ice	8.978	4.487	2.945	120.231	-184.356	-0.015
0.9 Dead+1.6 Wind 120 deg - No Ice	6.733	4.487	2.945	119.639	-183.523	-0.014
1.2 Dead+1.6 Wind 150 deg - No Ice	8.978	2.651	4.977	202.698	-108.339	0.211
0.9 Dead+1.6 Wind 150 deg - No Ice	6.733	2.651	4.977	201.721	-107.863	0.211
1.2 Dead+1.6 Wind 180 deg - No Ice	8.978	0.020	5.480	225.780	-0.691	0.277
0.9 Dead+1.6 Wind 180 deg - No Ice	6.733	0.020	5.480	224.691	-0.720	0.277
1.2 Dead+1.6 Wind 210 deg - No Ice	8.978	-2.517	4.784	196.970	104.341	0.269
0.9 Dead+1.6 Wind 210 deg - No Ice	6.733	-2.517	4.784	196.017	103.819	0.269
1.2 Dead+1.6 Wind 240 deg - No Ice	8.978	-4.392	2.867	117.587	181.668	0.292
0.9 Dead+1.6 Wind 240 deg - No Ice	6.733	-4.392	2.867	117.006	180.782	0.292
1.2 Dead+1.6 Wind 270 deg - No Ice	8.978	-5.515	-0.064	-2.373	223.251	0.504
0.9 Dead+1.6 Wind 270 deg - No Ice	6.733	-5.515	-0.064	-2.397	222.178	0.503
1.2 Dead+1.6 Wind 300 deg - No Ice	8.978	-4.515	-2.850	-116.330	185.699	0.252
0.9 Dead+1.6 Wind 300 deg - No Ice	6.733	-4.516	-2.850	-115.823	184.797	0.252
1.2 Dead+1.6 Wind 330 deg - No Ice	8.978	-2.627	-4.874	-198.496	107.688	-0.069
0.9 Dead+1.6 Wind 330 deg - No Ice	6.733	-2.628	-4.874	-197.605	107.152	-0.069
Dead+Wind 0 deg - Service	7.481	-0.006	-1.499	-61.488	0.333	-0.077
Dead+Wind 30 deg - Service	7.481	0.694	-1.304	-53.454	-28.581	-0.115
Dead+Wind 60 deg - Service	7.481	1.231	-0.772	-31.494	-50.607	-0.147
Dead+Wind 90 deg - Service	7.481	1.536	-0.007	-0.128	-61.854	-0.140
Dead+Wind 120 deg - Service	7.481	1.250	0.820	33.465	-51.123	-0.004
Dead+Wind 150 deg - Service	7.481	0.739	1.387	56.366	-30.014	0.059
Dead+Wind 180 deg - Service	7.481	0.006	1.527	62.774	-0.121	0.077
Dead+Wind 210 deg - Service	7.481	-0.701	1.333	54.774	29.045	0.075
Dead+Wind 240 deg - Service	7.481	-1.223	0.799	32.730	50.517	0.082
Dead+Wind 270 deg - Service	7.481	-1.536	-0.018	-0.583	62.066	0.140
Dead+Wind 300 deg - Service	7.481	-1.258	-0.794	-32.228	51.637	0.070
Dead+Wind 330 deg - Service	7.481	-0.732	-1.358	-55.046	29.975	-0.019

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-7.481	0.000	-0.000	7.481	0.000	0.000%
2	-0.020	-8.978	-5.381	0.020	8.978	5.380	0.004%
3	-0.020	-6.733	-5.381	0.020	6.733	5.380	0.003%
4	2.493	-8.978	-4.681	-2.493	8.978	4.681	0.004%
5	2.493	-6.733	-4.681	-2.493	6.733	4.681	0.003%
6	4.421	-8.978	-2.772	-4.421	8.978	2.772	0.004%
7	4.421	-6.733	-2.772	-4.421	6.733	2.772	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
8	5.515	-8.978	-0.025	-5.515	8.978	0.025	0.004%
9	5.515	-6.733	-0.025	-5.515	6.733	0.025	0.003%
10	4.487	-8.978	2.945	-4.487	8.978	-2.945	0.004%
11	4.487	-6.733	2.945	-4.487	6.733	-2.945	0.003%
12	2.651	-8.978	4.978	-2.651	8.978	-4.977	0.004%
13	2.651	-6.733	4.978	-2.651	6.733	-4.977	0.003%
14	0.020	-8.978	5.481	-0.020	8.978	-5.480	0.004%
15	0.020	-6.733	5.481	-0.020	6.733	-5.480	0.003%
16	-2.517	-8.978	4.784	2.517	8.978	-4.784	0.004%
17	-2.517	-6.733	4.784	2.517	6.733	-4.784	0.003%
18	-4.392	-8.978	2.867	4.392	8.978	-2.867	0.004%
19	-4.392	-6.733	2.867	4.392	6.733	-2.867	0.003%
20	-5.515	-8.978	-0.064	5.515	8.978	0.064	0.004%
21	-5.515	-6.733	-0.064	5.515	6.733	0.064	0.003%
22	-4.516	-8.978	-2.850	4.515	8.978	2.850	0.004%
23	-4.516	-6.733	-2.850	4.516	6.733	2.850	0.003%
24	-2.628	-8.978	-4.875	2.627	8.978	4.874	0.004%
25	-2.628	-6.733	-4.875	2.628	6.733	4.874	0.003%
26	-0.006	-7.481	-1.499	0.006	7.481	1.499	0.007%
27	0.695	-7.481	-1.304	-0.694	7.481	1.304	0.007%
28	1.232	-7.481	-0.772	-1.231	7.481	0.772	0.006%
29	1.537	-7.481	-0.007	-1.536	7.481	0.007	0.007%
30	1.250	-7.481	0.821	-1.250	7.481	-0.820	0.007%
31	0.739	-7.481	1.387	-0.739	7.481	-1.387	0.007%
32	0.006	-7.481	1.527	-0.006	7.481	-1.527	0.007%
33	-0.701	-7.481	1.333	0.701	7.481	-1.333	0.007%
34	-1.224	-7.481	0.799	1.223	7.481	-0.799	0.007%
35	-1.537	-7.481	-0.018	1.536	7.481	0.018	0.007%
36	-1.258	-7.481	-0.794	1.258	7.481	0.794	0.007%
37	-0.732	-7.481	-1.358	0.732	7.481	1.358	0.007%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00000001	0.00008524
3	Yes	12	0.00000001	0.00007033
4	Yes	12	0.00000001	0.00006485
5	Yes	12	0.00000001	0.00005312
6	Yes	12	0.00000001	0.00007198
7	Yes	12	0.00000001	0.00005987
8	Yes	12	0.00000001	0.00008658
9	Yes	12	0.00000001	0.00007147
10	Yes	12	0.00000001	0.00006457
11	Yes	12	0.00000001	0.00005292
12	Yes	12	0.00000001	0.00006597
13	Yes	12	0.00000001	0.00005351
14	Yes	12	0.00000001	0.00008597
15	Yes	12	0.00000001	0.00007065
16	Yes	12	0.00000001	0.00007100
17	Yes	12	0.00000001	0.00005842
18	Yes	12	0.00000001	0.00006290
19	Yes	12	0.00000001	0.00005157
20	Yes	12	0.00000001	0.00008682
21	Yes	12	0.00000001	0.00007165

22	Yes	12	0.00000001	0.00006781
23	Yes	12	0.00000001	0.00005586
24	Yes	12	0.00000001	0.00006819
25	Yes	12	0.00000001	0.00005580
26	Yes	10	0.00000001	0.00012551
27	Yes	10	0.00000001	0.00012254
28	Yes	10	0.00000001	0.00012126
29	Yes	10	0.00000001	0.00012609
30	Yes	10	0.00000001	0.00012324
31	Yes	10	0.00000001	0.00012722
32	Yes	10	0.00000001	0.00012799
33	Yes	10	0.00000001	0.00012511
34	Yes	10	0.00000001	0.00012230
35	Yes	10	0.00000001	0.00012659
36	Yes	10	0.00000001	0.00012289
37	Yes	10	0.00000001	0.00012515

Compression Checks

Pole Design Data

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (K)	ϕP_n (K)	Ratio $\frac{P_u}{\phi P_n}$
L1	65 - 55.5 (1)	P2x.218 (2.38 OD)	9.50	0.00	0.0	1.4773	-0.708	47.863	0.015
L2	55.5 - 2.5 (2)	P20x.375	53.00	0.00	0.0	23.1202	-8.970	749.093	0.012

Pole Bending Design Data

Section No.	Elevation (ft)	Size	M_{ux} (kip-ft)	ϕM_{nx} (kip-ft)	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} (kip-ft)	ϕM_{ny} (kip-ft)	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	65 - 55.5 (1)	P2x.218 (2.38 OD)	2.316	2.748	0.843	0.000	2.748	0.000
L2	55.5 - 2.5 (2)	P20x.375	229.834	390.003	0.589	0.000	390.003	0.000

Pole Shear Design Data

Section No.	Elevation (ft)	Size	Actual V_u (K)	ϕV_n (K)	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u (kip-ft)	ϕT_n (kip-ft)	Ratio $\frac{T_u}{\phi T_n}$
L1	65 - 55.5 (1)	P2x.218 (2.38 OD)	0.466	23.932	0.019	0.000	3.947	0.000
L2	55.5 - 2.5 (2)	P20x.375	5.651	374.547	0.015	0.211	601.274	0.000

Pole Interaction Design Data

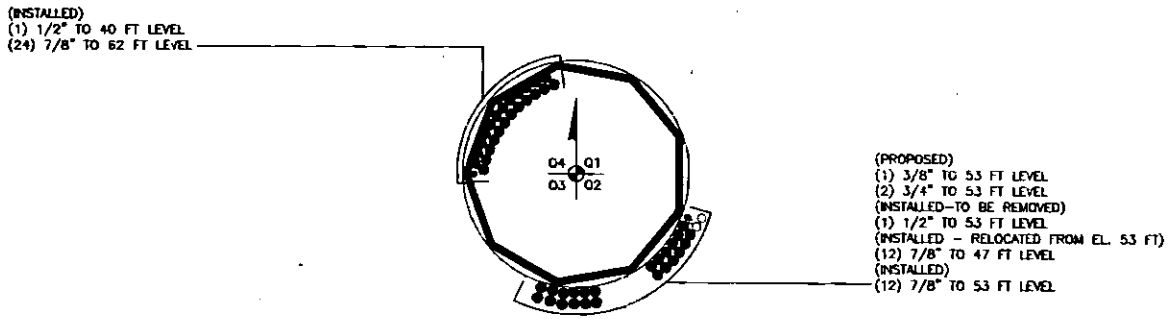
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	65 - 55.5 (1)	0.015	0.843	0.000	0.019	0.000	0.858 ✔	1.000	4.8.2 ✔
L2	55.5 - 2.5 (2)	0.012	0.589	0.000	0.015	0.000	0.602 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	65 - 55.5	Pole	P2x.218 (2.38 OD)	1	-0.708	47.863	85.8	Pass
L2	55.5 - 2.5	Pole	P20x.375	2	-8.970	749.093	60.2	Pass
							Summary	
						Pole (L1)	85.8	Pass
						RATING =	**85.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 827753 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU #: *827753*
Site Name: *SF436 Blasi Property*
App #:

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	4	
Diam:	1.5	in
Rod Material:	Other	
Yield, Fy:	90	ksi
Strength, Fu:	105	ksi
Bolt Circle:	31.112698	in

Plate Data		
W=Side:	27	in
Thick:	3	in
Grade:	36	ksi
Clip Distance:	6	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi
Clear Space between Stiffeners at B.C.		in

Pole Data		
Diam:	20	in
Thick:	0.375	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	230	ft-kips
Factored Axial, Pu:	9	kips
Factored Shear, Vu:	6	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	94.0 Kips
Axial Design Strength, Φ*Fu*Anet:	118.4 Kips
Anchor Rod Stress Ratio:	79.3% Pass

Base Plate Results — Flexural Check

Base Plate Stress:	12.4 ksi
PL Design Bending Strength, Φ*Fy:	32.4 ksi
Base Plate Stress Ratio:	38.1% Pass

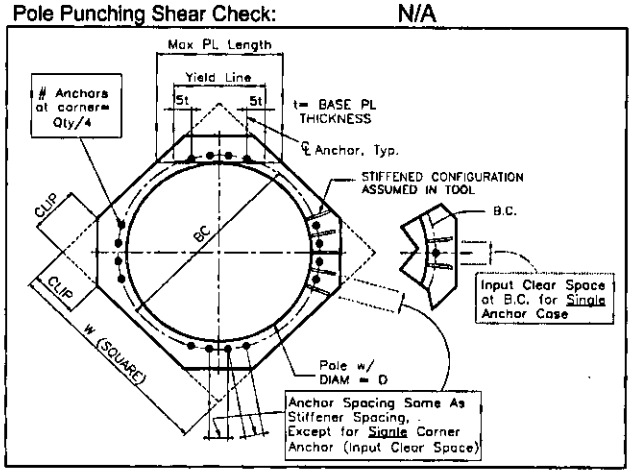
PL Ref. Data
Yield Line (in): 18.18
Max PL Length: 18.18

N/A - Unstiffened
Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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FDH Engineering

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*****************************************************************************************
*                                                                                       *
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*                                                                                       *
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Project Title: SF436 Blasi Property, 827753
Project Notes: 1318641400

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
3.50	2.50	3.00	60.00

Soil Properties

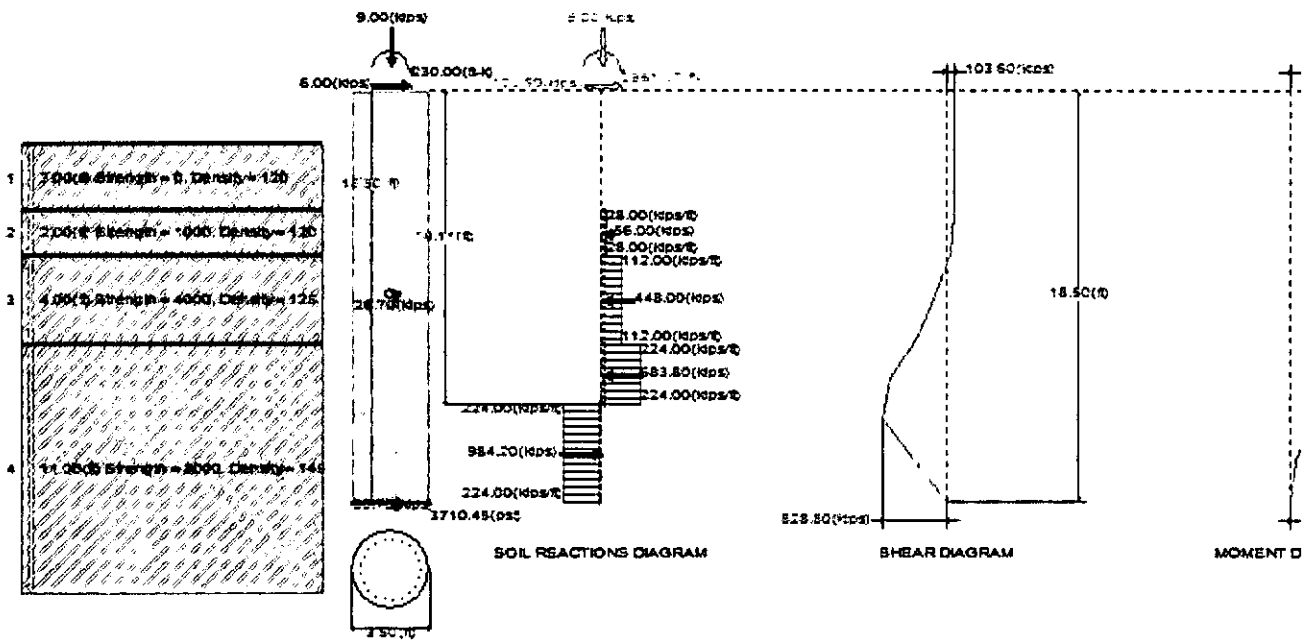
Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.00	0.00	120.0			
2	Clay	2.00	3.00	120.0	1000.0		
3	Clay	4.00	5.00	125.0	4000.0		
4	Clay	11.00	9.00	145.0	8000.0		

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
230.0	9.0	6.00	17.17

FDN Capacity: 1.33/17.17*100 = 7.7%

******* R E S U L T S



Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
18.500	26.699	935.4	2775.0	3710.4

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	2.50	3.00	120.0			0.00	4.00
Clay	5.50	2.00	120.0	1000.0		56.00	6.50
Clay	7.50	4.00	125.0	4000.0		448.00	9.50
Clay	11.50	2.61	145.0	8000.0		583.80	12.80
Clay	14.11	4.39	145.0	8000.0		-984.20	16.30

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	103.6	3951.1	6.0	230.1
1.85	103.6	4142.7	6.0	241.3
3.70	103.6	4334.4	6.0	252.4
5.55	102.2	4526.0	6.0	263.6
7.40	50.4	4667.2	2.9	271.8
9.25	-148.4	4583.9	-8.6	267.0
11.10	-355.6	4117.7	-20.7	239.8
12.95	-725.2	3150.4	-42.2	183.5
14.80	-828.8	1533.3	-48.3	89.3
16.65	-414.4	383.3	-24.1	22.3
18.50	0.0	-0.0	0.0	-0.0

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *827753*
Site Name: *SF436 Blasi Property*
App #:

Loads Already Factored		
For M (WL)	1.3	<----Disregard
For P (DL)	1.3	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	3.5	ft
Concrete Area =	1385.4	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	3	
Vert. Cage Diameter =	2.88	ft
Vert. Cage Diameter =	34.50	in
Vertical Bar Size =	6	
Bar Diameter =	0.75	in
Bar Area =	0.44	in^2
Number of Bars =	12	
As Total=	5.28	in^2
A s/ Aconc, Rho:	0.0038	0.38%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.38%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	1994.83	kips
at Mu=(ϕ=0.65)Mn=	601.53	ft-kips
Max Tu, (φ=0.9) Tn =	285.12	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	G	
Max. Factored Shaft Mu:	271.8	ft-kips (* Note)
Max. Factored Shaft Pu:	9	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

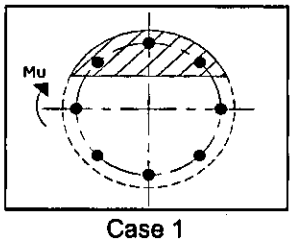
Load Factor	Shaft Factored Loads		
1.00	Mu:	271.8	ft-kips
1.00	Pu:	9	kips

Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2008	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	**High**	

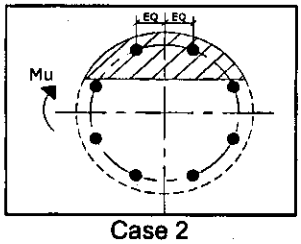
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis: **5.93** in
Extreme Steel Strain, εt: **0.0161**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	9.00	kips
Drilled Shaft Moment Capacity, φMn:	**427.21**	ft-kips
Drilled Shaft Superimposed Mu:	**271.80**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**63.6%**