



1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051
Attn: Ms. Melanie Bachman, Executive Director

Re: Notice of Exempt Modification Application
Manchester Police Department Tower
239 Middle Turnpike East
Manchester, CT 06040

September 18, 2017

Dear Ms. Bachman:

On behalf of Sprint Spectrum Realty Company, L.P. ("Sprint"), enclosed for filing are an original and two (2) copies of Sprint's Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. A soft copy will also be forwarded.

I also enclose herewith a check in the amount of \$625.00 representing the fee for the Notice of Exempt Modification.

If you have any questions, please feel free to contact me.

Thank you,

By: *Paul F. Sagristano*

Paul F. Sagristano
Cherundolo Consulting
4 Davis Road West, Suite 5
Old Lyme, CT 06371
917.841.0247
psagristano@lrvassoc.com



1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Ms. Melanie Bachman
Executive Director
CT Siting Council
10 Franklin Square
New Britain, CT 06051

September 18, 2017

Re: Notice of Exempt Modification –
Existing Sprint Telecommunication Facility
239 Middle Turnpike East, Manchester, CT
Latitude: N41.78444
Longitude: W72.51166

Dear Ms. Bachman:

Sprint currently maintains three (3) existing telecommunications antennas, 3 tower mounted amplifiers, 3 Clearwire antennas, 3 Clearwire Parabolic Dishes and associated equipment at the 154' level of an existing 190' multicarrier telecommunications tower at 239 Middle Turnpike East in Manchester, Connecticut. Sprint intends to replace 3 existing Clearwire panel antennas with three (3) new panel antennas to existing pipe mounts as well as (3) new tower mounted amplifiers. Sprint is performing a new high-performance air interface upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The facility noted above was approved for collocation for Sprint by CT Siting Council on July 18, 2002. A copy of this approval is attached.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to Mr. Jay Moran, Mayor of the Town of Manchester. Another copy is being sent to Mr. Scott Shanley, Town Manager of the Town of Manchester the property owner.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The Manchester facility is located at 239 Middle Turnpike Road, the Site coordinates are: 41. 78444 N, - 72. 51166 W. The facility is owned by Town of Manchester, CT 06045.

The existing facility consists of a 190' Monopole tower. Sprint currently operates wireless communications equipment on a steel platform at the facility and has three antennas mounted on the tower at a centerline of 154' feet.

Statutory Considerations

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.
2. The proposed changes will not require an extension of the property boundaries.
3. The proposed additions will not increase the noise level at the existing facility by six decibels or more, or to levels that exceed state and/or local criteria
4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Sprint respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,

Paul F. Sagristano

Paul F. Sagristano
Charles Cherundolo Consulting
917-841-0247
psagristano@lrivassoc.com

PFS/mtf

Additional Recipients:
Town of Manchester Town Manager, Scott Shanley
Town of Manchester Mayor, Jay Moran



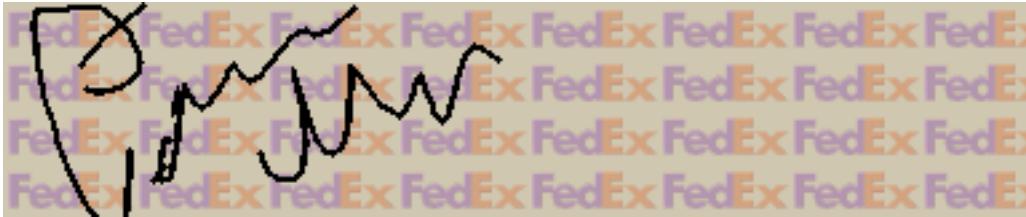
September 18,2017

Dear Customer:

The following is the proof-of-delivery for tracking number **770214958980**.

Delivery Information:

Status:	Delivered	Delivered to:	Residence
Signed for by:	P.MORAN	Delivery location:	149 STRAWBERRY LN MANCHESTER, CT 06040
Service type:	FedEx Express Saver	Delivery date:	Sep 15, 2017 16:08
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		



Shipping Information:

Tracking number:	770214958980	Ship date:	Sep 8, 2017
		Weight:	0.5 lbs/0.2 kg

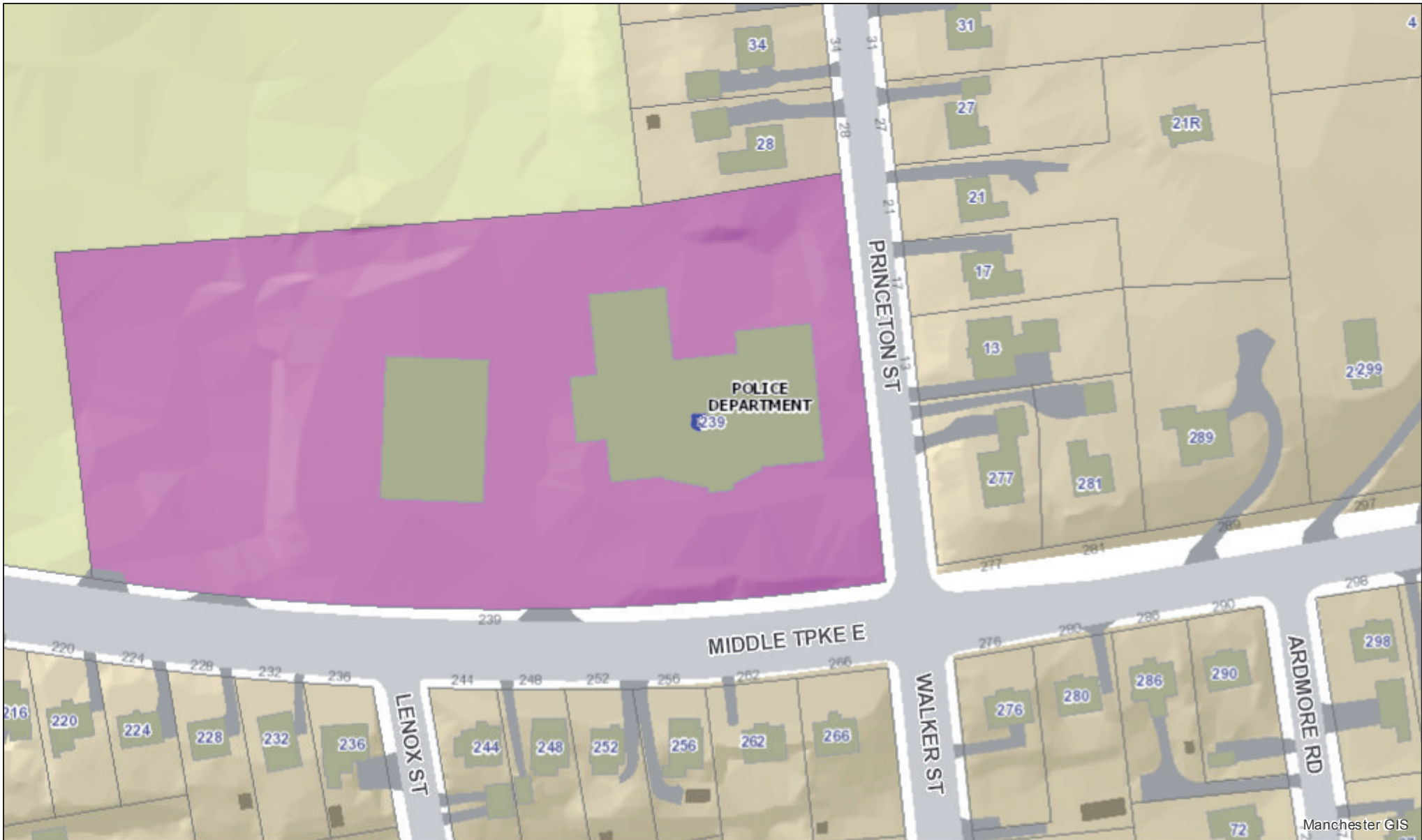
Recipient:
Jay Moran, Mayor
Town of Manchester
149 Strawberry Lane
MANCHESTER, CT 06040 US

Shipper:
Paul Sagristano
Charles Cherundolo Consulting
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CT43XC827 CSC to Mayor

Reference

Thank you for choosing FedEx.

Town of Manchester, CT



Town of Manchester, CT
DISCLAIMER: This map is compiled from other maps, deeds, dimensions and other sources of information. Not to be construed as accurate surveys and subject to final changes as a more accurate survey may disclose.
NOTES: Original planimetric and topographic data were compiled by stereophotogrammetric methods from photography dated April 1999 in accordance with ASPR accuracy standards for 1 inch = 40ft large scale Class I mapping. The updating of the GIS data is performed by the GIS/Maps & Records Unit on a continual basis utilizing the best and most appropriated sources available.

1 inch = 100 feet

Author:



Date: 7/6/2017



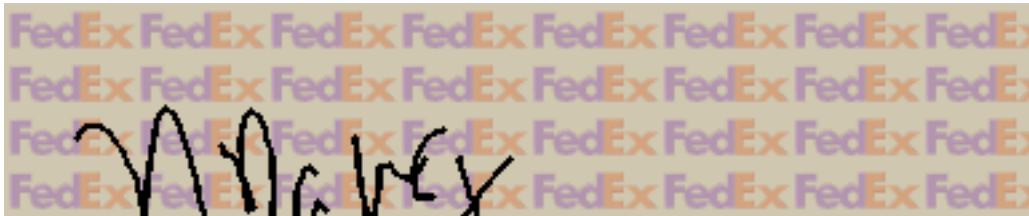
September 13, 2017

Dear Customer:

The following is the proof-of-delivery for tracking number **770213563960**.

Delivery Information:

Status:	Delivered	Delivered to:	Receptionist/Front Desk
Signed for by:	N.DAVEY	Delivery location:	41 CENTER ST MANCHESTER, CT 06045
Service type:	FedEx Express Saver	Delivery date:	Sep 13, 2017 10:26
Special Handling:	Deliver Weekday Direct Signature Required		



Shipping Information:

Tracking number:	770213563960	Ship date:	Sep 8, 2017
		Weight:	0.5 lbs/0.2 kg

Recipient:
Scott Shanley, Town Manager
Town of Manchester
41 Center Street
MANCHESTER, CT 06045 US

Shipper:
Paul Sagristano
Charles Cherundolo Consulting
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CT43XC827 - CSC Pkg to Town

Reference

Thank you for choosing FedEx.

239 MIDDLE TURNPIKE EAST

Location 239 MIDDLE TURNPIKE EAST

Mblu 92/ 3950/ 239/ /

Acct# 395000239

Owner MANCHESTER TOWN OF

Assessment \$4,243,700

Appraisal \$6,062,100

PID 10705

Building Count 2

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$5,573,900	\$488,200	\$6,062,100

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$3,901,900	\$341,800	\$4,243,700

Owner of Record

Owner MANCHESTER TOWN OF

Sale Price \$0

Address 41 CENTER ST

Certificate C

MANCHESTER, CT 06040-5096

Book & Page

Sale Date

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
MANCHESTER TOWN OF	\$0	C		

Building Information

Building 1 : Section 1

Year Built: 1995

Living Area: 46,701

Replacement Cost: \$6,306,043

Replacement Cost

Less Depreciation: \$5,044,800

Building Attributes	
Field	Description
STYLE	Other Municip
MODEL	Ind/Comm

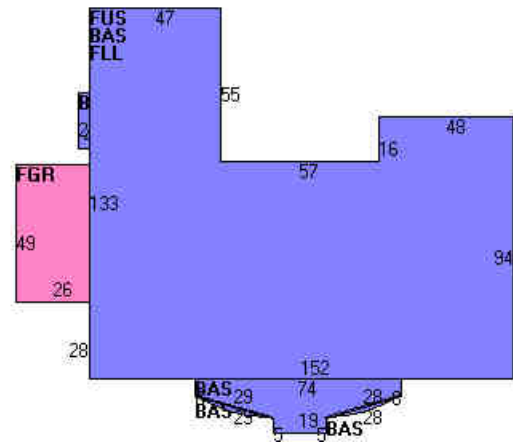
Grade	Average +10
Stories:	2
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	Stucco/Masonry
Roof Structure	Flat
Roof Cover	Tar + Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheetr
Interior Floor 1	Carpet
Interior Floor 2	Tile/Vinyl Cmp
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Bldg Use	Municipal 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	901I
Heat/AC	Heat/AC Packag
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Susp Ceil & WI
Rooms/Prtns	Average
Wall Height	10
% Comn Wall	0

Building Photo



(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\03\2

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	16,283	16,283
FLL	Finished Lower Level	15,209	15,209
FUS	Upper Story, Finished	15,209	15,209
FGR	Garage	1,274	0
		47,975	46,701

Building 2 : Section 1

Year Built: 1975
Living Area: 7,000
Replacement Cost: \$506,690
Replacement Cost Less Depreciation: \$309,100

Building Attributes : Bldg 2 of 2	
Field	Description
STYLE	Service Shop
MODEL	Ind/Comm

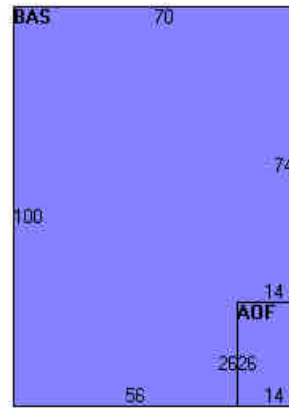
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	Municipal 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	901I
Heat/AC	Heat/AC Packag
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min WI
Rooms/Prtns	Average
Wall Height	19
% Comn Wall	0

Building Photo



(<http://images.vgsi.com/photos2/ManchesterCTPhotos/\00\03\2>)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	6,636	6,636
AOF	Office, (Average)	364	364
		7,000	7,000

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
MEZ1	Mezzanine-Unfin	1900 S.F.	\$13,300	2
SPR1	Sprinklers-Wet	47975 S.F.	\$54,000	1

Land

Land Use

Use Code 901I

Land Line Valuation

Size (Acres) 3.97

Description Municipal 96
Zone RA
Neighborhood 4000
Alt Land Appr Category No

Frontage 0
Depth 0
Assessed Value \$341,800
Appraised Value \$488,200

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving Asphalt			97700 S.F.	\$122,100	1
FN4	Fence 8' Chain			128 L.F.	\$1,900	1
LT1	Lights 1Fix			15 UNITS	\$12,900	1
CNP1	Canopy Ave			360 S.F.	\$7,800	1
SHD2	Shed W/Imp			120 S.F.	\$1,300	1
SHD1	Shed			168 S.F.	\$1,500	1
FN3	Fence 6' Chain			160 L.F.	\$3,700	1
SHD2	Shed W/Imp			140 S.F.	\$1,500	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$4,365,100	\$488,200	\$4,853,300
2010	\$4,125,100	\$423,400	\$4,548,500
2005	\$3,622,600	\$380,200	\$4,002,800

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$3,055,600	\$341,800	\$3,397,400
2010	\$2,887,500	\$296,400	\$3,183,900
2005	\$2,535,800	\$266,200	\$2,802,000



Town of Manchester

41 Center Street • P.O. Box 191
Manchester, Connecticut 06045-0191
www.ci.manchester.ct.us

STEPHEN T. CASSANO, MAYOR
JOSH M. HOWROYD, DEPUTY MAYOR
CHRISTY SCOTT, SECRETARY

DIRECTORS
TIMOTHY H. BECKER
THOMAS P. CROCKETT
JOSEPH S. HACHEY
DAVID M. SHERIDAN
LOUIS A. SPADACCINI
KEVIN L. ZINGLER

STEVEN R. WERBNER, GENERAL MANAGER

June 14, 2002

Mr. Wayne Medlin
Sprint PCS
Crossroads Corporate Center – Suite 800
1 International Blvd.
Mahwah, NJ 07495

Re: Manchester Police Antenna

Dear Mr. Medlin:

We understand that an agreement between the Town of Manchester and Sprint PCS has been executed, and that Sprint PCS will construct a monopole tower at the Manchester Police Headquarters for its communications needs and build a new parking lot as part of that arrangement.

The police station's monopole tower is considered an accessory municipal structure and is permitted by the Town of Manchester zoning regulations. In Connecticut, before such an improvement project can be carried out, the Planning and Zoning Commission must issue a report on that project. Our PZC issued such a report on March 18, 2002. I have enclosed a memorandum dated March 21, 2002 relaying that report, and my supporting memorandum dated March 14, 2002.

At this stage Sprint PCS and the Town will need to secure the necessary building permits from the town building department and a zoning certificate from the zoning officer before construction can proceed.

Very truly yours,

Mark Pellegrini, AICP
Director of Neighborhood Services and
Economic Development

MP/s

R:\SHARON09\MARK\LETTERS\SPRINT PCS.DOC

cc: Mr. William Bellock
Timothy O'Neil, Assistant Town Attorney

An Equal Opportunity Employer



**TOWN OF MANCHESTER
PLANNING DEPARTMENT**

TO: Steven R. Werbner, General Manager

FROM: Mark Pellegrini, Director of Neighborhood Services
and Economic Development



DATE: March 21, 2002

RE: Mandatory Referral Report
Police Station Radio Tower and Parking Lot Expansion (MR-0201)

At its meeting of March 18, 2002 the Planning and Zoning Commission voted unanimously to endorse the proposal to construct a monopole tower at the Manchester Police Headquarters, dismantle the existing tower, and build a new parking lot as shown on plans submitted by the Manchester Police Department dated September 11, 2001 and amended to September 26, 2001. In making this decision the Planning and Zoning Commission considered my memorandum of March 14, 2002 (copy attached) as well as a review of the site plan and photo simulations of the proposed new tower presented by Lt. Marc Montminy at their meeting.


MP/s

R:\SHARON09\MARK\MEMOS\Werbner-MR0102.doc

Attach.

**TOWN OF MANCHESTER
PLANNING DEPARTMENT**

TO: Planning and Zoning Commission

FROM: Mark Pellegrini, Director of Neighborhood Services
And Economic Development 

DATE: March 14, 2002

RE: Mandatory Referral Report
Police Station Radio Tower and Parking Lot Expansion (MR-0201)

The Planning and Zoning Commission is being asked to report on a proposal developed by the Manchester Police Department to replace its current radio tower and build a new parking lot in the location of the current tower at the Police Headquarters.

Description of Project

The police department has an existing 190' high lattice-type radio tower to serve its radio communications needs. The department wishes to replace this tower and equipment. They also have experienced parking problems, especially on Princeton Street, during daytime hours. The activity at the department's headquarters has created a greater demand for daytime parking than originally anticipated. Relocating the tower would provide room to add parking in front of the garage along Middle Turnpike. Attached is a site plan showing the proposed new tower location and the new parking lot, as well as a series of photo simulations showing the potential visual impact of the new monopole tower proposed to be constructed here.

There is no PZC approval aside from this mandatory referral report required for this project. The parking lot is less than one-half acre and therefore no erosion control plan will be needed. The new monopole tower is a permitted accessory structure and will only require a building permit and zoning permit from the Zoning Enforcement Officer.

Construction and Other Uses

The Police Department, through the Town, issued a request for proposals for the construction of the replacement tower. The proposal favored by the department was received from Sprint PCS. Under this proposal Sprint would pay for the construction of the new tower, provide new radio and related equipment to allow for a "hot" transfer so there will be no interruption in police communication during the switch-over from one tower to the other. Sprint PCS will also construct the parking lot and landscaping as proposed on the attached plans. In exchange for

these services, the police department will allow Sprint to locate a personal communications system antenna array on the tower and related hardware on the ground near the tower. The tower will also be capable of holding additional PCS arrays at the discretion of the Town.

Recommendation

The proposed improvements to the police department's headquarters site would be generally consistent with our Plan of Conservation and Development. The police department does require a tall communications antenna for its communication needs, which has become more sophisticated as communications and computing technology have evolved. It would also be beneficial to have more on-site parking at the police department to relieve the traffic problems experienced on Princeton Street and to a lesser extent on Middle Turnpike during certain times of the day.

The construction of a 190±' monopole in this location will have some visual impact. It is possible through the proposed planting around the base of the unit and equipment cabinets to minimize the view of the lowest portions of the tower from passing motorists, but this area would primarily be visible to people driving into the Illing Middle School. The upper portions of the tower will be visible from various locations in the vicinity as shown on the attached photo simulations. The only alternative to a monopole tower would be a lattice-type tower, which in some respects is less intrusive since there is so much open air around the structure itself. However, we have been advised that such towers may become less attractive if multiple antenna arrays are placed on them and increased cabling is run up to the arrays. Lattice towers also require a larger footprint.

MP/s

R:\SHARON09\PZCMEMOS\18MAR02-PZC memos\MR-0201.doc

Attach.



July 18, 2002

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCILTen Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402

RE: **TS-SPRINT-077-020624** - Sprint Spectrum L.P. request for an order to approve tower sharing at an existing telecommunications facility located at 239 Middle Turnpike East, Manchester, Connecticut.

Dear Attorney Regan:

At a public meeting held July 11, 2002, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letters dated June 24, 2002, and July 8, 2002.

Thank you for your attention and cooperation.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mortimer A. Gelston".
Mortimer A. Gelston
Chairman

MAG/DM/laf

c: Honorable Stephen T. Cassano, Mayor, Town of Manchester
Thomas R. O'Marra, Zoning Enforcement Officer, Town of Manchester



RADIO FREQUENCY EMISSIONS ANALYSIS REPORT EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

SPRINT Existing Facility

Site ID: CT43XC827

Manchester / Police Tower
239 Middle Turnpike
Manchester, CT 06040

August 24, 2017

EBI Project Number: 6217003812

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.49 %



August 24, 2017

SPRINT

Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT43XC827 – Manchester / Police Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **239 Middle Turnpike, Manchester, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 850 MHz Band is approximately $567 \mu\text{W}/\text{cm}^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **239 Middle Turnpike, Manchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **RFS APXVSP18-C-A20** and the **RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerlines of the proposed antennas are **154 feet** above ground level (AGL) for **Sector A**, **154 feet** above ground level (AGL) for **Sector B** and **154 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general population threshold limits.



SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	154 feet	Height (AGL):	154 feet	Height (AGL):	154 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	1.40 %	Antenna B1 MPE%	1.40 %	Antenna C1 MPE%	1.40 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	154 feet	Height (AGL):	154 feet	Height (AGL):	154 feet
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	1.02 %	Antenna B2 MPE%	1.02 %	Antenna C2 MPE%	1.02 %

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	2.42 %
Town MFRE	0.11 %
Town MPD - ch 1	0.01 %
Town MPD - ch 2	0.02 %
Town MFD	0.03 %
Town services intercity	0.06 %
RAFS I/2	0.19 %
Town public works	0.08 %
Town Services EOC	0.08 %
Town FD	0.08 %
town SP hotline	0.11 %
Town Vol FD	0.07 %
Town Service - School	0.02 %
Htfd City FD	0.08 %
Tolland MUT	0.08 %
Clearwire	0.09 %
T-Mobile	2.53 %
Verizon Wireless	3.51 %
AT&T	1.91 %
Site Total MPE %:	11.49 %

SPRINT Sector A Total:	2.42 %
SPRINT Sector B Total:	2.42 %
SPRINT Sector C Total:	2.42 %
Site Total:	11.49 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	154	0.72	850 MHz	567	0.13%
Sprint 850 MHz LTE	2	437.55	154	1.44	850 MHz	567	0.25%
Sprint 1900 MHz (PCS) CDMA	5	622.47	154	5.11	1900 MHz (PCS)	1000	0.51%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	154	5.11	1900 MHz (PCS)	1000	0.51%
Sprint 2500 MHz (BRS) LTE	8	778.09	154	10.22	2500 MHz (BRS)	1000	1.02%
Total:						2.42%	



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	2.42 %
Sector B:	2.42 %
Sector C:	2.42 %
SPRINT Maximum Total (per sector):	2.42 %
Site Total:	11.49 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **11.49 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.



CT43XC827

“DO MACRO UPGRADE”

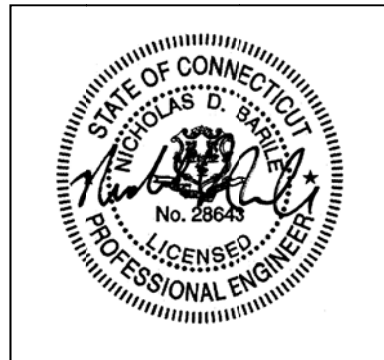
239 Middle Turnpike, Manchester, CT 06040 (Hartford County)

Structural Analysis of Antenna Mount

August 1, 2017

Item	Pass/Fail	Capacity
Monopole	Pass	66.9%
Foundation	Pass	90.2%

Nicholas D. Barile, PE
Connecticut Professional Engineer
License No. 28643
Com-Ex Project No. 17044-CHE





Executive Summary

At the request of Sprint, COMEX has performed a structural analysis of antenna mounting system for proposed antenna equipment loading under *2015 International Building Code, ASCE 7, and AISC (LRFD14)*. Information pertaining the antenna mounts was obtained from:

- Construction Drawings completed by Com-Ex Engineering of NY, dated 05/19/17

Discussion

Wind speed is based on IBC 2015, Section 1609.1. Exemption 5 and section 1609.3.1 ($V_{asd} = V_{ult} (.6)^{1/2}$; $V_{asd} = 124\text{mph} \times (.6)^{1/2} = 96\text{ mph}$) using exposure B and terrain type 1.

The monopole has been reinforced using vertical steel plates attached with a "blind" bolt system. The upgrade appears to be inadequate, due to an unreinforced section between base plate stiffeners and steel plates. The stiffeners will need to be extended past reinforcement plates per standard practice.

Conclusions

Per our analysis, the antenna mounting system is capable of supporting proposed loading under 2015 International Building Code.

General Comments

If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, COMEX should be notified immediately to perform a revised analysis. This report is not a condition assessment and assumes good workmanship will be used and systems will be properly maintained.

Limitations

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



Attachment A

Proposed Equipment

Final Alpha Sector Antenna Configuration

Antenna Rad Center - 154'

(1) (N) APXVTM-ALU-120 RFS Antenna

(1) (N) RRH 8x20-25 (2500MHz)

Final Beta Sector Antenna Configuration

Antenna Rad Center - 154'

(1) (N) APXVTM-ALU-120 RFS Antenna

(1) (N) RRH 8x20-25 (2500MHz)

Final Gamma Sector Antenna Configuration

Antenna Rad Center - 154'

(1) (N) APXVTM-ALU-120 RFS Antenna

(1) (N) RRH 8x20-25 (2500MHz)

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 2"X21FT	185	Ericsson RRUS-E2 (ATI)	144
PIROD 13' Low Profile Platform	185	Ericsson RRUS-A2 Module (ATI)	144
20' - 4 Bay Dipole	185	Ericsson RRUS-A2 Module (ATI)	144
20' - 4 Bay Dipole	185	Ericsson RRUS-A2 Module (ATI)	144
PIROD 13' Low Profile Platform	164	DC6-48-60-18-8F (ATI)	144
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	164	PIROD 13' Low Profile	144
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	164	Kathrein 800 10121 w/ mount pipe (ATI)	144
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	164	Kathrein 800 10121 w/ mount pipe (ATI)	144
RFS ATMAP1412D-1A20 (T-Mobile)	164	Kathrein 800 10121 w/ mount pipe (ATI)	144
RFS ATMAP1412D-1A20 (T-Mobile)	164	Ericsson RRUS 11 (ATI)	144
RFS ATMAP1412D-1A20 (T-Mobile)	164	Ericsson RRUS 11 (ATI)	144
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	164	Ericsson RRUS 11 (ATI)	144
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	164	DC6-48-60-18-8F (ATI)	144
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	164	(2) OPA-65R-LCUU-H6 (ATI)	144
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	164	(2) OPA-65R-LCUU-H8 (ATI)	144
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	164	(2) OPA-65R-LCUU-H8 (ATI)	144
Ericsson RRUS 11 (T-Mobile)	164	Ericsson RRUS-12 (ATI)	144
Ericsson RRUS 11 (T-Mobile)	164	PIROD 13' Low Profile	124
Ericsson RRUS 11 (T-Mobile)	164	Omni 2"x10"	124
PIROD 13' Low Profile	154	Omni 2"x10"	124
APXVSP18-C w/ mount (Sprint)	154	20' - 4 Bay Dipole	124
APXVSP18-C w/ mount (Sprint)	154	3' Yagi	124
APXVSP18-C w/ mount (Sprint)	154	3' Yagi	124
(2) RRH-1900 (Sprint)	154	RRH 2X40-07U (Verizon)	111
(2) RRH-1900 (Sprint)	154	RRH 2X40-PCS (Verizon)	111
(2) RRH-1900 (Sprint)	154	RRH 2X40-PCS (Verizon)	111
RRH-800 (Sprint)	154	RRH 2X40-PCS (Verizon)	111
RRH-800 (Sprint)	154	RFS DB-T1-6Z-8AB-0Z (Verizon)	111
RRH-800 (Sprint)	154	RFS DB-T1-6Z-8AB-0Z (Verizon)	111
RRH-800 (Sprint)	154	PIROD 13' Low Profile	111
APXVTM14-ALU-120 W/ MOUNT (Sprint)	154	(2) LNX6514DS-VTM (Verizon)	111
APXVTM14-ALU-120 W/ MOUNT (Sprint)	154	(2) LNX6514DS-VTM (Verizon)	111
APXVTM14-ALU-120 W/ MOUNT (Sprint)	154	(2) LNX6514DS-VTM (Verizon)	111
APXVTM14-ALU-120 W/ MOUNT (Sprint)	154	(2) HBX-6517DS-VTM (Verizon)	111
RRH 8X20-25 (Sprint)	154	(2) HBX-6517DS-VTM (Verizon)	111
RRH 8X20-25 (Sprint)	154	(2) HBX-6517DS-VTM (Verizon)	111
RRH 8X20-25 (Sprint)	154	RRH 2X40-AWS+RDEM (Verizon)	111
Ring Mount	154	RRH 2X40-AWS+RDEM (Verizon)	111
VHLP2-11 ANDREW	151	RRH 2X40-AWS+RDEM (Verizon)	111
VHLPX2.5 ANDREW	151	RRH 2X40-07U (Verizon)	111
VHLP2-11 ANDREW	151	RRH 2X40-07U (Verizon)	111
Ericsson RRUS-12 (ATI)	144	1' Side Mount Standoff	55
Ericsson RRUS-12 (ATI)	144	GPS	55
Ericsson RRUS-12 (ATI)	144	1ft Side Mount Standoff	39.9
Ericsson RRUS-32 (ATI)	144	1ft Side Mount Standoff	39.9
Ericsson RRUS-32 (ATI)	144	1ft Side Mount Standoff	39.9
Ericsson RRUS-32 (ATI)	144	VHLPX2-18-2WH/B	39.9
Ericsson RRUS-E2 (ATI)	144	VHLPX2-18-2WH/B	39.9
Ericsson RRUS-E2 (ATI)	144	VHLPX2-18-2WH/B	39.9
Ericsson RRUS-E2 (ATI)	144	(2) VHLPX2-18-2WH/B	39.9

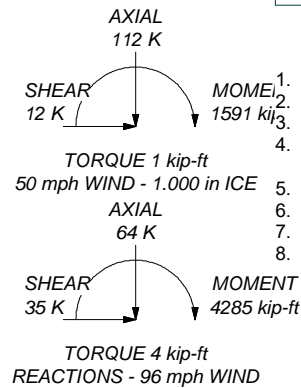
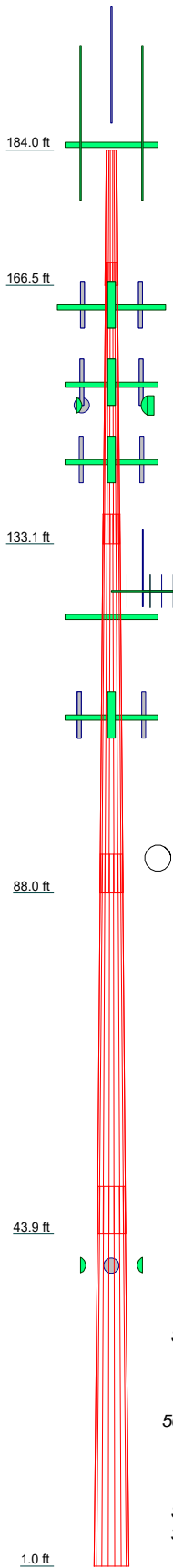
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 67.2%

ALL REACTIONS
ARE FACTORED



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	17.500	18	0.188	3.000	15.500	19.399	A572-65	0.6
2	36.420	18	0.250	3.830	18.356	26.401	A572-65	2.2
3	48.920	18	0.375	5.000	25.055	35.892	A572-65	6.0
4	49.080	18	0.485	6.170	34.034	44.903	A572-65	10.1
5	49.080	18	0.540	42.567	53.500		A572-65	13.7
								32.7

SZS Engineering
4551 E Carriage Way
Gilbert, AZ 85297
Phone: 480-528-0914
FAX:

Job: 17044-CHE	
Project: 183FT MONOPOLE	
Client: T-Mobile	Drawn by: Samuel Gonzalez
Code: TIA-222-G	Date: 07/25/17
Path:	App'd:
	Scale: NTS
	Dwg No. E-1

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	Project 183FT MONOPOLE	Date 22:04:37 07/25/17
	Client T-Mobile	Designed by Samuel Gonzalez

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 Hartford County, Connecticut.

Basic wind speed of 96 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 1.000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

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, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	184.000-166.500	17.500	3.000	18	15.500	19.399	0.188	0.750	A572-65 (65 ksi)
L2	166.500-133.080	36.420	3.830	18	18.356	26.401	0.250	1.000	A572-65 (65 ksi)
L3	133.080-87.990	48.920	5.000	18	25.055	35.892	0.375	1.500	A572-65 (65 ksi)
L4	87.990-43.910	49.080	6.170	18	34.034	44.903	0.485	1.940	A572-65 (65 ksi)
L5	43.910-1.000	49.080		18	42.567	53.500	0.540	2.160	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	15.739	9.113	269.950	5.436	7.874	34.284	540.256	4.557	2.398	12.789
	19.698	11.433	533.126	6.820	9.855	54.099	1066.953	5.718	3.084	16.449
L2	19.312	14.367	595.008	6.427	9.325	63.810	1190.800	7.185	2.791	11.162
	26.808	20.751	1792.872	9.284	13.412	133.680	3588.103	10.377	4.207	16.826
L3	26.303	29.375	2260.515	8.761	12.728	177.603	4524.004	14.690	3.750	9.999
	36.446	42.274	6737.278	12.609	18.233	369.507	13483.421	21.141	5.657	15.085
L4	35.684	51.646	7344.110	11.910	17.289	424.774	14697.883	25.828	5.136	10.591
	45.596	68.377	17043.670	15.768	22.811	747.178	34109.766	34.195	7.049	14.535

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	Client T-Mobile	Designed by Samuel Gonzalez

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L5	44.619	72.032	16073.597	14.919	21.624	743.327	32168.345	36.023	6.541	12.114
	54.325	90.771	32164.889	18.801	27.178	1183.490	64372.102	45.394	8.466	15.677

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 184.000-166.500				0	1	1.01			
L2 166.500-133.080				0	1	1.01			
L3 133.080-87.990				0	1	1.01			
L4 87.990-43.910				0	1	1.01			
L5 43.910-1.000				0	1	1.01			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	18
Embedment length	84.000 in
f _c	4.000 ksi
Grout space	2.000 in
Base plate grade	A572-60
Base plate thickness	2.000 in
Bolt circle diameter	62.000 in
Outer diameter	68.000 in
Inner diameter	43.000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.500 in
Stiffener height	9.000 in

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A	Weight	
						ft ² /ft	klf	
2" Conduit	A	No	CaAa (Out Of Face)	154.000 - 7.000	2	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004
						1" Ice	0.400	0.001
1/2	A	No	CaAa (Out Of Face)	154.000 - 7.000	3	No Ice	0.060	0.000
						1/2" Ice	0.160	0.001
						1" Ice	0.260	0.000

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	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight klf
							ft ² /ft	
3/8	A	No	Inside Pole	154.000 - 7.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
7/8	B	No	Inside Pole	184.000 - 7.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 5/8	B	No	Inside Pole	164.000 - 7.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 5/8 Fiber Cable (T-Mobile)	B	No	Inside Pole	164.000 - 7.000	9	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 1/4 (T-Mobile)	B	No	Inside Pole	154.000 - 7.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
1 5/8 (Sprint)	B	No	Inside Pole	144.000 - 7.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
FB-L98B-002 (AT&T)	B	No	Inside Pole	144.000 - 7.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG122ST-BRDA (AT&T)	B	No	Inside Pole	144.000 - 7.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
1/2 (AT&T)	B	No	Inside Pole	13.000 - 7.000	5	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
1/2 (AT&T)	B	No	Inside Pole	55.000 - 7.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
1/2 (AT&T)	B	No	Inside Pole	39.900 - 7.000	4	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
1 5/8 Fiber Cable (Verizon)	B	No	Inside Pole	111.000 - 7.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R	A _F	C _{AA} In Face	C _{AA} Out Face	Weight K
			ft ²	ft ²	ft ²	ft ²	
L1	184.000-166.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.038
		C	0.000	0.000	0.000	0.000	0.000
L2	166.500-133.080	A	0.000	0.000	0.000	12.134	0.149
		B	0.000	0.000	0.000	0.000	0.882
		C	0.000	0.000	0.000	0.000	0.000
L3	133.080-87.990	A	0.000	0.000	0.000	26.152	0.320
		B	0.000	0.000	0.000	0.000	1.602
		C	0.000	0.000	0.000	0.000	0.000
L4	87.990-43.910	A	0.000	0.000	0.000	25.566	0.313
		B	0.000	0.000	0.000	0.000	1.614
		C	0.000	0.000	0.000	0.000	0.000
L5	43.910-1.000	A	0.000	0.000	0.000	21.408	0.262
		B	0.000	0.000	0.000	0.000	1.399
		C	0.000	0.000	0.000	0.000	0.000

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	Client T-Mobile	Designed by Samuel Gonzalez

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	184.000-166.500	A	2.363	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.038
		C		0.000	0.000	0.000	0.000	0.000
L2	166.500-133.080	A	2.325	0.000	0.000	0.000	61.567	0.064
		B		0.000	0.000	0.000	0.000	0.882
		C		0.000	0.000	0.000	0.000	0.000
L3	133.080-87.990	A	2.255	0.000	0.000	0.000	131.005	0.137
		B		0.000	0.000	0.000	0.000	1.602
		C		0.000	0.000	0.000	0.000	0.000
L4	87.990-43.910	A	2.142	0.000	0.000	0.000	124.974	0.134
		B		0.000	0.000	0.000	0.000	1.614
		C		0.000	0.000	0.000	0.000	0.000
L5	43.910-1.000	A	1.920	0.000	0.000	0.000	100.476	0.112
		B		0.000	0.000	0.000	0.000	1.399
		C		0.000	0.000	0.000	0.000	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Lighting Rod 2"X21FT	A	From Leg	1.000	0.000	185.000	No Ice	4.200	4.200	0.080
			0.000			1/2" Ice	6.330	6.330	0.112
			10.000			1" Ice	8.460	8.460	0.145
PiROD 13' Low Profile Platform	A	None	4.000	0.000	185.000	No Ice	15.700	15.700	1.300
						1/2" Ice	20.100	20.100	1.765
						1" Ice	24.500	24.500	2.230
20' - 4 Bay Dipole	C	From Face	3.500	0.000	185.000	No Ice	4.750	4.750	0.050
			4.000			1/2" Ice	6.250	6.250	0.080
			2.500			1" Ice	7.750	7.750	0.110
20' - 4 Bay Dipole	C	From Face	3.500	0.000	185.000	No Ice	4.750	4.750	0.050
			-4.000			1/2" Ice	6.250	6.250	0.080
			2.500			1" Ice	7.750	7.750	0.110
PiROD 13' Low Profile Platform	A	None		0.000	164.000	No Ice	15.700	15.700	1.300
						1/2" Ice	20.100	20.100	1.765
						1" Ice	24.500	24.500	2.230
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	A	From Face	3.500	0.000	164.000	No Ice	6.830	5.640	0.112
			0.000			1/2" Ice	7.350	6.480	0.169
			0.000			1" Ice	7.870	7.320	0.226

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	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	B	From Face	3.500	0.000	0.000	164.000	No Ice 6.830	5.640	0.112
			0.000				1/2" Ice 7.350	6.480	0.169
			0.000				1" Ice 7.870	7.320	0.226
ERICSSON AIR 21 B2AB4P w/ Mount Pipe (T-Mobile)	C	From Face	3.500	0.000	0.000	164.000	No Ice 6.830	5.640	0.112
			0.000				1/2" Ice 7.350	6.480	0.169
			0.000				1" Ice 7.870	7.320	0.226
RFS ATMAP1412D-1A20 (T-Mobile)	A	From Face	2.500	0.000	0.000	164.000	No Ice 1.170	0.470	0.013
			0.000				1/2" Ice 1.310	0.570	0.021
			0.000				1" Ice 1.450	0.670	0.028
RFS ATMAP1412D-1A20 (T-Mobile)	B	From Face	2.500	0.000	0.000	164.000	No Ice 1.170	0.470	0.013
			0.000				1/2" Ice 1.310	0.570	0.021
			0.000				1" Ice 1.450	0.670	0.028
RFS ATMAP1412D-1A20 (T-Mobile)	C	From Face	2.500	0.000	0.000	164.000	No Ice 1.170	0.470	0.013
			0.000				1/2" Ice 1.310	0.570	0.021
			0.000				1" Ice 1.450	0.670	0.028
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	A	From Face	3.500	0.000	0.000	164.000	No Ice 11.340	9.070	0.161
			0.000				1/2" Ice 12.000	10.300	0.248
			0.000				1" Ice 12.660	11.530	0.336
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	B	From Face	3.500	0.000	0.000	164.000	No Ice 11.340	9.070	0.161
			0.000				1/2" Ice 12.000	10.300	0.248
			0.000				1" Ice 12.660	11.530	0.336
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe (T-Mobile)	C	From Face	3.500	0.000	0.000	164.000	No Ice 11.340	9.070	0.161
			0.000				1/2" Ice 12.000	10.300	0.248
			0.000				1" Ice 12.660	11.530	0.336
Ericsson RRUS 11 (T-Mobile)	A	From Face	2.500	0.000	0.000	164.000	No Ice 2.940	1.240	0.055
			0.000				1/2" Ice 3.170	1.410	0.074
			0.000				1" Ice 3.400	1.580	0.094
Ericsson RRUS 11 (T-Mobile)	B	From Face	2.500	0.000	0.000	164.000	No Ice 2.940	1.240	0.055
			0.000				1/2" Ice 3.170	1.410	0.074
			0.000				1" Ice 3.400	1.580	0.094
Ericsson RRUS 11 (T-Mobile)	C	From Face	2.500	0.000	0.000	164.000	No Ice 2.940	1.240	0.055
			0.000				1/2" Ice 3.170	1.410	0.074
			0.000				1" Ice 3.400	1.580	0.094
PiROD 13' Low Profile	A	None			0.000	124.000	No Ice 15.700	15.700	1.300
							1/2" Ice 20.100	20.100	1.765
							1" Ice 24.500	24.500	2.230
Omni 2"x10"	B	From Face	3.500	0.000	0.000	124.000	No Ice 2.000	2.000	0.020
			0.000				1/2" Ice 3.020	3.020	0.035
			6.000				1" Ice 4.040	4.040	0.051
Omni 2"x10"	B	From Face	3.500	0.000	0.000	124.000	No Ice 2.000	2.000	0.020
			0.000				1/2" Ice 3.020	3.020	0.035
			6.000				1" Ice 4.040	4.040	0.051
20' - 4 Bay Dipole	C	From Face	3.500	0.000	0.000	124.000	No Ice 4.750	4.750	0.050
			0.000				1/2" Ice 6.250	6.250	0.080
			3.000				1" Ice 7.750	7.750	0.110
3' Yagi	B	From Face	3.500	0.000	0.000	124.000	No Ice 0.700	0.350	0.010
			0.000				1/2" Ice 0.950	0.480	0.036
			3.000				1" Ice 1.200	0.610	0.063
3' Yagi	C	From Face	3.500	0.000	0.000	124.000	No Ice 0.700	0.350	0.010
			0.000				1/2" Ice 0.950	0.480	0.036
			3.000				1" Ice 1.200	0.610	0.063
1' Side Mount Standoff	C	From Face	1.000	0.000	0.000	55.000	No Ice 1.000	1.000	0.030
			0.000				1/2" Ice 1.500	1.500	0.050
			0.000				1" Ice 2.000	2.000	0.070
GPS	C	From Face	3.000	0.000	0.000	55.000	No Ice 0.210	0.210	0.005
			0.000				1/2" Ice 0.320	0.320	0.008
			0.000				1" Ice 0.430	0.430	0.010

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Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
PiROD 13' Low Profile	A	None			0.000	144.000	No Ice 15.700 1/2" Ice 20.100 1" Ice 24.500	15.700 20.100 24.500	1.300 1.765 2.230
Kathrein 800 10121 w/ mount pipe (AT&T)	A	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 5.720 1/2" Ice 6.210 1" Ice 6.700	4.810 5.490 6.170	0.078 0.128 0.178
Kathrein 800 10121 w/ mount pipe (AT&T)	B	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 5.720 1/2" Ice 6.210 1" Ice 6.700	4.810 5.490 6.170	0.078 0.128 0.178
Kathrein 800 10121 w/ mount pipe (AT&T)	C	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 5.720 1/2" Ice 6.210 1" Ice 6.700	4.810 5.490 6.170	0.078 0.128 0.178
Ericsson RRUS 11 (AT&T)	A	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 2.940 1/2" Ice 3.170 1" Ice 3.400	1.240 1.410 1.580	0.055 0.074 0.094
Ericsson RRUS 11 (AT&T)	B	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 2.940 1/2" Ice 3.170 1" Ice 3.400	1.240 1.410 1.580	0.055 0.074 0.094
Ericsson RRUS 11 (AT&T)	C	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 2.940 1/2" Ice 3.170 1" Ice 3.400	1.240 1.410 1.580	0.055 0.074 0.094
DC6-48-60-18-8F (AT&T)	C	From Leg	2.000 0.000 0.000		0.000	144.000	No Ice 1.270 1/2" Ice 1.460 1" Ice 1.650	1.270 1.460 1.650	0.020 0.035 0.050
(2) OPA-65R-LCUU-H6 (AT&T)	A	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 10.650 1/2" Ice 11.300 1" Ice 11.950	7.530 8.560 9.590	0.113 0.193 0.273
(2) OPA-65R-LCUU-H8 (AT&T)	B	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 13.340 1/2" Ice 14.180 1" Ice 15.020	9.830 11.340 12.850	0.140 0.239 0.339
(2) OPA-65R-LCUU-H8 (AT&T)	C	From Face	3.500 0.000 0.000		0.000	144.000	No Ice 13.340 1/2" Ice 14.180 1" Ice 15.020	9.830 11.340 12.850	0.140 0.239 0.339
Ericsson RRUS-12 (AT&T)	A	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.670 1/2" Ice 3.930 1" Ice 4.190	1.490 1.670 1.850	0.058 0.081 0.104
Ericsson RRUS-12 (AT&T)	B	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.670 1/2" Ice 3.930 1" Ice 4.190	1.490 1.670 1.850	0.058 0.081 0.104
Ericsson RRUS-12 (AT&T)	C	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.670 1/2" Ice 3.930 1" Ice 4.190	1.490 1.670 1.850	0.058 0.081 0.104
Ericsson RRUS-32 (AT&T)	A	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.870 1/2" Ice 4.150 1" Ice 4.430	2.760 3.020 3.280	0.077 0.105 0.133
Ericsson RRUS-32 (AT&T)	B	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.870 1/2" Ice 4.150 1" Ice 4.430	2.760 3.020 3.280	0.077 0.105 0.133
Ericsson RRUS-32 (AT&T)	C	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.870 1/2" Ice 4.150 1" Ice 4.430	2.760 3.020 3.280	0.077 0.105 0.133
Ericsson RRUS-E2 (AT&T)	A	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.870 1/2" Ice 4.150 1" Ice 4.430	2.760 3.020 3.280	0.077 0.105 0.133
Ericsson RRUS-E2 (AT&T)	B	From Face	2.500 0.000 0.000		0.000	144.000	No Ice 3.870 1/2" Ice 4.150 1" Ice 4.430	2.760 3.020 3.280	0.077 0.105 0.133

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	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
Ericsson RRUS-E2 (AT&T)	C	From Face	2.500	0.000	0.000	144.000	No Ice	3.870	2.760	0.077
			0.000	0.000			1/2" Ice	4.150	3.020	0.105
			0.000	0.000			1" Ice	4.430	3.280	0.133
Ericsson RRUS-A2 Module (AT&T)	A	From Face	2.500	0.000	0.000	144.000	No Ice	2.420	0.540	0.022
			0.000	0.000			1/2" Ice	2.630	0.670	0.035
			0.000	0.000			1" Ice	2.840	0.800	0.047
Ericsson RRUS-A2 Module (AT&T)	B	From Face	2.500	0.000	0.000	144.000	No Ice	2.420	0.540	0.022
			0.000	0.000			1/2" Ice	2.630	0.670	0.035
			0.000	0.000			1" Ice	2.840	0.800	0.047
Ericsson RRUS-A2 Module (AT&T)	C	From Face	2.500	0.000	0.000	144.000	No Ice	2.420	0.540	0.022
			0.000	0.000			1/2" Ice	2.630	0.670	0.035
			0.000	0.000			1" Ice	2.840	0.800	0.047
DC6-48-60-18-8F (AT&T)	A	From Leg	2.000	0.000	0.000	144.000	No Ice	1.270	1.270	0.020
			0.000	0.000			1/2" Ice	1.460	1.460	0.035
			0.000	0.000			1" Ice	1.650	1.650	0.050
PiROD 13' Low Profile	A	None			0.000	111.000	No Ice	15.700	15.700	1.300
							1/2" Ice	20.100	20.100	1.765
							1" Ice	24.500	24.500	2.230
(2) LNX6514DS-VTM (Verizon)	A	From Face	3.500	0.000	0.000	111.000	No Ice	8.630	7.070	0.065
			0.000	0.000			1/2" Ice	9.290	8.250	0.134
			0.000	0.000			1" Ice	9.950	9.430	0.203
(2) LNX6514DS-VTM (Verizon)	B	From Face	3.500	0.000	0.000	111.000	No Ice	8.630	7.070	0.065
			0.000	0.000			1/2" Ice	9.290	8.250	0.134
			0.000	0.000			1" Ice	9.950	9.430	0.203
(2) LNX6514DS-VTM (Verizon)	C	From Face	3.500	0.000	0.000	111.000	No Ice	8.630	7.070	0.065
			0.000	0.000			1/2" Ice	9.290	8.250	0.134
			0.000	0.000			1" Ice	9.950	9.430	0.203
(2) HBX-6517DS-VTM (Verizon)	A	From Face	3.500	0.000	0.000	111.000	No Ice	5.420	4.960	0.039
			0.000	0.000			1/2" Ice	5.970	6.140	0.085
			0.000	0.000			1" Ice	6.520	7.320	0.131
(2) HBX-6517DS-VTM (Verizon)	A	From Face	3.500	0.000	0.000	111.000	No Ice	5.420	4.960	0.039
			0.000	0.000			1/2" Ice	5.970	6.140	0.085
			0.000	0.000			1" Ice	6.520	7.320	0.131
RRH 2X40-AWS+RDEM (Verizon)	A	From Face	2.500	0.000	0.000	111.000	No Ice	3.770	2.230	0.048
			0.000	0.000			1/2" Ice	4.040	2.460	0.074
			0.000	0.000			1" Ice	4.310	2.690	0.100
RRH 2X40-AWS+RDEM (Verizon)	B	From Face	2.500	0.000	0.000	111.000	No Ice	3.770	2.230	0.048
			0.000	0.000			1/2" Ice	4.040	2.460	0.074
			0.000	0.000			1" Ice	4.310	2.690	0.100
RRH 2X40-AWS+RDEM (Verizon)	C	From Face	2.500	0.000	0.000	111.000	No Ice	3.770	2.230	0.048
			0.000	0.000			1/2" Ice	4.040	2.460	0.074
			0.000	0.000			1" Ice	4.310	2.690	0.100
RRH 2X40-07U (Verizon)	A	From Face	2.500	0.000	0.000	111.000	No Ice	2.290	1.210	0.050
			0.000	0.000			1/2" Ice	2.490	1.360	0.067
			0.000	0.000			1" Ice	2.690	1.510	0.084
RRH 2X40-07U (Verizon)	B	From Face	2.500	0.000	0.000	111.000	No Ice	2.290	1.210	0.050
			0.000	0.000			1/2" Ice	2.490	1.360	0.067
			0.000	0.000			1" Ice	2.690	1.510	0.084
RRH 2X40-07U (Verizon)	C	From Face	2.500	0.000	0.000	111.000	No Ice	2.290	1.210	0.050
			0.000	0.000			1/2" Ice	2.490	1.360	0.067
			0.000	0.000			1" Ice	2.690	1.510	0.084
RRH 2X40-PCS (Verizon)	A	From Face	2.500	0.000	0.000	111.000	No Ice	2.570	2.020	0.055
			0.000	0.000			1/2" Ice	2.790	2.230	0.075
			0.000	0.000			1" Ice	3.010	2.440	0.096

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Client						Designed by			
T-Mobile						Samuel Gonzalez			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
RRH 2X40-PCS (Verizon)	A	From Face	2.500 0.000 0.000	0.000	111.000	No Ice 2.570 1/2" Ice 2.790 1" Ice 3.010	2.020 2.230 2.440	0.055 0.075 0.096
RRH 2X40-PCS (Verizon)	A	From Face	2.500 0.000 0.000	0.000	111.000	No Ice 2.570 1/2" Ice 2.790 1" Ice 3.010	2.020 2.230 2.440	0.055 0.075 0.096
RFS DB-T1-6Z-8AB-0Z (Verizon)	B	From Face	1.500 0.000 0.000	0.000	111.000	No Ice 5.600 1/2" Ice 5.920 1" Ice 6.240	2.330 2.560 2.790	0.044 0.088 0.132
RFS DB-T1-6Z-8AB-0Z (Verizon)	C	From Face	1.500 0.000 0.000	0.000	111.000	No Ice 5.600 1/2" Ice 5.920 1" Ice 6.240	2.330 2.560 2.790	0.044 0.088 0.132
1ft Side Mount Standoff	A	From Face	0.500 0.000 0.000	0.000	39.900	No Ice 1.000 1/2" Ice 1.500 1" Ice 2.000	1.000 1.500 2.000	0.030 0.050 0.070
1ft Side Mount Standoff	B	From Face	0.500 0.000 0.000	0.000	39.900	No Ice 1.000 1/2" Ice 1.500 1" Ice 2.000	1.000 1.500 2.000	0.030 0.050 0.070
1ft Side Mount Standoff	C	From Face	0.500 0.000 0.000	0.000	39.900	No Ice 1.000 1/2" Ice 1.500 1" Ice 2.000	1.000 1.500 2.000	0.030 0.050 0.070
PiROD 13' Low Profile	A	None		0.000	154.000	No Ice 15.700 1/2" Ice 20.100 1" Ice 24.500	15.700 20.100 24.500	1.300 1.765 2.230
APXVSPP18-C w/ mount (Sprint)	A	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 8.500 1/2" Ice 9.150 1" Ice 9.800	6.950 8.130 9.310	0.083 0.151 0.219
APXVSPP18-C w/ mount (Sprint)	B	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 8.500 1/2" Ice 9.150 1" Ice 9.800	6.950 8.130 9.310	0.083 0.151 0.219
APXVSPP18-C w/ mount (Sprint)	C	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 8.500 1/2" Ice 9.150 1" Ice 9.800	6.950 8.130 9.310	0.083 0.151 0.219
(2) RRH-1900 (Sprint)	A	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.710 1/2" Ice 2.950 1" Ice 3.190	3.660 3.920 4.180	0.060 0.088 0.117
(2) RRH-1900 (Sprint)	B	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.710 1/2" Ice 2.950 1" Ice 3.190	3.660 3.920 4.180	0.060 0.088 0.117
(2) RRH-1900 (Sprint)	C	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.710 1/2" Ice 2.950 1" Ice 3.190	3.660 3.920 4.180	0.060 0.088 0.117
RRH-800 (Sprint)	A	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.490 1/2" Ice 2.710 1" Ice 2.930	3.220 3.460 3.700	0.064 0.092 0.119
RRH-800 (Sprint)	B	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.490 1/2" Ice 2.710 1" Ice 2.930	3.220 3.460 3.700	0.064 0.092 0.119
RRH-800 (Sprint)	C	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 2.490 1/2" Ice 2.710 1" Ice 2.930	3.220 3.460 3.700	0.064 0.092 0.119
APXVTM14-ALU-120 W/ MOUNT (Sprint)	A	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 6.340 1/2" Ice 6.970 1" Ice 7.600	1.980 3.020 4.060	0.056 0.096 0.135
APXVTM14-ALU-120 W/ MOUNT (Sprint)	B	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 6.340 1/2" Ice 6.970 1" Ice 7.600	1.980 3.020 4.060	0.056 0.096 0.135

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	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
APXVTM14-ALU-120 W/ MOUNT (Sprint)	C	From Face	3.500 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	6.340 6.970 7.600	1.980 3.020 4.060	0.056 0.096 0.135
RRH 8X20-25 (Sprint)	A	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	4.720 5.010 5.300	1.700 1.920 2.140	0.070 0.097 0.124
RRH 8X20-25 (Sprint)	B	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	4.720 5.010 5.300	1.700 1.920 2.140	0.070 0.097 0.124
RRH 8X20-25 (Sprint)	C	From Face	1.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	4.720 5.010 5.300	1.700 1.920 2.140	0.070 0.097 0.124
Ring Mount	A	None		0.000	154.000	No Ice 1/2" Ice 1" Ice	1.400 2.400 3.400	1.400 2.400 3.400	0.090 0.130 0.170

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft ft ft	°	°	ft	ft	ft ²	K	
VHLP2-11 ANDREW	A	Paraboloid w/o Radome	From Face	3.500 0.000 0.000	0.000		151.000	2.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.031 0.041 0.051
VHLPX2.5 ANDREW	B	Paraboloid w/Shroud (HP)	From Leg	3.500 0.000 0.000	0.000		151.000	2.500	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.049 0.077 0.105
VHLP2-11 ANDREW	C	Paraboloid w/o Radome	From Leg	3.500 0.000 0.000	0.000		151.000	2.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.031 0.041 0.051
VHLPX2-18-2WH/B	A	Paraboloid w/o Radome	From Leg	2.000 0.000 0.000	0.000		39.900	2.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.025 0.035 0.045
VHLPX2-18-2WH/B	B	Paraboloid w/o Radome	From Leg	2.000 0.000 0.000	0.000		39.900	2.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.025 0.035 0.045
(2) VHLPX2-18-2WH/B	C	Paraboloid w/o Radome	From Leg	2.000 0.000 0.000	0.000		39.900	2.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.025 0.035 0.045

Tower Pressures - No Ice

$$G_H = 1.100$$

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	Project 183FT MONOPOLE	Date 22:04:37 07/25/17
	Client T-Mobile	Designed by Samuel Gonzalez

Section Elevation ft	z ft	K _Z	q _z ksf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 184.000-166.500	174.924	1.159	0.026	25.840	A	0.000	25.840	25.840	100.00	0.000	0.000
					B	0.000	25.840	100.00	0.000	0.000	
					C	0.000	25.840	100.00	0.000	0.000	
L2 166.500-133.080	149.017	1.108	0.025	64.222	A	0.000	64.222	64.222	100.00	0.000	12.134
					B	0.000	64.222	100.00	0.000	0.000	
					C	0.000	64.222	100.00	0.000	0.000	
L3 133.080-87.990	109.648	1.015	0.023	117.889	A	0.000	117.889	117.889	100.00	0.000	26.152
					B	0.000	117.889	100.00	0.000	0.000	
					C	0.000	117.889	100.00	0.000	0.000	
L4 87.990-43.910	65.585	0.876	0.020	149.283	A	0.000	149.283	149.283	100.00	0.000	25.566
					B	0.000	149.283	100.00	0.000	0.000	
					C	0.000	149.283	100.00	0.000	0.000	
L5 43.910-1.000	21.904	0.7	0.016	176.904	A	0.000	176.904	176.904	100.00	0.000	21.408
					B	0.000	176.904	100.00	0.000	0.000	
					C	0.000	176.904	100.00	0.000	0.000	

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z ksf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 184.000-166.500	174.924	1.159	0.007	2.363	32.732	A	0.000	32.732	32.732	100.00	0.000	0.000
						B	0.000	32.732	100.00	0.000	0.000	
						C	0.000	32.732	100.00	0.000	0.000	
L2 166.500-133.080	149.017	1.108	0.007	2.325	77.384	A	0.000	77.384	77.384	100.00	0.000	61.567
						B	0.000	77.384	100.00	0.000	0.000	
						C	0.000	77.384	100.00	0.000	0.000	
L3 133.080-87.990	109.648	1.015	0.006	2.255	135.365	A	0.000	135.365	135.365	100.00	0.000	131.005
						B	0.000	135.365	100.00	0.000	0.000	
						C	0.000	135.365	100.00	0.000	0.000	
L4 87.990-43.910	65.585	0.876	0.005	2.142	165.851	A	0.000	165.851	165.851	100.00	0.000	124.974
						B	0.000	165.851	100.00	0.000	0.000	
						C	0.000	165.851	100.00	0.000	0.000	
L5 43.910-1.000	21.904	0.7	0.004	1.920	192.224	A	0.000	192.224	192.224	100.00	0.000	100.476
						B	0.000	192.224	100.00	0.000	0.000	
						C	0.000	192.224	100.00	0.000	0.000	

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z ksf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 184.000-166.500	174.924	1.159	0.009	25.840	A	0.000	25.840	25.840	100.00	0.000	0.000
					B	0.000	25.840	100.00	0.000	0.000	
					C	0.000	25.840	100.00	0.000	0.000	
L2	149.017	1.108	0.009	64.222	A	0.000	64.222	64.222	100.00	0.000	12.134

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Section Elevation ft	z ft	K _Z	q _z ksf	A _G ft ²	F _a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
166.500-133.0	109.648	1.015	0.008	117.889	B	0.000	64.222	117.889	100.00	0.000	0.000
80					C	0.000	64.222		100.00	0.000	0.000
L3					A	0.000	117.889		100.00	0.000	26.152
133.080-87.99	65.585	0.876	0.007	149.283	B	0.000	117.889	149.283	100.00	0.000	0.000
0					C	0.000	117.889		100.00	0.000	0.000
L4					A	0.000	149.283		100.00	0.000	25.566
87.990-43.910	21.904	0.7	0.006	176.904	B	0.000	149.283	176.904	100.00	0.000	0.000
					C	0.000	149.283		100.00	0.000	0.000
L5					A	0.000	176.904		100.00	0.000	21.408
43.910-1.000					B	0.000	176.904		100.00	0.000	0.000
					C	0.000	176.904		100.00	0.000	0.000

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 ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Lighting Rod 2"x21FT	0.000	0.080	0.000	-1.646	195.000	1.196	0.027	4.200	4.200
PiROD 13' Low Profile Platform	0.000	1.300	0.000	0.000	185.000	1.178	0.026	15.700	15.700
20' - 4 Bay Dipole	180.000	0.050	-4.000	4.146	187.500	1.183	0.027	4.750	4.750
20' - 4 Bay Dipole	180.000	0.050	4.000	4.146	187.500	1.183	0.027	4.750	4.750
PiROD 13' Low Profile Platform	0.000	1.300	0.000	0.000	164.000	1.138	0.026	15.700	15.700
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	300.000	0.112	-3.737	-2.158	164.000	1.138	0.026	6.830	5.640
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	60.000	0.112	3.737	-2.158	164.000	1.138	0.026	6.830	5.640
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	180.000	0.112	0.000	4.315	164.000	1.138	0.026	6.830	5.640
RFS	300.000	0.013	-2.871	-1.658	164.000	1.138	0.026	1.170	0.470
ATMAP1412D-1A20 RFS	60.000	0.013	2.871	-1.658	164.000	1.138	0.026	1.170	0.470
ATMAP1412D-1A20 RFS	180.000	0.013	0.000	3.315	164.000	1.138	0.026	1.170	0.470
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	300.000	0.161	-3.737	-2.158	164.000	1.138	0.026	11.340	9.070
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	60.000	0.161	3.737	-2.158	164.000	1.138	0.026	11.340	9.070
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	180.000	0.161	0.000	4.315	164.000	1.138	0.026	11.340	9.070
Ericsson RRUS 11	300.000	0.055	-2.871	-1.658	164.000	1.138	0.026	2.940	1.240
Ericsson RRUS 11	60.000	0.055	2.871	-1.658	164.000	1.138	0.026	2.940	1.240
Ericsson RRUS 11	180.000	0.055	0.000	3.315	164.000	1.138	0.026	2.940	1.240
PiROD 13' Low Profile Omni 2"x10"	0.000	1.300	0.000	0.000	124.000	1.051	0.024	15.700	15.700
Omni 2"x10"	60.000	0.020	4.038	-2.332	130.000	1.065	0.024	2.000	2.000
Omni 2"x10"	60.000	0.020	4.038	-2.332	130.000	1.065	0.024	2.000	2.000
20' - 4 Bay Dipole	180.000	0.050	0.000	4.663	127.000	1.058	0.024	4.750	4.750
3' Yagi	60.000	0.010	4.038	-2.332	127.000	1.058	0.024	0.700	0.350
3' Yagi	180.000	0.010	0.000	4.663	127.000	1.058	0.024	0.700	0.350
1' Side Mount Standoff	180.000	0.030	0.000	2.769	55.000	0.833	0.019	1.000	1.000
GPS	180.000	0.005	0.000	4.769	55.000	0.833	0.019	0.210	0.210
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	144.000	1.097	0.025	15.700	15.700

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Project	183FT MONOPOLE	Date	22:04:37 07/25/17
Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Kathrein 800 10121 w/ mount pipe	300.000	0.078	-3.897	-2.250	144.000	1.097	0.025	5.720	4.810
Kathrein 800 10121 w/ mount pipe	60.000	0.078	3.897	-2.250	144.000	1.097	0.025	5.720	4.810
Kathrein 800 10121 w/ mount pipe	180.000	0.078	0.000	4.500	144.000	1.097	0.025	5.720	4.810
Ericsson RRUS 11	300.000	0.055	-3.031	-1.750	144.000	1.097	0.025	2.940	1.240
Ericsson RRUS 11	60.000	0.055	3.031	-1.750	144.000	1.097	0.025	2.940	1.240
Ericsson RRUS 11	180.000	0.055	0.000	3.500	144.000	1.097	0.025	2.940	1.240
DC6-48-60-18-8F	240.000	0.020	-2.598	1.500	144.000	1.097	0.025	1.270	1.270
OPA-65R-LCUU-H6	300.000	0.225	-3.897	-2.250	144.000	1.097	0.025	21.300	15.060
OPA-65R-LCUU-H8	60.000	0.280	3.897	-2.250	144.000	1.097	0.025	26.680	19.660
OPA-65R-LCUU-H8	180.000	0.280	0.000	4.500	144.000	1.097	0.025	26.680	19.660
Ericsson RRUS-12	300.000	0.058	-3.031	-1.750	144.000	1.097	0.025	3.670	1.490
Ericsson RRUS-12	60.000	0.058	3.031	-1.750	144.000	1.097	0.025	3.670	1.490
Ericsson RRUS-12	180.000	0.058	0.000	3.500	144.000	1.097	0.025	3.670	1.490
Ericsson RRUS-32	300.000	0.077	-3.031	-1.750	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-32	60.000	0.077	3.031	-1.750	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-32	180.000	0.077	0.000	3.500	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-E2	300.000	0.077	-3.031	-1.750	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-E2	60.000	0.077	3.031	-1.750	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-E2	180.000	0.077	0.000	3.500	144.000	1.097	0.025	3.870	2.760
Ericsson RRUS-A2 Module	300.000	0.022	-3.031	-1.750	144.000	1.097	0.025	2.420	0.540
Ericsson RRUS-A2 Module	60.000	0.022	3.031	-1.750	144.000	1.097	0.025	2.420	0.540
Ericsson RRUS-A2 Module	180.000	0.022	0.000	3.500	144.000	1.097	0.025	2.420	0.540
DC6-48-60-18-8F	0.000	0.020	0.000	-3.000	144.000	1.097	0.025	1.270	1.270
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	111.000	1.018	0.023	15.700	15.700
LNx6514DS-VTM	300.000	0.129	-4.142	-2.392	111.000	1.018	0.023	17.260	14.140
LNx6514DS-VTM	60.000	0.129	4.142	-2.392	111.000	1.018	0.023	17.260	14.140
LNx6514DS-VTM	180.000	0.129	0.000	4.783	111.000	1.018	0.023	17.260	14.140
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.023	10.840	9.920
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.023	10.840	9.920
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.023	10.840	9.920
RRH	300.000	0.048	-3.276	-1.892	111.000	1.018	0.023	3.770	2.230
2X40-AWS+RDEM RRH	60.000	0.048	3.276	-1.892	111.000	1.018	0.023	3.770	2.230
2X40-AWS+RDEM RRH	180.000	0.048	0.000	3.783	111.000	1.018	0.023	3.770	2.230
2X40-AWS+RDEM RRH 2X40-07U	300.000	0.050	-3.276	-1.892	111.000	1.018	0.023	2.290	1.210
RRH 2X40-07U	60.000	0.050	3.276	-1.892	111.000	1.018	0.023	2.290	1.210
RRH 2X40-07U	180.000	0.050	0.000	3.783	111.000	1.018	0.023	2.290	1.210
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.023	2.570	2.020
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.023	2.570	2.020
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.023	2.570	2.020
RFS DB-T1-6Z-8AB-0Z	60.000	0.044	2.410	-1.392	111.000	1.018	0.023	5.600	2.330
RFS DB-T1-6Z-8AB-0Z	180.000	0.044	0.000	2.783	111.000	1.018	0.023	5.600	2.330
1ft Side Mount Standoff	300.000	0.030	-2.051	-1.184	39.900	0.760	0.017	1.000	1.000
1ft Side Mount Standoff	60.000	0.030	2.051	-1.184	39.900	0.760	0.017	1.000	1.000
1ft Side Mount Standoff	180.000	0.030	0.000	2.368	39.900	0.760	0.017	1.000	1.000
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	154.000	1.118	0.025	15.700	15.700
APXVSP18-C w/ mount	300.000	0.083	-3.817	-2.204	154.000	1.118	0.025	8.500	6.950
APXVSP18-C w/ mount	60.000	0.083	3.817	-2.204	154.000	1.118	0.025	8.500	6.950
APXVSP18-C w/ mount	180.000	0.083	0.000	4.407	154.000	1.118	0.025	8.500	6.950
RRH-1900	300.000	0.120	-1.652	-0.954	154.000	1.118	0.025	5.420	7.320

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	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
RRH-1900	60.000	0.120	1.652	-0.954	154.000	1.118	0.025	5.420	7.320
RRH-1900	180.000	0.120	0.000	1.907	154.000	1.118	0.025	5.420	7.320
RRH-800	300.000	0.064	-1.652	-0.954	154.000	1.118	0.025	2.490	3.220
RRH-800	60.000	0.064	1.652	-0.954	154.000	1.118	0.025	2.490	3.220
RRH-800	180.000	0.064	0.000	1.907	154.000	1.118	0.025	2.490	3.220
APXVTM14-ALU-120 W/ MOUNT	300.000	0.056	-3.817	-2.204	154.000	1.118	0.025	6.340	1.980
APXVTM14-ALU-120 W/ MOUNT	60.000	0.056	3.817	-2.204	154.000	1.118	0.025	6.340	1.980
APXVTM14-ALU-120 W/ MOUNT	180.000	0.056	0.000	4.407	154.000	1.118	0.025	6.340	1.980
RRH 8X20-25	300.000	0.070	-1.652	-0.954	154.000	1.118	0.025	4.720	1.700
RRH 8X20-25	60.000	0.070	1.652	-0.954	154.000	1.118	0.025	4.720	1.700
RRH 8X20-25	180.000	0.070	0.000	1.907	154.000	1.118	0.025	4.720	1.700
Ring Mount	0.000	0.090	0.000	0.000	154.000	1.118	0.025	1.400	1.400
Sum Weight:		13.601							

Discrete Appurtenance Pressures - With Ice G_H = 1.100

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
Lighting Rod 2"X21FT	0.000	0.234	0.000	-1.646	195.000	1.196	0.007	14.323	14.323	2.376
PiROD 13' Low Profile Platform	0.000	3.510	0.000	0.000	185.000	1.178	0.007	36.611	36.611	2.376
20' - 4 Bay Dipole	180.000	0.193	-4.000	4.146	187.500	1.183	0.007	11.879	11.879	2.376
20' - 4 Bay Dipole	180.000	0.193	4.000	4.146	187.500	1.183	0.007	11.879	11.879	2.376
PiROD 13' Low Profile Platform	0.000	3.483	0.000	0.000	164.000	1.138	0.007	36.361	36.361	2.348
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	300.000	0.379	-3.737	-2.158	164.000	1.138	0.007	9.272	9.584	2.348
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	60.000	0.379	3.737	-2.158	164.000	1.138	0.007	9.272	9.584	2.348
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	180.000	0.379	0.000	4.315	164.000	1.138	0.007	9.272	9.584	2.348
RFS	300.000	0.049	-2.871	-1.658	164.000	1.138	0.007	1.827	0.940	2.348
ATMAP1412D-1A20 RFS	60.000	0.049	2.871	-1.658	164.000	1.138	0.007	1.827	0.940	2.348
ATMAP1412D-1A20 RFS	180.000	0.049	0.000	3.315	164.000	1.138	0.007	1.827	0.940	2.348
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	300.000	0.573	-3.737	-2.158	164.000	1.138	0.007	14.439	14.846	2.348
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	60.000	0.573	3.737	-2.158	164.000	1.138	0.007	14.439	14.846	2.348
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	180.000	0.573	0.000	4.315	164.000	1.138	0.007	14.439	14.846	2.348
Ericsson RRUS 11	300.000	0.146	-2.871	-1.658	164.000	1.138	0.007	4.020	2.038	2.348
Ericsson RRUS 11	60.000	0.146	2.871	-1.658	164.000	1.138	0.007	4.020	2.038	2.348
Ericsson RRUS 11	180.000	0.146	0.000	3.315	164.000	1.138	0.007	4.020	2.038	2.348
PiROD 13' Low Profile	0.000	3.423	0.000	0.000	124.000	1.051	0.006	35.791	35.791	2.283
Omni 2"x10"	60.000	0.091	4.038	-2.332	130.000	1.065	0.006	6.657	6.657	2.283
Omni 2"x10"	60.000	0.091	4.038	-2.332	130.000	1.065	0.006	6.657	6.657	2.283
20' - 4 Bay Dipole	180.000	0.187	0.000	4.663	127.000	1.058	0.006	11.599	11.599	2.283

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Project	183FT MONOPOLE	Date	22:04:37 07/25/17
Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
3' Yagi	60.000	0.130	4.038	-2.332	127.000	1.058	0.006	1.842	0.944	2.283
3' Yagi	180.000	0.130	0.000	4.663	127.000	1.058	0.006	1.842	0.944	2.283
1' Side Mount Standoff	180.000	0.114	0.000	2.769	55.000	0.833	0.005	3.105	3.105	2.105
GPS	180.000	0.016	0.000	4.769	55.000	0.833	0.005	0.673	0.673	2.105
PiROD 13' Low Profile	0.000	3.455	0.000	0.000	144.000	1.097	0.007	36.094	36.094	2.317
Kathrein 800 10121 w/ mount pipe	300.000	0.310	-3.897	-2.250	144.000	1.097	0.007	7.991	7.962	2.317
Kathrein 800 10121 w/ mount pipe	60.000	0.310	3.897	-2.250	144.000	1.097	0.007	7.991	7.962	2.317
Kathrein 800 10121 w/ mount pipe	180.000	0.310	0.000	4.500	144.000	1.097	0.007	7.991	7.962	2.317
Ericsson RRUS 11	300.000	0.145	-3.031	-1.750	144.000	1.097	0.007	4.006	2.028	2.317
Ericsson RRUS 11	60.000	0.145	3.031	-1.750	144.000	1.097	0.007	4.006	2.028	2.317
Ericsson RRUS 11	180.000	0.145	0.000	3.500	144.000	1.097	0.007	4.006	2.028	2.317
DC6-48-60-18-8F	240.000	0.090	-2.598	1.500	144.000	1.097	0.007	2.151	2.151	2.317
OPA-65R-LCUU-H6	300.000	0.969	-3.897	-2.250	144.000	1.097	0.007	27.325	24.608	2.317
OPA-65R-LCUU-H8	60.000	1.200	3.897	-2.250	144.000	1.097	0.007	34.467	33.658	2.317
OPA-65R-LCUU-H8	180.000	1.200	0.000	4.500	144.000	1.097	0.007	34.467	33.658	2.317
Ericsson RRUS-12	300.000	0.166	-3.031	-1.750	144.000	1.097	0.007	4.875	2.324	2.317
Ericsson RRUS-12	60.000	0.166	3.031	-1.750	144.000	1.097	0.007	4.875	2.324	2.317
Ericsson RRUS-12	180.000	0.166	0.000	3.500	144.000	1.097	0.007	4.875	2.324	2.317
Ericsson RRUS-32	300.000	0.206	-3.031	-1.750	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-32	60.000	0.206	3.031	-1.750	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-32	180.000	0.206	0.000	3.500	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-E2	300.000	0.206	-3.031	-1.750	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-E2	60.000	0.206	3.031	-1.750	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-E2	180.000	0.206	0.000	3.500	144.000	1.097	0.007	5.168	3.965	2.317
Ericsson RRUS-A2 Module	300.000	0.081	-3.031	-1.750	144.000	1.097	0.007	3.393	1.143	2.317
Ericsson RRUS-A2 Module	60.000	0.081	3.031	-1.750	144.000	1.097	0.007	3.393	1.143	2.317
Ericsson RRUS-A2 Module	180.000	0.081	0.000	3.500	144.000	1.097	0.007	3.393	1.143	2.317
DC6-48-60-18-8F	0.000	0.090	0.000	-3.000	144.000	1.097	0.007	2.151	2.151	2.317
PiROD 13' Low Profile	0.000	3.400	0.000	0.000	111.000	1.018	0.006	35.570	35.570	2.258
LNx6514DS-VTM	300.000	0.752	-4.142	-2.392	111.000	1.018	0.006	23.221	24.797	2.258
LNx6514DS-VTM	60.000	0.752	4.142	-2.392	111.000	1.018	0.006	23.221	24.797	2.258
LNx6514DS-VTM	180.000	0.752	0.000	4.783	111.000	1.018	0.006	23.221	24.797	2.258
HBX-6517DS-VTM	300.000	0.492	-4.142	-2.392	111.000	1.018	0.006	15.807	20.577	2.258
HBX-6517DS-VTM	300.000	0.492	-4.142	-2.392	111.000	1.018	0.006	15.807	20.577	2.258
HBX-6517DS-VTM	300.000	0.492	-4.142	-2.392	111.000	1.018	0.006	15.807	20.577	2.258
RRH	300.000	0.166	-3.276	-1.892	111.000	1.018	0.006	4.989	3.269	2.258
2X40-AWS+RDEM RRH	60.000	0.166	3.276	-1.892	111.000	1.018	0.006	4.989	3.269	2.258
2X40-AWS+RDEM RRH	180.000	0.166	0.000	3.783	111.000	1.018	0.006	4.989	3.269	2.258
2X40-AWS+RDEM RRH	300.000	0.126	-3.276	-1.892	111.000	1.018	0.006	3.193	1.887	2.258
RRH 2X40-07U	60.000	0.126	3.276	-1.892	111.000	1.018	0.006	3.193	1.887	2.258
RRH 2X40-07U	180.000	0.126	0.000	3.783	111.000	1.018	0.006	3.193	1.887	2.258
RRH 2X40-PCS	300.000	0.147	-3.276	-1.892	111.000	1.018	0.006	3.563	2.968	2.258
RRH 2X40-PCS	300.000	0.147	-3.276	-1.892	111.000	1.018	0.006	3.563	2.968	2.258
RRH 2X40-PCS	300.000	0.147	-3.276	-1.892	111.000	1.018	0.006	3.563	2.968	2.258
RFS DB-T1-6Z-8AB-0Z	60.000	0.243	2.410	-1.392	111.000	1.018	0.006	7.045	3.369	2.258
RFS DB-T1-6Z-8AB-0Z	180.000	0.243	0.000	2.783	111.000	1.018	0.006	7.045	3.369	2.258
1ft Side Mount Standoff	300.000	0.112	-2.051	-1.184	39.900	0.760	0.005	3.038	3.038	2.038
1ft Side Mount Standoff	60.000	0.112	2.051	-1.184	39.900	0.760	0.005	3.038	3.038	2.038
1ft Side Mount Standoff	180.000	0.112	0.000	2.368	39.900	0.760	0.005	3.038	3.038	2.038
PiROD 13' Low Profile	0.000	3.470	0.000	0.000	154.000	1.118	0.007	36.231	36.231	2.333
APXVSP18-C w/ mount	300.000	0.400	-3.817	-2.204	154.000	1.118	0.007	11.533	12.456	2.333

tnxTower SZS Engineering 4551 E Carriage Way Gilbert, AZ 85297 Phone: 480-528-0914 FAX:	Job	17044-CHE	Page	15 of 25
	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
APXVSP18-C w/ mount	60.000	0.400	3.817	-2.204	154.000	1.118	0.007	11.533	12.456	2.333
APXVSP18-C w/ mount	180.000	0.400	0.000	4.407	154.000	1.118	0.007	11.533	12.456	2.333
RRH-1900	300.000	0.384	-1.652	-0.954	154.000	1.118	0.007	7.660	9.746	2.333
RRH-1900	60.000	0.384	1.652	-0.954	154.000	1.118	0.007	7.660	9.746	2.333
RRH-1900	180.000	0.384	0.000	1.907	154.000	1.118	0.007	7.660	9.746	2.333
RRH-800	300.000	0.193	-1.652	-0.954	154.000	1.118	0.007	3.517	4.340	2.333
RRH-800	60.000	0.193	1.652	-0.954	154.000	1.118	0.007	3.517	4.340	2.333
RRH-800	180.000	0.193	0.000	1.907	154.000	1.118	0.007	3.517	4.340	2.333
APXVTM14-ALU-120 W/ MOUNT	300.000	0.241	-3.817	-2.204	154.000	1.118	0.007	9.280	6.833	2.333
APXVTM14-ALU-120 W/ MOUNT	60.000	0.241	3.817	-2.204	154.000	1.118	0.007	9.280	6.833	2.333
APXVTM14-ALU-120 W/ MOUNT	180.000	0.241	0.000	4.407	154.000	1.118	0.007	9.280	6.833	2.333
RRH 8X20-25	300.000	0.197	-1.652	-0.954	154.000	1.118	0.007	6.073	2.727	2.333
RRH 8X20-25	60.000	0.197	1.652	-0.954	154.000	1.118	0.007	6.073	2.727	2.333
RRH 8X20-25	180.000	0.197	0.000	1.907	154.000	1.118	0.007	6.073	2.727	2.333
Ring Mount	0.000	0.277	0.000	0.000	154.000	1.118	0.007	6.066	6.066	2.333
Sum Weight:		42.841								

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 ksf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Lighting Rod 2"X21FT	0.000	0.080	0.000	-1.646	195.000	1.196	0.009	4.200	4.200
PiROD 13' Low Profile Platform	0.000	1.300	0.000	0.000	185.000	1.178	0.009	15.700	15.700
20' - 4 Bay Dipole	180.000	0.050	-4.000	4.146	187.500	1.183	0.009	4.750	4.750
20' - 4 Bay Dipole	180.000	0.050	4.000	4.146	187.500	1.183	0.009	4.750	4.750
PiROD 13' Low Profile Platform	0.000	1.300	0.000	0.000	164.000	1.138	0.009	15.700	15.700
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	300.000	0.112	-3.737	-2.158	164.000	1.138	0.009	6.830	5.640
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	60.000	0.112	3.737	-2.158	164.000	1.138	0.009	6.830	5.640
ERICSSON AIR 21 B2AB4P w/ Mount Pipe	180.000	0.112	0.000	4.315	164.000	1.138	0.009	6.830	5.640
RFS	300.000	0.013	-2.871	-1.658	164.000	1.138	0.009	1.170	0.470
ATMAP1412D-1A20 RFS	60.000	0.013	2.871	-1.658	164.000	1.138	0.009	1.170	0.470
ATMAP1412D-1A20 RFS	180.000	0.013	0.000	3.315	164.000	1.138	0.009	1.170	0.470
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	300.000	0.161	-3.737	-2.158	164.000	1.138	0.009	11.340	9.070
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	60.000	0.161	3.737	-2.158	164.000	1.138	0.009	11.340	9.070
ERICSSON AIR 21 B4A B12P-B8P w/ Mount Pipe	180.000	0.161	0.000	4.315	164.000	1.138	0.009	11.340	9.070
Ericsson RRUS 11	300.000	0.055	-2.871	-1.658	164.000	1.138	0.009	2.940	1.240
Ericsson RRUS 11	60.000	0.055	2.871	-1.658	164.000	1.138	0.009	2.940	1.240

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Project	183FT MONOPOLE	Date	22:04:37 07/25/17
Client	T-Mobile	Designed by	Samuel Gonzalez

Description	Aiming	Weight	Offset _x	Offset _z	z	K _z	q _z	C _{AAc} Front	C _{AAc} Side
	Azimuth °	K	ft	ft	ft		ksf	ft ²	ft ²
Ericsson RRUS 11	180.000	0.055	0.000	3.315	164.000	1.138	0.009	2.940	1.240
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	124.000	1.051	0.008	15.700	15.700
Omni 2"x10"	60.000	0.020	4.038	-2.332	130.000	1.065	0.008	2.000	2.000
Omni 2"x10"	60.000	0.020	4.038	-2.332	130.000	1.065	0.008	2.000	2.000
20' - 4 Bay Dipole	180.000	0.050	0.000	4.663	127.000	1.058	0.008	4.750	4.750
3' Yagi	60.000	0.010	4.038	-2.332	127.000	1.058	0.008	0.700	0.350
3' Yagi	180.000	0.010	0.000	4.663	127.000	1.058	0.008	0.700	0.350
1' Side Mount Standoff	180.000	0.030	0.000	2.769	55.000	0.833	0.007	1.000	1.000
GPS	180.000	0.005	0.000	4.769	55.000	0.833	0.007	0.210	0.210
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	144.000	1.097	0.009	15.700	15.700
Kathrein 800 10121 w/ mount pipe	300.000	0.078	-3.897	-2.250	144.000	1.097	0.009	5.720	4.810
Kathrein 800 10121 w/ mount pipe	60.000	0.078	3.897	-2.250	144.000	1.097	0.009	5.720	4.810
Kathrein 800 10121 w/ mount pipe	180.000	0.078	0.000	4.500	144.000	1.097	0.009	5.720	4.810
Ericsson RRUS 11	300.000	0.055	-3.031	-1.750	144.000	1.097	0.009	2.940	1.240
Ericsson RRUS 11	60.000	0.055	3.031	-1.750	144.000	1.097	0.009	2.940	1.240
Ericsson RRUS 11	180.000	0.055	0.000	3.500	144.000	1.097	0.009	2.940	1.240
DC6-48-60-18-8F	240.000	0.020	-2.598	1.500	144.000	1.097	0.009	1.270	1.270
OPA-65R-LCUU-H6	300.000	0.225	-3.897	-2.250	144.000	1.097	0.009	21.300	15.060
OPA-65R-LCUU-H8	60.000	0.280	3.897	-2.250	144.000	1.097	0.009	26.680	19.660
OPA-65R-LCUU-H8	180.000	0.280	0.000	4.500	144.000	1.097	0.009	26.680	19.660
Ericsson RRUS-12	300.000	0.058	-3.031	-1.750	144.000	1.097	0.009	3.670	1.490
Ericsson RRUS-12	60.000	0.058	3.031	-1.750	144.000	1.097	0.009	3.670	1.490
Ericsson RRUS-12	180.000	0.058	0.000	3.500	144.000	1.097	0.009	3.670	1.490
Ericsson RRUS-32	300.000	0.077	-3.031	-1.750	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-32	60.000	0.077	3.031	-1.750	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-32	180.000	0.077	0.000	3.500	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-E2	300.000	0.077	-3.031	-1.750	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-E2	60.000	0.077	3.031	-1.750	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-E2	180.000	0.077	0.000	3.500	144.000	1.097	0.009	3.870	2.760
Ericsson RRUS-A2 Module	300.000	0.022	-3.031	-1.750	144.000	1.097	0.009	2.420	0.540
Ericsson RRUS-A2 Module	60.000	0.022	3.031	-1.750	144.000	1.097	0.009	2.420	0.540
Ericsson RRUS-A2 Module	180.000	0.022	0.000	3.500	144.000	1.097	0.009	2.420	0.540
DC6-48-60-18-8F	0.000	0.020	0.000	-3.000	144.000	1.097	0.009	1.270	1.270
PiROD 13' Low Profile	0.000	1.300	0.000	0.000	111.000	1.018	0.008	15.700	15.700
LNx6514DS-VTM	300.000	0.129	-4.142	-2.392	111.000	1.018	0.008	17.260	14.140
LNx6514DS-VTM	60.000	0.129	4.142	-2.392	111.000	1.018	0.008	17.260	14.140
LNx6514DS-VTM	180.000	0.129	0.000	4.783	111.000	1.018	0.008	17.260	14.140
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.008	10.840	9.920
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.008	10.840	9.920
HBX-6517DS-VTM	300.000	0.079	-4.142	-2.392	111.000	1.018	0.008	10.840	9.920
RRH	300.000	0.048	-3.276	-1.892	111.000	1.018	0.008	3.770	2.230
2X40-AWS+RDEM RRH	60.000	0.048	3.276	-1.892	111.000	1.018	0.008	3.770	2.230
2X40-AWS+RDEM RRH	180.000	0.048	0.000	3.783	111.000	1.018	0.008	3.770	2.230
2X40-AWS+RDEM RRH	300.000	0.050	-3.276	-1.892	111.000	1.018	0.008	2.290	1.210
RRH 2X40-07U	60.000	0.050	3.276	-1.892	111.000	1.018	0.008	2.290	1.210
RRH 2X40-07U	180.000	0.050	0.000	3.783	111.000	1.018	0.008	2.290	1.210
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.008	2.570	2.020
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.008	2.570	2.020
RRH 2X40-PCS	300.000	0.055	-3.276	-1.892	111.000	1.018	0.008	2.570	2.020
RFS DB-T1-6Z-8AB-0Z	60.000	0.044	2.410	-1.392	111.000	1.018	0.008	5.600	2.330
RFS DB-T1-6Z-8AB-0Z	180.000	0.044	0.000	2.783	111.000	1.018	0.008	5.600	2.330
1ft Side Mount Standoff	300.000	0.030	-2.051	-1.184	39.900	0.760	0.006	1.000	1.000

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	Client T-Mobile	Designed by Samuel Gonzalez

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 ksf
151.000	VHLP2-11 ANDREW	300.000	0.031	-3.841	-2.218	1.112	3.142	0.009
151.000	VHLPX2.5 ANDREW	120.000	0.049	3.841	2.218	1.112	4.909	0.009
151.000	VHLP2-11 ANDREW	240.000	0.031	-3.841	2.218	1.112	3.142	0.009
39.900	VHLPX2-18-2WH/B	0.000	0.025	0.000	-3.868	0.760	3.142	0.006
39.900	VHLPX2-18-2WH/B	120.000	0.025	3.350	1.934	0.760	3.142	0.006
39.900	VHLPX2-18-2WH/B	240.000	0.050	-3.350	1.934	0.760	6.283	0.006
	Sum		0.211					
	Weight:							

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	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service

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Comb. No.	Description
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

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	184 - 166.5	Pole	Max Tension	36	0.001	-0.000	0.008
			Max. Compression	26	-5.903	0.017	-1.299
			Max. Mx	8	-2.137	-32.484	-0.164
			Max. My	14	-2.139	-0.030	-32.800
			Max. Vy	8	2.292	-32.484	-0.164
			Max. Vx	14	2.290	-0.030	-32.800
			Max. Torque	20			1.545
L2	166.5 - 133.08	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.140	-0.605	-2.219
			Max. Mx	8	-14.006	-345.250	-1.359
			Max. My	14	-14.042	-3.671	-342.505
			Max. Vy	8	17.387	-345.250	-1.359
			Max. Vx	2	-17.194	-0.463	341.506
			Max. Torque	6			-2.258
L3	133.08 - 87.99	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.944	5.897	1.233
			Max. Mx	8	-27.504	-1328.593	-3.140
			Max. My	2	-27.529	-1.109	1318.834
			Max. Vy	8	27.720	-1328.593	-3.140
			Max. Vx	2	-27.535	-1.109	1318.834
			Max. Torque	2			3.704
L4	87.99 - 43.91	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-84.688	6.156	0.863
			Max. Mx	8	-41.896	-2608.167	-5.428
			Max. My	2	-41.909	-3.000	2590.388
			Max. Vy	8	31.779	-2608.167	-5.428
			Max. Vx	2	-31.597	-3.000	2590.388
			Max. Torque	2			3.693
L5	43.91 - 1	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-112.233	6.392	0.726
			Max. Mx	8	-63.672	-4267.331	-2.108
			Max. My	2	-63.672	-9.875	4241.915
			Max. Vy	8	35.325	-4267.331	-2.108
			Max. Vx	2	-35.179	-9.875	4241.915
			Max. Torque	14			-3.757

Maximum Reactions

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	112.233	12.387	-0.022
	Max. H _x	20	63.698	35.159	0.132
	Max. H _z	2	63.698	-0.166	35.132
	Max. M _x	2	4241.915	-0.166	35.132
	Max. M _z	8	4267.331	-35.277	0.100
	Max. Torsion	2	3.747	-0.166	35.132
	Min. Vert	13	47.774	-17.596	-30.282
	Min. H _x	8	63.698	-35.277	0.100
	Min. H _z	14	63.698	-0.204	-35.051
	Min. M _x	14	-4237.251	-0.204	-35.051
	Min. M _z	20	-4256.771	35.159	0.132
	Min. Torsion	14	-3.754	-0.204	-35.051

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	53.082	0.000	0.000	-0.009	1.179	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	63.698	0.166	-35.132	-4241.915	-9.876	-3.747
0.9 Dead+1.6 Wind 0 deg - No Ice	47.774	0.166	-35.132	-4176.509	-10.146	-3.732
1.2 Dead+1.6 Wind 30 deg - No Ice	63.698	17.802	-30.244	-3656.126	-2143.386	-2.817
0.9 Dead+1.6 Wind 30 deg - No Ice	47.774	17.802	-30.244	-3599.736	-2110.728	-2.802
1.2 Dead+1.6 Wind 60 deg - No Ice	63.698	30.691	-17.422	-2096.530	-3712.963	-1.740
0.9 Dead+1.6 Wind 60 deg - No Ice	47.774	30.691	-17.422	-2064.260	-3656.024	-1.731
1.2 Dead+1.6 Wind 90 deg - No Ice	63.698	35.277	-0.100	2.108	-4267.331	-0.157
0.9 Dead+1.6 Wind 90 deg - No Ice	47.774	35.277	-0.100	1.993	-4201.853	-0.156
1.2 Dead+1.6 Wind 120 deg - No Ice	63.698	30.724	17.372	2102.961	-3713.061	1.709
0.9 Dead+1.6 Wind 120 deg - No Ice	47.774	30.724	17.372	2070.515	-3656.137	1.702
1.2 Dead+1.6 Wind 150 deg - No Ice	63.698	17.596	30.282	3659.001	-2139.811	3.117
0.9 Dead+1.6 Wind 150 deg - No Ice	47.774	17.596	30.282	3602.569	-2107.083	3.104
1.2 Dead+1.6 Wind 180 deg - No Ice	63.698	0.204	35.051	4237.251	-33.429	3.754
0.9 Dead+1.6 Wind 180 deg - No Ice	47.774	0.204	35.051	4171.884	-33.211	3.738
1.2 Dead+1.6 Wind 210 deg - No Ice	63.698	-17.433	30.332	3661.911	2112.520	3.288
0.9 Dead+1.6 Wind 210 deg - No Ice	47.774	-17.433	30.332	3605.442	2079.531	3.273
1.2 Dead+1.6 Wind 240 deg - No Ice	63.698	-30.527	17.449	2101.895	3691.463	2.038
0.9 Dead+1.6 Wind 240 deg - No Ice	47.774	-30.527	17.449	2069.518	3634.119	2.029
1.2 Dead+1.6 Wind 270 deg - No Ice	63.698	-35.159	-0.132	-13.309	4256.771	-0.027

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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
0.9 Dead+1.6 Wind 270 deg - No Ice	47.774	-35.159	-0.132	-13.107	4190.683	-0.028
1.2 Dead+1.6 Wind 300 deg - No Ice	63.698	-30.470	-17.530	-2121.374	3689.140	-2.013
0.9 Dead+1.6 Wind 300 deg - No Ice	47.774	-30.470	-17.530	-2088.628	3631.809	-2.007
1.2 Dead+1.6 Wind 330 deg - No Ice	63.698	-17.645	-30.242	-3661.453	2135.292	-3.403
0.9 Dead+1.6 Wind 330 deg - No Ice	47.774	-17.645	-30.242	-3604.936	2101.956	-3.391
1.2 Dead+1.0 Ice	112.233	-0.000	0.000	-0.726	6.392	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	112.233	0.073	-12.439	-1585.796	-0.564	-1.243
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	112.233	6.270	-10.764	-1372.999	-791.354	-1.000
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	112.233	10.790	-6.234	-793.306	-1370.381	-0.593
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	112.233	12.407	-0.062	-5.454	-1576.463	-0.021
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	112.233	10.751	6.148	784.105	-1365.224	0.597
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	112.233	6.158	10.726	1366.842	-781.880	1.056
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	112.233	-0.010	12.425	1583.439	5.292	1.243
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	112.233	-6.207	10.779	1372.515	798.457	1.081
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	112.233	-10.763	6.238	792.780	1379.124	0.646
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	112.233	-12.387	0.022	1.949	1587.261	-0.009
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	112.233	-10.708	-6.175	-789.033	1373.564	-0.650
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	112.233	-6.166	-10.719	-1368.861	793.719	-1.106
Dead+Wind 0 deg - Service	53.082	0.036	-7.674	-918.730	-1.200	-0.825
Dead+Wind 30 deg - Service	53.082	3.889	-6.606	-791.854	-463.283	-0.616
Dead+Wind 60 deg - Service	53.082	6.704	-3.806	-454.091	-803.241	-0.378
Dead+Wind 90 deg - Service	53.082	7.706	-0.022	0.450	-923.318	-0.031
Dead+Wind 120 deg - Service	53.082	6.711	3.795	455.488	-803.277	0.378
Dead+Wind 150 deg - Service	53.082	3.844	6.615	792.483	-462.494	0.686
Dead+Wind 180 deg - Service	53.082	0.045	7.657	917.715	-6.288	0.824
Dead+Wind 210 deg - Service	53.082	-3.808	6.626	793.097	458.468	0.721
Dead+Wind 240 deg - Service	53.082	-6.668	3.812	455.241	800.448	0.447
Dead+Wind 270 deg - Service	53.082	-7.680	-0.029	-2.881	922.894	-0.008
Dead+Wind 300 deg - Service	53.082	-6.656	-3.829	-459.454	799.953	-0.446
Dead+Wind 330 deg - Service	53.082	-3.854	-6.606	-793.012	463.416	-0.752

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-53.082	0.000	0.000	53.082	0.000	0.000%
2	0.166	-63.698	-35.132	-0.166	63.698	35.132	0.000%
3	0.166	-47.774	-35.132	-0.166	47.774	35.132	0.000%
4	17.802	-63.698	-30.244	-17.802	63.698	30.244	0.000%
5	17.802	-47.774	-30.244	-17.802	47.774	30.244	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
6	30.691	-63.698	-17.422	-30.691	63.698	17.422	0.000%
7	30.691	-47.774	-17.422	-30.691	47.774	17.422	0.000%
8	35.277	-63.698	-0.100	-35.277	63.698	0.100	0.000%
9	35.277	-47.774	-0.100	-35.277	47.774	0.100	0.000%
10	30.724	-63.698	17.372	-30.724	63.698	-17.372	0.000%
11	30.724	-47.774	17.372	-30.724	47.774	-17.372	0.000%
12	17.596	-63.698	30.282	-17.596	63.698	-30.282	0.000%
13	17.596	-47.774	30.282	-17.596	47.774	-30.282	0.000%
14	0.204	-63.698	35.051	-0.204	63.698	-35.051	0.000%
15	0.204	-47.774	35.051	-0.204	47.774	-35.051	0.000%
16	-17.433	-63.698	30.332	17.433	63.698	-30.332	0.000%
17	-17.433	-47.774	30.332	17.433	47.774	-30.332	0.000%
18	-30.527	-63.698	17.449	30.527	63.698	-17.449	0.000%
19	-30.527	-47.774	17.449	30.527	47.774	-17.449	0.000%
20	-35.159	-63.698	-0.132	35.159	63.698	0.132	0.000%
21	-35.159	-47.774	-0.132	35.159	47.774	0.132	0.000%
22	-30.470	-63.698	-17.530	30.470	63.698	17.530	0.000%
23	-30.470	-47.774	-17.530	30.470	47.774	17.530	0.000%
24	-17.645	-63.698	-30.242	17.645	63.698	30.242	0.000%
25	-17.645	-47.774	-30.242	17.645	47.774	30.242	0.000%
26	0.000	-112.233	0.000	0.000	112.233	-0.000	0.000%
27	0.073	-112.233	-12.439	-0.073	112.233	12.439	0.000%
28	6.270	-112.233	-10.764	-6.270	112.233	10.764	0.000%
29	10.790	-112.233	-6.234	-10.790	112.233	6.234	0.000%
30	12.407	-112.233	-0.062	-12.407	112.233	0.062	0.000%
31	10.751	-112.233	6.148	-10.751	112.233	-6.148	0.000%
32	6.158	-112.233	10.726	-6.158	112.233	-10.726	0.000%
33	-0.010	-112.233	12.425	0.010	112.233	-12.425	0.000%
34	-6.207	-112.233	10.779	6.207	112.233	-10.779	0.000%
35	-10.763	-112.233	6.238	10.763	112.233	-6.238	0.000%
36	-12.387	-112.233	0.022	12.387	112.233	-0.022	0.000%
37	-10.708	-112.233	-6.175	10.708	112.233	6.175	0.000%
38	-6.166	-112.233	-10.719	6.166	112.233	10.719	0.000%
39	0.036	-53.082	-7.674	-0.036	53.082	7.674	0.000%
40	3.889	-53.082	-6.606	-3.889	53.082	6.606	0.000%
41	6.704	-53.082	-3.806	-6.704	53.082	3.806	0.000%
42	7.706	-53.082	-0.022	-7.706	53.082	0.022	0.000%
43	6.711	-53.082	3.795	-6.711	53.082	-3.795	0.000%
44	3.844	-53.082	6.615	-3.844	53.082	-6.615	0.000%
45	0.045	-53.082	7.656	-0.045	53.082	-7.657	0.000%
46	-3.808	-53.082	6.626	3.808	53.082	-6.626	0.000%
47	-6.668	-53.082	3.812	6.668	53.082	-3.812	0.000%
48	-7.680	-53.082	-0.029	7.680	53.082	0.029	0.000%
49	-6.656	-53.082	-3.829	6.656	53.082	3.829	0.000%
50	-3.854	-53.082	-6.606	3.854	53.082	6.606	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00020813
3	Yes	5	0.00000001	0.00009989
4	Yes	6	0.00000001	0.00040610
5	Yes	6	0.00000001	0.00013042
6	Yes	6	0.00000001	0.00039809

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7	Yes	6	0.00000001	0.00012755
8	Yes	5	0.00000001	0.00035608
9	Yes	5	0.00000001	0.00016998
10	Yes	6	0.00000001	0.00042239
11	Yes	6	0.00000001	0.00013625
12	Yes	6	0.00000001	0.00039488
13	Yes	6	0.00000001	0.00012606
14	Yes	5	0.00000001	0.00012402
15	Yes	5	0.00000001	0.00006032
16	Yes	6	0.00000001	0.00040402
17	Yes	6	0.00000001	0.00013005
18	Yes	6	0.00000001	0.00040936
19	Yes	6	0.00000001	0.00013175
20	Yes	5	0.00000001	0.00030101
21	Yes	5	0.00000001	0.00014477
22	Yes	6	0.00000001	0.00039241
23	Yes	6	0.00000001	0.00012513
24	Yes	6	0.00000001	0.00042132
25	Yes	6	0.00000001	0.00013607
26	Yes	4	0.00000001	0.00000497
27	Yes	5	0.00021465	0.00034285
28	Yes	6	0.00004114	0.00051865
29	Yes	6	0.00004114	0.00049933
30	Yes	5	0.00021468	0.00046617
31	Yes	6	0.00004115	0.00055395
32	Yes	6	0.00004116	0.00049002
33	Yes	5	0.00021466	0.00034399
34	Yes	6	0.00004113	0.00053047
35	Yes	6	0.00004113	0.00054984
36	Yes	5	0.00021470	0.00048106
37	Yes	6	0.00004115	0.00049089
38	Yes	6	0.00004115	0.00055392
39	Yes	4	0.00000001	0.00019774
40	Yes	4	0.00000001	0.00094181
41	Yes	4	0.00000001	0.00089033
42	Yes	4	0.00000001	0.00026568
43	Yes	5	0.00000001	0.00007458
44	Yes	4	0.00000001	0.00086248
45	Yes	4	0.00000001	0.00018069
46	Yes	4	0.00000001	0.00094452
47	Yes	4	0.00000001	0.00098574
48	Yes	4	0.00000001	0.00025901
49	Yes	4	0.00000001	0.00085426
50	Yes	5	0.00000001	0.00007407

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
in		in						
2.000	18	2.250	139.251	2.479	29.438	36.134	Stiff	0.67
			223.654	4.080	54.000	54.000		✓
			0.62	0.61	0.55	0.67		

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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	184 - 166.5 (1)	TP19.399x15.5x0.188	17.500	0.000	0.0	11.035	-2.139	819.880	0.003
L2	166.5 - 133.08 (2)	TP26.401x18.356x0.25	36.420	0.000	0.0	20.080	-14.007	1487.470	0.009
L3	133.08 - 87.99 (3)	TP35.892x25.055x0.375	48.920	0.000	0.0	40.956	-27.504	3042.810	0.009
L4	87.99 - 43.91 (4)	TP44.903x34.034x0.485	49.080	0.000	0.0	66.273	-41.896	4923.780	0.009
L5	43.91 - 1 (5)	TP53.5x42.567x0.54	49.080	0.000	0.0	88.184	-61.217	6551.660	0.009

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	184 - 166.5 (1)	TP19.399x15.5x0.188	32.800	311.929	0.105	0.000	311.929	0.000
L2	166.5 - 133.08 (2)	TP26.401x18.356x0.25	345.482	772.462	0.447	0.000	772.462	0.000
L3	133.08 - 87.99 (3)	TP35.892x25.055x0.375	1328.600	2146.525	0.619	0.000	2146.525	0.000
L4	87.99 - 43.91 (4)	TP44.903x34.034x0.485	2608.175	4344.258	0.600	0.000	4344.258	0.000
L5	43.91 - 1 (5)	TP53.5x42.567x0.54	4029.558	6913.550	0.583	0.000	6913.550	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	184 - 166.5 (1)	TP19.399x15.5x0.188	2.290	409.940	0.006	0.006	624.621	0.000
L2	166.5 - 133.08 (2)	TP26.401x18.356x0.25	17.383	743.736	0.023	1.424	1546.817	0.001
L3	133.08 - 87.99 (3)	TP35.892x25.055x0.375	27.720	1521.400	0.018	0.254	4298.300	0.000
L4	87.99 - 43.91 (4)	TP44.903x34.034x0.485	31.779	2461.890	0.013	0.131	8699.167	0.000
L5	43.91 - 1 (5)	TP53.5x42.567x0.54	35.080	3307.860	0.011	0.157	13844.000	0.000

Pole Interaction Design Data

tnxTower SZS Engineering 4551 E Carriage Way Gilbert, AZ 85297 Phone: 480-528-0914 FAX:	Job	17044-CHE	Page	25 of 25
	Project	183FT MONOPOLE	Date	22:04:37 07/25/17
	Client	T-Mobile	Designed by	Samuel Gonzalez

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	184 - 166.5 (1)	0.003	0.105	0.000	0.006	0.000	0.108	1.000	4.8.2 ✓
L2	166.5 - 133.08 (2)	0.009	0.447	0.000	0.023	0.001	0.457	1.000	4.8.2 ✓
L3	133.08 - 87.99 (3)	0.009	0.619	0.000	0.018	0.000	0.628	1.000	4.8.2 ✓
L4	87.99 - 43.91 (4)	0.009	0.600	0.000	0.013	0.000	0.609	1.000	4.8.2 ✓
L5	43.91 - 1 (5)	0.009	0.583	0.000	0.011	0.000	0.592	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	184 - 166.5	Pole	TP19.399x15.5x0.188	1	-2.139	819.880	10.8	Pass
L2	166.5 - 133.08	Pole	TP26.401x18.356x0.25	2	-14.007	1487.470	45.7	Pass
L3	133.08 - 87.99	Pole	TP35.892x25.055x0.375	3	-27.504	3042.810	62.8	Pass
L4	87.99 - 43.91	Pole	TP44.903x34.034x0.485	4	-41.896	4923.780	60.9	Pass
L5	43.91 - 1	Pole	TP53.5x42.567x0.54	5	-61.217	6551.660	59.2	Pass
Summary								
Pole (L3)							62.8	Pass
Base Plate							66.9	Pass
RATING =							66.9	Pass

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LPile for Windows, Version 2016-09.007

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method
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Files Used for Analysis

Path to file locations:

\SZS Engineering\COMEX\DOUG\17044-CHE - CT43XC827 - DO Macro Upgrade\Structural
Report\DATA-Exception 5\

Name of input data file:

New LPile (USCS units).lp9d

Name of output report file:

New LPile (USCS units).lp9o

Name of plot output file:

New LPile (USCS units).lp9p

Name of runtime message file:

New LPile (USCS units).lp9r

New LPILE (USCS units).lp9o
Date and Time of Analysis

Date: July 25, 2017

Time: 22:08:18

Problem Title

Project Name: CT43XC827

Job Number:

Client:

Engineer:

Description: Monopole Pile Foundation

Program Options and Settings

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed = 500
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

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Loading Type and Number of Cycles of Loading:

- Static loading specified
- Use of p-y modification factors for p-y curves not selected
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined = 1
Total length of pile = 32.000 ft
Depth of ground surface below top of pile = 0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	84.0000
2	32.000	84.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

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Section 1 is a round drilled shaft, bored pile, or CIDH pile

Length of section = 32.000000 ft
Shaft Diameter = 84.000000 in
Shear capacity of section = 0.0000 lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees
= 0.000 radians

Pile Batter Angle = 0.000 degrees
= 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 0.0000 ft
Distance from top of pile to bottom of layer = 4.000000 ft
Effective unit weight at top of layer = 100.000000 pcf
Effective unit weight at bottom of layer = 100.000000 pcf
Friction angle at top of layer = 30.000000 deg.
Friction angle at bottom of layer = 30.000000 deg.
Subgrade k at top of layer = 1.000000 pci
Subgrade k at bottom of layer = 1.000000 pci

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 4.000000 ft
Distance from top of pile to bottom of layer = 9.000000 ft
Effective unit weight at top of layer = 70.000000 pcf
Effective unit weight at bottom of layer = 70.000000 pcf
Friction angle at top of layer = 38.000000 deg.
Friction angle at bottom of layer = 38.000000 deg.
Subgrade k at top of layer = 70.000000 pci
Subgrade k at bottom of layer = 70.000000 pci

New LPILE (USCS units).lp9o

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 9.000000 ft
 Distance from top of pile to bottom of layer = 15.000000 ft
 Effective unit weight at top of layer = 70.000000 pcf
 Effective unit weight at bottom of layer = 70.000000 pcf
 Friction angle at top of layer = 38.000000 deg.
 Friction angle at bottom of layer = 38.000000 deg.
 Subgrade k at top of layer = 40.000000 pci
 Subgrade k at bottom of layer = 40.000000 pci

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 15.000000 ft
 Distance from top of pile to bottom of layer = 34.000000 ft
 Effective unit weight at top of layer = 70.000000 pcf
 Effective unit weight at bottom of layer = 70.000000 pcf
 Friction angle at top of layer = 38.000000 deg.
 Friction angle at bottom of layer = 38.000000 deg.
 Subgrade k at top of layer = 70.000000 pci
 Subgrade k at bottom of layer = 70.000000 pci

(Depth of the lowest soil layer extends 2.000 ft below the pile tip)

 Summary of Input Soil Properties

Layer Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand (Reese, et al.)	0.00	100.0000	30.0000	1.0000
2	Sand (Reese, et al.)	4.0000	100.0000	30.0000	1.0000
3	Sand (Reese, et al.)	9.0000	70.0000	38.0000	70.0000
4	Sand (Reese, et al.)	15.0000	70.0000	38.0000	40.0000
		34.0000	70.0000	38.0000	70.0000

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Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Compute No.	Load Top y vs. Pile Length	Condition 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 35000. lbs	M = 51204000. in-lbs	64000.
	No			
2	1	V = 21875. lbs	M = 32002500. in-lbs	53333.
	No			

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

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-----
Length of Section                = 32.000000 ft
Shaft Diameter                  = 84.000000 in
Concrete Cover Thickness        = 3.000000 in
Number of Reinforcing Bars      = 27 bars
Yield Stress of Reinforcing Bars = 60000. psi
Modulus of Elasticity of Reinforcing Bars = 29000000. psi
Gross Area of Shaft            = 5542. sq. in.
Total Area of Reinforcing Steel = 42.120000 sq. in.
Area Ratio of Steel Reinforcement = 0.76 percent
Edge-to-Edge Bar Spacing       = 7.481556 in
Maximum Concrete Aggregate Size = 0.750000 in
Ratio of Bar Spacing to Aggregate Size = 9.98
Offset of Center of Rebar Cage from Center of Pile = 0.0000 in

```

Axial Structural Capacities:

```

-----
Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As = 21226.008 kips
Tensile Load for Cracking of Concrete = -2428.279 kips
Nominal Axial Tensile Capacity = -2527.200 kips

```

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.410000	1.560000	38.295000	0.000000
2	1.410000	1.560000	37.262753	8.831435
3	1.410000	1.560000	34.221662	17.186765
4	1.410000	1.560000	29.335672	24.615552
5	1.410000	1.560000	22.868188	30.717308
6	1.410000	1.560000	15.167875	35.163086
7	1.410000	1.560000	6.649857	37.713213
8	1.410000	1.560000	-2.226656	38.230211
9	1.410000	1.560000	-10.983130	36.686208
10	1.410000	1.560000	-19.147500	33.164443
11	1.410000	1.560000	-26.279624	27.854774
12	1.410000	1.560000	-31.995006	21.043446
13	1.410000	1.560000	-35.985529	13.097661
14	1.410000	1.560000	-38.036063	4.445778
15	1.410000	1.560000	-38.036063	-4.445778
16	1.410000	1.560000	-35.985529	-13.097661
17	1.410000	1.560000	-31.995006	-21.043446
18	1.410000	1.560000	-26.279624	-27.854774
19	1.410000	1.560000	-19.147500	-33.164443

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20	1.410000	1.560000	-10.983130	-36.686208
21	1.410000	1.560000	-2.226656	-38.230211
22	1.410000	1.560000	6.649857	-37.713213
23	1.410000	1.560000	15.167875	-35.163086
24	1.410000	1.560000	22.868188	-30.717308
25	1.410000	1.560000	29.335672	-24.615552
26	1.410000	1.560000	34.221662	-17.186765
27	1.410000	1.560000	37.262753	-8.831435

NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero = 7.482 inches
between bars 18 and 19.

Ratio of bar spacing to maximum aggregate size = 9.98

Concrete Properties:

Compressive Strength of Concrete	=	4000. psi
Modulus of Elasticity of Concrete	=	3604997. psi
Modulus of Rupture of Concrete	=	-474.341649 psi
Compression Strain at Peak Stress	=	0.001886
Tensile Strain at Fracture of Concrete	=	-0.0001154
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
-----	-----
1	53.333
2	64.000

Definitions of Run Messages and Notes:

- C = concrete in section has cracked in tension.
- Y = stress in reinforcing steel has reached yield stress.
- T = ACI 318 criteria for tension-controlled section met, tensile strain in reinforcement exceeds 0.005 while simultaneously compressive strain in concrete more than 0.003. See ACI 318, Section 10.3.4.
- Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

New LPile (USCS units).lp9o

Bending Stiffness (EI) = Computed Bending Moment / Curvature.
 Position of neutral axis is measured from edge of compression side of pile.
 Compressive stresses and strains are positive in sign.
 Tensile stresses and strains are negative in sign.

Axial Thrust Force = 53.333 kips

Bending Max Conc Curvature Stress rad/in. ksi	Bending Max Steel Moment Stress in-kip ksi	Bending Run Stiffness Msg kip-in ²	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
3.12500E-07	3470.	1.11056E+10	48.9725311	0.00001530	-0.00001095
0.0640911	0.4400073				
6.25000E-07	6926.	1.10823E+10	45.4960019	0.00002844	-0.00002406
0.1185922	0.8170025				
9.37500E-07	10367.	1.10584E+10	44.3372254	0.00004157	-0.00003718
0.1727135	1.1939996				
0.00000125	13793.	1.10344E+10	43.7578707	0.00005470	-0.00005030
0.2264550	1.5709978				
0.00000156	17204.	1.10103E+10	43.4102820	0.00006783	-0.00006342
0.2798167	1.9479972				
0.00000188	20599.	1.09863E+10	43.1785762	0.00008096	-0.00007654
0.3327986	2.3249976				
0.00000219	23980.	1.09622E+10	43.0130887	0.00009409	-0.00008966
0.3854007	2.7019990				
0.00000250	27345.	1.09380E+10	42.8889875	0.0001072	-0.0001028
0.4376229	3.0790016				
0.00000281	27345.	9722709296.	22.0288470	0.00006196	-0.0001743
0.2536043	-5.0202659 C				
0.00000313	27345.	8750438367.	21.7177239	0.00006787	-0.0001946
0.2772930	-5.6062688 C				
0.00000344	27345.	7954943970.	21.4640092	0.00007378	-0.0002150
0.3009183	-6.1921878 C				
0.00000375	27345.	7292031972.	21.2457877	0.00007967	-0.0002353
0.3243649	-6.7788456 C				
0.00000406	27345.	6731106436.	21.0601789	0.00008556	-0.0002557
0.3477211	-7.3656164 C				
0.00000438	27345.	6250313119.	20.9017641	0.00009145	-0.0002761
0.3710148	-7.9523012 C				
0.00000469	27345.	5833625578.	20.7651061	0.00009734	-0.0002964
0.3942460	-8.5388996 C				
0.00000500	27345.	5469023979.	20.6461270	0.0001032	-0.0003168

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0.4174146	-9.1254116	C				
0.00000531	27345.		5147316686.	20.5399093	0.0001091	-0.0003371
0.4404822	-9.7121140	C				
0.00000563	27345.		4861354648.	20.4432832	0.0001150	-0.0003575
0.4634258	-10.2991769	C				
0.00000594	27345.		4605493877.	20.3573497	0.0001209	-0.0003779
0.4863075	-10.8861501	C				
0.00000625	27345.		4375219183.	20.2805062	0.0001268	-0.0003982
0.5091272	-11.4730332	C				
0.00000656	27345.		4166875413.	20.2114554	0.0001326	-0.0004186
0.5318848	-12.0598261	C				
0.00000688	27345.		3977471985.	20.1491359	0.0001385	-0.0004390
0.5545803	-12.6465285	C				
0.00000719	27345.		3804538420.	20.0926710	0.0001444	-0.0004593
0.5772136	-13.2331401	C				
0.00000750	27345.		3646015986.	20.0413298	0.0001503	-0.0004797
0.5997846	-13.8196607	C				
0.00000781	27345.		3500175347.	19.9944988	0.0001562	-0.0005000
0.6222932	-14.4060901	C				
0.00000813	27345.		3365553218.	19.9516585	0.0001621	-0.0005204
0.6447393	-14.9924279	C				
0.00000844	27345.		3240903099.	19.9123665	0.0001680	-0.0005407
0.6671228	-15.5786740	C				
0.00000875	27345.		3125156560.	19.8762438	0.0001739	-0.0005611
0.6894436	-16.1648281	C				
0.00000906	27345.		3017392540.	19.8429634	0.0001798	-0.0005814
0.7117017	-16.7508899	C				
0.00000938	27345.		2916812789.	19.8122420	0.0001857	-0.0006018
0.7338969	-17.3368592	C				
0.00000969	27345.		2822722054.	19.7838329	0.0001917	-0.0006221
0.7560292	-17.9227357	C				
0.00001000	27345.		2734511990.	19.7575202	0.0001976	-0.0006424
0.7780985	-18.5085191	C				
0.00001031	27345.		2651647990.	19.7327695	0.0002035	-0.0006628
0.8000911	-19.0943123	C				
0.00001063	27345.		2573658343.	19.7089667	0.0002094	-0.0006831
0.8219880	-19.6802621	C				
0.00001094	27345.		2500125248.	19.6868324	0.0002153	-0.0007034
0.8438225	-20.2661141	C				
0.00001125	27345.		2430677324.	19.6662284	0.0002212	-0.0007238
0.8655944	-20.8518680	C				
0.00001156	27345.		2364983342.	19.6470315	0.0002272	-0.0007441
0.8873036	-21.4375238	C				
0.00001188	27345.		2302746939.	19.6291314	0.0002331	-0.0007644
0.9089500	-22.0230806	C				
0.00001219	27345.		2243702145.	19.6124294	0.0002390	-0.0007847
0.9305337	-22.6085385	C				
0.00001281	27345.		2134253260.	19.5822717	0.0002509	-0.0008254

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0.9735120	-23.7791559	C				
0.00001344	27345.		2034985667.	19.5559444	0.0002628	-0.0008660
1.0162377	-24.9493741	C				
0.00001406	27389.		1947691967.	19.5329427	0.0002747	-0.0009066
1.0587101	-26.1191905	C				
0.00001469	28541.		1943220401.	19.5128478	0.0002866	-0.0009472
1.1009284	-27.2886026	C				
0.00001531	29692.		1939055204.	19.4953093	0.0002985	-0.0009877
1.1428917	-28.4576079	C				
0.00001594	30842.		1935159945.	19.4800319	0.0003105	-0.0010283
1.1845994	-29.6262043	C				
0.00001656	31991.		1931503966.	19.4667649	0.0003224	-0.0010688
1.2260505	-30.7943885	C				
0.00001719	33139.		1928060780.	19.4552941	0.0003344	-0.0011094
1.2672444	-31.9621583	C				
0.00001781	34286.		1924807713.	19.4454355	0.0003464	-0.0011499
1.3081801	-33.1295111	C				
0.00001844	35432.		1921725163.	19.4370299	0.0003584	-0.0011904
1.3488568	-34.2964444	C				
0.00001906	36577.		1918796096.	19.4299392	0.0003704	-0.0012309
1.3892737	-35.4629555	C				
0.00001969	37721.		1916005638.	19.4240429	0.0003824	-0.0012713
1.4294300	-36.6290418	C				
0.00002031	38865.		1913340743.	19.4192354	0.0003945	-0.0013118
1.4693248	-37.7947004	C				
0.00002094	40007.		1910789921.	19.4154236	0.0004065	-0.0013522
1.5089573	-38.9599287	C				
0.00002156	41149.		1908343010.	19.4125255	0.0004186	-0.0013927
1.5483265	-40.1247239	C				
0.00002219	42289.		1905990992.	19.4104680	0.0004307	-0.0014331
1.5874317	-41.2890832	C				
0.00002281	43429.		1903725834.	19.4091865	0.0004428	-0.0014735
1.6262720	-42.4530038	C				
0.00002344	44567.		1901540357.	19.4086230	0.0004549	-0.0015139
1.6648464	-43.6164827	C				
0.00002406	45705.		1899428127.	19.4087259	0.0004670	-0.0015542
1.7031540	-44.7795172	C				
0.00002469	46842.		1897383357.	19.4094485	0.0004792	-0.0015946
1.7411940	-45.9421042	C				
0.00002531	47977.		1895400830.	19.4107490	0.0004913	-0.0016349
1.7789655	-47.1042408	C				
0.00002594	49112.		1893475831.	19.4125896	0.0005035	-0.0016752
1.8164674	-48.2659239	C				
0.00002656	50246.		1891604084.	19.4149362	0.0005157	-0.0017155
1.8536990	-49.4271506	C				
0.00002719	51378.		1889781705.	19.4177578	0.0005279	-0.0017558
1.8906592	-50.5879178	C				
0.00002781	52510.		1888005156.	19.4210262	0.0005401	-0.0017961

New LPILE (USCS units).lp9o

1.9273471	-51.7482222	C				
0.00002844	53641.	1886271210.	19.4247158	0.0005524	-0.0018364	
1.9637618	-52.9080609	C				
0.00002906	54771.	1884576912.	19.4288033	0.0005646	-0.0018766	
1.9999022	-54.0674305	C				
0.00002969	55899.	1882919556.	19.4332671	0.0005769	-0.0019168	
2.0357674	-55.2263279	C				
0.00003031	57027.	1881296655.	19.4380878	0.0005892	-0.0019570	
2.0713565	-56.3847497	C				
0.00003094	58153.	1879705924.	19.4432475	0.0006015	-0.0019972	
2.1066684	-57.5426927	C				
0.00003156	59279.	1878145252.	19.4487297	0.0006139	-0.0020374	
2.1417020	-58.7001534	C				
0.00003219	60403.	1876612693.	19.4545192	0.0006262	-0.0020776	
2.1764565	-59.8571286	C				
0.00003281	61527.	1875106446.	19.4606022	0.0006386	-0.0021177	
2.2109307	-60.0000000	CY				
0.00003344	62649.	1873624843.	19.4669656	0.0006509	-0.0021578	
2.2451237	-60.0000000	CY				
0.00003406	63758.	1871787410.	19.4722706	0.0006633	-0.0021980	
2.2789086	-60.0000000	CY				
0.00003469	64719.	1865761933.	19.4628186	0.0006751	-0.0022386	
2.3109728	-60.0000000	CY				
0.00003531	65569.	1856822009.	19.4428572	0.0006866	-0.0022797	
2.3416902	-60.0000000	CY				
0.00003594	66351.	1846282783.	19.4169806	0.0006978	-0.0023210	
2.3714829	-60.0000000	CY				
0.00003656	67065.	1834247739.	19.3853967	0.0007088	-0.0023625	
2.4003591	-60.0000000	CY				
0.00003719	67745.	1821712851.	19.3517680	0.0007196	-0.0024041	
2.4286700	-60.0000000	CY				
0.00003969	70054.	1765151983.	19.1898803	0.0007616	-0.0025722	
2.5355218	-60.0000000	CY				
0.00004219	71953.	1705545757.	19.0106626	0.0008020	-0.0027417	
2.6347972	-60.0000000	CY				
0.00004469	73547.	1645802512.	18.8202641	0.0008410	-0.0029127	
2.7272516	-60.0000000	CY				
0.00004719	74930.	1587918243.	18.6251238	0.0008789	-0.0030849	
2.8137508	-60.0000000	CY				
0.00004969	76105.	1531671455.	18.4302643	0.0009158	-0.0032580	
2.8950635	-60.0000000	CY				
0.00005219	77140.	1478122544.	18.2411918	0.0009520	-0.0034318	
2.9720446	-60.0000000	CY				
0.00005469	78081.	1427761785.	18.0618876	0.0009878	-0.0036060	
3.0453947	-60.0000000	CY				
0.00005719	78896.	1379607853.	17.8755074	0.0010223	-0.0037815	
3.1134339	-60.0000000	CY				
0.00005969	79629.	1334097277.	17.6970981	0.0010563	-0.0039575	

New LPile (USCS units).lp9o					
3.1780813	-60.0000000	CY			
0.00006219	80343.	1291949763.	17.5328748	0.0010903	-0.0041334
3.2402633	-60.0000000	CY			
0.00006469	80923.	1250984223.	17.3670482	0.0011234	-0.0043103
3.2983579	-60.0000000	CY			
0.00006719	81488.	1212847624.	17.2132025	0.0011565	-0.0044872
3.3541010	-60.0000000	CY			
0.00006969	82038.	1177232544.	17.0611744	0.0011890	-0.0046648
3.4064879	-60.0000000	CY			
0.00007219	82499.	1142846497.	16.9095085	0.0012207	-0.0048431
3.4555117	-60.0000000	CY			
0.00007469	82920.	1110220566.	16.7642531	0.0012521	-0.0050217
3.5020043	-60.0000000	CY			
0.00007719	83338.	1079679871.	16.6296329	0.0012836	-0.0052002
3.5465575	-60.0000000	CY			
0.00007969	83754.	1051027739.	16.5046607	0.0013152	-0.0053785
3.5891534	-60.0000000	CY			
0.00008219	84118.	1023494683.	16.3817961	0.0013464	-0.0055574
3.6290657	-60.0000000	CY			
0.00008469	84421.	996852433.	16.2501340	0.0013762	-0.0057376
3.6652733	-60.0000000	CY			
0.00008719	84722.	971716621.	16.1268877	0.0014061	-0.0059177
3.6997095	-60.0000000	CY			
0.00008969	85020.	947962734.	16.0115070	0.0014360	-0.0060977
3.7323748	-60.0000000	CY			
0.00009219	85318.	925478061.	15.9033632	0.0014661	-0.0062777
3.7632528	-60.0000000	CY			
0.00009469	85595.	903971387.	15.7991754	0.0014960	-0.0064578
3.7920781	-60.0000000	CY			
0.00009719	85836.	883203672.	15.6961181	0.0015255	-0.0066383
3.8186618	-60.0000000	CY			
0.00009969	86055.	863251334.	15.5959881	0.0015547	-0.0068190
3.8432403	-60.0000000	CY			
0.0001022	86267.	844205182.	15.4975621	0.0015837	-0.0070001
3.8657761	-60.0000000	CY			
0.0001047	86472.	826003540.	15.3994589	0.0016121	-0.0071816
3.8862364	-60.0000000	CY			
0.0001072	86676.	808637812.	15.3067342	0.0016407	-0.0073631
3.9050620	-60.0000000	CY			
0.0001097	86878.	792050674.	15.2190294	0.0016693	-0.0075444
3.9222373	-60.0000000	CY			
0.0001122	87072.	776128542.	15.1348524	0.0016979	-0.0077258
3.9376777	-60.0000000	CY			
0.0001147	87257.	760819744.	15.0537652	0.0017265	-0.0079073
3.9513800	-60.0000000	CY			
0.0001172	87408.	745883988.	14.9715427	0.0017545	-0.0080893
3.9631645	-60.0000000	CY			
0.0001197	87556.	731537935.	14.8929803	0.0017825	-0.0082712

New LPile (USCS units).lp9o					
3.9733255	-60.0000000	CY			
0.0001222	87697.	717728171.	14.8174960	0.0018105	-0.0084532
3.9818455	-60.0000000	CY			
0.0001247	87838.	704461797.	14.7457321	0.0018386	-0.0086351
3.9887508	-60.0000000	CY			
0.0001272	87974.	691687381.	14.6749626	0.0018665	-0.0088173
3.9939732	-60.0000000	CY			
0.0001297	88104.	679358799.	14.6027052	0.0018938	-0.0090000
3.9975217	-60.0000000	CY			
0.0001322	88234.	667487631.	14.5338360	0.0019212	-0.0091826
3.9995230	-60.0000000	CY			
0.0001347	88361.	656046959.	14.4682372	0.0019487	-0.0093651
3.9981655	-60.0000000	CY			
0.0001372	88484.	644984723.	14.4051696	0.0019762	-0.0095475
3.9922705	-60.0000000	CY			
0.0001522	89067.	585245050.	14.0583372	0.0021395	-0.0106442
3.9950491	60.0000000	CY			
0.0001672	89534.	535531977.	13.7689340	0.0023020	-0.0117418
3.9935392	60.0000000	CY			
0.0001822	89939.	493659020.	13.5167168	0.0024626	-0.0128412
3.9872475	60.0000000	CY			
0.0001972	90223.	457549782.	13.2910405	0.0026208	-0.0139429
3.9998686	60.0000000	CY			
0.0002122	90467.	426354372.	13.1046049	0.0027806	-0.0150431
3.9916961	60.0000000	CY			
0.0002272	90687.	399172226.	12.9399140	0.0029398	-0.0161440
3.9987743	60.0000000	CY			
0.0002422	90850.	375121738.	12.8057757	0.0031014	-0.0172424
3.9870768	60.0000000	CYT			
0.0002572	90974.	353726470.	12.6826237	0.0032618	-0.0183419
3.9990738	60.0000000	CYT			
0.0002722	91040.	334476384.	12.5837475	0.0034251	-0.0194386
3.9834697	60.0000000	CYT			
0.0002872	91092.	317187404.	12.4966911	0.0035889	-0.0205349
3.9872108	60.0000000	CYT			
0.0003022	91134.	301581921.	12.4256084	0.0037549	-0.0216289
3.9986079	60.0000000	CYT			
0.0003172	91134.	287319918.	12.4833964	0.0039596	-0.0226842
3.9764778	60.0000000	CYT			

Axial Thrust Force = 64.000 kips

Bending Max Conc Curvature Stress rad/in.	Bending Max Steel Moment Stress in-kip	Bending Run Stiffness Msg kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in
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New LPILE (USCS units).lp9o

ksi	ksi				
3.12500E-07	3470.	1.11049E+10	50.3672353	0.00001574	-0.00001051
0.0659245	0.4526468				
6.25000E-07	6926.	1.10819E+10	46.1952676	0.00002887	-0.00002363
0.1204178	0.8296767				
9.37500E-07	10367.	1.10582E+10	44.8047073	0.00004200	-0.00003675
0.1745315	1.2067092				
0.00000125	13793.	1.10342E+10	44.1094702	0.00005514	-0.00004986
0.2282653	1.5837433				
0.00000156	17203.	1.10102E+10	43.6923581	0.00006827	-0.00006298
0.2816192	1.9607787				
0.00000188	20599.	1.09861E+10	43.4143072	0.00008140	-0.00007610
0.3345933	2.3378155				
0.00000219	23979.	1.09620E+10	43.2157200	0.00009453	-0.00008922
0.3871875	2.7148535				
0.00000250	27345.	1.09380E+10	43.0667972	0.0001077	-0.0001023
0.4394018	3.0918928				
0.00000281	27345.	9722624443.	22.6489840	0.00006370	-0.0001725
0.2607598	-4.9696860 C				
0.00000313	27345.	8750361999.	22.2904952	0.00006966	-0.0001928
0.2846129	-5.5543614 C				
0.00000344	27345.	7954874544.	21.9863632	0.00007558	-0.0002132
0.3082380	-6.1401157 C				
0.00000375	27345.	7291968332.	21.7325641	0.00008150	-0.0002335
0.3317825	-6.7259086 C				
0.00000406	27345.	6731047691.	21.5185269	0.00008742	-0.0002538
0.3552633	-7.3116173 C				
0.00000438	27345.	6250258571.	21.3318981	0.00009333	-0.0002742
0.3786129	-7.8977279 C				
0.00000469	27345.	5833574666.	21.1669075	0.00009922	-0.0002945
0.4018262	-8.4842797 C				
0.00000500	27345.	5468976249.	21.0231385	0.0001051	-0.0003149
0.4249768	-9.0707449 C				
0.00000531	27345.	5147271764.	20.8968475	0.0001110	-0.0003352
0.4480647	-9.6571232 C				
0.00000563	27345.	4861312222.	20.7851229	0.0001169	-0.0003556
0.4710898	-10.2434143 C				
0.00000594	27345.	4605453684.	20.6856660	0.0001228	-0.0003759
0.4940520	-10.8296181 C				
0.00000625	27345.	4375180999.	20.5966379	0.0001287	-0.0003963
0.5169511	-11.4157344 C				
0.00000656	27345.	4166839047.	20.5135551	0.0001346	-0.0004166
0.5397097	-12.0023328 C				
0.00000688	27345.	3977437272.	20.4377669	0.0001405	-0.0004370
0.5623867	-12.5889827 C				
0.00000719	27345.	3804505217.	20.3690052	0.0001464	-0.0004573

New LPile (USCS units).lp9o

0.5850014	-13.1755417	C				
0.00000750	27345.		3645984166.	20.3063928	0.0001523	-0.0004777
0.6075537	-13.7620095	C				
0.00000781	27345.		3500144799.	20.2491930	0.0001582	-0.0004981
0.6300436	-14.3483859	C				
0.00000813	27345.		3365523846.	20.1967823	0.0001641	-0.0005184
0.6524710	-14.9346706	C				
0.00000844	27345.		3240874814.	20.1486296	0.0001700	-0.0005387
0.6748358	-15.5208634	C				
0.00000875	27345.		3125129285.	20.1042797	0.0001759	-0.0005591
0.6971379	-16.1069640	C				
0.00000906	27345.		3017366206.	20.0633402	0.0001818	-0.0005794
0.7193771	-16.6929721	C				
0.00000938	27345.		2916787333.	20.0254710	0.0001877	-0.0005998
0.7415535	-17.2788876	C				
0.00000969	27345.		2822697419.	19.9903758	0.0001937	-0.0006201
0.7636669	-17.8647100	C				
0.00001000	27345.		2734488125.	19.9577956	0.0001996	-0.0006404
0.7857172	-18.4504393	C				
0.00001031	27345.		2651624848.	19.9275025	0.0002055	-0.0006607
0.8077044	-19.0360750	C				
0.00001063	27345.		2573635882.	19.8992957	0.0002114	-0.0006811
0.8296283	-19.6216170	C				
0.00001094	27345.		2500103428.	19.8729970	0.0002174	-0.0007014
0.8514888	-20.2070650	C				
0.00001125	27345.		2430656111.	19.8484484	0.0002233	-0.0007217
0.8732860	-20.7924187	C				
0.00001156	27345.		2364962702.	19.8255087	0.0002292	-0.0007420
0.8950196	-21.3776778	C				
0.00001188	27345.		2302726842.	19.8040517	0.0002352	-0.0007623
0.9166895	-21.9628422	C				
0.00001219	27345.		2243682564.	19.7839641	0.0002411	-0.0007826
0.9382958	-22.5479114	C				
0.00001281	27345.		2134234634.	19.7474991	0.0002530	-0.0008232
0.9813168	-23.7177636	C				
0.00001344	27345.		2034967907.	19.7141663	0.0002649	-0.0008638
1.0240206	-24.8877170	C				
0.00001406	27634.		1965098240.	19.6844390	0.0002768	-0.0009044
1.0664530	-26.0574084	C				
0.00001469	28786.		1959869714.	19.6581929	0.0002887	-0.0009450
1.1086311	-27.2266947	C				
0.00001531	29936.		1955009254.	19.6350073	0.0003007	-0.0009856
1.1505541	-28.3955733	C				
0.00001594	31086.		1950473261.	19.6145277	0.0003126	-0.0010261
1.1922213	-29.5640417	C				
0.00001656	32234.		1946224710.	19.5964530	0.0003246	-0.0010667
1.2336317	-30.7320974	C				
0.00001719	33382.		1942231856.	19.5805260	0.0003365	-0.0011072

New LPILE (USCS units).lp9o

1.2747845	-31.8997382	C				
0.00001781	34529.		1938467730.	19.5665256	0.0003485	-0.0011477
1.3156791	-33.0669607	C				
0.00001844	35675.		1934908685.	19.5542609	0.0003605	-0.0011882
1.3563146	-34.2337627	C				
0.00001906	36820.		1931534285.	19.5435658	0.0003725	-0.0012287
1.3966900	-35.4001415	C				
0.00001969	37964.		1928326688.	19.5342957	0.0003846	-0.0012692
1.4368046	-36.5660944	C				
0.00002031	39107.		1925270245.	19.5263236	0.0003966	-0.0013096
1.4766575	-37.7316188	C				
0.00002094	40249.		1922351173.	19.5195378	0.0004087	-0.0013501
1.5162479	-38.8967119	C				
0.00002156	41390.		1919557284.	19.5138396	0.0004208	-0.0013905
1.5555748	-40.0613709	C				
0.00002219	42531.		1916877760.	19.5091415	0.0004329	-0.0014309
1.5946375	-41.2255930	C				
0.00002281	43670.		1914302968.	19.5053655	0.0004450	-0.0014713
1.6334350	-42.3893754	C				
0.00002344	44808.		1911824298.	19.5024421	0.0004571	-0.0015117
1.6719664	-43.5527151	C				
0.00002406	45946.		1909434034.	19.5003091	0.0004692	-0.0015520
1.7102309	-44.7156093	C				
0.00002469	47082.		1907125237.	19.4989105	0.0004814	-0.0015924
1.7482275	-45.8780549	C				
0.00002531	48218.		1904891652.	19.4981961	0.0004935	-0.0016327
1.7859554	-47.0400491	C				
0.00002594	49352.		1902727624.	19.4981203	0.0005057	-0.0016730
1.8234135	-48.2015888	C				
0.00002656	50485.		1900628029.	19.4986422	0.0005179	-0.0017133
1.8606010	-49.3626709	C				
0.00002719	51618.		1898588211.	19.4997243	0.0005301	-0.0017536
1.8975169	-50.5232923	C				
0.00002781	52749.		1896603929.	19.5013328	0.0005424	-0.0017939
1.9341603	-51.6834500	C				
0.00002844	53880.		1894671314.	19.5034368	0.0005546	-0.0018341
1.9705303	-52.8431407	C				
0.00002906	55009.		1892786827.	19.5060082	0.0005669	-0.0018744
2.0066257	-54.0023612	C				
0.00002969	56137.		1890947226.	19.5090212	0.0005792	-0.0019146
2.0424457	-55.1611083	C				
0.00003031	57265.		1889149531.	19.5124523	0.0005915	-0.0019548
2.0779893	-56.3193786	C				
0.00003094	58391.		1887391003.	19.5162798	0.0006038	-0.0019950
2.1132554	-57.4771690	C				
0.00003156	59516.		1885669118.	19.5204839	0.0006161	-0.0020351
2.1482431	-58.6344759	C				
0.00003219	60641.		1883981543.	19.5250463	0.0006285	-0.0020753

New LPile (USCS units).lp9o

2.1829514	-59.7912959	C				
0.00003281	61764.	1882326124.	19.5299501	0.0006408	-0.0021154	
2.2173791	-60.0000000	CY				
0.00003344	62886.	1880700863.	19.5351799	0.0006532	-0.0021555	
2.2515253	-60.0000000	CY				
0.00003406	63996.	1878776359.	19.5395736	0.0006656	-0.0021957	
2.2852804	-60.0000000	CY				
0.00003469	64969.	1872981051.	19.5303564	0.0006775	-0.0022363	
2.3174231	-60.0000000	CY				
0.00003531	65824.	1864032138.	19.5097944	0.0006889	-0.0022773	
2.3481387	-60.0000000	CY				
0.00003594	66608.	1853440845.	19.4831771	0.0007002	-0.0023186	
2.3779143	-60.0000000	CY				
0.00003656	67326.	1841400375.	19.4510465	0.0007112	-0.0023601	
2.4067904	-60.0000000	CY				
0.00003719	68011.	1828867153.	19.4169271	0.0007221	-0.0024017	
2.4351045	-60.0000000	CY				
0.00003969	70327.	1772018864.	19.2520774	0.0007641	-0.0025697	
2.5418496	-60.0000000	CY				
0.00004219	72231.	1712133599.	19.0701445	0.0008045	-0.0027392	
2.6410077	-60.0000000	CY				
0.00004469	73832.	1652191231.	18.8809575	0.0008437	-0.0029100	
2.7337321	-60.0000000	CY				
0.00004719	75221.	1594082701.	18.6835866	0.0008816	-0.0030821	
2.8201139	-60.0000000	CY				
0.00004969	76395.	1537515131.	18.4860607	0.0009185	-0.0032552	
2.9012347	-60.0000000	CY				
0.00005219	77435.	1483784707.	18.2951994	0.0009548	-0.0034290	
2.9780956	-60.0000000	CY				
0.00005469	78376.	1433156056.	18.1136573	0.0009906	-0.0036032	
3.0512516	-60.0000000	CY				
0.00005719	79199.	1384905713.	17.9293744	0.0010253	-0.0037784	
3.1195741	-60.0000000	CY				
0.00005969	79931.	1339165605.	17.7489305	0.0010594	-0.0039544	
3.1840183	-60.0000000	CY				
0.00006219	80647.	1296840814.	17.5831013	0.0010934	-0.0041303	
3.2460256	-60.0000000	CY				
0.00006469	81230.	1255728832.	17.4159104	0.0011266	-0.0043072	
3.3039612	-60.0000000	CY				
0.00006719	81795.	1217415594.	17.2609084	0.0011597	-0.0044840	
3.3595521	-60.0000000	CY				
0.00006969	82348.	1181672980.	17.1103948	0.0011924	-0.0046614	
3.4120784	-60.0000000	CY				
0.00007219	82813.	1147197703.	16.9578875	0.0012241	-0.0048396	
3.4609627	-60.0000000	CY				
0.00007469	83233.	1114420741.	16.8111873	0.0012556	-0.0050182	
3.5072362	-60.0000000	CY				
0.00007719	83651.	1083738739.	16.6752197	0.0012871	-0.0051966	

New LPile (USCS units).lp9o					
3.5515682	-60.0000000	CY			
0.00007969	84067.	1054954107.	16.5489883	0.0013187	-0.0053750
3.5939407	-60.0000000	CY			
0.00008219	84435.	1027341978.	16.4254437	0.0013500	-0.0055538
3.6336843	-60.0000000	CY			
0.00008469	84742.	1000639074.	16.2964960	0.0013801	-0.0057336
3.6700730	-60.0000000	CY			
0.00008719	85042.	975390334.	16.1720875	0.0014100	-0.0059137
3.7042715	-60.0000000	CY			
0.00008969	85340.	951529768.	16.0556130	0.0014400	-0.0060938
3.7366968	-60.0000000	CY			
0.00009219	85637.	928944153.	15.9464382	0.0014701	-0.0062737
3.7673324	-60.0000000	CY			
0.00009469	85915.	907355983.	15.8414730	0.0015000	-0.0064538
3.7959328	-60.0000000	CY			
0.00009719	86160.	886530017.	15.7379602	0.0015295	-0.0066342
3.8223154	-60.0000000	CY			
0.00009969	86378.	866492190.	15.6369479	0.0015588	-0.0068149
3.8466498	-60.0000000	CY			
0.0001022	86594.	847400563.	15.5414474	0.0015881	-0.0069956
3.8692376	-60.0000000	CY			
0.0001047	86799.	829120459.	15.4425995	0.0016166	-0.0071771
3.8894438	-60.0000000	CY			
0.0001072	87002.	811678582.	15.3490329	0.0016452	-0.0073585
3.9080013	-60.0000000	CY			
0.0001097	87204.	795018727.	15.2605282	0.0016739	-0.0075399
3.9249058	-60.0000000	CY			
0.0001122	87398.	779032751.	15.1756948	0.0017025	-0.0077212
3.9400798	-60.0000000	CY			
0.0001147	87585.	763685733.	15.0944399	0.0017311	-0.0079026
3.9535367	-60.0000000	CY			
0.0001172	87737.	748685733.	15.0114953	0.0017592	-0.0080846
3.9650454	-60.0000000	CY			
0.0001197	87885.	734283841.	14.9323629	0.0017872	-0.0082665
3.9749330	-60.0000000	CY			
0.0001222	88026.	720414885.	14.8562156	0.0018152	-0.0084485
3.9831721	-60.0000000	CY			
0.0001247	88165.	707091660.	14.7838186	0.0018434	-0.0086304
3.9897935	-60.0000000	CY			
0.0001272	88304.	694281823.	14.7149585	0.0018716	-0.0088122
3.9947816	-60.0000000	CY			
0.0001297	88436.	681912845.	14.6437434	0.0018991	-0.0089946
3.9980517	-60.0000000	CY			
0.0001322	88564.	669990553.	14.5742706	0.0019265	-0.0091772
3.9997384	-60.0000000	CY			
0.0001347	88692.	658499450.	14.5081505	0.0019541	-0.0093597
3.9964801	-60.0000000	CY			
0.0001372	88814.	647393009.	14.4445996	0.0019816	-0.0095421

New LPile (USCS units).lp9o						
3.9932461	-60.0000000	CY				
0.0001522	89399.		587427839.	14.0955916	0.0021452	-0.0106386
3.9958589	60.0000000	CY				
0.0001672	89868.		537531002.	13.8083649	0.0023086	-0.0117352
3.9946140	60.0000000	CY				
0.0001822	90272.		495487328.	13.5540454	0.0024694	-0.0128344
3.9874724	60.0000000	CY				
0.0001972	90559.		459251232.	13.3270161	0.0026279	-0.0139358
3.9999845	60.0000000	CY				
0.0002122	90801.		427926980.	13.1389142	0.0027879	-0.0150358
3.9930433	60.0000000	CY				
0.0002272	91020.		400639052.	12.9802470	0.0029489	-0.0161348
3.9959014	60.0000000	CY				
0.0002422	91184.		376502672.	12.8450532	0.0031109	-0.0172328
3.9892683	60.0000000	CYT				
0.0002572	91305.		355012838.	12.7218886	0.0032719	-0.0183318
3.9996109	60.0000000	CYT				
0.0002722	91372.		335695622.	12.6228491	0.0034358	-0.0194280
3.9801329	60.0000000	CYT				
0.0002872	91423.		318340390.	12.5344079	0.0035997	-0.0205240
3.9896765	60.0000000	CYT				
0.0003022	91463.		302668459.	12.4633934	0.0037663	-0.0216175
3.9993648	60.0000000	CYT				
0.0003172	91463.		288355074.	12.5214887	0.0039717	-0.0226721
3.9726897	60.0000000	CYT				

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	53.333	90747.617	0.00300000
2	64.000	91071.895	0.00300000

Note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, Section

New LPILE (USCS units).lp9o

9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in ²
1	0.65	90748.	34.666450	58986.	1.8786E+09
2	0.65	91072.	41.600000	59197.	1.8862E+09
1	0.70	90748.	37.333100	63523.	1.8722E+09
2	0.70	91072.	44.800000	63750.	1.8792E+09
1	0.75	90748.	39.999750	68061.	1.8140E+09
2	0.75	91072.	48.000000	68304.	1.8217E+09

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.00	0.00	N.A.	No	0.00	48323.
2	4.0000	4.0000	Yes	No	48323.	323286.
3	9.0000	9.0000	Yes	No	371609.	687959.
4	15.0000	15.0000	Yes	No	1059568.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Computed Values of Pile Loading and Deflection for Lateral Loading for Load Case Number 1

New LPILE (USCS units).lp9o

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 35000.0 lbs
 Applied moment at pile head = 51204000.0 in-lbs
 Axial thrust load on pile head = 64000.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil
Res. Soil	Spr. Distrib.	Moment	Force	S	Stress	Stiffness	p
X	y	Lat. Load					
Es*h	Lat.						
feet	inches	in-lbs	lbs	radians	psi*	in-lb^2	
lb/inch	lb/inch	lb/inch					
0.00	0.9139	5.12E+07	35000.	-0.00689	0.00	1.90E+12	
0.00	0.00	0.00					
0.3200	0.8876	5.13E+07	34993.	-0.00678	0.00	1.90E+12	
-3.4085	14.7456	0.00					
0.6400	0.8618	5.15E+07	34974.	-0.00668	0.00	1.90E+12	
-6.6185	29.4912	0.00					
0.9600	0.8363	5.16E+07	34943.	-0.00658	0.00	1.90E+12	
-9.6345	44.2368	0.00					
1.2800	0.8113	5.17E+07	34901.	-0.00647	0.00	1.90E+12	
-12.4612	58.9824	0.00					
1.6000	0.7866	5.19E+07	34848.	-0.00637	0.00	1.90E+12	
-15.1032	73.7280	0.00					
1.9200	0.7624	5.20E+07	34785.	-0.00626	0.00	1.90E+12	
-17.5652	88.4736	0.00					
2.2400	0.7385	5.22E+07	34713.	-0.00616	0.00	1.90E+12	
-19.8518	103.2192	0.00					
2.5600	0.7151	5.23E+07	34633.	-0.00605	0.00	1.90E+12	
-21.9678	117.9648	0.00					
2.8800	0.6921	5.24E+07	34545.	-0.00594	0.00	1.90E+12	
-23.9177	132.7104	0.00					
3.2000	0.6694	5.26E+07	34449.	-0.00584	0.00	1.90E+12	
-25.7065	147.4560	0.00					
3.5200	0.6472	5.27E+07	34348.	-0.00573	0.00	1.90E+12	
-27.3387	162.2016	0.00					
3.8400	0.6254	5.28E+07	34240.	-0.00563	0.00	1.90E+12	
-28.8192	176.9472	0.00					
4.1600	0.6040	5.30E+07	30156.	-0.00552	0.00	1.90E+12	
-2098.	13337.	0.00					
4.4800	0.5830	5.31E+07	21916.	-0.00541	0.00	1.90E+12	
-2194.	14451.	0.00					
4.8000	0.5625	5.31E+07	13349.	-0.00530	0.00	1.90E+12	
-2268.	15483.	0.00					

New LPile (USCS units).lp9o						
5.1200	0.5423	5.32E+07	4517.	-0.00520	0.00	1.90E+12
-2332.	16515.	0.00				
5.4400	0.5226	5.32E+07	-4546.	-0.00509	0.00	1.90E+12
-2388.	17547.	0.00				
5.7600	0.5032	5.31E+07	-13806.	-0.00498	0.00	1.90E+12
-2435.	18579.	0.00				
6.0800	0.4843	5.31E+07	-23230.	-0.00487	0.00	1.90E+12
-2473.	19612.	0.00				
6.4000	0.4658	5.30E+07	-32787.	-0.00477	0.00	1.90E+12
-2504.	20644.	0.00				
6.7200	0.4477	5.28E+07	-42448.	-0.00466	0.00	1.90E+12
-2527.	21676.	0.00				
7.0400	0.4300	5.26E+07	-52183.	-0.00455	0.00	1.90E+12
-2543.	22708.	0.00				
7.3600	0.4128	5.24E+07	-61965.	-0.00445	0.00	1.90E+12
-2552.	23740.	0.00				
7.6800	0.3959	5.22E+07	-71768.	-0.00434	0.00	1.90E+12
-2554.	24773.	0.00				
8.0000	0.3794	5.19E+07	-81567.	-0.00423	0.00	1.90E+12
-2550.	25805.	0.00				
8.3200	0.3634	5.15E+07	-91339.	-0.00413	0.00	1.90E+12
-2540.	26837.	0.00				
8.6400	0.3477	5.12E+07	-101060.	-0.00403	0.00	1.90E+12
-2524.	27869.	0.00				
8.9600	0.3325	5.08E+07	-110709.	-0.00392	0.00	1.90E+12
-2502.	28901.	0.00				
9.2800	0.3176	5.03E+07	-118230.	-0.00382	0.00	1.90E+12
-1415.	17105.	0.00				
9.6000	0.3031	4.99E+07	-123628.	-0.00372	0.00	1.90E+12
-1397.	17695.	0.00				
9.9200	0.2890	4.94E+07	-128952.	-0.00362	0.00	1.90E+12
-1376.	18285.	0.00				
10.2400	0.2753	4.89E+07	-134192.	-0.00352	0.00	1.90E+12
-1353.	18874.	0.00				
10.5600	0.2620	4.83E+07	-139340.	-0.00342	0.00	1.90E+12
-1328.	19464.	0.00				
10.8800	0.2490	4.78E+07	-144387.	-0.00333	0.00	1.91E+12
-1301.	20054.	0.00				
11.2000	0.2364	4.72E+07	-149324.	-0.00323	0.00	1.91E+12
-1271.	20644.	0.00				
11.5200	0.2242	4.66E+07	-154145.	-0.00314	0.00	1.91E+12
-1240.	21234.	0.00				
11.8400	0.2124	4.60E+07	-158843.	-0.00304	0.00	1.91E+12
-1207.	21823.	0.00				
12.1600	0.2009	4.54E+07	-163411.	-0.00295	0.00	1.91E+12
-1172.	22413.	0.00				
12.4800	0.1897	4.48E+07	-167844.	-0.00286	0.00	1.91E+12
-1136.	23003.	0.00				

New LPile (USCS units).lp9o

12.8000	0.1789	4.41E+07	-172137.	-0.00277	0.00	1.91E+12
-1099.	23593.	0.00				
13.1200	0.1684	4.35E+07	-176284.	-0.00268	0.00	1.91E+12
-1061.	24183.	0.00				
13.4400	0.1583	4.28E+07	-180281.	-0.00260	0.00	1.92E+12
-1021.	24773.	0.00				
13.7600	0.1485	4.21E+07	-184125.	-0.00251	0.00	1.92E+12
-980.8098	25362.	0.00				
14.0800	0.1390	4.14E+07	-187812.	-0.00243	0.00	1.92E+12
-939.5534	25952.	0.00				
14.4000	0.1299	4.07E+07	-191340.	-0.00235	0.00	1.92E+12
-897.5820	26542.	0.00				
14.7200	0.1210	3.99E+07	-194704.	-0.00226	0.00	1.92E+12
-855.0003	27132.	0.00				
15.0400	0.1125	3.92E+07	-199074.	-0.00219	0.00	1.93E+12
-1421.	48513.	0.00				
15.3600	0.1042	3.84E+07	-204384.	-0.00211	0.00	1.93E+12
-1345.	49545.	0.00				
15.6800	0.09627	3.76E+07	-209400.	-0.00203	0.00	1.93E+12
-1268.	50577.	0.00				
16.0000	0.08861	3.68E+07	-214121.	-0.00196	0.00	1.93E+12
-1191.	51610.	0.00				
16.3200	0.08123	3.59E+07	-218546.	-0.00189	0.00	1.93E+12
-1114.	52642.	0.00				
16.6400	0.07412	3.51E+07	-222673.	-0.00182	0.00	1.94E+12
-1036.	53674.	0.00				
16.9600	0.06728	3.42E+07	-226502.	-0.00175	0.00	1.94E+12
-958.4691	54706.	0.00				
17.2800	0.06070	3.34E+07	-230034.	-0.00168	0.00	1.94E+12
-881.0366	55738.	0.00				
17.6000	0.05437	3.25E+07	-233269.	-0.00162	0.00	1.95E+12
-803.8105	56771.	0.00				
17.9200	0.04829	3.16E+07	-236208.	-0.00155	0.00	1.95E+12
-726.8876	57803.	0.00				
18.2400	0.04245	3.07E+07	-238852.	-0.00149	0.00	1.95E+12
-650.3554	58835.	0.00				
18.5600	0.03684	2.97E+07	-241204.	-0.00143	0.00	1.96E+12
-574.2926	59867.	0.00				
18.8800	0.03145	2.88E+07	-243264.	-0.00137	0.00	1.96E+12
-498.7687	60899.	0.00				
19.2000	0.02628	2.79E+07	-245035.	-0.00132	0.00	1.96E+12
-423.8445	61932.	0.00				
19.5200	0.02132	2.69E+07	-246520.	-0.00129	0.00	1.09E+13
-349.5713	62964.	0.00				
19.8400	0.01640	2.60E+07	-247716.	-0.00128	0.00	1.09E+13
-273.2362	63996.	0.00				
20.1600	0.01151	2.50E+07	-248615.	-0.00127	0.00	1.10E+13
-194.8462	65028.	0.00				

New LPile (USCS units).lp9o

20.4800	0.00665	2.41E+07	-249209.	-0.00126	0.00	1.10E+13
-114.4072	66060.	0.00				
20.8000	0.00183	2.31E+07	-249490.	-0.00125	0.00	1.10E+13
-31.9235	67092.	0.00				
21.1200	-0.00297	2.21E+07	-249450.	-0.00124	0.00	1.10E+13
52.6021	68125.	0.00				
21.4400	-0.00773	2.12E+07	-249082.	-0.00124	0.00	1.10E+13
139.1679	69157.	0.00				
21.7600	-0.01246	2.02E+07	-248377.	-0.00123	0.00	1.10E+13
227.7738	70189.	0.00				
22.0800	-0.01717	1.93E+07	-247329.	-0.00122	0.00	1.10E+13
318.4210	71221.	0.00				
22.4000	-0.02185	1.83E+07	-245928.	-0.00122	0.00	1.10E+13
411.1118	72253.	0.00				
22.7200	-0.02651	1.74E+07	-244167.	-0.00121	0.00	1.10E+13
505.8500	73286.	0.00				
23.0400	-0.03114	1.65E+07	-242039.	-0.00120	0.00	1.10E+13
602.6405	74318.	0.00				
23.3600	-0.03575	1.55E+07	-239535.	-0.00120	0.00	1.10E+13
701.4891	75350.	0.00				
23.6800	-0.04034	1.46E+07	-236648.	-0.00119	0.00	1.10E+13
802.4031	76382.	0.00				
24.0000	-0.04491	1.37E+07	-233369.	-0.00119	0.00	1.10E+13
905.3905	77414.	0.00				
24.3200	-0.04946	1.28E+07	-229690.	-0.00118	0.00	1.10E+13
1010.	78447.	0.00				
24.6400	-0.05400	1.20E+07	-225604.	-0.00118	0.00	1.10E+13
1118.	79479.	0.00				
24.9600	-0.05852	1.11E+07	-221103.	-0.00117	0.00	1.11E+13
1227.	80511.	0.00				
25.2800	-0.06302	1.03E+07	-216178.	-0.00117	0.00	1.11E+13
1338.	81543.	0.00				
25.6000	-0.06751	9441539.	-210821.	-0.00117	0.00	1.11E+13
1452.	82575.	0.00				
25.9200	-0.07199	8642978.	-205024.	-0.00116	0.00	1.11E+13
1567.	83608.	0.00				
26.2400	-0.07646	7867528.	-198779.	-0.00116	0.00	1.11E+13
1685.	84640.	0.00				
26.5600	-0.08091	7116928.	-192077.	-0.00116	0.00	1.11E+13
1805.	85672.	0.00				
26.8800	-0.08536	6392945.	-184911.	-0.00116	0.00	1.11E+13
1927.	86704.	0.00				
27.2000	-0.08980	5697382.	-177271.	-0.00115	0.00	1.11E+13
2052.	87736.	0.00				
27.5200	-0.09423	5032072.	-169149.	-0.00115	0.00	1.11E+13
2178.	88769.	0.00				
27.8400	-0.09865	4398881.	-160538.	-0.00115	0.00	1.11E+13
2307.	89801.	0.00				

New LPile (USCS units).lp9o						
28.1600	-0.1031	3799709.	-151427.	-0.00115	0.00	1.11E+13
2438.	90833.	0.00				
28.4800	-0.1075	3236486.	-141809.	-0.00115	0.00	1.11E+13
2571.	91865.	0.00				
28.8000	-0.1119	2711180.	-131675.	-0.00115	0.00	1.11E+13
2707.	92897.	0.00				
29.1200	-0.1163	2225788.	-121016.	-0.00115	0.00	1.11E+13
2845.	93929.	0.00				
29.4400	-0.1207	1782343.	-109823.	-0.00115	0.00	1.11E+13
2985.	94962.	0.00				
29.7600	-0.1251	1382910.	-98088.	-0.00115	0.00	1.11E+13
3127.	95994.	0.00				
30.0800	-0.1295	1029592.	-85801.	-0.00115	0.00	1.11E+13
3272.	97026.	0.00				
30.4000	-0.1339	724521.	-72954.	-0.00114	0.00	1.11E+13
3419.	98058.	0.00				
30.7200	-0.1383	469866.	-59538.	-0.00114	0.00	1.11E+13
3569.	99090.	0.00				
31.0400	-0.1427	267832.	-45543.	-0.00114	0.00	1.11E+13
3720.	100123.	0.00				
31.3600	-0.1471	120655.	-30962.	-0.00114	0.00	1.11E+13
3874.	101155.	0.00				
31.6800	-0.1515	30609.	-15784.	-0.00114	0.00	1.11E+13
4031.	102187.	0.00				
32.0000	-0.1559	0.00	0.00	-0.00114	0.00	1.11E+13
4190.	51610.	0.00				

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 1:

Pile-head deflection	=	0.91388873 inches
Computed slope at pile head	=	-0.00688822 radians
Maximum bending moment	=	53163745. inch-lbs
Maximum shear force	=	-249490. lbs
Depth of maximum bending moment	=	5.44000000 feet below pile head
Depth of maximum shear force	=	20.80000000 feet below pile head
Number of iterations	=	66
Number of zero deflection points	=	1

New LPILE (USCS units).lp9o

 Computed Values of Pile Loading and Deflection
 for Lateral Loading for Load Case Number 2

Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 21875.0 lbs
 Applied moment at pile head = 32002500.0 in-lbs
 Axial thrust load on pile head = 53333.0 lbs

Depth Res.	Deflect. Soil Spr.	Bending Distrib.	Shear Force	Slope S	Total Stress	Bending Stiffness	Soil p
X Es*h feet lb/inch	y Lat. inches lb/inch	Moment Load in-lbs lb/inch	lbs	radians	psi*	in-lb^2	
0.00	0.5035	3.20E+07	21875.	-0.00383	0.00	1.93E+12	
0.00	0.00	0.00					
0.3200	0.4889	3.21E+07	21871.	-0.00376	0.00	1.93E+12	
-1.8775	14.7456	0.00					
0.6400	0.4746	3.22E+07	21861.	-0.00370	0.00	1.93E+12	
-3.6450	29.4912	0.00					
0.9600	0.4605	3.23E+07	21844.	-0.00364	0.00	1.93E+12	
-5.3052	44.2368	0.00					
1.2800	0.4467	3.23E+07	21820.	-0.00357	0.00	1.93E+12	
-6.8610	58.9824	0.00					
1.6000	0.4331	3.24E+07	21791.	-0.00351	0.00	1.93E+12	
-8.3153	73.7280	0.00					
1.9200	0.4197	3.25E+07	21757.	-0.00344	0.00	1.93E+12	
-9.6709	88.4736	0.00					
2.2400	0.4066	3.26E+07	21717.	-0.00338	0.00	1.93E+12	
-10.9307	103.2192	0.00					
2.5600	0.3938	3.27E+07	21673.	-0.00331	0.00	1.93E+12	
-12.0976	117.9648	0.00					
2.8800	0.3812	3.28E+07	21624.	-0.00325	0.00	1.93E+12	
-13.1744	132.7104	0.00					
3.2000	0.3689	3.28E+07	21572.	-0.00318	0.00	1.93E+12	
-14.1641	147.4560	0.00					
3.5200	0.3568	3.29E+07	21516.	-0.00312	0.00	1.93E+12	
-15.0695	162.2016	0.00					
3.8400	0.3449	3.30E+07	21456.	-0.00305	0.00	1.93E+12	
-15.8937	176.9472	0.00					
4.1600	0.3333	3.31E+07	19189.	-0.00299	0.00	1.93E+12	
-1165.	13418.	0.00					
4.4800	0.3220	3.32E+07	14627.	-0.00292	0.00	1.93E+12	

New LPile (USCS units).lp9o

-1212.	14451.	0.00					
4.8000	0.3109	3.32E+07	9893.	-0.00285	0.00	1.93E+12	
-1254.	15483.	0.00					
5.1200	0.3001	3.32E+07	5009.	-0.00279	0.00	1.93E+12	
-1291.	16515.	0.00					
5.4400	0.2895	3.32E+07	-9.0161	-0.00272	0.00	1.93E+12	
-1323.	17547.	0.00					
5.7600	0.2792	3.32E+07	-5142.	-0.00266	0.00	1.93E+12	
-1351.	18579.	0.00					
6.0800	0.2691	3.32E+07	-10374.	-0.00259	0.00	1.93E+12	
-1374.	19612.	0.00					
6.4000	0.2593	3.32E+07	-15689.	-0.00252	0.00	1.93E+12	
-1394.	20644.	0.00					
6.7200	0.2497	3.31E+07	-21072.	-0.00246	0.00	1.93E+12	
-1410.	21676.	0.00					
7.0400	0.2404	3.30E+07	-26509.	-0.00239	0.00	1.93E+12	
-1422.	22708.	0.00					
7.3600	0.2314	3.29E+07	-31985.	-0.00233	0.00	1.93E+12	
-1430.	23740.	0.00					
7.6800	0.2226	3.28E+07	-37487.	-0.00226	0.00	1.93E+12	
-1436.	24773.	0.00					
8.0000	0.2140	3.26E+07	-43005.	-0.00220	0.00	1.93E+12	
-1438.	25805.	0.00					
8.3200	0.2057	3.24E+07	-48527.	-0.00213	0.00	1.93E+12	
-1438.	26837.	0.00					
8.6400	0.1976	3.22E+07	-54041.	-0.00207	0.00	1.93E+12	
-1434.	27869.	0.00					
8.9600	0.1898	3.20E+07	-59538.	-0.00200	0.00	1.93E+12	
-1429.	28901.	0.00					
9.2800	0.1823	3.18E+07	-63840.	-0.00194	0.00	1.93E+12	
-811.8743	17105.	0.00					
9.6000	0.1749	3.15E+07	-66946.	-0.00188	0.00	1.93E+12	
-806.1213	17695.	0.00					
9.9200	0.1679	3.13E+07	-70029.	-0.00181	0.00	1.93E+12	
-799.2634	18285.	0.00					
10.2400	0.1610	3.10E+07	-73083.	-0.00175	0.00	1.93E+12	
-791.4011	18874.	0.00					
10.5600	0.1544	3.07E+07	-76105.	-0.00169	0.00	1.94E+12	
-782.6329	19464.	0.00					
10.8800	0.1480	3.04E+07	-79092.	-0.00163	0.00	1.94E+12	
-773.0558	20054.	0.00					
11.2000	0.1419	3.01E+07	-82041.	-0.00157	0.00	1.94E+12	
-762.7646	20644.	0.00					
11.5200	0.1360	2.98E+07	-84949.	-0.00151	0.00	1.94E+12	
-751.8525	21234.	0.00					
11.8400	0.1303	2.94E+07	-87814.	-0.00145	0.00	1.94E+12	
-740.4102	21823.	0.00					
12.1600	0.1248	2.91E+07	-90634.	-0.00139	0.00	1.94E+12	

New LPile (USCS units).lp9o

-728.5266	22413.	0.00				
12.4800	0.1196	2.87E+07	-93408.	-0.00134	0.00	1.94E+12
-716.2884	23003.	0.00				
12.8000	0.1145	2.84E+07	-96135.	-0.00128	0.00	1.94E+12
-703.7802	23593.	0.00				
13.1200	0.1097	2.80E+07	-98813.	-0.00122	0.00	1.95E+12
-691.0840	24183.	0.00				
13.4400	0.1051	2.76E+07	-101442.	-0.00117	0.00	1.95E+12
-678.2798	24773.	0.00				
13.7600	0.1008	2.72E+07	-104022.	-0.00114	0.00	1.09E+13
-665.4451	25362.	0.00				
14.0800	0.09640	2.68E+07	-106551.	-0.00113	0.00	1.09E+13
-651.5104	25952.	0.00				
14.4000	0.09208	2.64E+07	-109024.	-0.00112	0.00	1.09E+13
-636.4887	26542.	0.00				
14.7200	0.08780	2.60E+07	-111437.	-0.00111	0.00	1.09E+13
-620.3927	27132.	0.00				
15.0400	0.08356	2.56E+07	-114655.	-0.00110	0.00	1.10E+13
-1056.	48513.	0.00				
15.3600	0.07935	2.51E+07	-118647.	-0.00109	0.00	1.10E+13
-1024.	49545.	0.00				
15.6800	0.07517	2.46E+07	-122514.	-0.00108	0.00	1.10E+13
-990.1127	50577.	0.00				
16.0000	0.07103	2.42E+07	-126248.	-0.00107	0.00	1.10E+13
-954.6300	51610.	0.00				
16.3200	0.06692	2.37E+07	-129842.	-0.00107	0.00	1.10E+13
-917.3654	52642.	0.00				
16.6400	0.06284	2.32E+07	-133290.	-0.00106	0.00	1.10E+13
-878.3357	53674.	0.00				
16.9600	0.05879	2.27E+07	-136585.	-0.00105	0.00	1.10E+13
-837.5569	54706.	0.00				
17.2800	0.05477	2.21E+07	-139719.	-0.00104	0.00	1.10E+13
-795.0438	55738.	0.00				
17.6000	0.05079	2.16E+07	-142687.	-0.00103	0.00	1.10E+13
-750.8103	56771.	0.00				
17.9200	0.04683	2.10E+07	-145482.	-0.00103	0.00	1.10E+13
-704.8692	57803.	0.00				
18.2400	0.04290	2.05E+07	-148097.	-0.00102	0.00	1.10E+13
-657.2323	58835.	0.00				
18.5600	0.03899	1.99E+07	-150526.	-0.00101	0.00	1.10E+13
-607.9104	59867.	0.00				
18.8800	0.03512	1.93E+07	-152763.	-0.00101	0.00	1.10E+13
-556.9134	60899.	0.00				
19.2000	0.03127	1.87E+07	-154800.	-9.99E-04	0.00	1.10E+13
-504.2500	61932.	0.00				
19.5200	0.02744	1.81E+07	-156632.	-9.93E-04	0.00	1.10E+13
-449.9279	62964.	0.00				
19.8400	0.02364	1.75E+07	-158253.	-9.87E-04	0.00	1.10E+13

New LPile (USCS units).lp9o

-393.9539	63996.	0.00					
20.1600	0.01986	1.69E+07	-159655.	-9.81E-04	0.00	1.10E+13	
-336.3336	65028.	0.00					
20.4800	0.01611	1.63E+07	-160832.	-9.75E-04	0.00	1.10E+13	
-277.0718	66060.	0.00					
20.8000	0.01237	1.57E+07	-161779.	-9.69E-04	0.00	1.10E+13	
-216.1722	67092.	0.00					
21.1200	0.00866	1.50E+07	-162489.	-9.64E-04	0.00	1.10E+13	
-153.6374	68125.	0.00					
21.4400	0.00497	1.44E+07	-162956.	-9.59E-04	0.00	1.10E+13	
-89.4693	69157.	0.00					
21.7600	0.00129	1.38E+07	-163173.	-9.54E-04	0.00	1.10E+13	
-23.6687	70189.	0.00					
22.0800	-0.00236	1.32E+07	-163135.	-9.49E-04	0.00	1.10E+13	
43.7646	71221.	0.00					
22.4000	-0.00600	1.25E+07	-162834.	-9.45E-04	0.00	1.10E+13	
112.8316	72253.	0.00					
22.7200	-0.00962	1.19E+07	-162265.	-9.41E-04	0.00	1.10E+13	
183.5341	73286.	0.00					
23.0400	-0.01322	1.13E+07	-161422.	-9.37E-04	0.00	1.11E+13	
255.8750	74318.	0.00					
23.3600	-0.01681	1.07E+07	-160297.	-9.33E-04	0.00	1.11E+13	
329.8577	75350.	0.00					
23.6800	-0.02039	1.01E+07	-158885.	-9.29E-04	0.00	1.11E+13	
405.4867	76382.	0.00					
24.0000	-0.02395	9458712.	-157180.	-9.26E-04	0.00	1.11E+13	
482.7670	77414.	0.00					
24.3200	-0.02750	8858891.	-155174.	-9.23E-04	0.00	1.11E+13	
561.7045	78447.	0.00					
24.6400	-0.03103	8267352.	-152863.	-9.20E-04	0.00	1.11E+13	
642.3055	79479.	0.00					
24.9600	-0.03456	7685283.	-150238.	-9.17E-04	0.00	1.11E+13	
724.5773	80511.	0.00					
25.2800	-0.03807	7113898.	-147295.	-9.14E-04	0.00	1.11E+13	
808.5274	81543.	0.00					
25.6000	-0.04158	6554435.	-144025.	-9.12E-04	0.00	1.11E+13	
894.1641	82575.	0.00					
25.9200	-0.04508	6008157.	-140424.	-9.10E-04	0.00	1.11E+13	
981.4959	83608.	0.00					
26.2400	-0.04857	5476351.	-136484.	-9.08E-04	0.00	1.11E+13	
1071.	84640.	0.00					
26.5600	-0.05205	4960330.	-132199.	-9.06E-04	0.00	1.11E+13	
1161.	85672.	0.00					
26.8800	-0.05553	4461432.	-127562.	-9.04E-04	0.00	1.11E+13	
1254.	86704.	0.00					
27.2000	-0.05900	3981022.	-122567.	-9.03E-04	0.00	1.11E+13	
1348.	87736.	0.00					
27.5200	-0.06246	3520487.	-117207.	-9.02E-04	0.00	1.11E+13	

New LPILE (USCS units).lp9o

1444.	88769.	0.00					
	27.8400	-0.06592	3081244.	-111474.	-9.00E-04	0.00	1.11E+13
1542.	89801.	0.00					
	28.1600	-0.06938	2664733.	-105364.	-9.00E-04	0.00	1.11E+13
1641.	90833.	0.00					
	28.4800	-0.07283	2272420.	-98868.	-8.99E-04	0.00	1.11E+13
1742.	91865.	0.00					
	28.8000	-0.07628	1905798.	-91979.	-8.98E-04	0.00	1.11E+13
1845.	92897.	0.00					
	29.1200	-0.07973	1566387.	-84692.	-8.97E-04	0.00	1.11E+13
1950.	93929.	0.00					
	29.4400	-0.08317	1255732.	-76999.	-8.97E-04	0.00	1.11E+13
2057.	94962.	0.00					
	29.7600	-0.08661	975405.	-68892.	-8.96E-04	0.00	1.11E+13
2165.	95994.	0.00					
	30.0800	-0.09006	727006.	-60366.	-8.96E-04	0.00	1.11E+13
2275.	97026.	0.00					
	30.4000	-0.09350	512159.	-51414.	-8.96E-04	0.00	1.11E+13
2388.	98058.	0.00					
	30.7200	-0.09694	332517.	-42027.	-8.96E-04	0.00	1.11E+13
2501.	99090.	0.00					
	31.0400	-0.1004	189760.	-32199.	-8.96E-04	0.00	1.11E+13
2617.	100123.	0.00					
	31.3600	-0.1038	85594.	-21924.	-8.96E-04	0.00	1.11E+13
2735.	101155.	0.00					
	31.6800	-0.1073	21754.	-11193.	-8.96E-04	0.00	1.11E+13
2854.	102187.	0.00					
	32.0000	-0.1107	0.00	0.00	-8.96E-04	0.00	1.11E+13
2975.	51610.	0.00					

* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 2:

Pile-head deflection	=	0.50351720 inches
Computed slope at pile head	=	-0.00382784 radians
Maximum bending moment	=	33248177. inch-lbs
Maximum shear force	=	-163173. lbs
Depth of maximum bending moment	=	5.44000000 feet below pile head
Depth of maximum shear force	=	21.76000000 feet below pile head
Number of iterations	=	133
Number of zero deflection points	=	1

 Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
 Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
 Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
 Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
 Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type	Load 1	Load 2	Axial Loading	Pile-head Deflection	Pile-head Rotation	Max in
		lbs	in-lbs	lbs	inches	radians	
1	V, lb	35000.	M, in-lb	5.12E+07	64000.	0.9139	-0.00689
		-249490.					
		5.32E+07					
2	V, lb	21875.	M, in-lb	3.20E+07	53333.	0.5035	-0.00383
		-163173.					
		3.32E+07					

Maximum pile-head deflection = 0.9138887291 inches
 Maximum pile-head rotation = -0.0068882182 radians = -0.394666 deg.

The analysis ended normally.

Pc = Concrete Pier Capacity = 58,986 kip-in x 1ft/12in = 4915.5ft-kip
 Mmax = 53,200,000in-lb x 1ft-kip/12,000in-lb = 4,433.3 ft-kip
 Capacity = Mmax/Pc x 100% = 90.2%

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SCHEDULE OF REVISIONS		
REV NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4		
3		
2	08/21/17	REVISED PER NEW RFDS
1	08/02/17	ISSUED FOR CONSTRUCTION
0	05/19/17	INITIAL SUBMISSION

DRAWN BY: AM
 CHECKED BY: DTS
 SCALE: AS NOTED
 JOB NO: 17044-CHE

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INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY THE SEAL & SIGNATURE OF THE REGISTERED PROFESSIONAL ENGINEER

NICHOLAS J. PARILE
 PROFESSIONAL ENGINEER, CT LIC. No. 28643

CT43XC827
239 MIDDLE TURNPIKE
MANCHESTER, CT 06040
HARTFORD COUNTY

DRAWING TITLE:
 TITLE SHEET

DRAWING SHEET: 1 OF 6

T-1

SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
C-1	SITE LAYOUT & GENERAL NOTES
C-2	EXISTING & FINAL ANTENNA PLANS
C-3	TOWER ELEVATION, B.O.M. & FINAL EQUIPMENT PLAN
C-4	CONSTRUCTION DETAILS
E-1	ELECTRICAL & GROUNDING DETAILS, NOTES & COAX COLOR CODE

SITE LOCATION INFORMATION	
SITE ID NUMBER:	CT43XC827
SITE NAME:	MANCHESTER / POLICE TOWER
SITE ADDRESS:	239 MIDDLE TURNPIKE MANCHESTER, CT 06040
PARCEL ID:	92 3950 239
CENSUS TRACT:	514300
CENSUS BLOCK:	3004
PROPERTY OWNER:	TOWN OF MANCHESTER 41 CENTER STREET MANCHESTER, CT
APPLICANT:	SPRINT 6100 SPRINT PARKWAY OVERLAND PARK, KS 66251
COUNTY:	HARTFORD COUNTY

SITE CHARACTERISTICS	
LATITUDE:	41.78373
LONGITUDE:	-72.512678
STRUCTURE TYPE:	MONOPOLE TOWER
LOCATION OF PROPOSED EQUIPMENT:	EXISTING EQUIPMENT PLATFORM
STRUCTURE HEIGHT:	±190'-0" AGL
ANTENNA (RAD CENTER):	±154'-0" AGL (ALPHA) ±154'-0" AGL (BETA) ±154'-0" AGL (GAMMA)



KEY MAP
 SCALE = N.T.S.

SIGNATURE BLOCK:	
SPRINT REPRESENTATIVE:	DATE
SPRINT RF ENGINEER:	DATE
PROPERTY OWNER:	DATE



SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4		
3		
2	08/21/17	REVISED PER NEW RFDS
1	08/02/17	ISSUED FOR CONSTRUCTION
0	05/19/17	INITIAL SUBMISSION

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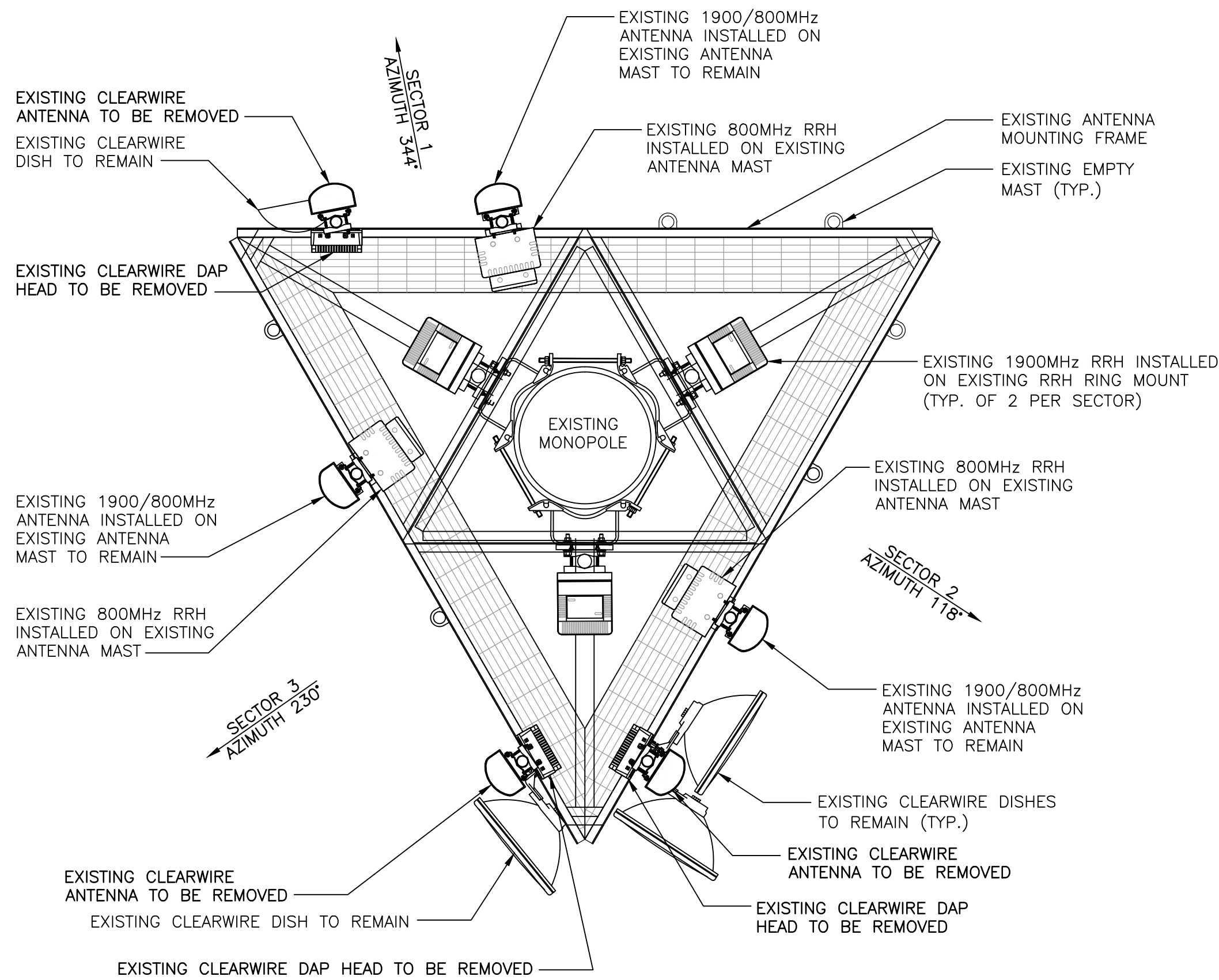
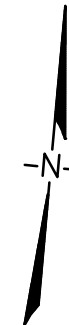
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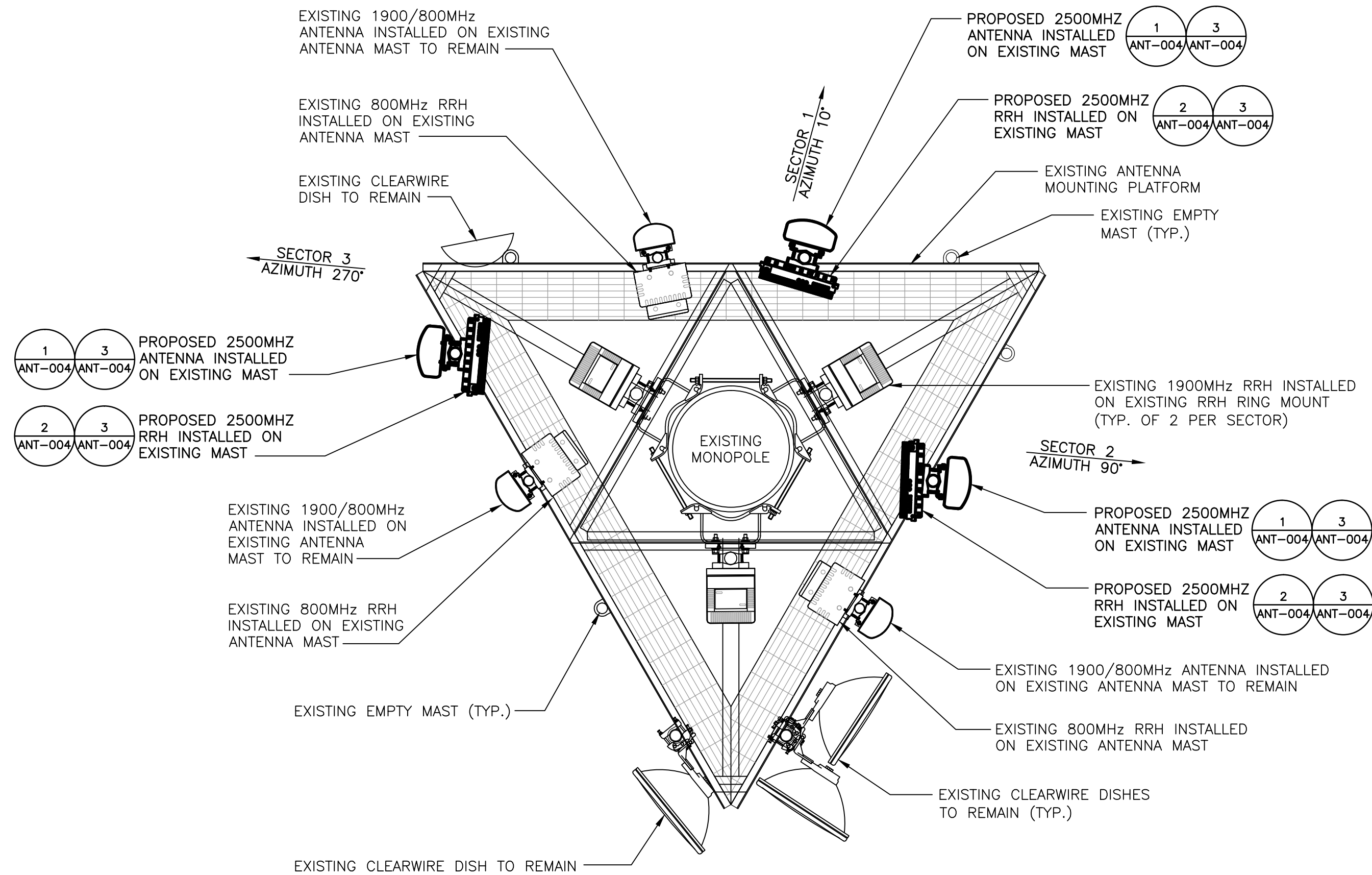
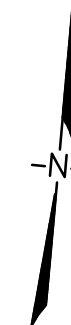
DRAWING TITLE:
EXISTING & FINAL ANTENNA PLANS

DRAWING SHEET: 3 OF 6

C-2



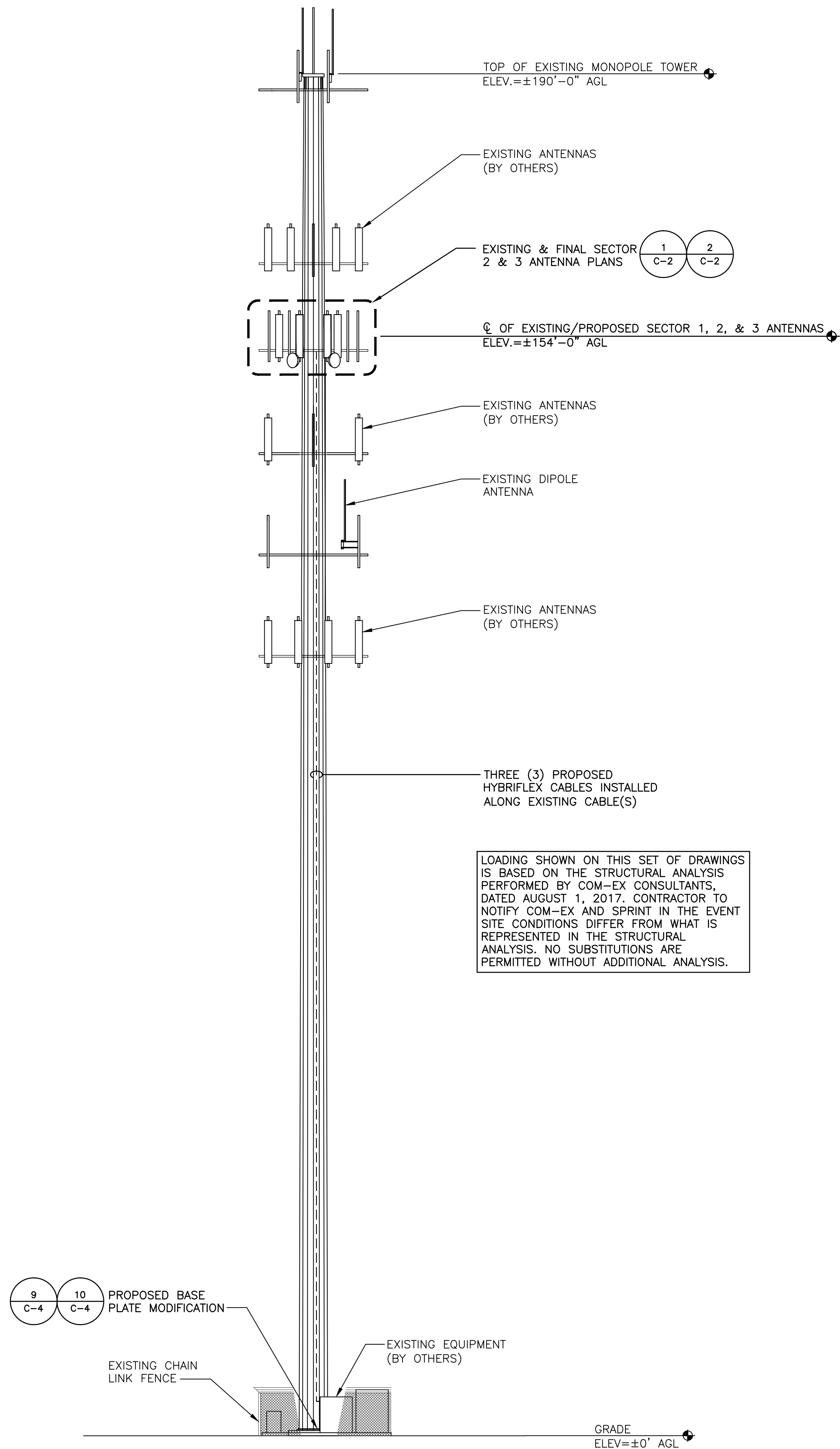
1 EXISTING SECTOR 1, 2, & 3 ANTENNA PLAN
C-2 SCALE: 1/2"=1'



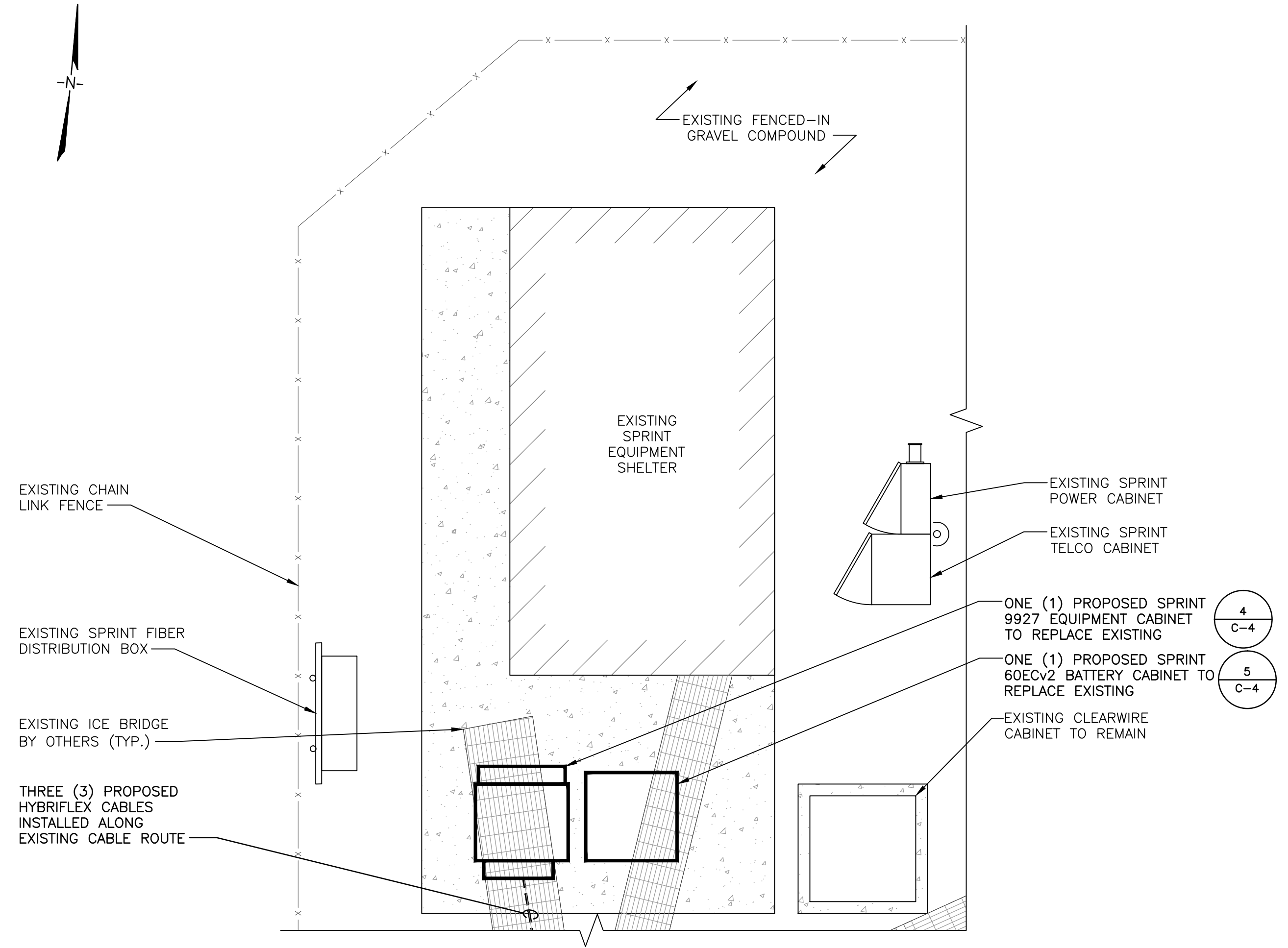
1A FINAL SECTOR 1, 2, & 3 ANTENNA PLAN
C-2 SCALE: 1/2"=1'

LOADING SHOWN ON THIS SET OF DRAWINGS IS BASED ON THE STRUCTURAL ANALYSIS PERFORMED BY COM-EX CONSULTANTS, DATED AUGUST 1, 2017. CONTRACTOR TO NOTIFY COM-EX AND SPRINT IN THE EVENT SITE CONDITIONS DIFFER FROM WHAT IS REPRESENTED IN THE STRUCTURAL ANALYSIS. NO SUBSTITUTIONS ARE PERMITTED WITHOUT ADDITIONAL ANALYSIS.

BILL OF MATERIALS					
	DESCRIPTION	QUANTITY EACH	DIMENSIONS (HxWxD)	WEIGHT (LBS) EACH	MANUFACTURER: PART/ MODEL#
ANTENNAS	2500 MHz PANEL ANTENNA - SECTOR 1	1	56.3"x12.6"x6.3"	56.2 LBS W/OUT MOUNTING HARDWARE	RFS: APXVTM14-ALU-120
	2500 MHz RRH, 8x20-25	1	26.1"x18.6"x6.7"	70 LBS W/OUT MOUNTING HARDWARE	ALCATEL LUCENT
	2500 MHz PANEL ANTENNA - SECTOR 2	1	56.3"x12.6"x6.3"	56.2 LBS W/OUT MOUNTING HARDWARE	RFS: APXVTM14-ALU-120
	2500 MHz RRH, 8x20-25	1	26.1"x18.6"x6.7"	70 LBS W/OUT MOUNTING HARDWARE	ALCATEL LUCENT
	2500 MHz PANEL ANTENNA - SECTOR 3	1	56.3"x12.6"x6.3"	56.2 LBS W/OUT MOUNTING HARDWARE	RFS: APXVTM14-ALU-120
	2500 MHz RRH, 8x20-25	1	26.1"x18.6"x6.7"	70 LBS W/OUT MOUNTING HARDWARE	ALCATEL LUCENT
	DESCRIPTION	QUANTITY EACH	DIMENSIONS (LENGTH)	WEIGHT (LBS/FOOT)	MANUFACTURER: SIZE/PART/MODEL#
CABLES	SECTOR 1 HYBRIFLEX RUN (BTS TO RRH)	1	±195'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 1 COAX CABLE JUMPERS	11	10'	N/A	LDF4-50 (OR EQUIVALENT)
	SECTOR 1 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD
	SECTOR 2 HYBRIFLEX RUN (BTS TO RRH)	1	±195'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 2 COAX CABLE JUMPERS	11	10'	N/A	LDF4-50 (OR EQUIVALENT)
	SECTOR 2 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD
	SECTOR 3 HYBRIFLEX RUN (BTS TO RRH)	1	±195'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 3 COAX CABLE JUMPERS	11	10'	N/A	LDF4-50 (OR EQUIVALENT)
	SECTOR 3 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD



1 TOWER ELEVATION
C-3 SCALE: 3/32"=1'
(24"x36" SHEET SIZE)



2 FINAL EQUIPMENT PLAN
C-3 SCALE: 3/8"=1'

SCHEDULE OF REVISIONS

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7		
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DRAWN BY: AM
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SCALE: AS NOTED
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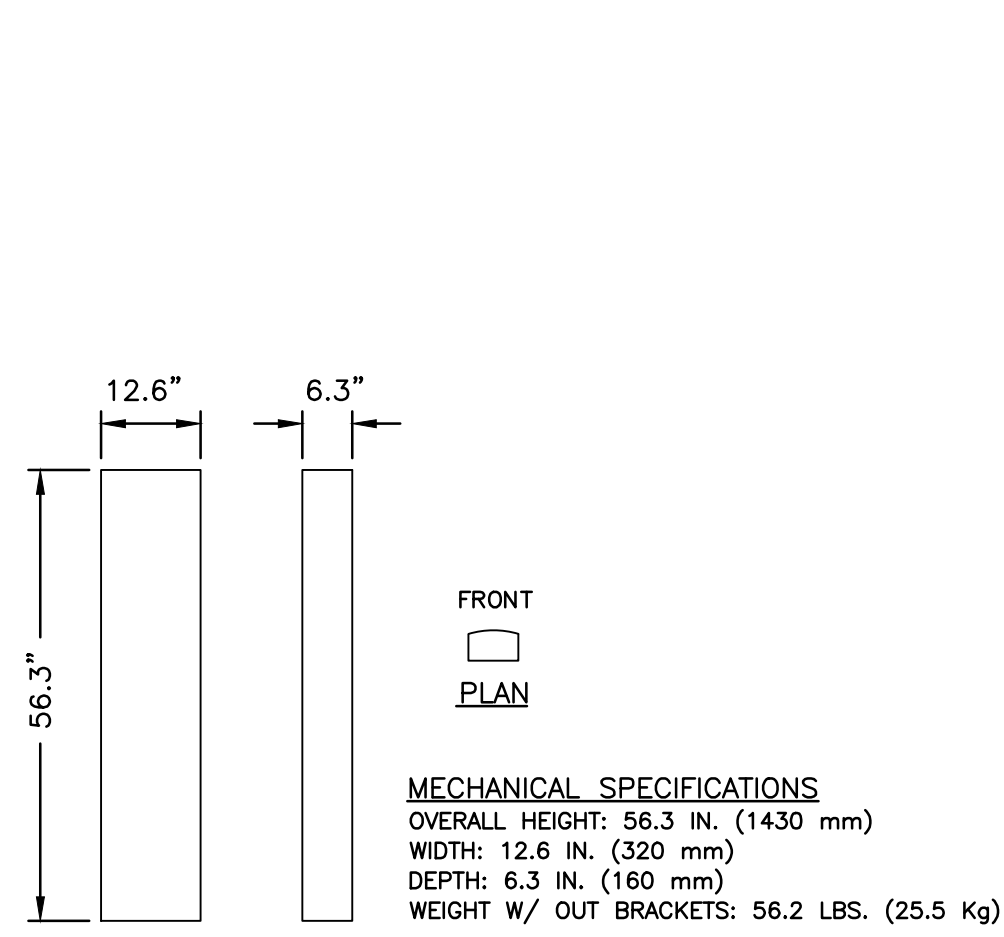
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NICHOLAS MARILE
PROFESSIONAL ENGINEER, CT LIC. No. 28643

CT43XC827
239 MIDDLE TURNPIKE
MANCHESTER, CT 06040
HARTFORD COUNTY

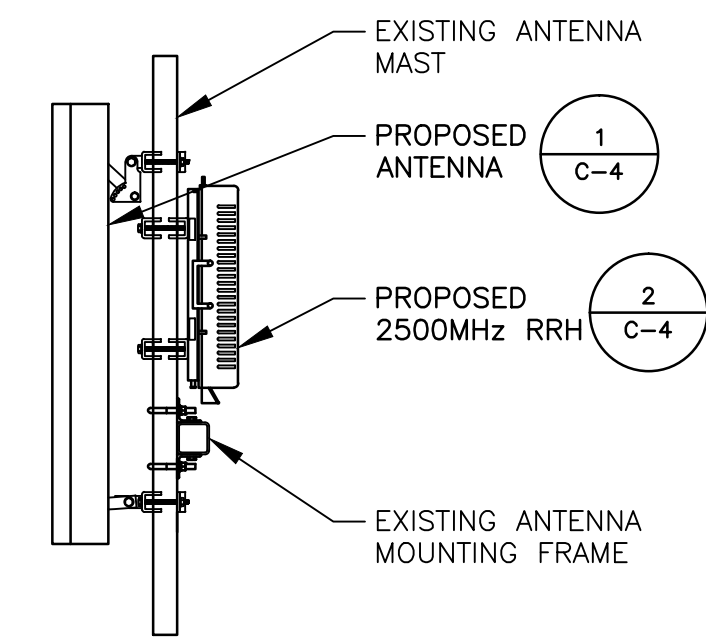
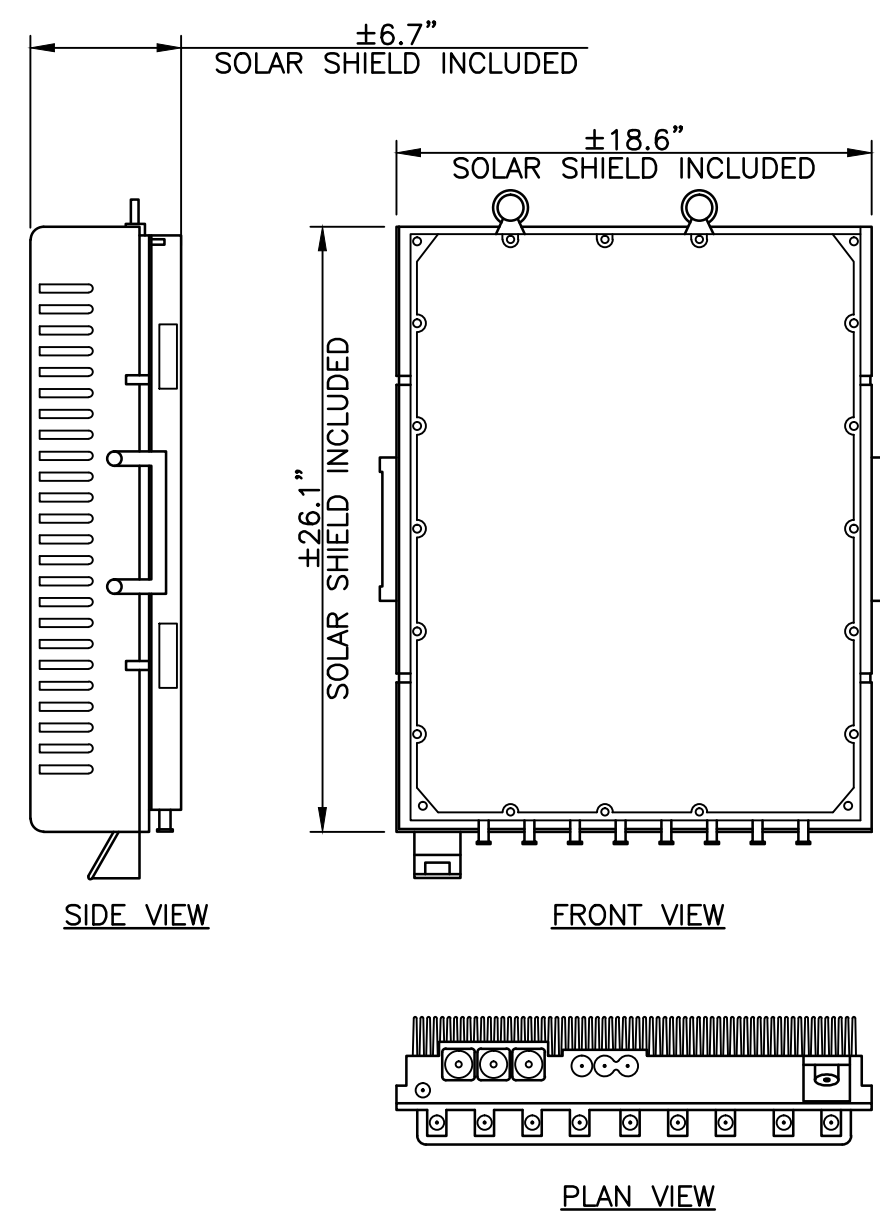
DRAWING TITLE:
TOWER ELEVATION, B.O.M. & FINAL EQUIPMENT PLAN

DRAWING SHEET: 4 OF 6

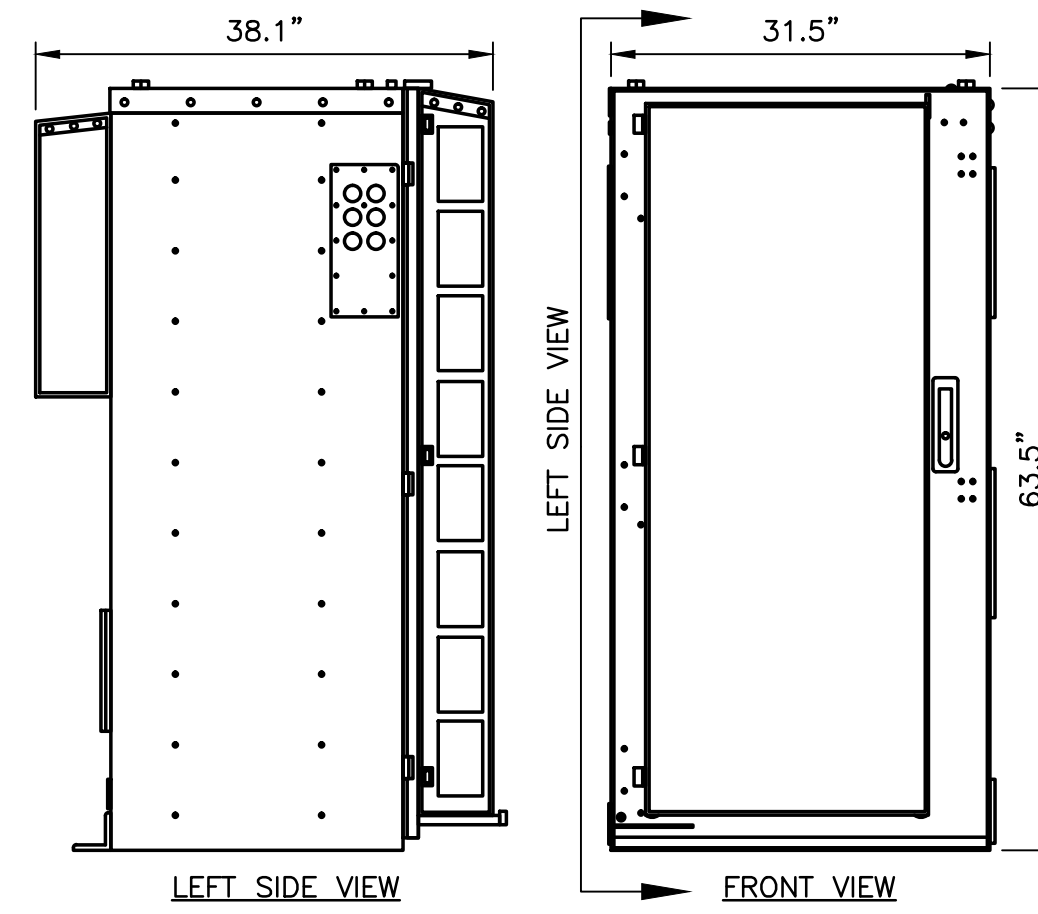
C-3



MECHANICAL SPECIFICATIONS
 OVERALL HEIGHT: 56.3 IN. (1430 mm)
 WIDTH: 12.6 IN. (320 mm)
 DEPTH: 6.3 IN. (160 mm)
 WEIGHT W/ OUT BRACKETS: 56.2 LBS. (25.5 Kg)



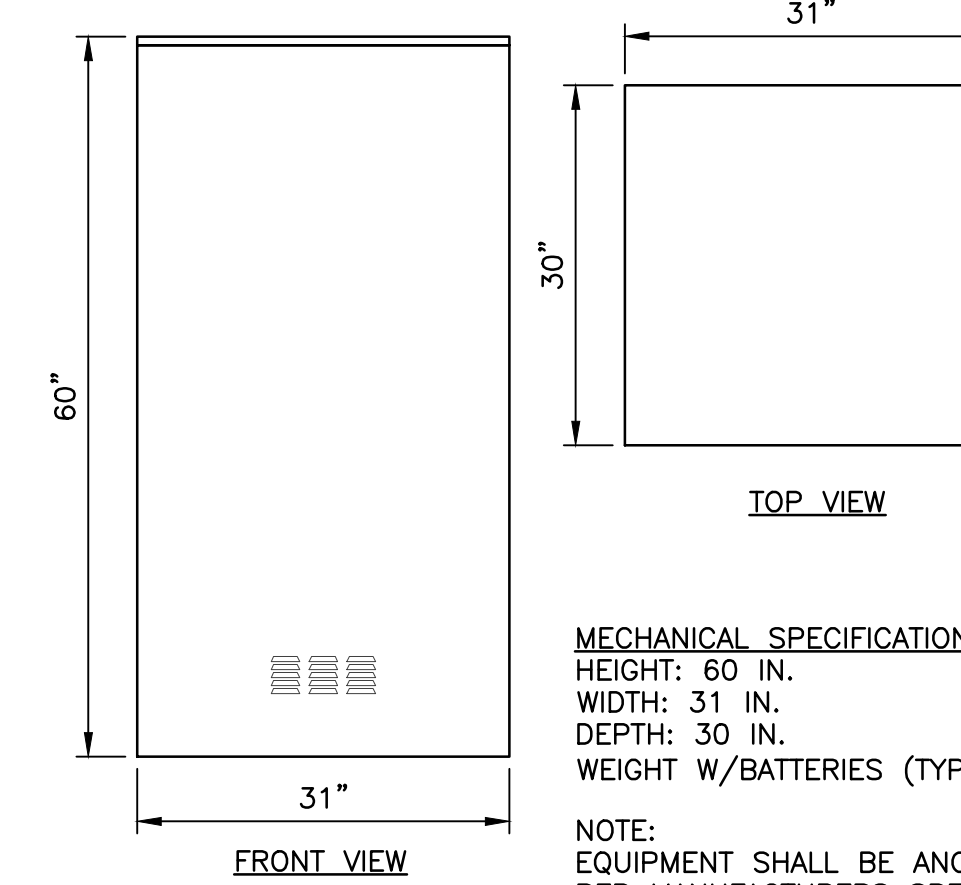
3 SECTOR 1, 2, & 3 ANTENNA INSTALLATION DETAIL
 SCALE: N.T.S.



MECHANICAL SPECIFICATIONS
 HEIGHT: 63.5 IN.
 WIDTH: 31.5 IN.
 DEPTH: 38.1 IN.
 WEIGHT: 1090 LBS.

EQUIPMENT SHALL BE ANCHORED PER MANUFACTURERS SPECIFICATIONS AND INSTALLATION GUIDELINES.

4 ALU 9927 EQUIPMENT CABINET DETAIL
 SCALE: N.T.S.



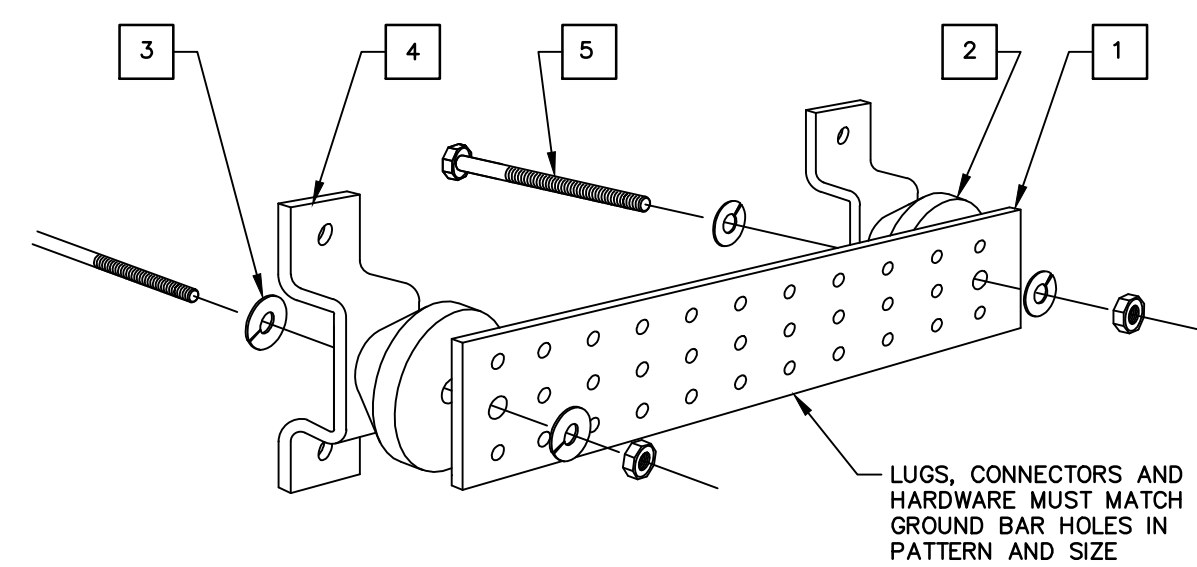
MECHANICAL SPECIFICATIONS
 HEIGHT: 60 IN.
 WIDTH: 31 IN.
 DEPTH: 30 IN.
 WEIGHT W/BATTERIES (TYP.): 2830 LBS.

NOTE: EQUIPMENT SHALL BE ANCHORED PER MANUFACTURERS SPECIFICATIONS AND INSTALLATION GUIDES.

5 ALU 60ECv2 BATTERY CABINET DETAIL
 SCALE: N.T.S.

1 2500MHz ANTENNA
 RFS: APXVTM14-ALU-120
 SCALE: N.T.S.

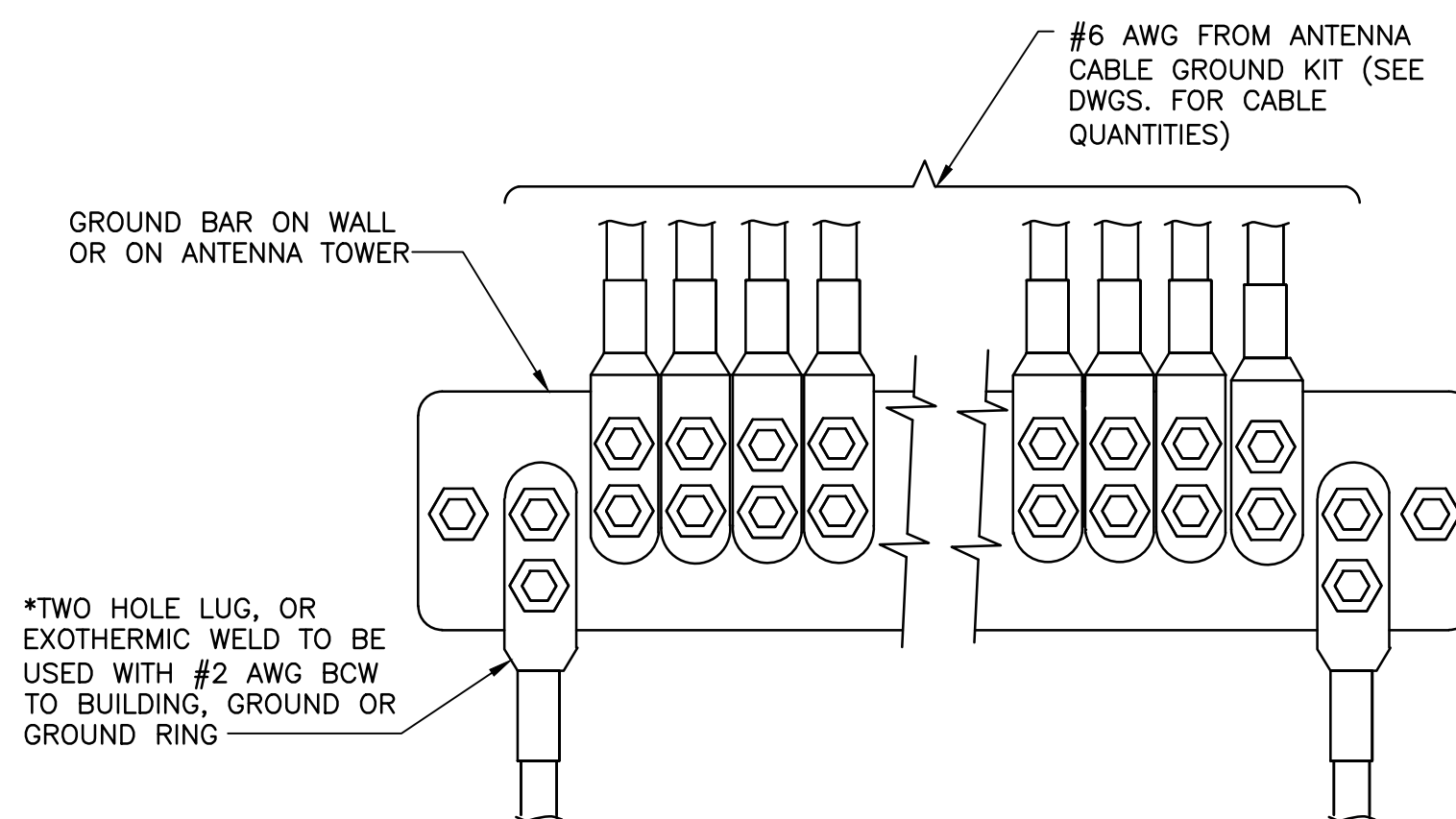
2 2500MHz RRH DETAIL
 SCALE: N.T.S.



LEGEND

1. COPPER GROUND BAR, 7/16" X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3081-4.
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-B.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 X 1" H.H.C.S.BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

GROUND BAR SCHEDULE				
TYPE	QTY.	MANUFACTURER	CAT. NO.	REMARKS
MGB	2	HARGER	GB14420TMGB	OR EQUAL
CGB	3	HARGER	GB14412TMGB	OR EQUAL

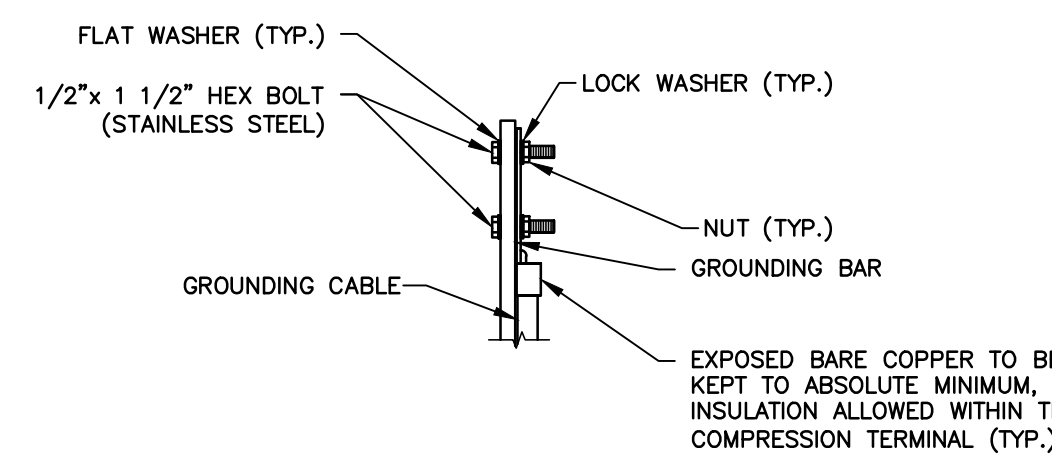


* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRIFLEX GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.

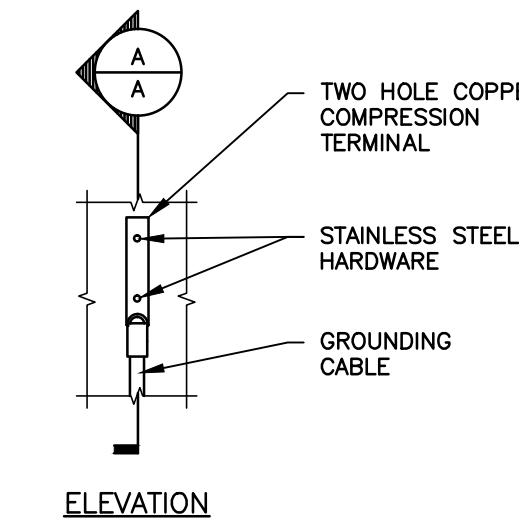
- CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

7 TYPICAL GROUND BAR CONNECTION PLAN
 SCALE: N.T.S.

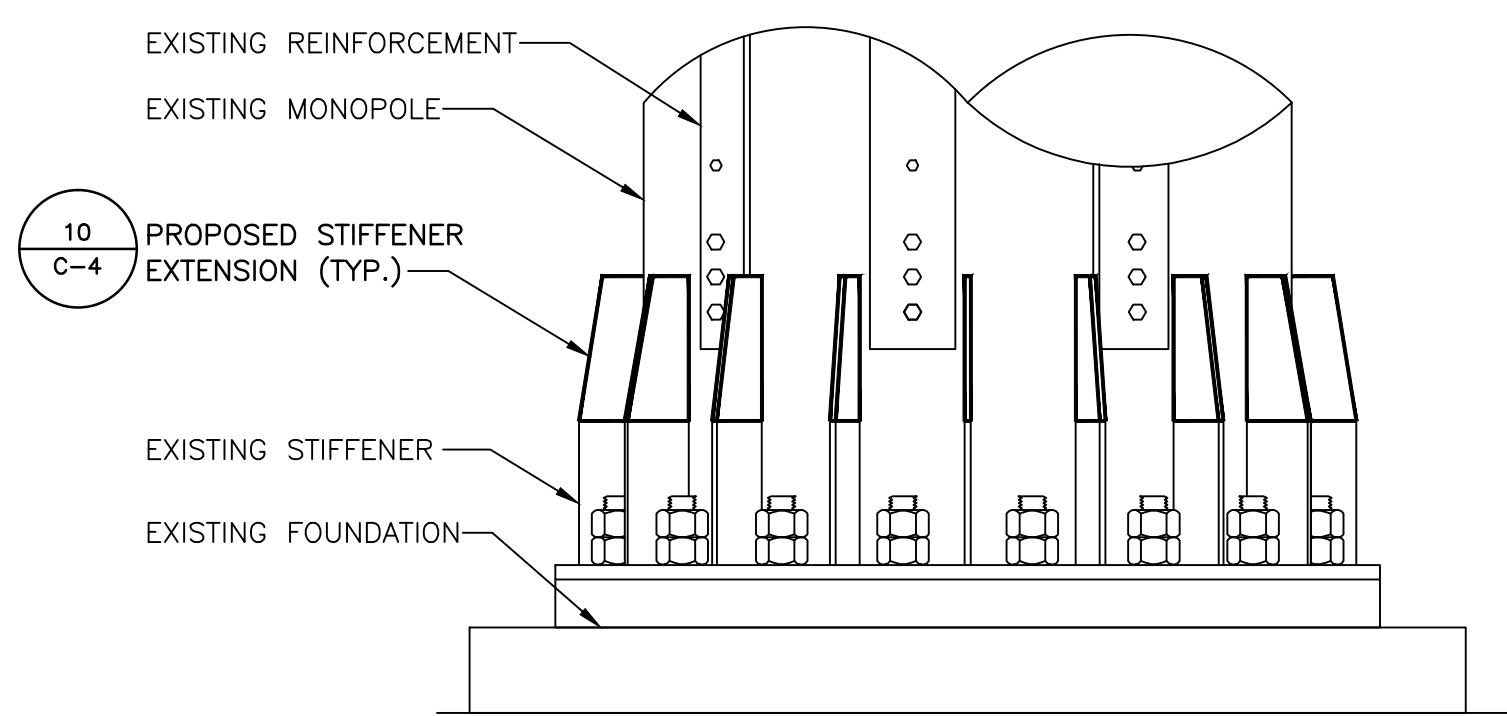


- NOTE:**
1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

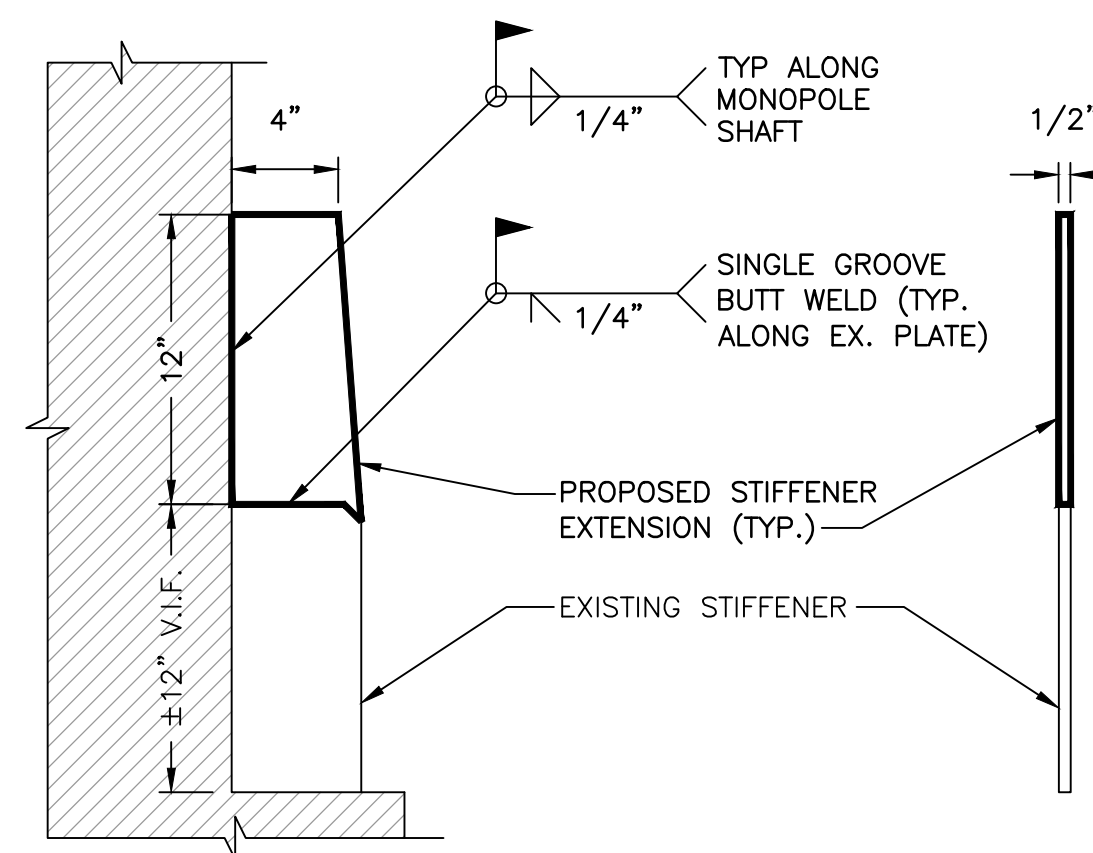
8 TYPICAL GROUND BAR CONNECTION DETAIL
 SCALE: N.T.S.



ELEVATION



9 BASE PLATE MODIFICATION DETAIL
 SCALE: N.T.S.



10 STIFFENER EXTENSION DETAIL
 SCALE: N.T.S.

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DRAWN BY: AM
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 SCALE: AS NOTED
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 NICHOLAS J. MARILE
 PROFESSIONAL ENGINEER, CT LIC. No. 28643

CT43XC827
**239 MIDDLE TURNPIKE
 MANCHESTER, CT 06040**
 HARTFORD COUNTY

DRAWING TITLE:
**CONSTRUCTION
 DETAILS**

DRAWING SHEET: 5 OF 6

C-4



6100 SPRINT PARKWAY
OVERLAND PARK, KS 66251



SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
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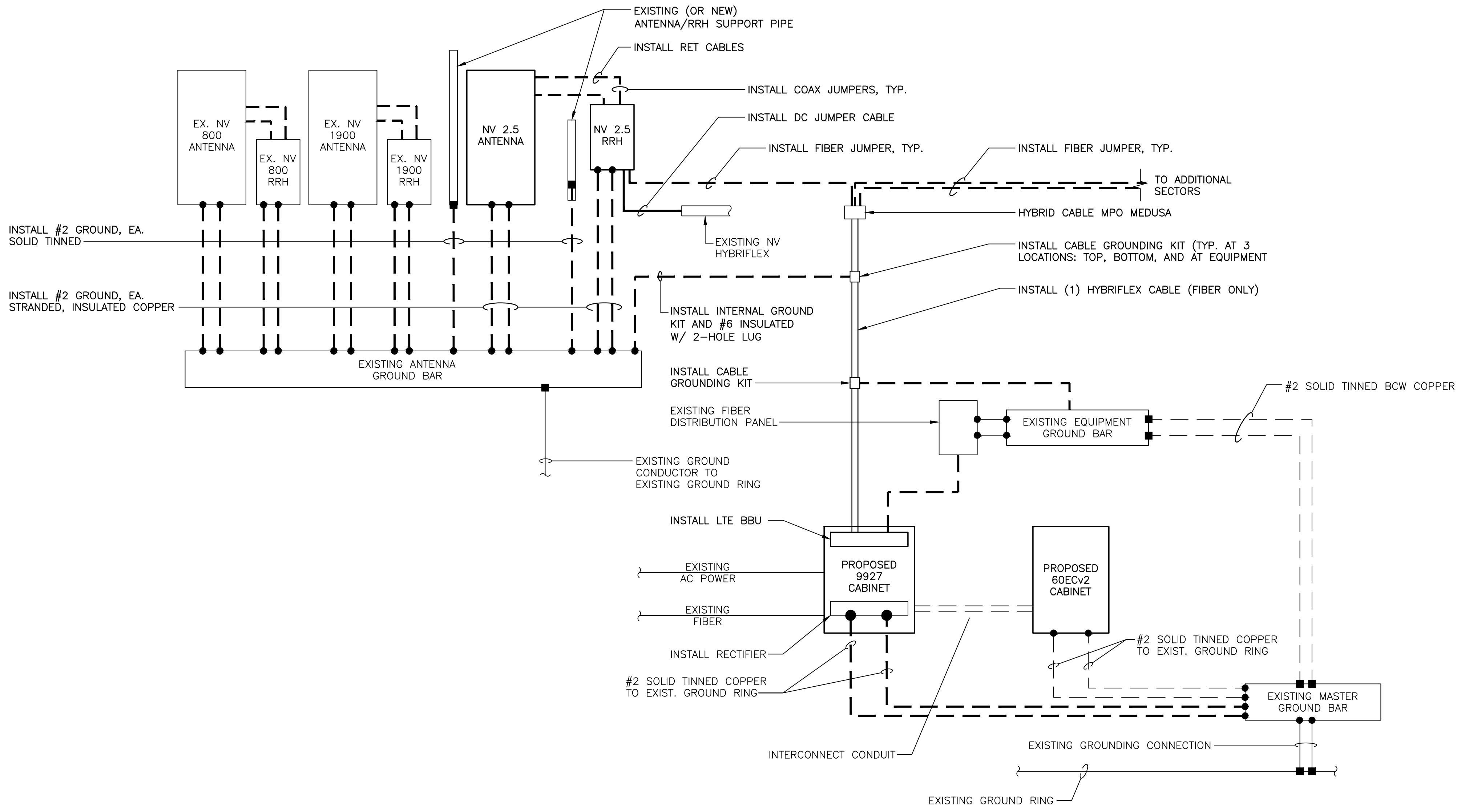
DRAWING TITLE:
ELECTRICAL & GROUNDING DETAILS, NOTES, & COAX COLOR CODE

DRAWING SHEET: 6 OF 6

E-1

ELECTRICAL AND GROUNDING NOTES

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND HYBRIFLEX CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRIFLEX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- BOND ANTENNA MOUNTING BRACKETS, HYBRIFLEX CABLE GROUND KITS, AND RRHS TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO GROUND RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, HYBRIFLEX CABLES, AND RRH RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
- CONTRACTOR (CERTIFIED ELECTRICIAN) SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.



1
E-1
TYPICAL POWER & GROUNDING ONE-LINE DIAGRAM
SCALE: N.T.S.

COAXIAL CABLE COLOR CODE

SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING
1ALPHA	1	GREEN	NO TAPE	NO TAPE
	2	BLUE	NO TAPE	NO TAPE
	3	BROWN	NO TAPE	NO TAPE
	4	WHITE	NO TAPE	NO TAPE
	5	RED	NO TAPE	NO TAPE
	6	SLATE	NO TAPE	NO TAPE
	7	PURPE	NO TAPE	NO TAPE
	8	ORANGE	NO TAPE	NO TAPE
2BETA	1	GREEN	GREEN	NO TAPE
	2	BLUE	BLUE	NO TAPE
	3	BROWN	BROWN	NO TAPE
	4	WHITE	WHITE	NO TAPE
	5	RED	RED	NO TAPE
	6	SLATE	SLATE	NO TAPE
	7	PURPLE	PURPLE	NO TAPE
	8	ORANGE	ORANGE	NO TAPE
3 GAMMA	1	GREEN	GREEN	GREEN
	2	BLUE	BLUE	BLUE
	3	BROWN	BROWN	BROWN
	4	WHITE	WHITE	WHITE
	5	RED	RED	RED
	6	SLATE	SLATE	SLATE
	7	PURPLE	PURPLE	PURPLE
	8	ORANGE	ORANGE	ORANGE

CONTRACTOR TO REPLACE ALL EXISTING GROUND BARS AND GROUND WIRES THROUGHOUT SITE INCLUDING COAX CABLE GROUNDING AND SECTOR GROUND BARS LOCATED AT ANTENNAS. CONTRACTOR IS TO ALSO REPLACE GROUND WIRE FROM GROUND BAR AT EQUIPMENT TO BUILDING WATER MAIN THROUGH EXISTING CONDUIT.

NOTES:
1. CONTRACTOR (ELECTRICIAN) TO VERIFY IN FIELD THAT THE CABLING SERVING THE EXISTING BTS CABINET FROM THE EXISTING POWER PANEL IS RATED EQUAL TO OR GREATER THAN (2) #1 AWG AND (2) #8 AWG SPECIFIED FOR THE PROPOSED BTS 9927/9928 CABINET. UPGRADE THE CABLING AND CONDUIT IF NEEDED.
2. ALU SUPPLIED SEALTITE BETWEEN BTS AND DISTRIBUTION BOX MUST BE SUPPORTED EVERY 24" MAX.

SPECIAL GROUNDING NOTE:
FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND THE FOLLOWING (SUPPLEMENTS).
• ANTI-THEFT UPDATE TO SPRINT GROUNDING 08.24.12
• SPRINT ENGINEERING LETTER EL-0504 DATED 04.20.12

SPRINT CONSTRUCTION STANDARDS:
GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS (AS AMENDED FROM TIME TO TIME AND AVAILABLE ON THE ALU FST DATABASE):
1. CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES VERSION 4.0, INCLUDING EXHIBITS A-M.
2. CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES (VERSION 4.0).
3. GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN.
4. GROUNDING STANDARDS (SUPPLEMENT): ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412 AND SPRINT ENGINEERING LETTER EL-0504 DATED 04.20.12.
5. WEATHER PROOFING STANDARDS: EXCERPT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHERPROOFING CONNECTORS AND GROUND KITS.
6. COLOR CODING: SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.