Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02739
Mobile: (508) 844-9813
mgentile@clinellc.com

August 2, 2018

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification // Site Number: CT1006
453 Loon Meadow Road, Norfolk, CT (Site Name: Norfolk – Loon Meadow Rd)
N 42.0088888 // W -73.1808333

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 142-foot level of the existing 160-foot guyed tower at 453 Loon Meadow Road, Norfolk, CT 06058. The tower is owned by New Cingular Wireless PCS, LLC ("AT&T"). The property is owned by AT&T. AT&T now intends to add three (3) new LTE models for its LTE upgrade. These antennas would be installed at the 142-foot level of the tower. AT&T also intends to install six (6) small RRUS (radios), as well as one (1) DC Surge Arrestor and associated two (2) DC and one (1) Fiber cables.

AT&T was originally approved for nine (9) antennas on July 31, 1991.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Matthew Riiska, First Selectman for the Town of Norfolk, as well as the tower and ground owner, AT&T.

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

Attached to accommodate this filing are construction drawings dated July 30, 2018, by Infinigy Engineering, a structural analysis dated July 19, 2018 by GPD Engineering and an Emissions Analysis Report dated July 24, 2018, by Centerline Communications, LLC.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility 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 as shown in the attached structural analysis by GPD Engineering, dated July 19, 2018.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

____

Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02739
Mobile: (508) 844-9813
mgentile@centerlincommunications.com

cc: Matthew Riiska, First Selectman, Town of Norfolk - as elected official
AT&T - as tower owner
AT&T - as property owner

Town of Norfolk

"Icebox" of Connecticut

Owner and Parcel Information			
Owner Name	NEW CINGULAR WIRELESS PCS LLC ATTN PROPERTY TAX DEPT	Today's Date	August 2, 2018
Mailing Address	1010 PINE; 9E-L-01	Parcel ID	574 (Account #: 6-14/007-0)
	ST LOUIS, MO 63101	Fire District	
Location Address	453 LOON MEADOW DR	Census Tract	3081
Map/Lot	6-14/7	Acreage	4.98
Use Class / Description	5-2 VAC COMM		
Assessing Neighborhood	0001A	Utilities	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
$ 0	$ 0	$ 1,028,780	$ 127,860		$ 1,156,640	$ 1,156,640	$ 809,650

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
Current	0	$ 720,150	$ 89,500	$ 809,650
2017	0	$ 720,150	$ 89,500	$ 809,650
2016	0	$ 720,150	$ 89,500	$ 809,650

Land Information

Use	Class	Zoning	Area	Value
VAC COMM	C	RU	1 AC	$ 100,000
VAC COMM	C		3.98 AC	$ 27,860

Building Information

No Building Information available for this parcel.

Out Buildings / Extra Features

Description	Sub Description	Area	Year Built	Value
1 STORY FRAME		408 S.F.		$ 20,400
1 STORY FRAME		256 S.F.		$ 6,400
8' FENCE		360 L.F.		$ 1,980
CELL TOWER C		1 UNITS		$ 1,000,000

Sale Information

Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
06/22/2015		118/1088	Unqualified	Unqualified Sale - Nonspecific	Vacant	NEW CINGULAR WIRELESS PCS LLC ATTN PROPERTY TAX DEPT
10/28/2014		118/ 311	Unqualified	No Consideration Sale	Improved	AT&T CAPITAL SERVICES INC
08/02/1957		42/ 29	Unqualified			SOUTHERN NEW ENGLAND TELEPHONE

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
828E	03/27/2015	EL	Electric	$ 15,000		0		UPG 3 ANTENNAS
388-E	03/02/2013	EL	Electric	$ 12,000		0		6 NEW ANTENNAS
7470-E	01/18/2001	EL	Electric	$ 54,000		0		ADD ANTENNAS TO TOWER
7457	12/18/2000	EL	Electric	$ 10,000		0		INSTALL CONDUITS

CECILIA AKINS
5088449030
CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS **1 OF 1**

DWT: 12,12,1

SHIP TO:
ATTN: PROPERTY TAX DEPT.
NEW CINGULAR WIRELESS PCS, LLC
9E-L-01
1010 PINE STREET
SAINT LOUIS MO 63101

MO 631 9-02

UPS GROUND
TRACKING #: 1Z 9Y4 503 43 0583 8749

BILLING: P/P

Reference No.1: CT1006 - 1x filing to tower/ground
Reference No.2: owner -- ATT

XOL 18.07.27 NV45 03.0A 07/2018

TM

CECILIA AKINS
5088449030
CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS

1 OF 1

DWT: 12,12,1

SHIP TO:
ATTN: BUILDING/ZONING DEPT
TOWN OF NORFOLK
ATTN: BUILDING AND ZONING
19 MAPLE AVENUE
NORFOLK CT 06058

CT 067 9-02

UPS GROUND
TRACKING #: 1Z 9Y4 503 43 2124 0112

BILLING: P/P

Reference No.1: CT1006 - 1x CSC to building/zoning

XOL 18.07.27 NV45 03.0A 07/2018

CECILIA AKINS
5088449030
CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS **1 OF 1**

DWT: 12,12,1

SHIP TO:
ATTN: MELANIE BACHMAN
CONNECTICUT SITING COUNCIL
10 FRANKILIN SQUARE
NEW BRITAIN CT 06051

CT 067 9-06

UPS GROUND
TRACKING #: 1Z 9Y4 503 43 3411 0283

BILLING: P/P

Reference No.1: CT1006 - 3x Copy of filing to CSC

XOL 18.07.27 NV45 03.0A 07/2018

CECILIA AKINS
5088449030
CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET
WEST BRIDGEWATER MA 02379

1 LBS **1 OF 1**

DWT: 12,12,1

SHIP TO:
ATTN: MATT RIISKA, SELECTMAN
TOWN OF NORFOLK
FIRST SELECTMAN
2ND FLOOR
ONE LIBERTY LANE
NORFOLK MA 02056

MA 020 9-02

UPS GROUND

TRACKING #: 1Z 9Y4 503 43 3749 3892

BILLING: P/P

Reference No.1: CT1006 - 1x CSC filing to Norfolk

XOL 18.07.27 NV45 03.0A 07/2018

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1006

FA#: 10035022

Norfolk - Loon Meadow Road
453 Loon Meadow Road
Norfolk, CT 06058

July 24, 2018

Centerline Communications Project Number: 950012-130

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.43 %**

Centerline Communications, LLC 95 Ryan Drive, Suite 1 Raynham MA 02767

July 24, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1006 – Norfolk - Loon Meadow Road**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **453 Loon Meadow Road, Norfolk, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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.

<u>General population/uncontrolled exposure</u> 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 ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. 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 performed for the proposed AT&T Wireless antenna facility located at **453 Loon Meadow Road, Norfolk, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	700 MHz (BAND 14)	4	40
LTE	1900 MHz (PCS)	4	40
LTE	700 MHz	2	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	143
A	2	Powerwave 7770 (Decommissioned)	143
A	3	Kathrein 800-10965	143
A	4	KMW AM-X-CD-16-65-00T-RET	143
B	1	Powerwave 7770	143
B	2	Powerwave 7770 (Decommissioned)	143
B	3	Kathrein 800-10965	143
B	4	KMW AM-X-CD-16-65-00T-RET	143
C	1	Powerwave 7770	143
C	2	Powerwave 7770 (Decommissioned)	143
C	3	Kathrein 800-10965	143
C	4	KMW AM-X-CD-16-65-00T-RET	143

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz	11.4	2	60	828.23	0.28
Antenna A2	Powerwave 7770 (Decommissioned)	NA	NA	0	0	0.00	0.00
Antenna A3	Kathrein 800-10965	700 MHz (Band 14) / 1900	12.65 / 15.65	8	320	8,821.75	2.33
Antenna A4	KMW AM-X-CD-16-65-00T-RET	700 MHz	13.35	2	80	1,730.17	0.71
						Sector A Composite MPE%	**3.32**
Antenna B1	Powerwave 7770	850 MHz	11.4	2	60	828.23	0.28
Antenna B2	Powerwave 7770 (Decommissioned)	NA	NA	0	0	0.00	0.00
Antenna B3	Kathrein 800-10965	700 MHz (Band 14) / 1900	12.65 / 15.65	8	320	8,821.75	2.33
Antenna B4	KMW AM-X-CD-16-65-00T-RET	700 MHz	13.35	2	80	1,730.17	0.71
						Sector B Composite MPE%	**3.32**
Antenna C1	Powerwave 7770	850 MHz	11.4	2	60	828.23	0.28
Antenna C2	Powerwave 7770 (Decommissioned)	NA	NA	0	0	0.00	0.00
Antenna C3	Kathrein 800-10965	700 MHz (Band 14) / 1900	12.65 / 15.65	8	320	8,821.75	2.33
Antenna C4	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900	13.35 / 0 / 0 / 0	2	80	1,730.17	0.71
						Sector C Composite MPE%	**3.32**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**3.32 %**
Clearwire	0.43 %
Sprint	1.27 %
T-Mobile	2.65 %
Verizon Wireless	8.76 %
Site Total MPE %:	**16.43 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	3.32 %
AT&T Sector B Total:	3.32 %
AT&T Sector C Total:	3.32 %
Site Total:	16.43 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	414.12	143	1.59	850 MHz	567	0.28%
AT&T 700 MHz LTE (Band 14) – Antenna 3	4	736.31	143	5.64	700 MHz (Band 14)	467	1.21%
AT&T 1900 MHz (PCS) LTE – Antenna 3	4	1,469.13	143	11.26	1900 MHz (PCS)	1000	1.13%
AT&T 700 MHz LTE – Antenna 4	2	865.09	143	3.31	700 MHz	467	0.71%
						Total:	**3.32%**

Table 6: AT&T Maximum Sector MPE Power Values

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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector A:	3.32 %
Sector B:	3.32 %
Sector C:	3.32 %
AT&T Maximum Total (per sector):	3.32 %
Site Total:	16.43 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.43 %** 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.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
(508) 844-9813

GPD Engineering and Architecture Professional Corporation

Kevin Fraleigh
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-2191
kfraleigh@gpdgroup.com

GPD# 2018702.82 Rev. 1
July 19, 2018

REVISED RIGOROUS STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**SNET020**
	Site FA:	**10137487**
	Client #:	**CT1006**
	Site Name:	**NORFOLK**
ANALYSIS CRITERIA:	**Codes:**	**TIA-222-G, 2012 IBC, and 2016 CTBC** **115-mph Ultimate (3-second gust) with 0" ice** **89-mph Nominal (3-second gust) with 0" ice** **40-mph (3-second gust) with 0.75" ice**
SITE DATA:		**402 Loon Meadow Dr., Norfolk, CT 06058, Litchfield County** **Latitude 42° 0' 32.004" N, Longitude 73° 10' 51" W** **Market: NEW ENGLAND** **160' Guyed Tower**

Mr. Michael Gentile,

GPD is pleased to submit this Revised Rigorous Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	51.1%	Pass
Foundation Ratio with Proposed Equipment:	85.2%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and Centerline Communications, LLC. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED
PROFESSIONAL ENGINEER

Christopher J. Scheks, P.E.
Connecticut #: 30026

7/19/2018

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by AT&T Mobility to Centerline Communications, LLC. This report was commissioned by Mr. Michael Gentile of Centerline Communications, LLC.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 115 mph converted to a nominal 3-second gust wind speed of 89 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.000 and Risk Category II was/were used in this analysis.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Legs	42.9%	Pass
Diagonals	51.1%	Pass
Horizontals	34.4%	Pass
Guy Wires	49.7%	Pass
Guy Pull-Offs	28.0%	Pass
Torque Arms	15.5%	Pass
Bolt Checks	51.1%	Pass
Guy Anchor Foundation	26.7%	Pass
Tower Base Foundation	85.2%	Pass

ANALYSIS METHOD

tnxTower (Version 7.0.7.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a recent detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
RF Data Sheet	RFDS Name: CTV1006 Rev 1.0, updated 10/2/2017	Centerline
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Geotechnical Report	WEI Project # 2010-1212, dated 9/15/2010	AT&T
Boring Log Review	GPD Job #: 2018704.07, dated 5/15/2018	GPD
Previous Structural Analysis	GPD Job #: 2015723.01.SNET020.04, dated 7/17/2015	AT&T
Tower Mapping	GPD & MTSI Northeast, dated 7/21/2010	AT&T
Foundation Mapping	WEI Project # 2010-1212, dated 9/15/2010	AT&T

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to $\pm$5' AGL, antenna size accurate to $\pm$3.3 sf, and coax equal to the number of existing antennas without reserve.
11. The existing loading was obtained from the previous structural analysis by GPD (Job #: 2015723.01.SNET020.04, dated 7/17/2015), the provided RF Data Sheet, and site photos and is assumed to be accurate.
12. The azimuth orientation of Leg A was assumed to be at 340 degrees based on the tower mapping performed by GPD & MTSI Northeast (dated 7/21/2010).
13. Foundation steel was not able to be determined through testing for the tower base. Therefore it was assumed that the foundation steel in place is equal to the minimum required steel per code specifications.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD has not performed a recent site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	NORFOLK
Site Number	SNET020
FA Number	10137487
Date of Analysis	7/19/2018
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info

Tower Info	Description	Date
Tower Type (G, SST, MP)	G	
Tower Height (top of steel AGL)	160'	
Tower Manufacturer	n/a	
Tower Model	n/a	
Tower Design	n/a	
Foundation Design	n/a	
Geotech Report	WEI Project #: 2010-1212	9/15/2010
Boring Log Review	GPD Job #: 2018704.07	5/15/2018
Tower Mapping	GPD & MTSI Northeast	7/21/2010
Previous Structural Analysis	GPD Job #: 2015723.01.SNET020.04	7/17/2015
Foundation Mapping	WEI Project #: 2010-1212	9/15/2010

Design Parameters

Design Code Used	TIA-222-G, 2012 IBC & 2016 CTBC
Location of Tower (County, State)	Litchfield, Connecticut
Basic Wind Speed (mph)	89-mph (3-second gust)
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	II
Exposure Category (B, C, D)	B
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	51.1%
Guy Wires (%)	49.7%
Foundation (%)	85.2%
Foundation Adequate?	Yes

Steel Yield Strength (ksi)

Legs	50
Braces	36
Member Bolts	A325
Guy Wires	EHS

Note: Steel grades assumed based on past experience with similar towers.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	160	168	1	Dipole	Unknown	10' Dipole		1	Unknown	Pipe Mount	1	Unknown	7/8"	Face A
AT&T Mobility	160	160	1	Omni	Unknown	3' Omni				Flush Mount				
Sprint	158	158	3	Panel	RFS	APXVSPP18-C-A20	50/170/250	3	Unknown	12' Boom Gate	3	Hybriflex	1-1/4"	Face A
Sprint	154	154	3	RRU	Andrew	800MHz 2x50w				Flush Mounted				
Sprint	154	154	3	RRU	Panasonic	1900MHz 2x40w				Flush Mounted				
Sprint	154	154	3	Filter	Andrew	800MHz 2x50w Notch Filter				Flush Mounted				
AT&T Mobility	148	148	1	Yagi	Unknown	4' Yagi		1	Unknown	Pipe Mount	1	Unknown	1/2"	Face A
AT&T Mobility	142	143	3	Panel	KMW	AM-X-CD-16-65-00T-RET	23/143/264	3	Unknown	8' Frame	12	Unknown	1-5/8"	Face B
AT&T Mobility	142	143	6	Panel	Powerwave	7770	23/143/264			on the same mounts	1	DC/Fiber Bundle	1-1/2"	Face B
AT&T Mobility	142	143	6	TMA	Powerwave	TT19-08BP111-001				on the same mounts				
AT&T Mobility	142	143	12	RET	Powerwave	7020				on the same mounts				
AT&T Mobility	142	143	3	RRU	Ericsson	RRUS 11				on the same mounts				
AT&T Mobility	142	143	1	Surge	Andrew	ABT-DFDM-ADBH				on the same mounts				
Unknown	137							2	Unknown	4' Sidearm				
T-Mobile	120	120	3	Panel	EMS	RR90-17-02DP	60/190/280	3	Unknown	4' Standoff	6	Unknown	1-1/4"	Face A
T-Mobile	120	120	3	Panel	Commscope	LNX-6515DS-VTM	60/190/280			on the same mounts	6	Unknown	1-5/8"	Face B
T-Mobile	120	120	6	TMA	RFS	1412D-1A20				on the same mounts	1	RET Cable	3/8"	Face B
Sprint	75	75	1	GPS	PCTEL	GPS-TMG-HR-26NCM		1	Unknown	2' Sidearm	1	Unknown	1/4"	Face A
AT&T Mobility	13	13	1	GPS	Unknown	GPS		1	Unknown	1' Sidearm	1	Unknown	1/2"	Face B

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	142	143	3	Panel	Kathrein	800-10965	23/143/264			on the existing mounts	1	DC/Fiber Bundle	1-1/2"	Face B
AT&T Mobility	142	143	3	RRU	Ericsson	B14 4478				on the existing mounts				
AT&T Mobility	142	143	3	RRU	Ericsson	RRUS-32 B2				on the existing mounts				
AT&T Mobility	142	143	1	Surge	Andrew	ABT-DFDM-ADBH				on the existing mounts				

Note: The proposed loading shall be in addition to the existing equipment at the same elevation.
Note: The proposed coax shall be installed inside the monopole in order for this analysis to be valid.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face

APPENDIX B

tnxTower Output File

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 160.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Litchfield County, Connecticut.
Basic wind speed of 89 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* *ft*	*Face Offset* *in*	*Lateral Offset (Frac FW)*	*#*	*# Per Row*	*Clear Spacing* *in*	*Width or Diameter* *in*	*Perimeter* *in*	*Weight* *plf*
Climbing Ladder	B	No	Af (CaAa)	160.00 - 8.00	-2.0000	0	1	1	3.8400	3.8400		7.90
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	160.00 - 8.00	-2.0000	-0.35	1	1	1.0000	1.0900		0.33
Coax Bracket 5/20' x 12"	A	No	Af (CaAa)	160.00 - 8.00	0.0000	0	1	1	0.5000	0.5000		0.43
Hybriflex (1-1/4")	A	No	Ar (CaAa)	158.00 - 8.00	0.0000	-0.15	3	3	0.5000	1.5400		1.30
LDF4-50A (1/2 FOAM)	A	No	Ar (CaAa)	148.00 - 8.00	-2.0000	0.1	1	1	0.0000	0.6300		0.15
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	142.00 - 8.00	0.0000	0.4	6	3	1.0000	1.9800		0.82
1.5" DC/Fiber Bundle	B	No	Ar (CaAa)	142.00 - 8.00	0.0000	0.3	2	2	1.5000	1.5000		0.80
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	142.00 - 8.00	0.0000	-0.4	6	3	1.0000	1.9800		0.82
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	120.00 - 8.00	-1.5000	0	6	6	1.0000	1.5500		0.66
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	120.00 - 8.00	0.0000	0	6	3	1.0000	1.9800		0.82
Coax Bracket 5/20' x 12"	C	No	Af (CaAa)	120.00 - 8.00	0.0000	0	1	1	0.5000	0.5000		0.43
3/8" RET Cable	C	No	Ar (CaAa)	120.00 - 8.00	0.0000	0.1	1	1	0.3750	0.3750		0.10
LDF1-50A	A	No	Ar (CaAa)	75.00 - 8.00	0.0000	-0.075	1	1	0.3500	0.3500		0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1/4 FOAM) LDF4-50A (1/2 FOAM)	B	No	Ar (CaAa)	13.00 - 8.00	0.0000	-0.25	1	1	0.6300	0.6300		0.15

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
10' Dipole	A	From Leg	0.50	0.0000	160.00	No Ice	2.00	2.00	0.02
			0.00			1/2" Ice	3.02	3.02	0.04
			8.00			1" Ice	4.07	4.07	0.06
Pipe Mount 3'x2.375"	A	From Leg	0.25	0.0000	160.00	No Ice	0.58	0.58	0.01
			0.00			1/2" Ice	0.77	0.77	0.02
			1.50			1" Ice	0.97	0.97	0.02
3' Omni	B	From Face	0.50	0.0000	160.00	No Ice	0.52	0.52	0.02
			0.00			1/2" Ice	0.71	0.71	0.02
			0.00			1" Ice	0.90	0.90	0.03
Rohn 12' Boom Gate	A	From Leg	1.29	50.0000	158.00	No Ice	15.35	14.00	0.56
			1.53			1/2" Ice	21.29	20.81	0.74
			0.00			1" Ice	27.23	27.62	0.92
Rohn 12' Boom Gate	B	From Leg	1.29	50.0000	158.00	No Ice	15.35	14.00	0.56
			1.53			1/2" Ice	21.29	20.81	0.74
			0.00			1" Ice	27.23	27.62	0.92
Rohn 12' Boom Gate	C	From Leg	1.29	50.0000	158.00	No Ice	15.35	14.00	0.56
			1.53			1/2" Ice	21.29	20.81	0.74
			0.00			1" Ice	27.23	27.62	0.92
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	2.57	70.0000	158.00	No Ice	8.02	6.71	0.08
			3.05			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	2.57	70.0000	158.00	No Ice	8.02	6.71	0.08
			3.05			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	2.57	30.0000	158.00	No Ice	8.02	6.71	0.08
			3.05			1/2" Ice	8.48	7.66	0.14
			0.00			1" Ice	8.94	8.49	0.22
800MHz 2x50w	A	From Leg	0.50	0.0000	154.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			0.00			1" Ice	2.93	2.48	0.10
800MHz 2x50w	B	From Leg	0.50	0.0000	154.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			0.00			1" Ice	2.93	2.48	0.10
800MHz 2x50w	C	From Leg	0.50	0.0000	154.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			0.00			1" Ice	2.93	2.48	0.10
1900MHz 2x40w	A	From Leg	0.50	0.0000	154.00	No Ice	2.49	3.06	0.09
			0.00			1/2" Ice	2.71	3.30	0.12
			0.00			1" Ice	2.93	3.54	0.15
1900MHz 2x40w	B	From Leg	0.50	0.0000	154.00	No Ice	2.49	3.06	0.09
			0.00			1/2" Ice	2.71	3.30	0.12
			0.00			1" Ice	2.93	3.54	0.15
1900MHz 2x40w	C	From Leg	0.50	0.0000	154.00	No Ice	2.49	3.06	0.09
			0.00			1/2" Ice	2.71	3.30	0.12
			0.00			1" Ice	2.93	3.54	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800MHz 2x50w Notch Filter	A	From Leg	0.50	0.0000	154.00	No Ice	0.85	0.37	0.01
			0.00			1/2" Ice	0.97	0.46	0.02
			0.00			1" Ice	1.11	0.56	0.03
800MHz 2x50w Notch Filter	B	From Leg	0.50	0.0000	154.00	No Ice	0.85	0.37	0.01
			0.00			1/2" Ice	0.97	0.46	0.02
			0.00			1" Ice	1.11	0.56	0.03
800MHz 2x50w Notch Filter	C	From Leg	0.50	0.0000	154.00	No Ice	0.85	0.37	0.01
			0.00			1/2" Ice	0.97	0.46	0.02
			0.00			1" Ice	1.11	0.56	0.03
4' Yagi	B	From Face	6.50	0.0000	148.00	No Ice	0.79	0.79	0.01
			0.00			1/2" Ice	1.03	1.03	0.01
			0.00			1" Ice	1.28	1.28	0.02
Pipe Mount 4'x2.375"	B	From Face	6.00	0.0000	148.00	No Ice	0.87	0.87	0.02
			0.00			1/2" Ice	1.11	1.11	0.03
			0.00			1" Ice	1.36	1.36	0.04
****									
8' Frame	A	From Leg	0.48	50.0000	142.00	No Ice	14.48	3.61	0.31
			0.57			1/2" Ice	18.67	4.62	0.45
			0.00			1" Ice	22.86	5.62	0.60
8' Frame	B	From Leg	0.48	50.0000	142.00	No Ice	14.48	3.61	0.31
			0.57			1/2" Ice	18.67	4.62	0.45
			0.00			1" Ice	22.86	5.62	0.60
8' Frame	C	From Leg	0.48	50.0000	142.00	No Ice	14.48	3.61	0.31
			0.57			1/2" Ice	18.67	4.62	0.45
			0.00			1" Ice	22.86	5.62	0.60
AM-X-CD-16-65-00T w/	A	From Leg	0.96	43.0000	142.00	No Ice	8.55	6.65	0.09
Mount Pipe			1.15			1/2" Ice	9.18	7.68	0.16
			1.00			1" Ice	9.79	8.56	0.23
AM-X-CD-16-65-00T w/	B	From Leg	0.96	43.0000	142.00	No Ice	8.55	6.65	0.09
Mount Pipe			1.15			1/2" Ice	9.18	7.68	0.16
			1.00			1" Ice	9.79	8.56	0.23
AM-X-CD-16-65-00T w/	C	From Leg	0.96	43.0000	142.00	No Ice	8.55	6.65	0.09
Mount Pipe			1.15			1/2" Ice	9.18	7.68	0.16
			1.00			1" Ice	9.79	8.56	0.23
(2) 7770.00 w/Mount Pipe	A	From Leg	0.96	43.0000	142.00	No Ice	5.51	4.10	0.06
			1.15			1/2" Ice	5.87	4.73	0.11
			1.00			1" Ice	6.23	5.37	0.16
(2) 7770.00 w/Mount Pipe	B	From Leg	0.96	43.0000	142.00	No Ice	5.51	4.10	0.06
			1.15			1/2" Ice	5.87	4.73	0.11
			1.00			1" Ice	6.23	5.37	0.16
(2) 7770.00 w/Mount Pipe	C	From Leg	0.96	44.0000	142.00	No Ice	5.51	4.10	0.06
			1.15			1/2" Ice	5.87	4.73	0.11
			1.00			1" Ice	6.23	5.37	0.16
80010965 w/ Mount Pipe	A	From Leg	0.96	43.0000	142.00	No Ice	14.05	7.63	0.13
			1.15			1/2" Ice	14.69	8.90	0.22
			1.00			1" Ice	15.30	9.96	0.33
80010965 w/ Mount Pipe	B	From Leg	0.96	43.0000	142.00	No Ice	14.05	7.63	0.13
			1.15			1/2" Ice	14.69	8.90	0.22
			1.00			1" Ice	15.30	9.96	0.33
80010965 w/ Mount Pipe	C	From Leg	0.96	43.0000	142.00	No Ice	14.05	7.63	0.13
			1.15			1/2" Ice	14.69	8.90	0.22
			1.00			1" Ice	15.30	9.96	0.33
(2) TT19-08BP111-001	A	From Leg	0.96	50.0000	142.00	No Ice	0.55	0.45	0.02
			1.15			1/2" Ice	0.65	0.53	0.02
			1.00			1" Ice	0.75	0.63	0.03
(2) TT19-08BP111-001	B	From Leg	0.96	50.0000	142.00	No Ice	0.55	0.45	0.02
			1.15			1/2" Ice	0.65	0.53	0.02

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			1.00			1" Ice	0.75	0.63	0.03
(2) TT19-08BP111-001	C	From Leg	0.96	50.0000	142.00	No Ice	0.55	0.45	0.02
			1.15			1/2" Ice	0.65	0.53	0.02
			1.00			1" Ice	0.75	0.63	0.03
(4) 7020.00 RET	A	From Leg	0.96	50.0000	142.00	No Ice	0.10	0.17	0.00
			1.15			1/2" Ice	0.15	0.24	0.01
			1.00			1" Ice	0.20	0.31	0.01
(4) 7020.00 RET	B	From Leg	0.96	50.0000	142.00	No Ice	0.10	0.17	0.00
			1.15			1/2" Ice	0.15	0.24	0.01
			1.00			1" Ice	0.20	0.31	0.01
(4) 7020.00 RET	C	From Leg	0.96	50.0000	142.00	No Ice	0.10	0.17	0.00
			1.15			1/2" Ice	0.15	0.24	0.01
			1.00			1" Ice	0.20	0.31	0.01
RRUS-11	A	From Leg	0.96	50.0000	142.00	No Ice	2.78	1.19	0.05
			1.15			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
RRUS-11	B	From Leg	0.96	50.0000	142.00	No Ice	2.78	1.19	0.05
			1.15			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
RRUS-11	C	From Leg	0.96	50.0000	142.00	No Ice	2.78	1.19	0.05
			1.15			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
B14 4478	A	From Leg	0.96	50.0000	142.00	No Ice	1.84	1.06	0.06
			1.15			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
B14 4478	B	From Leg	0.96	50.0000	142.00	No Ice	1.84	1.06	0.06
			1.15			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
B14 4478	C	From Leg	0.96	50.0000	142.00	No Ice	1.84	1.06	0.06
			1.15			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
RRUS 32 B2	A	From Leg	0.96	50.0000	142.00	No Ice	2.73	1.67	0.05
			1.15			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	0.96	50.0000	142.00	No Ice	2.73	1.67	0.05
			1.15			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Leg	0.96	50.0000	142.00	No Ice	2.73	1.67	0.05
			1.15			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
ABT-DFDM-ADBH	A	From Leg	0.96	50.0000	142.00	No Ice	0.02	0.04	0.00
			1.15			1/2" Ice	0.04	0.08	0.00
			1.00			1" Ice	0.07	0.11	0.00
ABT-DFDM-ADBH	B	From Leg	0.96	50.0000	142.00	No Ice	0.02	0.04	0.00
			1.15			1/2" Ice	0.04	0.08	0.00
			1.00			1" Ice	0.07	0.11	0.00
****									
4' Sidearm - Flat (GPD)	B	From Leg	2.00	0.0000	137.00	No Ice	0.80	3.20	0.06
			0.00			1/2" Ice	1.05	4.00	0.07
			0.00			1" Ice	1.30	4.80	0.09
4' Sidearm - Flat (GPD)	C	From Leg	2.00	0.0000	137.00	No Ice	0.80	3.20	0.06
			0.00			1/2" Ice	1.05	4.00	0.07
			0.00			1" Ice	1.30	4.80	0.09
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.00	60.0000	120.00	No Ice	4.59	3.32	0.03
			0.00			1/2" Ice	5.02	4.09	0.07
			0.00			1" Ice	5.44	4.78	0.12
RR90-17-02DP w/ Mount	A	From Leg	4.00	-60.0000	120.00	No Ice	4.59	3.32	0.03

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
Pipe			0.00			1/2" Ice	5.02	4.09	0.07
			0.00			1" Ice	5.44	4.78	0.12
RR90-17-02DP w/ Mount	B	From Leg	4.00	60.0000	120.00	No Ice	4.59	3.32	0.03
Pipe			0.00			1/2" Ice	5.02	4.09	0.07
			0.00			1" Ice	5.44	4.78	0.12
LNX-6515DS-VTM w/	B	From Leg	4.00	-60.0000	120.00	No Ice	11.64	9.79	0.08
Mount Pipe			0.00			1/2" Ice	12.34	11.30	0.17
			0.00			1" Ice	13.04	12.80	0.27
LNX-6515DS-VTM w/	C	From Leg	4.00	60.0000	120.00	No Ice	11.64	9.79	0.08
Mount Pipe			0.00			1/2" Ice	12.34	11.30	0.17
			0.00			1" Ice	13.04	12.80	0.27
LNX-6515DS-VTM w/	C	From Leg	4.00	-60.0000	120.00	No Ice	11.64	9.79	0.08
Mount Pipe			0.00			1/2" Ice	12.34	11.30	0.17
			0.00			1" Ice	13.04	12.80	0.27
(2) 1412D-1A20	A	From Leg	4.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00			1/2" Ice	0.00	0.57	0.02
			0.00			1" Ice	0.00	0.69	0.03
(2) 1412D-1A20	B	From Leg	4.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00			1/2" Ice	0.00	0.57	0.02
			0.00			1" Ice	0.00	0.69	0.03
(2) 1412D-1A20	C	From Leg	4.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00			1/2" Ice	0.00	0.57	0.02
			0.00			1" Ice	0.00	0.69	0.03
4' Standoff - Flat (GPD)	A	From Leg	2.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00			1/2" Ice	3.08	8.58	0.11
			0.00			1" Ice	4.20	11.03	0.14
4' Standoff - Flat (GPD)	B	From Leg	2.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00			1/2" Ice	3.08	8.58	0.11
			0.00			1" Ice	4.20	11.03	0.14
4' Standoff - Flat (GPD)	C	From Leg	2.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00			1/2" Ice	3.08	8.58	0.11
			0.00			1" Ice	4.20	11.03	0.14
GPS-TMG-HR-26NCM	C	From Leg	2.00	0.0000	75.00	No Ice	0.80	0.93	0.03
			0.00			1/2" Ice	1.05	1.17	0.03
			0.00			1" Ice	1.30	1.41	0.04
2' Sidearm - Round (GPD)	C	From Leg	1.00	0.0000	75.00	No Ice	0.80	0.93	0.03
			0.00			1/2" Ice	1.05	1.17	0.03
			0.00			1" Ice	1.30	1.41	0.04
GPS	B	From Leg	1.00	0.0000	13.00	No Ice	0.14	0.14	0.00
			0.00			1/2" Ice	0.21	0.21	0.00
			0.00			1" Ice	0.28	0.28	0.01
1' Sidearm - Flat (GPD)	B	From Leg	0.50	0.0000	13.00	No Ice	0.80	0.80	0.02
			0.00			1/2" Ice	1.05	1.00	0.02
			0.00			1" Ice	1.30	1.20	0.03

Critical Deflections and Radius of Curvature - Service Wind

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* *°*	*Twist* *°*	*Radius of Curvature* *ft*
160.00	10' Dipole	63	0.603	0.0612	0.0069	724092
158.00	Rohn 12' Boom Gate	63	0.628	0.0619	0.0095	724092
154.00	800MHz 2x50w	63	0.678	0.0633	0.0145	603419
148.00	4' Yagi	63	0.754	0.0644	0.0215	301709
145.75	Guy	63	0.782	0.0644	0.0238	254084
142.00	8' Frame	63	0.829	0.0636	0.0270	246002
137.00	4' Sidearm - Flat (GPD)	63	0.893	0.0609	0.0302	155916
120.00	RR90-17-02DP w/ Mount Pipe	63	1.076	0.0416	0.0375	28276
86.00	Guy	63	1.157	0.0120	0.0733	50428
75.00	GPS-TMG-HR-26NCM	63	1.168	0.0071	0.0828	70658
13.00	GPS	63	0.356	0.1199	0.0887	55203

Bolt Design Data

Section No.	*Elevation* *ft*	*Component Type*	*Bolt Grade*	*Bolt Size* *in*	*Number Of Bolts*	*Maximum Load per Bolt* *K*	*Allowable Load* *K*	*Ratio Load / Allowable*	*Allowable Ratio*	*Criteria*
T1	160	Leg	A325N	0.6250	12	3.57	22.75	0.157 ✔	1	Bearing
		Diagonal	A325N	0.6250	2	3.20	14.38	0.222 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	2	0.30	7.19	0.042 ✔	1	Member Block Shear
T2	141	Leg	A325N	0.6250	12	5.10	22.75	0.224 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	3.86	7.83	0.493 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	1.31	6.83	0.192 ✔	1	Member Block Shear
T3	121	Leg	A325N	0.6250	12	4.97	22.75	0.219 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	1.99	7.83	0.254 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	1.05	6.83	0.154 ✔	1	Member Block Shear
T4	101	Leg	A325N	0.6250	12	4.93	22.75	0.217 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	3.49	7.83	0.446 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	1.85	6.83	0.271 ✔	1	Member Block Shear
T5	86	Leg	A325N	0.6250	12	6.59	22.75	0.290 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	4.00	7.83	0.511 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	0.96	6.83	0.140 ✔	1	Member Block Shear
T6	66	Leg	A325N	0.6250	12	7.50	22.75	0.330 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	2.75	12.43	0.221 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	1.03	6.83	0.151 ✔	1	Member Block Shear
T7	46	Leg	A325N	0.6250	12	7.42	22.75	0.326 ✔	1	Bearing
		Diagonal	A325N	0.6250	1	2.92	12.43	0.235 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	1.08	6.83	0.158 ✔	1	Member Block Shear
T8	26	Leg	A325N	0.7500	3	4.88	29.82	0.164 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.6250	1	3.80	7.83	0.486	1	Member Bearing
		Horizontal	A325N	0.6250	1	1.09	6.83	0.159	1	Member Block Shear

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	160 - 141	Leg	V5x5x5/16	2	-21.43	106.64	20.1	Pass
T2	141 - 121	Leg	V5x5x5/16	30	-30.57	104.91	29.1	Pass
T3	121 - 101	Leg	V5x5x5/16	57	-31.83	104.91	30.3	Pass
T4	101 - 86	Leg	V5x5x5/16	84	-29.96	104.91	28.6	Pass
T5	86 - 66	Leg	V5x5x5/16	105	-39.55	104.91	37.7	Pass
T6	66 - 46	Leg	V5x5x5/16	132	-45.01	104.91	42.9	Pass
T7	46 - 26	Leg	V5x5x5/16	159	-44.76	104.91	42.7	Pass
T8	26 - 6	Leg	V5x5x5/16	186	-44.31	104.91	42.2	Pass
T9	6 - 0	Leg	V5x5x5/16	212	-47.29	115.78	40.8	Pass
T1	160 - 141	Diagonal	2L2 1/2x2 1/2x3/16	7	-7.25	41.74	17.4 22.2 (b)	Pass
T2	141 - 121	Diagonal	L2 1/2x2 1/2x3/16	52	-4.58	11.48	40.0 49.3 (b)	Pass
T3	121 - 101	Diagonal	L2 1/2x2 1/2x3/16	61	-2.64	11.48	23.0 25.4 (b)	Pass
T4	101 - 86	Diagonal	L2 1/2x2 1/2x3/16	88	-4.52	11.48	39.4 44.6 (b)	Pass
T5	86 - 66	Diagonal	L2 1/2x2 1/2x3/16	128	-4.90	11.48	42.7 51.1 (b)	Pass
T6	66 - 46	Diagonal	L2 1/2x2 1/2x3/16	155	-2.75	11.48	24.0	Pass
T7	46 - 26	Diagonal	L2 1/2x2 1/2x3/16	164	-2.92	11.48	25.4	Pass
T8	26 - 6	Diagonal	L2 1/2x2 1/2x3/16	198	-4.42	11.48	38.5 48.6 (b)	Pass
T9	6 - 0	Diagonal	L2 1/2x2 1/2x3/16	222	-0.91	16.39	5.6	Pass
T1	160 - 141	Horizontal	L2 1/2x2 1/2x3/16	24	-0.57	17.51	3.3 4.2 (b)	Pass
T2	141 - 121	Horizontal	L2x2x3/16	31	1.31	18.73	7.0 19.2 (b)	Pass
T3	121 - 101	Horizontal	L2x2x3/16	60	1.05	18.73	5.6 15.4 (b)	Pass
T4	101 - 86	Horizontal	L2x2x3/16	85	-1.43	12.12	11.8 27.1 (b)	Pass
T5	86 - 66	Horizontal	L2x2x3/16	114	-0.69	12.12	5.7 14.0 (b)	Pass
T6	66 - 46	Horizontal	L2x2x3/16	135	-0.78	12.12	6.4 15.1 (b)	Pass
T7	46 - 26	Horizontal	L2x2x3/16	162	-0.78	12.12	6.4 15.8 (b)	Pass
T8	26 - 6	Horizontal	L2x2x3/16	188	-0.78	12.12	6.4 15.9 (b)	Pass
T9	6 - 0	Horizontal	L2 1/2x2 1/2x3/16	214	10.04	29.22	34.4	Pass
T1	160 - 141	Top Girt	L2 1/2x2 1/2x3/16	5	-0.40	16.64	2.4	Pass
T1	160 - 141	Guy A@145.75	3/4	235	10.70	34.98	30.6	Pass
T5	86 - 66	Guy A@86	5/8	243	11.88	25.44	46.7	Pass
T1	160 - 141	Guy B@145.75	3/4	229	11.26	34.98	32.2	Pass
T5	86 - 66	Guy B@86	5/8	242	12.63	25.44	49.7	Pass
T1	160 - 141	Guy C@145.75	3/4	224	11.10	34.98	31.7	Pass

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2222
FAX: (330) 572-3722

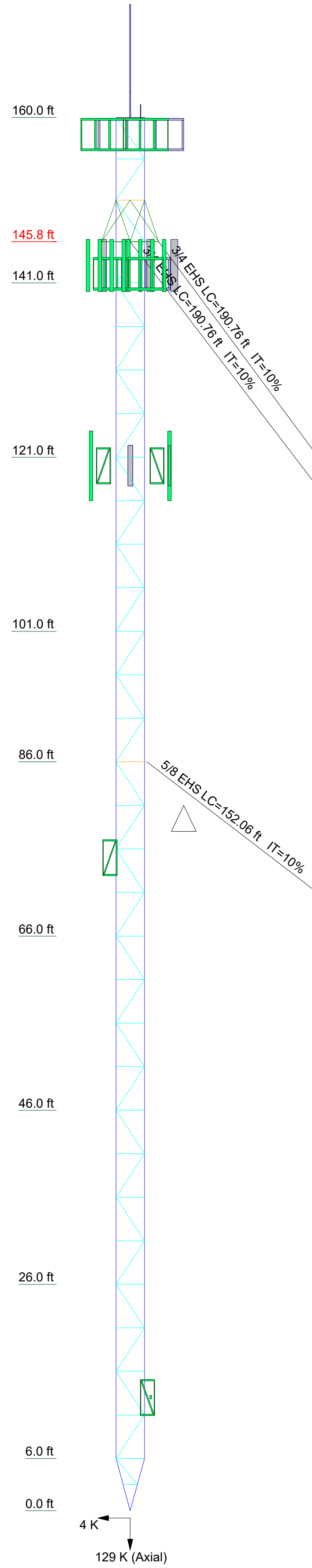
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	86 - 66	Guy C@86	5/8	241	12.40	25.44	48.8	Pass
T1	160 - 141	Top Guy Pull-Off@145.75	L2 1/2x2 1/2x3/16	18	3.33	29.22	11.4	Pass
T5	86 - 66	Top Guy Pull-Off@86	L 2 x 2 x 3/16	106	6.50	23.17	28.0	Pass
T1	160 - 141	Bottom Guy Pull-Off@145.75	L2 1/2x2 1/2x3/16	10	4.56	29.22	15.6	Pass
T1	160 - 141	Torque Arm Top@145.75	2L2 1/2x2x1/4	231	10.68	69.01	15.5	Pass
T1	160 - 141	Torque Arm Bottom@145.75	2L3x2 1/2x1/4	239	-7.05	75.42	9.4	Pass

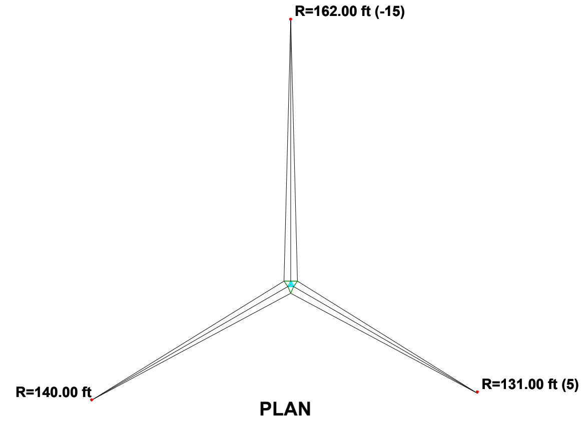
Summary	ELC:	Proposed
Leg (T6)	42.9	Pass
Diagonal (T5)	51.1	Pass
Horizontal (T9)	34.4	Pass
Top Girt (T1)	2.4	Pass
Guy A (T5)	46.7	Pass
Guy B (T5)	49.7	Pass
Guy C (T5)	48.8	Pass
Top Guy Pull-Off (T5)	28.0	Pass
Bottom Guy Pull-Off (T1)	15.6	Pass
Torque Arm Top (T1)	15.5	Pass
Torque Arm Bottom (T1)	9.4	Pass
Bolt Checks	51.1	Pass
Rating =	51.1	Pass

APPENDIX C

Tower Elevation Drawing

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Top Guy Pull-Offs	Bot Guy Pull-Offs	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	V5x5x5/16	A572-50	2L2 1/2x2 1/2x3/16	A36	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	4	4 @ 4.75	1.7
T2			L2 1/2x2 1/2x3/16		N.A.	L2x2x3/16	N.A.	N.A.		27 @ 5	1.0
T3											1.0
T4											0.7
T5							L 2 x 2 x 3/16				1.0
T6							N.A.				1.0
T7											1.0
T8											1.0
T9						A				2 @ 3	0.3
											8.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' Dipole	160	(2) TT19-08BP111-001	142
Pipe Mount 3'x2.375"	160	(4) 7020.00 RET	142
3' Omni	160	(4) 7020.00 RET	142
Rohn 12' Boom Gate	158	(4) 7020.00 RET	142
Rohn 12' Boom Gate	158	RRUS-11	142
Rohn 12' Boom Gate	158	RRUS-11	142
APXVSPP18-C-A20 w/ Mount Pipe	158	RRUS-11	142
APXVSPP18-C-A20 w/ Mount Pipe	158	B14 4478	142
APXVSPP18-C-A20 w/ Mount Pipe	158	B14 4478	142
800MHz 2x50w	154	B14 4478	142
800MHz 2x50w	154	RRUS 32 B2	142
800MHz 2x50w	154	RRUS 32 B2	142
1900MHz 2x40w	154	RRUS 32 B2	142
1900MHz 2x40w	154	ABT-DFDM-ADBH	142
1900MHz 2x40w	154	ABT-DFDM-ADBH	142
800MHz 2x50w Notch Filter	154	4' Sidearm - Flat (GPD)	137
800MHz 2x50w Notch Filter	154	4' Sidearm - Flat (GPD)	137
800MHz 2x50w Notch Filter	154	RR90-17-02DP w/ Mount Pipe	120
4' Yagi	148	RR90-17-02DP w/ Mount Pipe	120
Pipe Mount 4'x2.375"	148	RR90-17-02DP w/ Mount Pipe	120
8' Frame	142	LNX-6515DS-VTM w/ Mount Pipe	120
8' Frame	142	LNX-6515DS-VTM w/ Mount Pipe	120
8' Frame	142	LNX-6515DS-VTM w/ Mount Pipe	120
AM-X-CD-16-65-00T w/ Mount Pipe	142	(2) 1412D-1A20	120
AM-X-CD-16-65-00T w/ Mount Pipe	142	(2) 1412D-1A20	120
AM-X-CD-16-65-00T w/ Mount Pipe	142	(2) 1412D-1A20	120
(2) 7770.00 w/Mount Pipe	142	4' Standoff - Flat (GPD)	120
(2) 7770.00 w/Mount Pipe	142	4' Standoff - Flat (GPD)	120
(2) 7770.00 w/Mount Pipe	142	4' Standoff - Flat (GPD)	120
80010965 w/ Mount Pipe	142	GPS-TMG-HR-26NCM	75
80010965 w/ Mount Pipe	142	2' Sidearm - Round (GPD)	75
80010965 w/ Mount Pipe	142	GPS	13
(2) TT19-08BP111-001	142	1' Sidearm - Flat (GPD)	13
(2) TT19-08BP111-001	142		

SYMBOL LIST

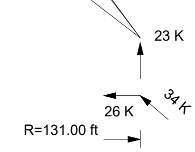
MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 89 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 51.1%

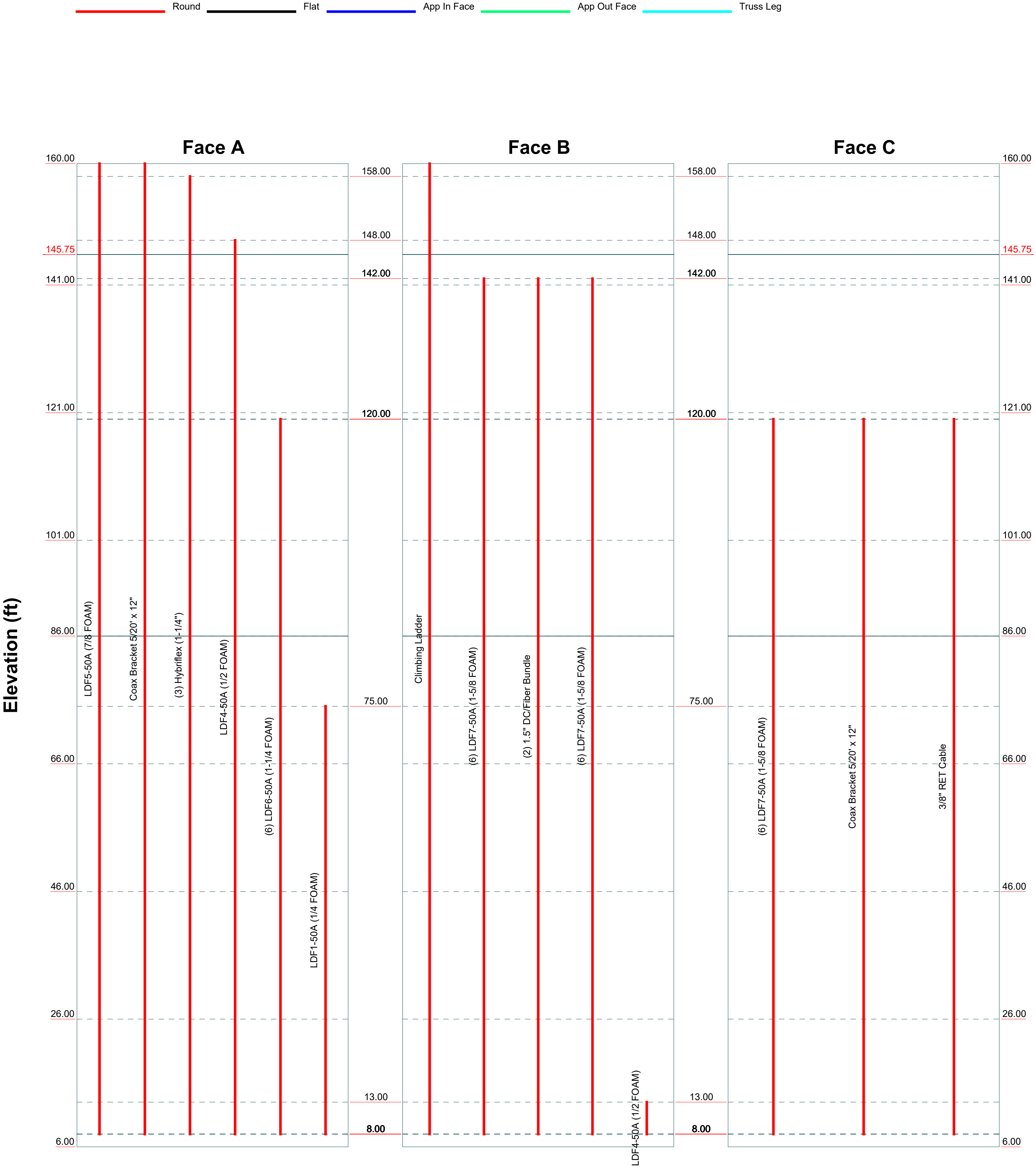


ALL REACTIONS ARE FACTORED

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2222
FAX: (330) 572-3722

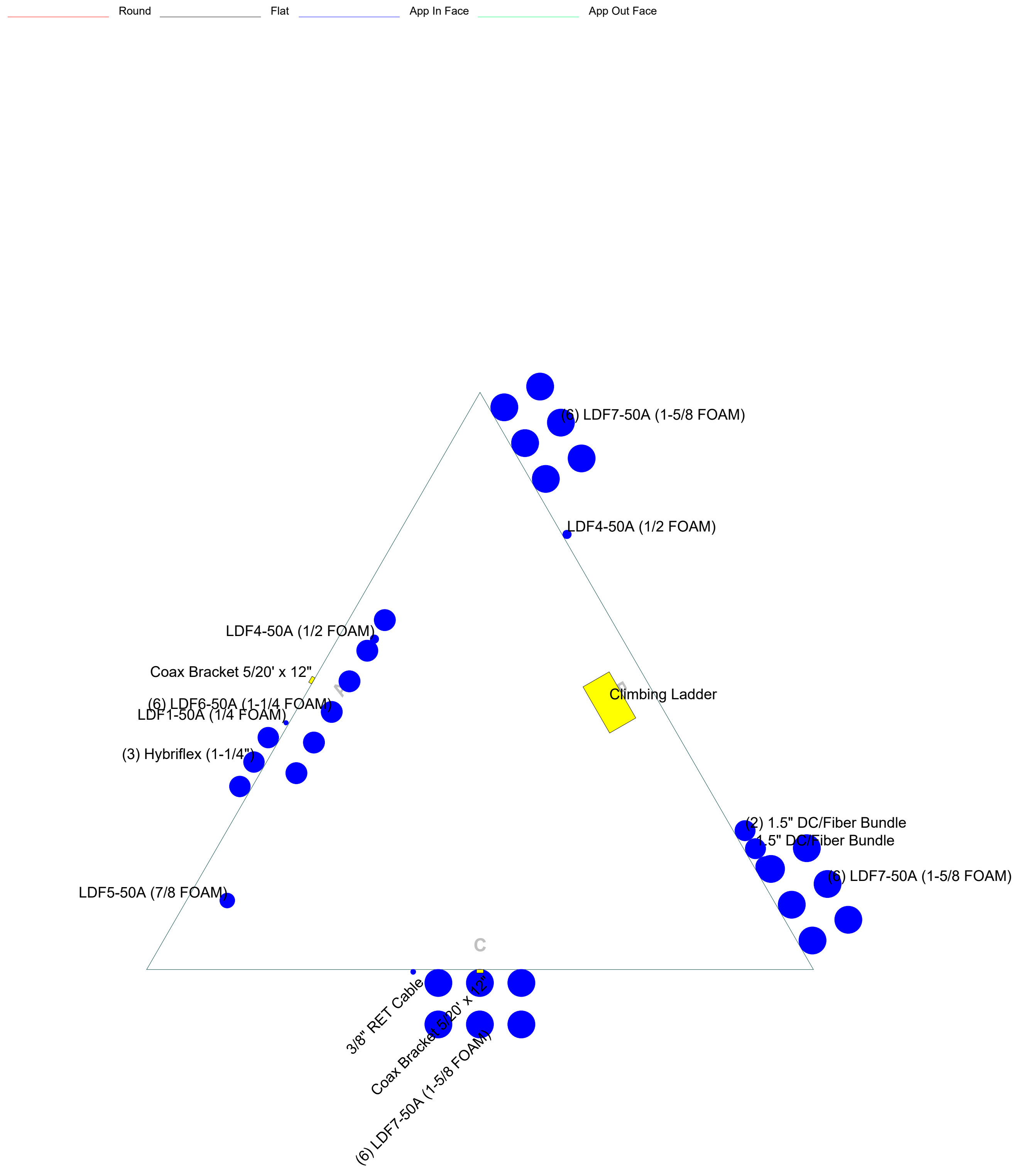
Job: SNET020 (CT1006) NORFOLK			
Project: 2018702.82			
Client: Centerline Communications, LLC	Drawn by: chake	App'd:	
Code: TIA-222-G	Date: 04/03/18	Scale: NTS	
Path: T:\ATandT\SNET020\8 2018702 82 Centerline SA\TNX\SNET020 TNX.eri		Dwg No. E-1	

Feed Line Distribution Chart
6' - 160'



GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2222 FAX: (330) 572-3722	Job: ***SNET020 (CT1006) NORFOLK***		
	Project: ***2018702.82***		
	Client: Centerline Communications, LLC	Drawn by: chake	App'd:
	Code: TIA-222-G	Date: 04/03/18	Scale: NTS
	Path: T:\ATandT\SNET020\8 2018702 82 Centerline SA\TNX\SNET020 TNX.eri		Dwg No. E-7

Feed Line Plan



GPD 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2222 FAX: (330) 572-3722	Job: ***SNET020 (CT1006) NORFOLK*** Project: ***2018702.82*** Client: Centerline Communications, LLC — Drawn by: chake — App'd: Code: TIA-222-G — Date: 04/03/18 — Scale: NTS Path: T:\ATandT\SNET020\8 2018702 82 Centerline SA\TNX\SNET020 TNX.eri — Dwg No. E-7

APPENDIX D

Foundation Analysis

Mat Foundation Analysis
SNET020 (CT1006) NORFOLK
2018702.82

General Info	
Foundation Criteria	GPD
TIA Code	TIA-222-G
Soil Code	AASHTO 2012
Concrete Code	ACI 318-11
Seismic Design Category	B
Tower Height	160 ft
Bearing On	Rock
Foundation Type	Guyed Pad
Pier Type	None
Reinforcing Known	Yes
Max Bearing Capacity	105%
Max Overturning Capacity	105%

Tower Reactions	
Moment, M	0 k-ft
Axial, P	128.73 k
Shear, V	4.26 k

Pad & Pier Geometry	
Pier N/A	0 ft
Pad Length, L [y]	4 ft
Pad Width, W [x]	4 ft
Pad Thickness, t	3.5 ft
Depth, D	3.5 ft
Height Above Grade, HG	0.5 ft
Tower Centroid, X	2 ft
Tower Centroid, Y	2 ft
Tower Eccentricity	0.0000 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete F'c	3 ksi
Pier Reinforcing Clear Cover	
Shear Rebar Type	Tie
Shear Rebar Size	# 4
Pad Reinforcing Clear Cover	3 in
Reinforced Top & Bottom?	No
Pad Reinforcing Size	# 6
Pad Quantity Per Layer	5
Pier Rebar Size	
Pier Quantity of Rebar	

Soil Properties	
Soil Type	Cohesive
Soil Unit Weight	135 pcf
Cohesion, Cu (ksf)	2.5
Base Friction Coeff. Provided in Geo?	Yes
Base Friction Coefficient, μ	0.4
Bearing Type	Net
Ultimate Bearing	21 ksf
Water Table Depth	99 ft
Frost Depth	3.33 ft

GPD Mat Foundation Analysis - V3.2

Bearing Summary

Case	*Demand/Limits*	*Capacity/Availability*	*Check*	*Eccentricity*	*Load Case*
Qxmax	10.34 ksf	12.88 ksf	OK, <= 105%	L/33.4	1.2D+1.6W
Qymax	10.34 ksf	12.88 ksf	OK, <= 105%	W/33.4	1.2D+1.6W
Qmax @ 45°	10.98 ksf	12.88 ksf	OK, <= 105%	W/47.5	1.2D+1.6W
Controlling Capacity		**85.2%**	**Pass**		

Overturning Summary

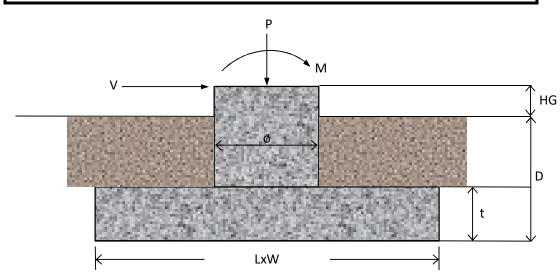
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Ovtx	16.8 k-ft	280.5 k-ft	8.0%	OK	0.9D+1.6W
Ovty	16.8 k-ft	280.5 k-ft	8.0%	OK	0.9D+1.6W
Ovtxy	11.8 k-ft	280.5 k-ft	5.6%	OK	0.9D+1.6W
Controlling Capacity		**8.0%**	**Pass**		

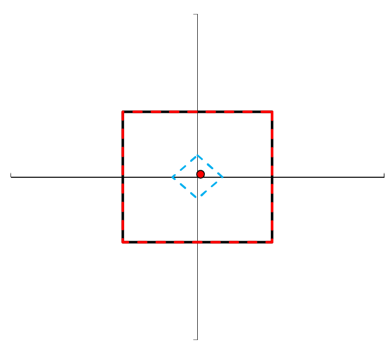
Sliding Summary

Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Slidingx	4.3 k	34.3 k	12.4%	OK	0.9D+1.6W
Slidingy	4.3 k	34.3 k	12.4%	OK	0.9D+1.6W
Controlling Capacity		**12.4%**	**Pass**		

Reinforcement Summary

Component	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Pad Flexural Bending	18.2 k-ft	107.3 k-ft	17.0%	OK	1.2D+1.6W
One-Way Shear in Pad	0.0 k	173.0 k	0.0%	OK	1.2D+1.6W
Two-Way Shear in Pad	50.5 k	1265.2 k	4.0%	OK	0.9D+1.6W
As Min Pad Met?	0.55 sq. in.	0.17 sq. in.	Yes		
Controlling Capacity		**17.0%**	**Pass**		





Guyed Tower Anchor Foundation
SNET020 (CT1006) NORFOLK
2018702.82

Guy Anchor Location	
Azimuth/Leg	A/B/C
Radius	131'
Tower Height (ft)	160'

Tower Reactions		
Vertical	22.73	k
Horizontal	25.87	k

Capacity Summary		
Soil Capacity=	26.7%	OK
Reinforcing Capacity=	4.1%	OK
Controlling Capacity=	**26.7%**	**OK**

Minimum steel has been assumed

Anchor Block Geometry		
Width	5	ft
Height	5	ft
Length	12.5	ft
Depth	4.5	ft

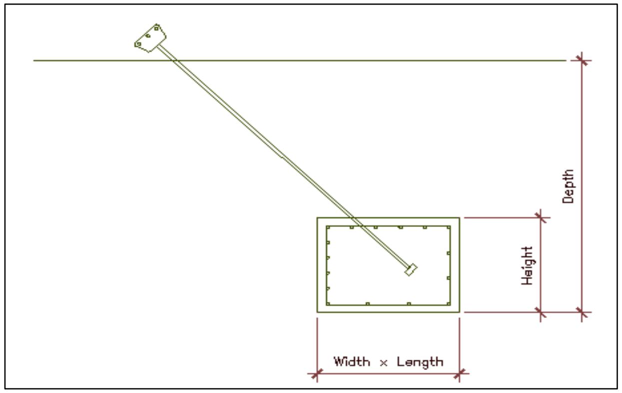
Soil Properties

Layer	C_u, psf	ϕ, degrees	γ_{soil}, pcf	$\gamma_{concrete}$, pcf	d, ft	$P_{p,top}$, psf	$P_{p,bot}$, psf	f_s, psf
1	0	0	120	150	2.5	0	0	0
2	2500	0	135	150	2.5	5000	5000	1500
3								
4								
5								
6								

Ignored Depth	2.5 ft	Consider soil for uplift		User Input Angle (°)	
Water Table	99 ft	Cohesive		Angle for Uplift (°)	0

General Info	
Foundation Criteria	GPD
TIA Code	TIA-222-G

Soil Capacity Calculations			
W_s	0.00	k	
W_c	46.88	k	
Uplift Resistance	85.16	k	
Horizontal Resistance	110.65	k	
Uplift Capacity=	26.7%		OK
Horizontal Capacity=	23.4%		OK



Anchor Block Reinforcement		
Is Reinforcement Known?	assume min	
fc'	4	ksi
Fy	60	ksi

Block Moment and Shear Calculations							
Moment Check							
M_{ux}=	35.52	k-ft		M_{uy}=	40.42	k-ft	
ϕM_{nx}=	2736.73	k-ft		ϕM_{ny}=	2736.73	k-ft	
Capacity	1.3%		OK	Capacity	1.5%		OK
Shear Check							
V_{ux}=	11.37	k		V_{uy}=	12.94	k	
ϕV_{nx}=	318.76	k		ϕV_{ny}=	318.76	k	
Capacity	3.6%		OK	Capacity	4.1%		OK

Guy Anchor Shaft Calculations	
Shape of Anchor Shaft	Unknown

at&t

SITE NAME
NORFOLK - LOON MEADOW ROAD
PROJECT
LTE 2C/3C
SITE ID
CT1006
FA SITE NUMBER
10035022
PACE ID
MRCTB023511/MRCTB023526
SITE ADDRESS
453 LOON MEADOW ROAD
NORFOLK, CT 06058
STRUCTURE TYPE
GUYED TOWER

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

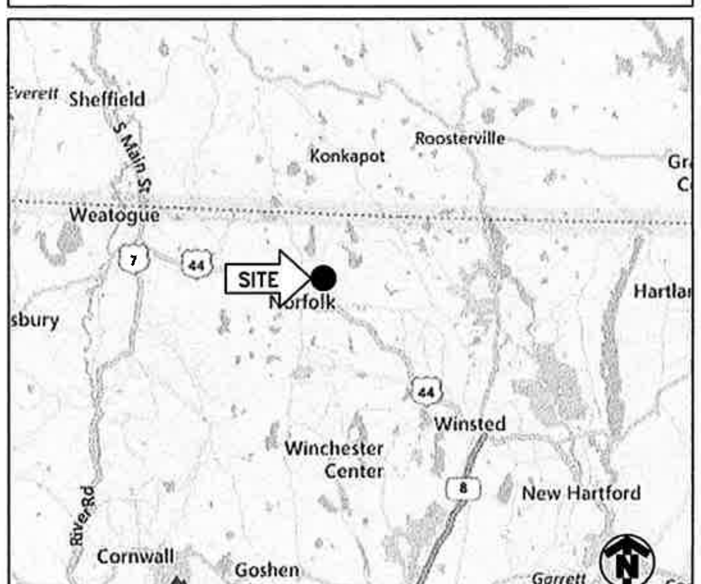
SHEET INDEX

NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	GENERAL NOTES
C3	COMPOUND PLAN
C4	EQUIPMENT SITE PLAN
C5	ELEVATION VIEW
C6	EQUIPMENT DETAILS
C7	EQUIPMENT DETAILS
C8	SCHEMATICS, DIAGRAMS & NOTES
C9	PLUMBING DIAGRAM

DRIVING DIRECTIONS

1. TURN LEFT ONTO COCHITUATE RD
2. USE THE RIGHT LANE TO TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON
3. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W/MASSACHUSETTS TURNPIKE/WORCHESTER/SPRINGFIELD AND MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE
4. MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE
5. USE THE RIGHT 2 LANES TO TAKE EXIT 9 FOR I-84 TOWARD US-20/HARTFORD/NEW YORK CITY
6. CONTINUE ONTO I-84
7. TAKE EXIT 61 FOR I-291 W TOWARD WINDSOR
8. CONTINUE ONTO I-291 W
9. TAKE EXIT 2B TO MERGE ONTO I-91 N TOWARD SPRINGFIELD
10. USE THE RIGHT 2 LANES TO TAKE EXIT 40 FOR CT-20 TOWARD BRADLEY INTERNATIONAL AIRPORT
11. CONTINUE ONTO CT-20 W
12. TAKE THE CT-20 W EXIT TOWARD E GRANBY/GRANBY
13. SLIGHT LEFT ONTO CT-20 W/W GRANBY RD
14. TURN LEFT ONTO CT-219 S
15. TURN LEFT ONTO CT-179 S/CT-219 S
16. TURN RIGHT ONTO CT-318 W
17. TURN LEFT ONTO CT-181 S/CT-318 W
18. TURN RIGHT ONTO US-44 W
19. TURN RIGHT ONTO CT-182 E
20. SLIGHT LEFT ONTO LOON MEADOW DR
21. TURN LEFT TO STAY ON LOON MEADOW DR

LOCATION MAP



PROJECT TEAM

CENTERLINE COMMUNICATIONS
95 Ryan Drive Suite 1 | Raynham, MA 02767
Office: 781.713.4725 - Fax: 413-541-8158
PROJECT MANAGER

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
ENGINEER

SCOPE OF WORK:

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- ADD GROUND ISOLATION WHERE NEEDED.

TOWER SCOPE
- INSTALL (3) PANEL ANTENNAS
- RELOCATE (6) PANEL ANTENNAS
- INSTALL (3) RRUS-32 B2
- INSTALL (3) B14 4478 RADIOS
- INSTALL (1) DC6 "SQUID" WITH (1) FIBER, (2) DC CABLES & (1) ALARM CABLE

GROUND SCOPE
- INSTALL (1) FIBER MANAGEMENT BOX ON ICE BRIDGE POST.
- INSTALL (1) FIBER TRAY IN EXISTING LTE RACK
- INSTALL (1) DC12 IN EXISTING LTE RACK
- SWAP DUL TO 5216 AND ADD (1) XMU IN EXISTING LTE RACK
- INSTALL (6) 30AMP BREAKERS AND (1) 25AMP BREAKER IN EXISTING INFINITY PLANT.
- REWIRE ALL TECHNOLOGIES TO NEW POWERPLANT

PROJECT SUMMARY

SITE NAME:	NORFOLK - LOON MEADOW ROAD	
FA SITE NO.:	10035022	
PACE ID:	MRCTB023511/MRCTB023526	
SITE ID:	CT1006	
SITE ADDRESS:	453 LOON MEADOW ROAD NORFOLK, CT 06058	
COUNTY:	LITCHFIELD	
SITE COORDINATES:		
LATITUDE:	42.0090750° N	(NAD 83)
LONGITUDE:	73.1808881° W	(NAD 83)
GROUND ELEVATION:	±1650'	(AMSL)
ANTENNA RAD:	±143'	(AGL)
JURISDICTION:	LITCHFIELD COUNTY	
PROPERTY OWNER:	AT&T TOWERS	
APPLICANT:	AT&T MOBILITY 550 COCHITUATE ROAD FARMINGHAM, MA 01701	
PROJECT MANAGER:	CENTERLINE 95 RYAN DRIVE SUITE 1 RAYNHAM, MA 02767	
CONTACT:	PETER LAMONTAGNE (508) 341-7854	
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205	
CONTACT:	ALEX WELLER (518) 690-0790	
BUILDING CODE:	CT BUILDING CODE UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)	

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

LICENSED ENGINEER – STATE OF CONNECTICUT

APPROVALS

CONSTRUCTION MGR.		DATE
AT&T PROJECT MGR.		DATE
SITE ACQ.		DATE
SITE OWNER	NAME/COMPANY: TITLE:	DATE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
JUL 30 2018
No. 24705
LICENSED PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No.	Submittal / Revision	App'd	Date
1	REVISED FOR PERMIT	ASW	07/30/18
0	ISSUED FOR PERMIT	BMM	03/16/18

Drawn: RCD Date: 12/14/17
Designed: ASW Date: 12/14/17
Checked: ASW Date: 12/14/17

Project Number: 555-022

Project Title:
FA# 10035022
CT1006
NORFOLK - LOON MEADOW ROAD
453 LOON MEADOW ROAD
NORFOLK, CT 06058

Prepared For:
CENTERLINE COMMUNICATIONS

Drawing Scale: AS NOTED
Date: 07/30/18

Drawing Title
TITLE SHEET

Drawing Number
T1

GENERAL CONSTRUCTION NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   GENERAL CONTRACTOR
   SUBCONTRACTOR – CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ARCHIETCT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS. THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE SPACE FOR APPROVAL BY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINE.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. SUBCONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. SUBCONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. SUBCONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND SUBCONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR AND SUBCONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ARCHITECT/ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. SUBCONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. SUBCONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION OF AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING." IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
35. SUBCONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF SUBCONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
36. SUBCONTRACTOR SHALL REMOVED ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
37. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
38. NO WHITE STROBE LIGHTS ARE PERMITTED. ANY REQUIRED LIGHTING MUST MEET FAA STANDARDS AND REQUIREMENTS.
39. ALL COAXIAL CABLE INSTALLATIONS TO FOLLOW MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
40. NO SIGNIFICANT NOISE, SMOKE, DUST OR VIBRATIONS WILL RESULT FROM THIS FACILITY. (DISREGARD THIS NOTE IF THIS SITE HAS A GENERATOR)
41. NO ADDITIONAL PARKING TO BE PROPOSED. EXISTING ACCESS AND PARKING TO REMAIN, UNLESS NOTED OTHERWISE.
42. NO LANDSCAPING IS PROPOSED AT THIS SITE, UNLESS NOTED OTHERWISE.

ELECTRICAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTING OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   C – NATIONAL FIRE CODES
   A. UL – UNDERWRITERS LABORATORIES
   B. NEC – NATIONAL ELECTRICAL CODE
   C. NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
   D. OSHA – OCCUPATIONAL SAFETY AND HEALTH ACT
   E. SBC – STANDARD BUILDING CODE
4. DO NOT SCALE ELECTRICAL DRAWINGS; REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH CONSTRUCTION MANAGER' ANY SIZES AND LOCATIONS WHEN NEEDED.
5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.
6. CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS, AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.
7. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
8. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS, SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC... ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
9. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.
10. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
11. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
12. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTY BY AT&T.
13. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND SUBJECT TO REGULATORY INSPECTION & APPROVAL BY CONSTRUCTION MANAGER.
14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
15. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.
16. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.
17. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
18. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
19. DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION, BACKFILLING AND COMPACTION. REFER TO 'FOUNDATION, EXCAVATION, AND BACKFILLING NOTES.'
20. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA, AND IECE.
21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURERS CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES, AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
22. ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.
23. THE ELECTRICAL CONTRACTOR SHALL LABEL AL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY-DUTY, QUICK-MADE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
25. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED – NO SUBSTITUTIONS.
26. RACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 – 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS – 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADING RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD CALV.'
27. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
28. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, 800 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.
29. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
30. SERVICES: 240/120V, SINGLE PHASE, 3 WIRE CONNECTION AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.
31. TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.
32. ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.
33. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTION TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOMM."
34. ALL BOLTS SHALL BE STAINLESS STEEL

GROUNDING NOTES:

1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P," "A," "N," "I") WITH 1" LETTERS.
3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE.
6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
7. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.
8. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.

FOUNDATION, EXCAVATION, & BACKFILL NOTES:

1. ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL.
2. ALL EXCAVATIONS PREPARED FOR PLACEMENT OF CONCRETE SHALL BE OF UNDISTURBED SOILS, SUBSTANTIALLY HORIZONTAL, AND FREE FROM ANY LOOSE, UNSUITABLE MATERIAL OR FROZEN SOILS, AND WITHOUT THE PRESENCE OF POUNDING WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED WHEN REQUIRED. COMPACTION OF SOILS UNDER CONCRETE PAD FOUNDATIONS SHALL NOT BE LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR THE SOIL IN ACCORDANCE WITH ASTM D1557.
3. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF INADEQUATE BEARING CAPACITY IS REACHED AT THE DESIGNED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME TYPE SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. ANY STONE SUB BASE MATERIAL, IF USED, SHALL NOT SUBSTITUTE FOR REQUIRED THICKNESS OF CONCRETE.
4. ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH PRIOR TO BACK FILLING. BACK FILL SHALL CONSIST OF APPROVED MATERIALS SUCH AS EARTH, LOAM, SANDY CLAY, SAND AND GRAVEL, OR SOFT SHALE, FREE FROM CLODS OR LARGE STONES OVER 2 1/2 MAX DIMENSIONS. ALL BACK FILL SHALL BE PLACED IN COMPACTED LAYERS.
5. ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED IN MAXIMUM 6" THICK LIFTS BEFORE COMPACTION. EACH LIFT SHALL BE WETTED IF REQUIRED AND COMPACTED TO NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D1557
6. NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HOURS PRIOR TO BACK FILLING.
7. FINISHED GRADING SHALL BE SLOPED TO PROVIDE POSITIVE DRAINAGE AND PREVENT STANDING WATER. THE FINAL (FINISH) ELEVATION OF SLAB FOUNDATIONS SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE CENTER. FINISH GRADE OF CONCRETE PADS SHALL BE A MAXIMUM OF 4 INCHES ABOVE FINAL FINISH GRADE ELEVATIONS. PROVIDE SURFACE FILL GRAVEL TO ESTABLISH SPECIFIED ELEVATIONS WHERE REQUIRED.
8. NEWLY GRADED SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR-3401 AS MANUFACTURED BY "CONSTRUCTION MATERIAL 1-800-239-3841" OR AN APPROVED EQUIVALENT, SHOWN ON PLANS. THE GEOTEXTILE FABRIC SHALL BE BLACK IN COLOR TO CONTROL THE RECURRENCE OF VEGETATIVE GROWTH AND EXTEND TO WITHIN 1 FOOT OUTSIDE THE SITE FENCING OR ELECTRICAL GROUNDING SYSTEM PERIMETER WHICHEVER IS GREATER. ALL FABRIC SHALL BE COVERED WITH A MINIMUM OF 4" DEEP COMPACTED STONE OR GRAVEL AS SPECIFIED. I.E. FDOT TYPE NO.57 FOR FENCED COMPOUND; FDOT TYPE NO. 67 FOR ACCESS DRIVE AREA.
9. IN ALL AREAS TO RECEIVE FILL, REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE. PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SUCH THAT FILL MATERIAL WILL BIND WITH EXISTING/PREPARED SOIL SURFACE.

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
JUL 3 0 2018

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10. WHEN SUBGRADE OR PREPARED GROUND SURFACE HAS A DENSITY LESS THAN THAT REQUIRED FOR THE FILL MATERIAL, SCARIFY THE GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION AND/OR AERATE THE SOILS AND RE-COMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OR FILLS.
11. IN AREAS WHICH EXISTING GRAVEL SURFACING IS REMOVED OR DISTURBED DURING CONSTRUCTION OPERATIONS, REPLACE GRAVEL SURFACING TO MATCH ADJACENT GRAVEL SURFACING AND RESTORED TO THE SAME THICKNESS AND COMPACTION AS SPECIFIED. ALL RESTORED GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES.
12. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED WITH THE CONDITION THAT ANY UNFAVORABLE AMOUNTS OF ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ANY ADDITIONAL GRAVEL RESURFACING MATERIAL AS NEEDED TO PROVIDE A FULL DEPTH COMPACTED SURFACE THROUGHOUT SITE.
13. GRAVEL SUB SURFACE SHALL BE PREPARED TO REQUIRED COMPACTION AND SUBGRADE ELEVATIONS BEFORE GRAVEL SURFACING IS PLACED AND/OR RESTORED. ANY LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED AND ANY DEPRESSIONS IN THE SUBGRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUBGRADE.
14. PROTECT EXISTING GRAVEL SURFACING AND SUBGRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING 'MATTS' OR OTHER SUITABLE PROTECTION DESIGNED TO SPREAD EQUIPMENT LOADS AS MAY BE NECESSARY. REPAIR ANY DAMAGE TO EXISTING GRAVEL SURFACING OR SUB GRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTORS OPERATIONS.
15. DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.
16. ALL SUITABLE BORROW MATERIAL FOR BACK FILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES AT NO ADDITIONAL COST TO THE CONTRACT.

ENVIRONMENTAL NOTES:

1. ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.
2. CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
4. NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
6. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.
7. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
8. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
9. RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES.

CONCRETE MASONRY NOTES:

1. CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT UNITS CONFORMING TO ASTM C90, GRADE N-1, (F'M=1,500 PSI). MEDIUM WEIGHT (115).
2. MORTAR SHALL BE TYPE "S" (MINIMUM 1,800 PSI AT 28 DAYS).
3. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AT 28 DAYS.
4. ALL CELLS CONTAINING REINFORCING STEEL OR EMBEDDED ITEMS AND ALL CELLS IN RETAINING WALLS AND WALLS BELOW GRADE SHALL BE SOLID GROUTED.
5. ALL HORIZONTAL REINFORCING STEEL SHALL BE PLACED IN BOND BEAM OR LINTEL BEAM UNITS.
6. WHEN GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE GROUT POUR 1-1/2" BELOW TOP OF THE UPPERMOST UNIT.
7. ALL BOND BEAM BLOCK SHALL BE "DEEP CUT" UNITS.
8. PROVIDE INSPECTION AND CLEAN-OUT HOLES AT BASE OF VERTICAL CELLS HAVING GROUT LIFTS IN EXCESS OF 4'-0" OF HEIGHT.
9. ALL GROUT SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR.
10. CEMENT SHALL BE AS SPECIFIED FOR CONCRETE.
11. REINFORCING BARS - SEE NOTES UNDER "REINFORCING STEEL" FOR REQUIREMENTS.
31. PROVIDE ONE BAR DIAMETER (A MINIMUM OF 1/2") GROUT BETWEEN MAIN REINFORCING AND MASONRY UNITS.
32. LOW LIFT CONSTRUCTION, MAXIMUM GROUT POUR HEIGHT IS 4 FEET.
33. LIFT GROUTED CONSTRUCTION MAY BE USED IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND SECTION 2104.6.1 OF CURRENT BUILDING CODE.
34. ALL CELLS IN CONCRETE BLOCKS SHALL BE FILLED SOLID WITH GROUT, EXCEPT AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
35. CELLS SHALL BE IN VERTICAL ALIGNMENT, DOWELS IN FOOTINGS SHALL BE SET TO ALIGN WITH CORES CONTAINING REINFORCING STEEL.
36. REFER TO ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN AND JOINT TYPE.
37. SAND SHALL BE CLEAN, SHARP AND WELL GRADED, FREE FROM INJURIOUS AMOUNTS OF DUST, LUMPS, SHALE, ALKAU OR ORGANIC MATERIAL.
38. BRICK SHALL CONFORM TO ASTM C-62 AND SHALL BE GRADE MW OR BETTER.

STRUCTURAL CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI-301-10
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH fc'=2,500 PSI AT 28 DAYS UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

CONCRETE CAST AGAINST EARTH	3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:	
#6 AND LARGER	2 IN.
#5 AND SMALLER & WWF	1-1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER, NOR CAST AGAINST THE GROUND:	
SLAB AND WALL	3/4 IN.
BEAMS AND COLUMNS	1-1/2 IN.

5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE U.N.O. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. HOLES TO RECEIVE EXPANSION/WEDGE ANCHORS SHALL BE 1/8" LARGER IN DIAMETER THAN THE ANCHOR BOLD, DOWEL OR ROD AND SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. LOCATE AND AVOID CUTTING EXISTING REBAR WHEN DRILLING HOLES IN ELEVATED CONCRETE SLABS.
7. USE AND INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER ICBO & MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURES.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION. STEEL SECTIONS SHALL BE IN ACCORDANCE WITH ASTM AS INDICATED BELOW:
W-SHAPES: ASTM A992, 50 KSI
ANGLES, BARS CHANNELS: ASTM A36, 36 KSI
HSS SECTIONS: ASTM 500, 46 KSI
PIPE SECTIONS: ASTM A53-E, 35 KSI
2. ALL EXTERIOR EXPOSED STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED.
3. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION." PAINTED SURFACES SHALL BE TOUCHED UP.
4. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE 3/4" Ø CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" Ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
6. FIELD MODIFICATIONS ARE TO BE COATED WITH ZINC ENRICHED PAINT.

SITE WORK & DRAINAGE:

PART 1 - GENERAL

CLEARING, GRUBBING, STRIPPING, EROSION CONTROL, SURVEY, LAYOUT, SUBGRADE PREPARATION AND FINISH GRADING AS REQUIRED TO COMPLETE THE PROPOSED WORK SHOWN IN THESE PLANS.

1.1 REFERENCES:

A. DOT (STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR WAY CONSTRUCTION - CURRENT EDITION)
B. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
C. OSHA (OCCUPATION SAFETY AND HEALTH ADMINISTRATION)

1.2 INSPECTION AND TESTING:

A. FIELD TESTING OF EARTHWORK COMPACTION AND CONCRETE CYLINDERS
B. ALL WORK SHALL BE INSPECTED AND RELEASED BY THE GENERAL CONTRACTOR WHO SHALL CARRY OUT THE GENERAL INSPECTION OF THE WORK WITH SPECIFIC CONCERN TO PROPER PERFORMANCE OF THE WORK AS SPECIFIED AND/OR CALLED FOR ON THE DRAWINGS. IT IS THE SUBCONTRACTOR'S RESPONSIBILITY TO REQUEST TIMELY INSPECTIONS PRIOR TO PROCEEDING WITH FURTHER WORK THAT WOULD MAKE PARTS OF WORK INACCESSIBLE OR DIFFICULT TO INSPECT.

1.3 SITE MAINTENANCE AND PROTECTION:

A. PROVIDE ALL NECESSARY JOB SITE MAINTENANCE FROM COMMENCEMENT OF WORK UNTIL COMPLETION OF THE SUBCONTRACT.
B. AVOID DAMAGE TO THE SITE AND TO EXISTING FACILITIES, STRUCTURES, TREES, AND SHRUBS DESIGNATED TO REMAIN. TAKE PROTECTIVE MEASURES TO PREVENT EXISTING FACILITIES THAT ARE NOT DESIGNATED FOR REMOVAL FROM BEING DAMAGED BY THE WORK.
C. KEEP SITE FREE OF ALL PONDING WATER.
D. PROVIDE EROSION CONTROL MEASURES IN ACCORDANCE WITH STATE DOT AND EPA REQUIREMENTS.
E. PROVIDE AND MAINTAIN ALL TEMPORARY FENCING, BARRICADES, WARNING SIGNALS AND SIMILAR DEVICES NECESSARY TO PROTECT AGAINST THEFT FROM PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. REMOVE ALL SUCH DEVICES UPON COMPLETION OF THE WORK.
F. EXISTING UTILITIES: DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS, EXCEPT WHEN PERMITTED IN WRITING BY THE ENGINEER, AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.

PROVIDE A MINIMUM 48-HOUR NOTICE TO THE ENGINEER AND RECEIVE WRITTEN NOTICE TO PROCEED BEFORE INTERRUPTING ANY UTILITY SERVICE.

PART 2 - PRODUCTS

2.1 SUITABLE BACKFILL: ASTM D2321 (CLASS I, II, III, OR IVA) FREE FROM FROZEN LUMPS, REFUSE, STONES OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.2 NON-POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS III, IVA OR IVB) COARSE AGGREGATE. FREE FROM FROZEN LUMPS, REFUSE, STONES, OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.3 POROUS GRANULAR EMBANKMENT AND BACKFILL: ASTM D2321 (CLASS IA, IB, OR II) COARSE AGGREGATE FREE FROM FROZEN LUMPS, REFUSE, STONES, OR ROCKS LARGER THAN 3 INCHES IN ANY DIMENSION OR OTHER MATERIAL THAT MAY MAKE THE INORGANIC MATERIAL UNSUITABLE FOR BACKFILL.
2.4 SELECT STRUCTURAL FILL: GRANULAR FILL MATERIAL MEETING THE REQUIREMENTS OF ASTM E850-95. FOR USE AROUND AND UNDER STRUCTURES WHERE STRUCTURAL FILL MATERIAL ARE REQUIRED.
2.5 GRANULAR BEDDING AND TRENCH BACKFILL: WELL-GRADED SAND MEETING THE GRADATION REQUIREMENTS OF ASTM D2487 (SE OR SW-SM).
2.6 COARSE AGGREGATE FOR ACCESS ROAD SUB BASE COURSE SHALL CONFORM TO ASTM D2940.
2.7 UNSUITABLE MATERIAL: AND MODERATELY PLASTIC SILTS AND CLAYS (LL>45). MATERIAL CONTAINING REFUSE, FROZEN LUMPS, DEMOLISHED BITUMINOUS MATERIAL, VEGETATIVE MATTER, WOOD, STONES IN EXCESS OF 3 INCHES IN ANY DIMENSION, AND DEBRIS AS DETERMINED BY THE CONSTRUCTION MANAGER. TYPICAL THESE WILL BE SOILS CLASSIFIED BY ASTM AS PT, MH, CH, OH, ML, AND OL.
2.8 GEOTEXTILE FABRIC: MIRAFI 500X OR APPROVED EQUAL.
2.9 PLASTIC MARKING TAPE: SHALL BE ACID AND ALKALI RESISTANT POLYETHYLENE FILM SPECIFICALLY MANUFACTURED FOR MARKING AND LOCATING UNDERGROUND UTILITIES, 6 INCHES WIDE WITH A MINIMUM THICKNESS OF 0.004 INCH. TAPE SHALL HAVE MINIMUM STRENGTH OF 1500 PSI IN BOTH DIRECTIONS AND MANUFACTURED WITH INTEGRAL CONDUCTORS, FOIL BACKING OR OTHER MEANS TO ENABLE DETECTION BY A METAL DETECTOR WHEN BURIED UP TO 3 FEET DEEP. THE METALLIC CORE OF THE TAPE SHALL BE ENCASED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. TAPE COLOR SHALL BE RED FOR ELECTRIC UTILITIES AND ORANGE FOR TELECOMMUNICATION UTILITIES.

PART 2 - EXECUTION

3.1 GENERAL:

A. BEFORE STARTING GENERAL SITE PREPARATION ACTIVITIES, INSTALL EROSION AND SEDIMENT CONTROL MEASURES. THE WORK AREA SHALL BE CONSTRUCTED AND MAINTAINED IN SUCH A CONDITION THAT IN THE EVENT OF RAIN THE SITE WILL BE DRAINED AT ANY TIME.
B. BEFORE ALL SURVEY, LAYOUT, STAKING, AND MARKING, ESTABLISH AND MAINTAIN ALL LINES, GRADES, ELEVATIONS AND BENCHMARKS NEEDED FOR EXECUTION OF THE WORK.
C. CLEAR AND GRUB THE AREA WITHIN THE LIMITS OF THE SITE. REMOVE TREES, BRUSH, STUMPS, RUBBISH AND OTHER DEBRIS AND VEGETATION RESTING ON OR PROTRUDING THROUGH THE SURFACE OF THE SITE AREA TO BE CLEARED.
1. REMOVE THE FOLLOWING MATERIALS TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE ORIGINAL GROUND SURFACE: ROOTS, STUMPS, AND OTHER DEBRIS, BRUSH, AND REFUSE EMBEDDED IN OR PROTRUDING THROUGH THE GROUND SURFACE, RAKE, DISK OR PLOW THE AREA TO A DEPTH OF NO LESS THAN 6 INCHES, AND REMOVE TO A DEPTH OF 12 INCHES ALL ROOTS AND OTHER DEBRIS THEREBY EXPOSED.
2. REMOVE TOPSOIL MATERIAL COMPLETELY FROM THE SURFACE UNTIL THE SOIL NO LONGER MEETS THE DEFINITION OF TOPSOIL. AVOID MIXING TOPSOIL WITH SUBSOIL OR OTHER UNDESIRABLE MATERIALS.
3. EXCEPT WHERE EXCAVATION TO GREATER DEPTH IS INDICATED, FILL DEPRESSIONS RESULTING FROM CLEARING, GRUBBING, AND DEMOLITION WORK COMPLETELY WITH SUITABLE FILL.

D. REMOVE FROM THE SITE AND DISPOSE IN AN AUTHORIZED LANDFILL ALL DEBRIS RESULTING FROM CLEARING AND GRUBBING OPERATIONS. BURNING WILL NOT BE PERMITTED.
E. PRIOR TO EXCAVATING, THOROUGHLY EXAMINE THE AREA TO BE EXCAVATED AND/OR TRENCHED TO VERIFY THE LOCATIONS OF FEATURES INDICATED ON THE DRAWINGS AND TO ASCERTAIN THE EXISTENCE AND LOCATION OF ANY STRUCTURE, UNDERGROUND STRUCTURE, OR OTHER ITEM NOT SHOWN THAT MIGHT INTERFERE WITH THE PROPOSED CONSTRUCTION. NOTIFY THE CONSTRUCTION MANAGER OF ANY OBSTRUCTIONS THAT WILL PREVENT ACCOMPLISHMENT OF THE WORK AS INDICATED ON THE DRAWINGS.
F. SEPARATE AND STOCK PILE AL EXCAVATED MATERIALS SUITABLE FOR BACKFILL. ALL EXCESS EXCAVATED AND UNSUITABLE MATERIALS SHALL BE DISPOSED OF OFF-SITE IN A LEGAL MANNER.

3.2 BACKFILL:

A. AS SOON AS PRACTICAL, AFTER COMPLETING CONSTRUCTION OF THE RELATED STRUCTURE, INCLUDING EXPIRATION OF THE SPECIFIED MINIMUM CURING PERIOD FOR CAST-IN-PLACE CONCRETE, BACKFILL THE EXCAVATION WITH APPROVED MATERIAL TO RESTORE THE REQUIRED FINISHED GRADE.
B. PRIOR TO PLACING BACKFILL AROUND STRUCTURES, ALL FORMS SHALL BE REMOVED AND THE EXCAVATION CLEANED OF ALL TRASH, DEBRIS, AND UNSUITABLE MATERIALS.
C. BACKFILL BY PLACING AND COMPACTING SUITABLE BACKFILL MATERIAL OR SELECT GRANULAR BACKFILL MATERIAL WHEN REQUIRED IN UNIFORM HORIZONTAL LAYERS OF NO GREATER THAN 8-INCHES LOOSE THICKNESS AND COMPACTED. WHERE HAND OPERATED COMPACTORS ARE USED, THE FILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 4 INCHES IN LOOSE DEPTH AND COMPACTED.
D. WHENEVER THE DENSITY TESTING INDICATES THAT THE CONTRACTOR HAS NOT OBTAINED THE SPECIFIED DENSITY, THE SUCCEEDING LAYER SHALL NOT BE PLACED UNTIL THE SPECIFICATION REQUIREMENTS ARE MET UNLESS OTHERWISE AUTHORIZED BY THE GEOTECHNICAL ENGINEER. THE CONTRACTOR SHALL TAKE WHATEVER APPROPRIATE ACTION IS NECESSARY , SUCH AS DISKING AND DRYING, ADDING WATER, OR INCREASING THE COMPACTIVE EFFORT TO MEET THE MINIMUM COMPACTION REQUIREMENTS.
E. THOROUGHLY COMPACT EACH LAYER OF BACKFILL TO A MINIMUM 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.3 TRENCH EXCAVATION:

A. UTILITY TRENCHES SHALL BE EXCAVATED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE GENERAL CONTRACTOR. PROVIDE SHORING, SHEETING AND BRACING AS REQUIRED TO PREVENT CAVING OR SLOUGHING OF THE TRENCH WALLS.
B. EXTEND THE TRENCH WIDTH A MINIMUM OF 6 INCHES BEYOND THE OUTSIDE EDGE OF THE OUTERMOST CONDUIT.
C. WHEN SOFT YIELDING, OR OTHERWISE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, BACKFILL AT THE REQUIRED TRENCH TO A DEPTH OF NO LESS THAN 12 INCHES BELOW THE REQUIRED ELEVATION AND BACKFILL WITH GRANULAR BEDDING MATERIAL.

3.4 TRENCH BACKFILL:

A. PROVIDE GRANULAR BEDDING MATERIAL IN ACCORDANCE WITH THE DRAWINGS AND THE UTILITY REQUIREMENTS.
B. NOTIFY THE GENERAL CONTRACTOR 24 HOURS IN ADVANCE OF BACKFILLING.
C. CONDUCT UTILITY CHECK TESTS BEFORE BACKFILLING. BACKFILL AND COMPACT TRENCH BEFORE ACCEPTANCE TESTING.
D. PLACE GRANULAR TRENCH BACKFILL UNIFORMLY ON BOTH SIDES OF THE CONDUITS IN 6-INCH UNCOMPACTED LIFTS UNTIL 12 INCHES OVER THE CONDUITS. SOLIDLY RAM AND TAMP BACKFILL INTO SPACE AROUND CONDUITS.
E. PROTECT CONDUIT FROM LATERAL MOVEMENT, IMPACT DAMAGE, OR UNBALANCED LOADING.
F. ABOVE THE CONDUIT EMBEDMENT ZONE, PLACE AND COMPACT SATISFACTORY BACKFILL MATERIAL IN 8-INCH MAXIMUM LOOSE THICKNESS LIFTS TO RESTORE THE REQUIRED FINISHED SURFACE GRADE.
G. COMPACT FINAL TRENCH BACKFILL TO A DENSITY EQUAL TO OR GREATER THAN THAT OF THE EXISTING UNDISTURBED MATERIAL IMMEDIATELY ADJACENT TO THE TRENCH BUT NO LESS THAN A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS PROVIDED BY THE STANDARD PROCTOR TEST, ASTM D 698.

3.5 FINISH GRADING:

A. PERFORM ALL GRADING TO PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES AND SMOOTH, EVEN SURFACE DRAINAGE OF THE ENTIRE AREA WITHIN THE IMITS OF CONSTRUCTION. GRADING SHALL BE COMPATIBLE WITH ALL SURROUNDING TOPOGRAPHY AND STRUCTURES.
B. UTILIZE SATISFACTORY FILL MATERIAL RESULTING FROM THE EXCAVATION WORK IN THE CONSTRUCTION OF FILLS, EMBANKMENTS AND FOR REPLACEMENT OF REMOVED UNSUITABLE MATERIALS.
C. ACHIEVE FINISHED GRADE BY PLACING A MINIMUM OF 4 INCHES OF 1/2" - 3/4" CRUSHED STONE ON TOP SOIL STABILIZER FABRIC.
D. REPAIR ALL ACCESS ROADS AND SURROUNDING AREAS USED DURING THE CORSE OF THIS WORK TO THEIR ORIGINAL CONDITION.

3.7 ASPHALT PAVING ROAD:

A. DIVISION 600 - KDOT FLEXIBLE PAVEMENT. (UPDATE PER LOCAL DOT)
B. SECTION 403 - MODOT ASPHALT CONCRETE PAVEMENT.

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 21705
LICENSED PROFESSIONAL ENGINEER
JUL 30 2018

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Project Number: 555-022

Project Title:

FA# 10035022
CT1006
NORFOLK - LOON MEADOW ROAD
453 LOON MEADOW ROAD
NORFOLK, CT 06058

Prepared For:

CENTERLINE COMMUNICATIONS

Drawing Scale: AS NOTED

Date: 07/30/18

Drawing Title

GENERAL NOTES

Drawing Number

C2

NOTE:
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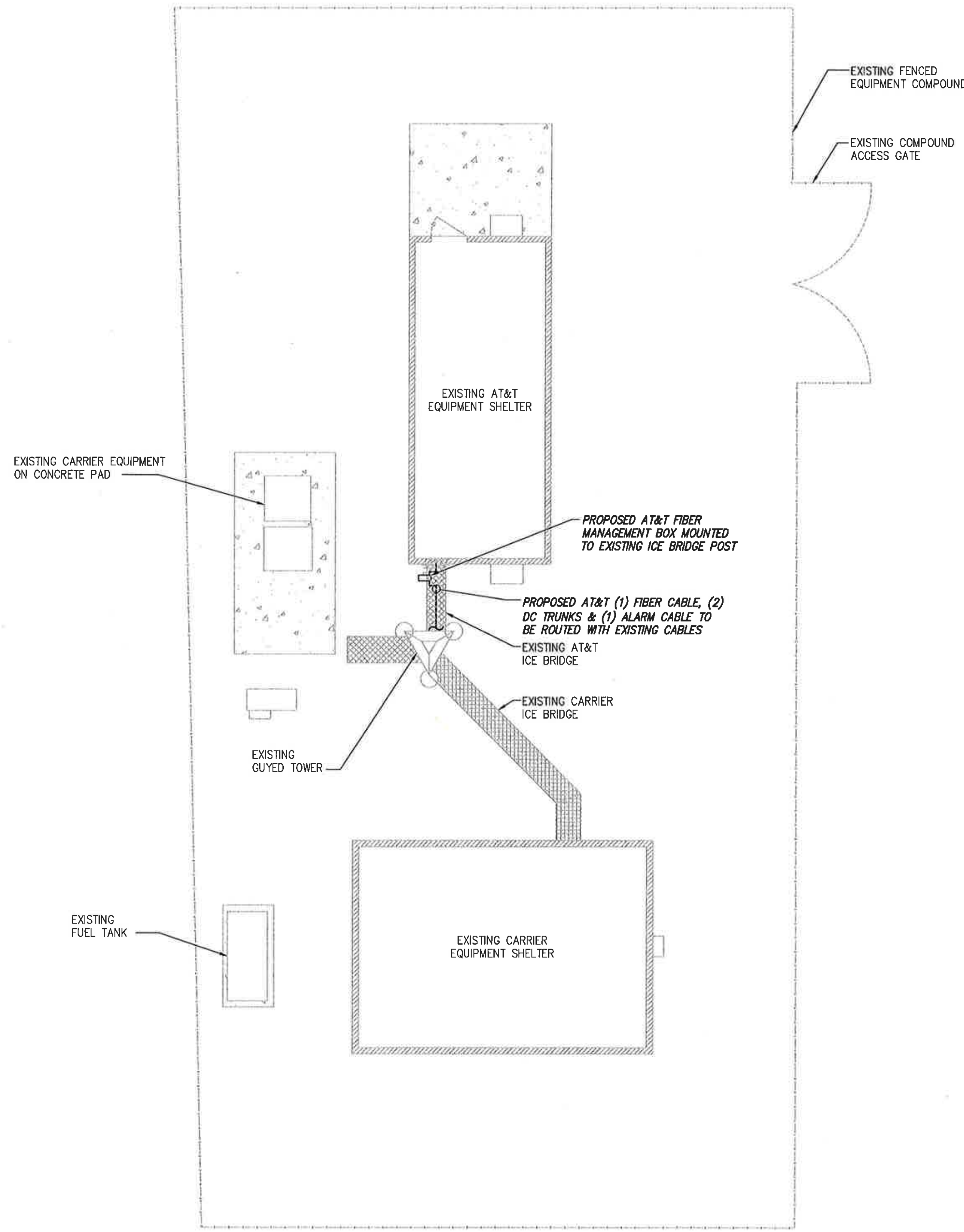
- *AT&T MOUNTS ARE PENDING MOUNT MODIFICATION DESIGN*

NOTE:
- 3' MINIMUM SEPARATION BETWEEN ALL LTE ANENNAS
- 6' MINIMUM SEPARATION BETWEEN 700 BC/700 DE ANTENNAS



1 OVERALL SITE PLAN
SCALE: AS NOTED

CALLED NORTH

GRAPHIC SCALE:
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"

NOTES:
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2. THESE DRAWINGS DO NOT REFLECT ADEQUACY OF EXISTING OR PROPOSED ANTENNA MOUNTS, MOUNT CONNECTIONS, OR CABLE ATTACHMENTS. INFINIGY DOES NOT ACCEPT LIABILITY FOR ANY OF THESE STRUCTURAL ELEMENTS.
3. ROUTE ALL PROPOSED CABLING ON EXISTING CABLE LADDER. ACTUAL ROUTE ON DRAWINGS MAY VARY FROM FIELD LOCATION OF EXISTING CABLE LADDER.
4. INSTALLER SHALL PROVIDE ALL NECESSARY CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED INSTALLATION AND SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION REQUIREMENTS.
5. INSTALLER SHALL PROVIDE ALL STRAIN RELIEF FOR ALL CABLE ASSEMBLIES ROUTING TO THE ANTENNAS. UTILIZATION OF HOISTING GRIPS ON ALL DC POWER AND FIBER OPTIC CABLES SHALL BE UTILIZED.

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
24705
LICENSED
PROFESSIONAL ENGINEER
JUL 30 2018

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453 LOON MEADOW ROAD
NORFOLK, CT 06058

Prepared For:
CENTERLINE COMMUNICATIONS

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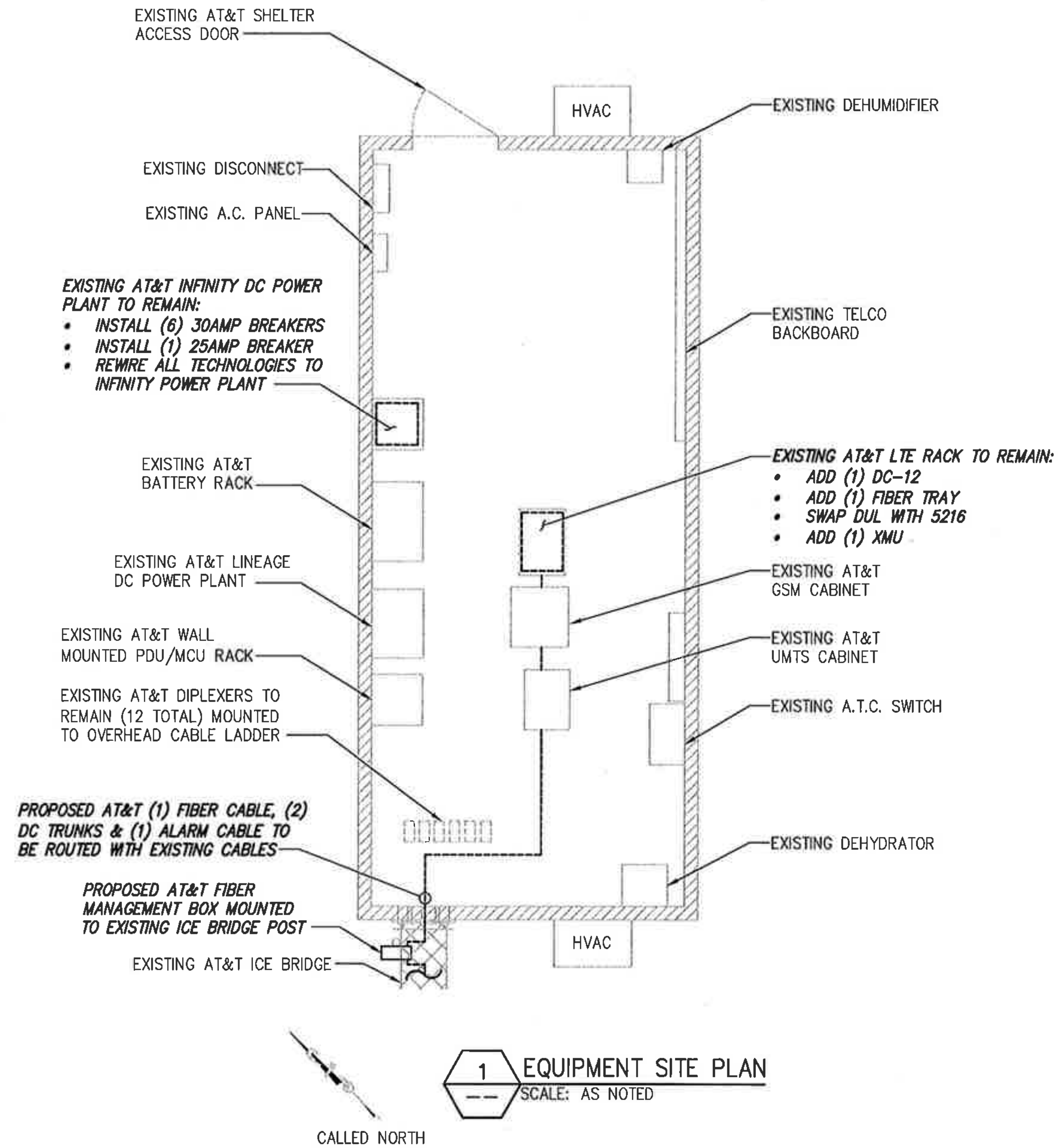
Date: 07/30/18

Drawing Title
COMPOUND PLAN

Drawing Number
C3



1 EQUIPMENT SITE PLAN
SCALE: AS NOTED

NOTES:
CONTRACTOR TO GROUND ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

SYMBOL	
⊗	COPPER GROUND ROD
▸	CONNECT PER MANUFACTURER SPECS
■	CADWELD CONNECTION
•	MECHANICAL CONNECTION
▬	GROUND BAR
———	ELECTRICAL CONDUIT
———	GROUND WIRE
- - - -	DC/FIBER LINE

NOTES:
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5. INSTALLER SHALL PROVIDE ALL STRAIN RELIEF FOR ALL CABLE ASSEMBLIES ROUTING TO THE ANTENNAS. UTILIZATION OF HOISTING GRIPS ON ALL DC POWER AND FIBER OPTIC CABLES SHALL BE UTILIZED.

ABBREVIATIONS:

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

GRAPHIC SCALE:
6' 3' 0 3' 6'
SCALE (11x17): 1" = 6'–0"
SCALE (22x34): 1" = 3'–0"

NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

ELECTRICAL NOTES:
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES.
2. GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL AT&T SERVICE DISCONNECTS WITH SWITCH AND PANEL WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 5 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY AT&TS REPRESENTATIVE.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO AT&T REPRESENTATIVE.
11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO AN AT&T REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY AN AT&T REPRESENTATIVE.
16. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
17. PROJECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE A SITE "PUNCH LIST" WALK TO AT&T'S REPRESENTATIVE.
22. ALL ABOVE GRADE CONDUIT TO BE RIGID METALLIC.

GROUNDING NOTES:
1. ALL DOWN CONDUCTORS AND GROUND RING AND CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE R FOUNDATION, WHICHEVER IS HIGHER. COLD-GALY AFTER. EXOTHERMICALLY WELD OTHER END TO THE GROUND.
4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN ¾" PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
8. UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH AT&T'S SSEQ DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
10. RESISTANCE TO EARTH TESTING IS REQUIRED PER AT&T STANDARDS ON ALL NEW SITES.

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
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NORFOLK, CT 06058

Prepared For:
CENTERLINE COMMUNICATIONS

Drawing Scale:
AS NOTED

Date:
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Drawing Title
EQUIPMENT SITE PLAN

Drawing Number
C4

NOTE:

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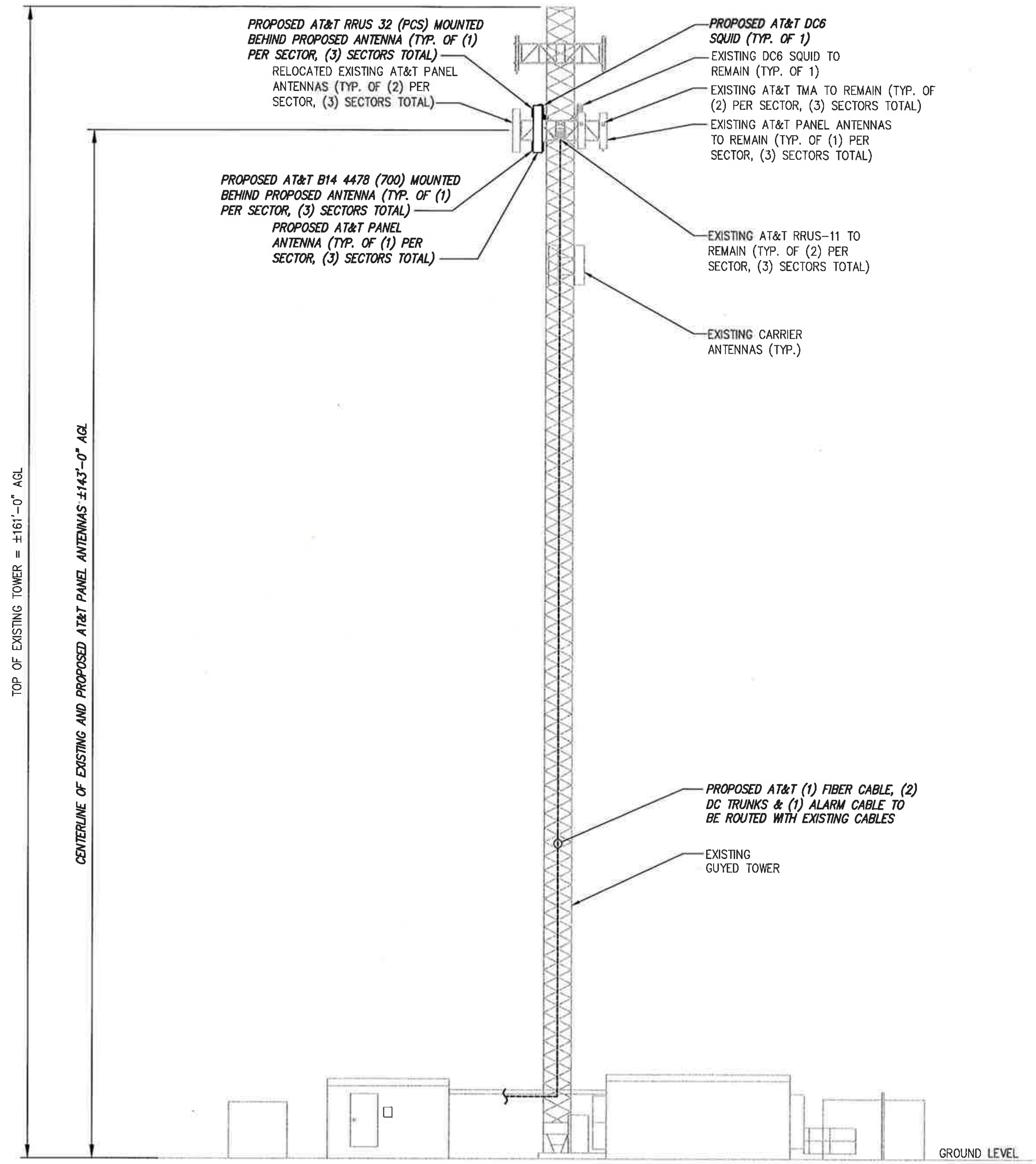
- *AT&T MOUNTS ARE PENDING MOUNT MODIFICATION DESIGN*

NOTE:

- 3' MINIMUM SEPARATION BETWEEN ALL LTE ANTENNAS
- 6' MINIMUM SEPARATION BETWEEN 700 BC/700 DE ANTENNAS



1 ELEVATION VIEW
NOT TO SCALE

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INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
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at&t

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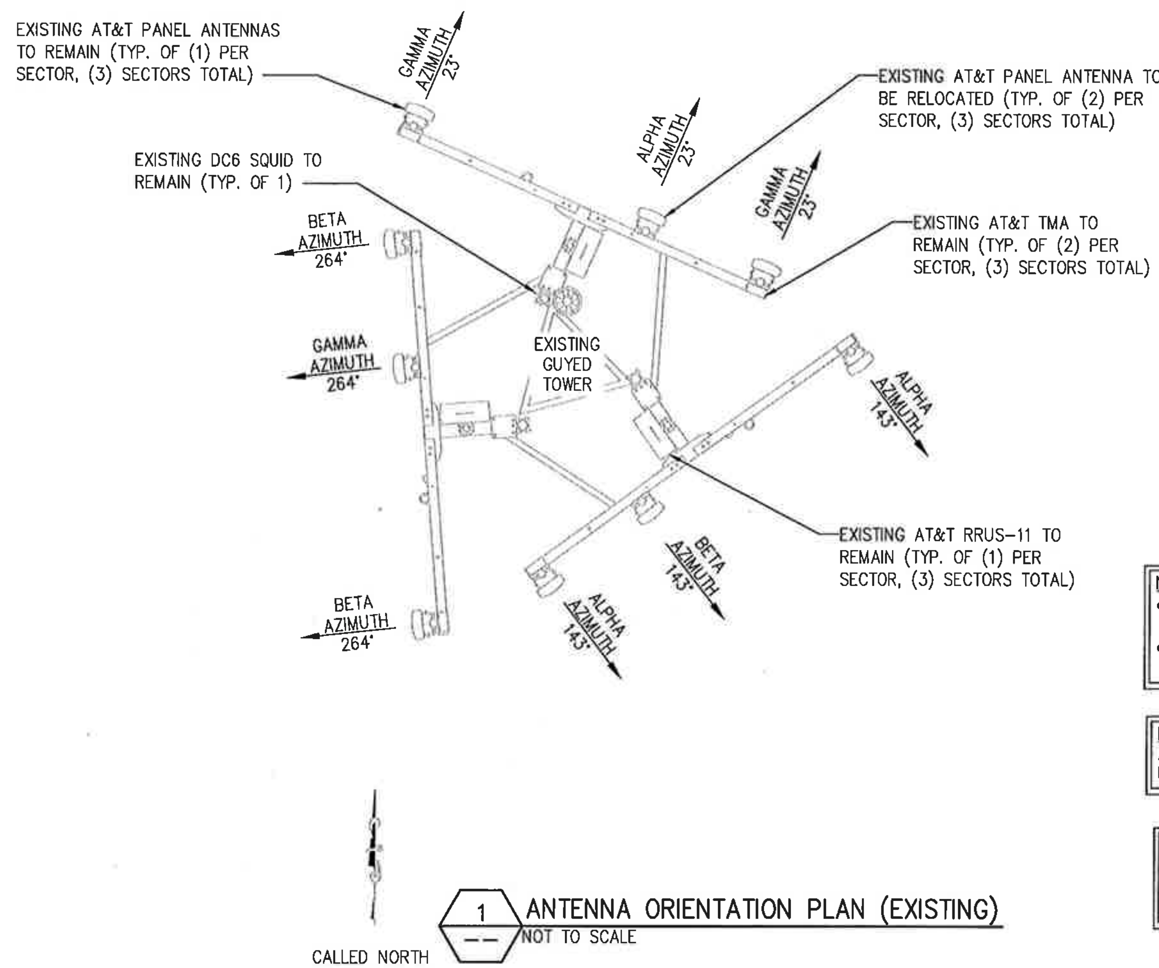
Drawing Title

ELEVATION VIEW

Drawing Number

C5

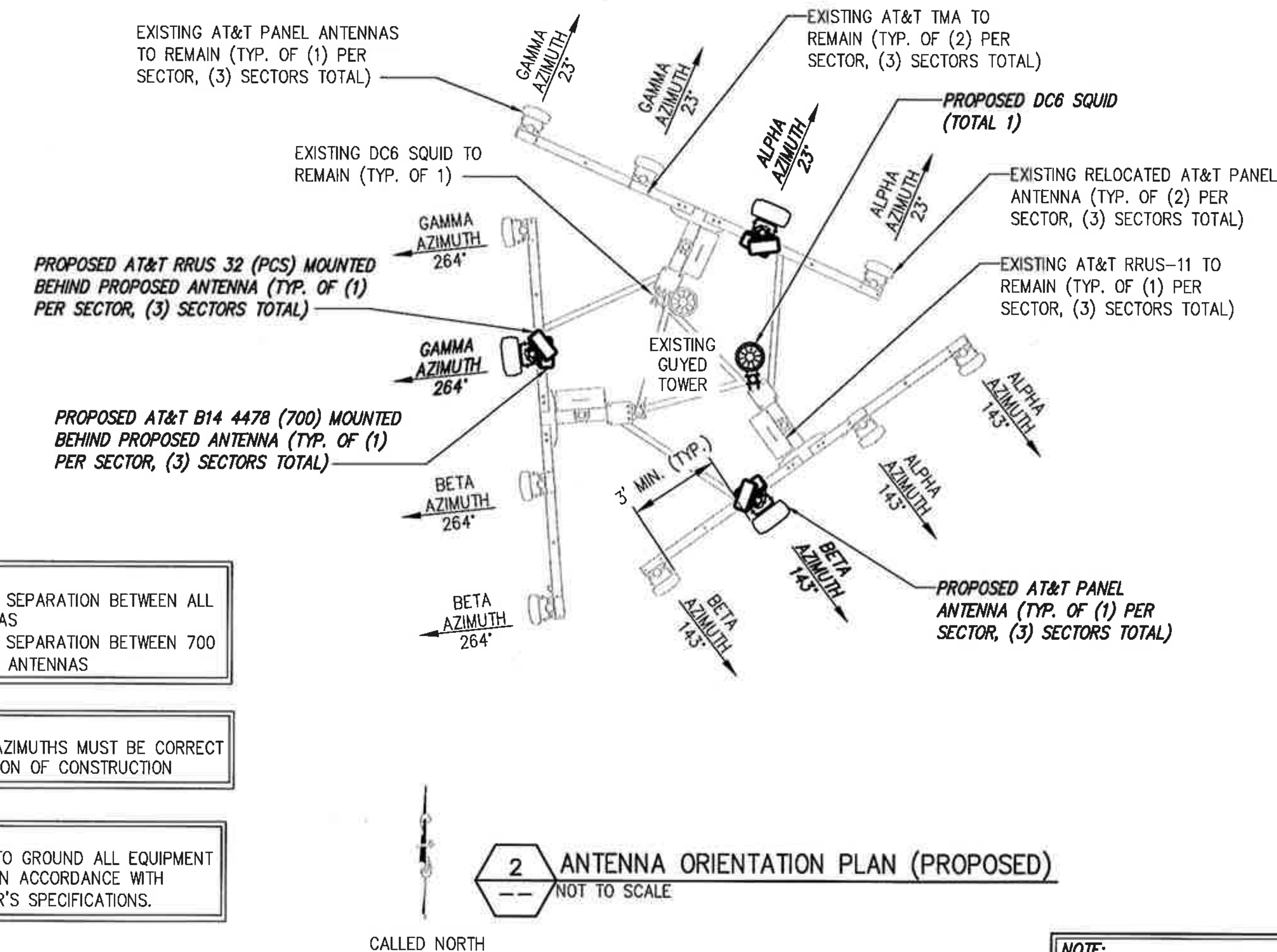


1 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

NOTE:
- 3' MINIMUM SEPARATION BETWEEN ALL LTE ANTENNAS
- 6' MINIMUM SEPARATION BETWEEN 700 BC/700 DE ANTENNAS

NOTES:
ALL ANTENNA AZIMUTHS MUST BE CORRECT UPON COMPLETION OF CONSTRUCTION

NOTES:
CONTRACTOR TO GROUND ALL EQUIPMENT AND MOUNTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.



2 ANTENNA ORIENTATION PLAN (PROPOSED)
NOT TO SCALE

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- ***AT&T MOUNTS ARE PENDING MOUNT MODIFICATION DESIGN***

EXISTING AND PROPOSED ANTENNA, TMA AND DIPLEXER MODEL NUMBERS

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	ANTENNA ℄ HEIGHT	AZIMUTH	TMA	RRU	FEEDER	RAYCAP
ALPHA	EXISTING	UMTS 850	7770	±143'	143°	(1) (E) TT19-08BP111-001	--	(2) 1-5/8 COAX	|
	EXISTING	GSM	7770	±143'	143°	(1) (E) TT19-08BP111-001	--	(2) 1-5/8 COAX	|
	PROPOSED	***LTE 700/1900***	***800 10965***	***±143'***	***23°***	--	***(P) (1) B14 700 (P) (1) RRUS 32 B2 (PCS)***	--	(1) (E) DC6 SQUID ***(1) (P) DC6 SQUID***
	EXISTING	LTE 700/AWS	AM-X-CD-16-65-00T-RET	±143'	23°	--	(E) (1) RRUS-11	--	
BETA	EXISTING	UMTS 850	7770	±143'	264°	(1) (E) TT19-08BP111-001	--	(2) 1-5/8 COAX	|
	EXISTING	GSM	7770	±143'	264°	(1) (E) TT19-08BP111-001	--	--	|
	PROPOSED	***LTE 700/1900***	***800 10965***	***±143'***	***143°***	--	***(P) (1) B14 700 (P) (1) RRUS 32 B2 (PCS)***	--	SHARED WITH ALPHA SECTOR
	EXISTING	LTE 700/AWS	AM-X-CD-16-65-00T-RET	±143'	143°	--	(E) (1) RRUS-11	--	
GAMMA	EXISTING	UMTS 850	7770	±143'	23°	(1) (E) TT19-08BP111-001	--	(2) 1-5/8 COAX	|
	EXISTING	GSM	7770	±143'	23°	(1) (E) TT19-08BP111-001	--	--	|
	PROPOSED	***LTE 700/1900***	***800 10965***	***±143'***	***264°***	--	***(P) (1) B14 700 (P) (1) RRUS 32 B2 (PCS)***	--	SHARED WITH ALPHA SECTOR
	EXISTING	LTE 700/AWS	AM-X-CD-16-65-00T-RET	±143'	264°	--	(E) (1) RRUS-11	--	

PROPOSED RRU AND CABLE SCHEDULE

SECTOR	FIBER TRUNK	SINGLE FIBER	DC 3-PAIR	DC 1-PAIR	RRU'S
ALPHA	***(1), 18P, ±155'****	***(4) 5 METER***	***(2) #8 AWG, ±155'****	***(4) #8 AWG, 15'***	(E) (1) RRUS-11 (P) (1) B14 (700) (P) (1) 32 B2 (PCS)
BETA		***(4) 5 METER***		***(4) #8 AWG, 15'***	(E) (1) RRUS-11 (P) (1) B14 (700) (P) (1) 32 B2 (PCS)
GAMMA		***(4) 5 METER***		***(4) #8 AWG, 15'***	(E) (1) RRUS-11 (P) (1) B14 (700) (P) (1) 32 B2 (PCS)

***** CABLE LENGTH FROM RFDS, CONTRACTOR TO VERIFY PRIOR TO ORDERING***

3 RF EQUIPMENT SCHEDULE
NOT TO SCALE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 31205
LICENSED PROFESSIONAL ENGINEER
JUL 30 2018

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Drawn: RCD Date: 12/14/17
Designed: ASW Date: 12/14/17
Checked: ASW Date: 12/14/17

Project Number: 555-022

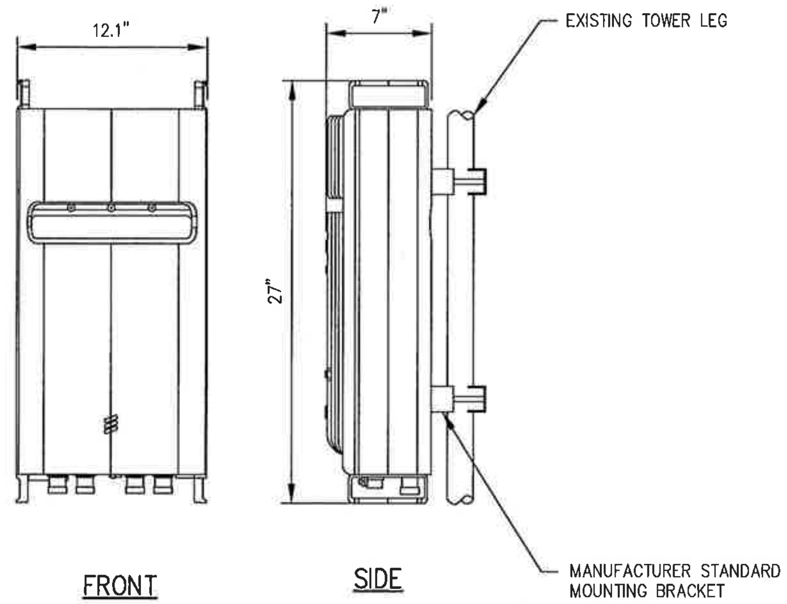
Project Title:
FA# 10035022
CT1006
NORFOLK - LOON MEADOW ROAD
453 LOON MEADOW ROAD
NORFOLK, CT 06058

Prepared For:
CENTERLINE COMMUNICATIONS

Drawing Scale: AS NOTED
Date: 07/30/18

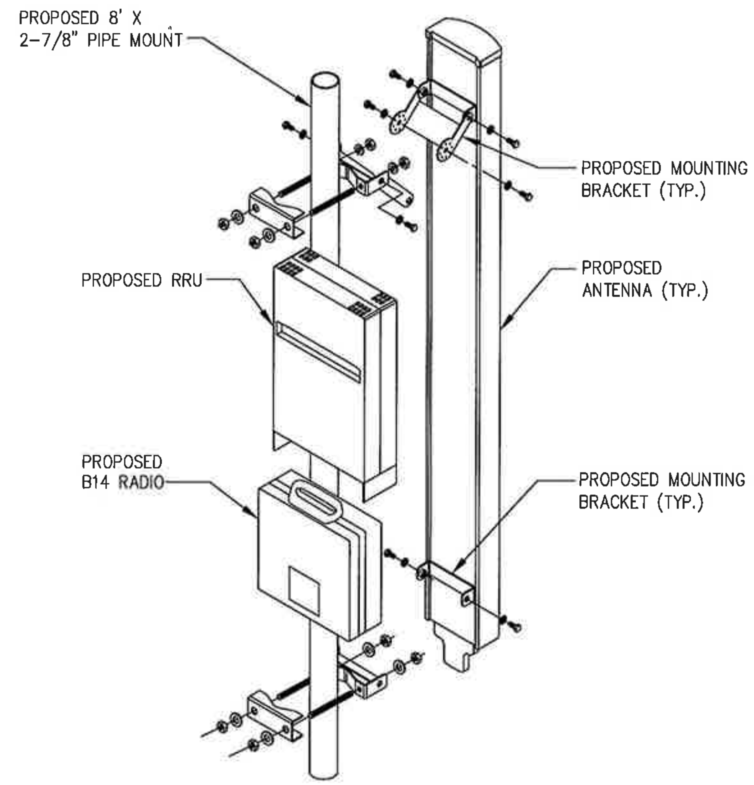
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C6

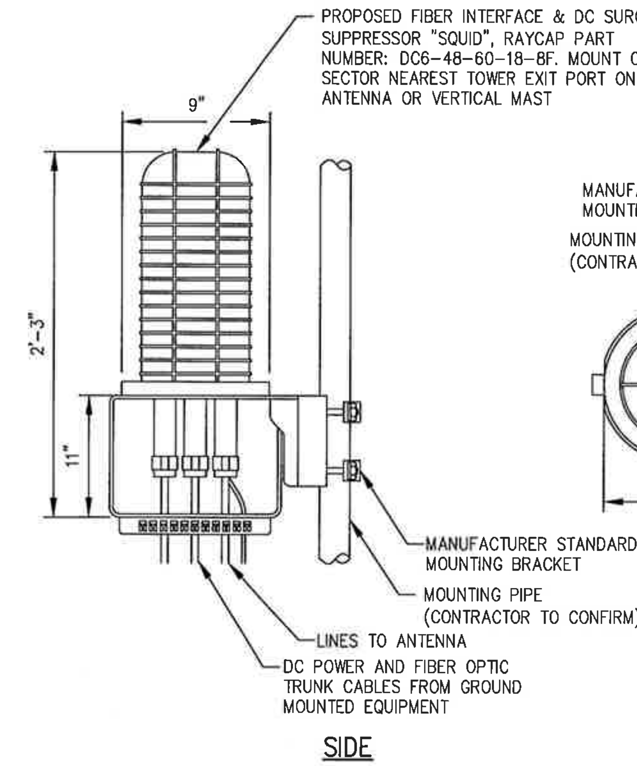


RRUS-32 SPECIFICATIONS
• HXWXD, (INCHES) : 27.2"x12.1"x7"
• WEIGHT (LBS) : 53
• COLOR : GRAY

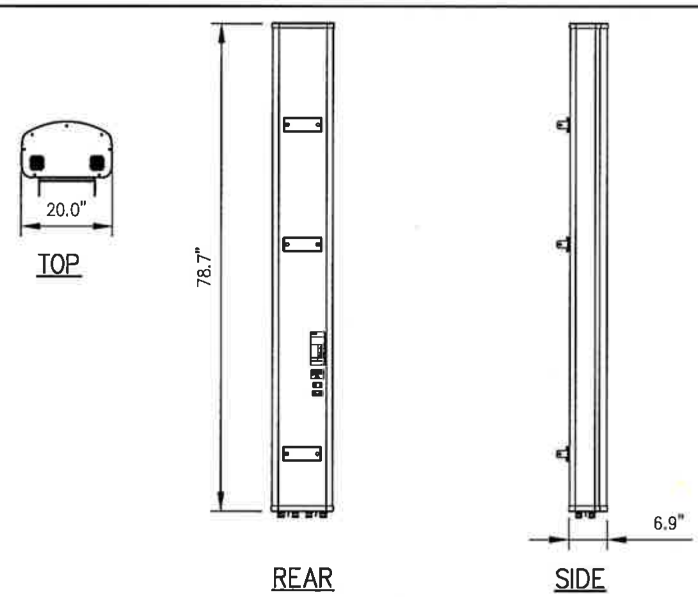
1 — RRUS-32 DETAIL
NOT TO SCALE



2 — MOUNTING DETAIL
NOT TO SCALE

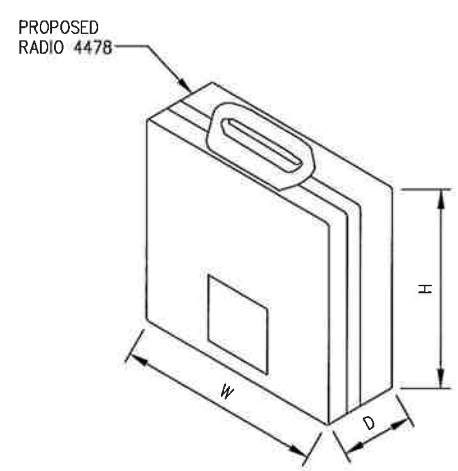


3 — SQUID DETAIL
NOT TO SCALE



KATHREIN MODEL NO.:	800-10965
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	78.7"x20.0"x6.9" (1998 x 508 x 175 mm)
WEIGHT, W/ PRE-MOUNTED BRACKETS:	108.6 LBS
CONNECTOR:	(6) 7-16 DIN FEMALE

4 — ANTENNA DETAIL
NOT TO SCALE



RADIO 4478 SPECIFICATIONS
• HXWXD, (INCHES) : TBD
• WEIGHT (LBS) : 59.5
• COLOR : GRAY

5 — ERICSSON RADIO 4478 DETAIL
NOT TO SCALE

6 — DETAIL NOT USED
NOT TO SCALE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
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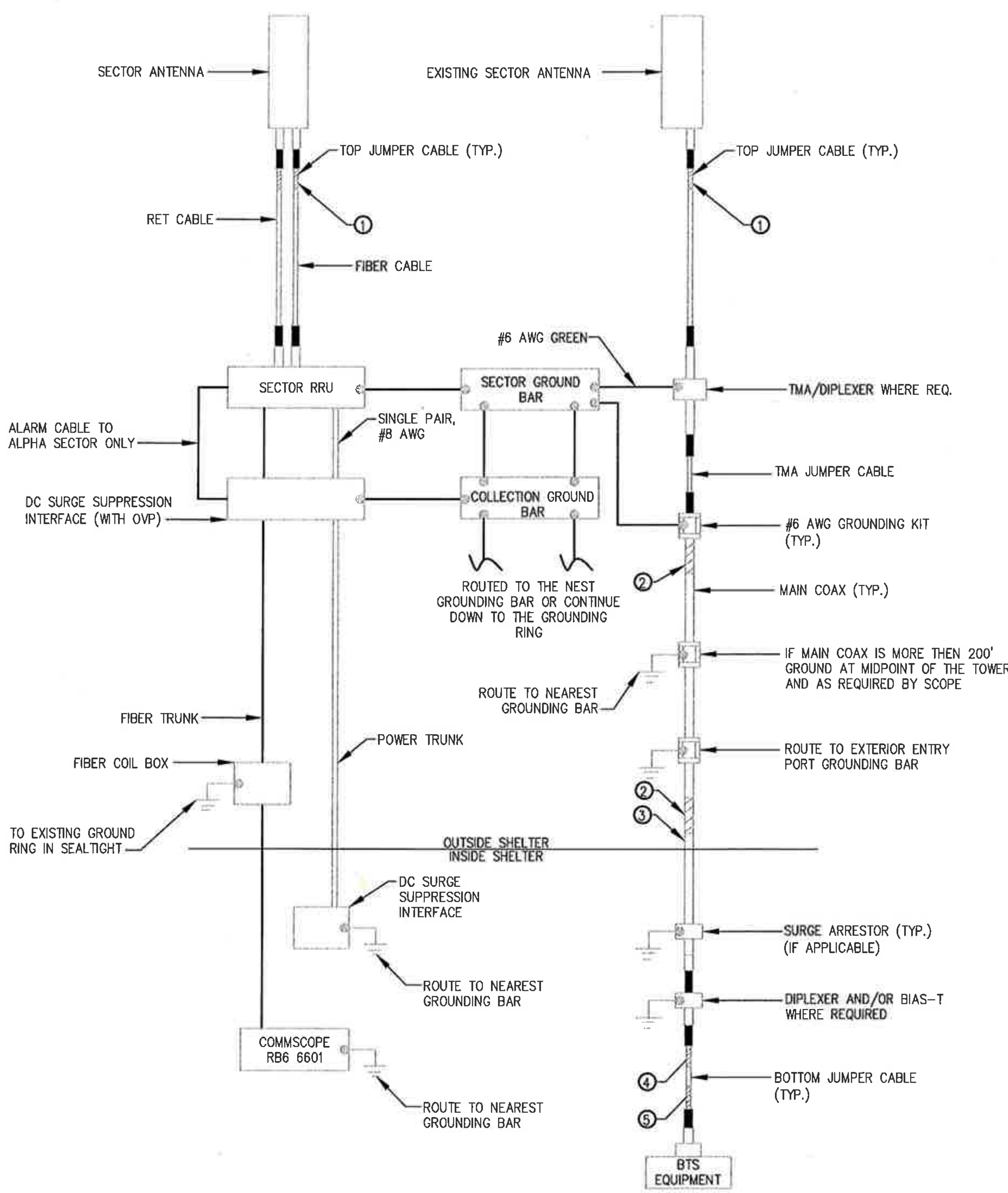
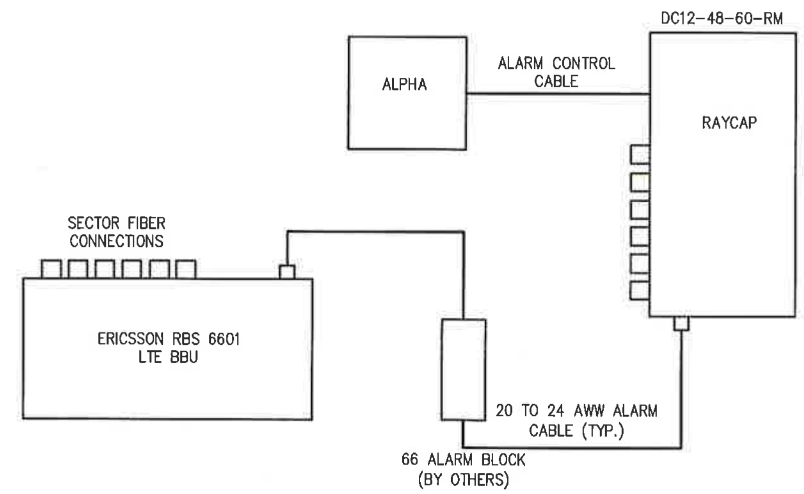
C7

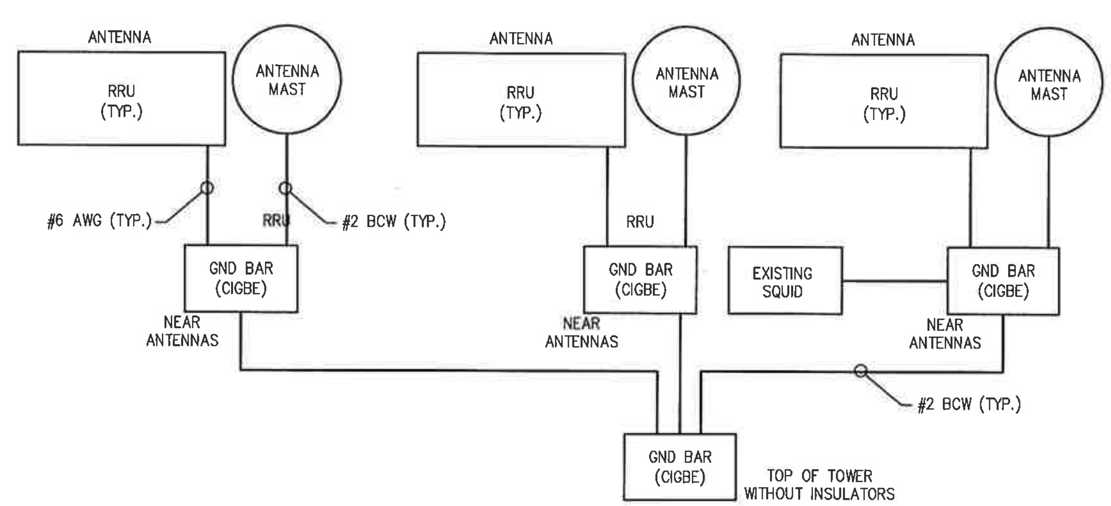
CABLE MARKING LOCATIONS TABLE	
NO.	LOCATIONS
①	EACH TOP JUMPER SHALL BE COLOR CODED WITH ONE (1) SET OF 3" WIDE BANDS
②	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP OF THE JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING
③	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER
④	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER
⑤	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER



1 CABLE MARKING LOCATIONS DIAGRAM
SCALE: NOT TO SCALE



2 ALARM BLOCK CONNECTIONS
SCALE: NOT TO SCALE



3 SCHEMATIC DIAGRAM GROUNDING SYSTEM
SCALE: NOT TO SCALE

COAX COLOR CODING & IDENTIFICATION NOTES:

1. SECTOR ORIENTATION/ AZIMUTH WILL VARY FROM REGION AND IS SITE SPECIFIC. REFER TO RF REPORT FOR EACH SITE TO DETERMINE THE ANTENNA LOCATION AND FUNCTION OF EACH TOWER SECTOR FACE.
2. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE EXCEPT IN LOCATIONS WHERE ENVIRONMENTAL CONDITIONS CAUSE PHYSICAL DAMAGE, THEN PHYSICAL TAGS ARE PREFERRED.
3. THE STANDARD IS BASED ON EIGHT COLORED TAPES– RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE AND VIOLET. THESE TAPES MUST BE 3/4" WIDE AND UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR SUBCONTRACTOR ON SITE.
4. USING COLOR BANDS ON THE CABLES MARK ALL RF CABLE BY SECTOR AND NUMBER AS SHOWN ON "CABLE MARKING COLOR CONVENTION TABLE".
5. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN GSM/3G TDMA IS ENCOUNTERED, THE SUBCONTRACTOR SHALL REMOVE THE COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING AND TAGGING STANDARD THAT IS OUTLINED IN THE CURRENT VERSION OF THE STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
6. ALL COLOR CODE TAPE SHALL BE 3M–35 AND SHALL BE A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID ANY UNRAVELING.
7. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM IF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE IN BETWEEN EACH COLOR.
8. ALL COLOR CODES SHALL BE INSTALLED AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE TO SIDE.
9. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE GSM TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING TAGS:

WHEN USING THE ALTERNATIVE LABELING METHOD, EACH RF CABLE SHALL BE IDENTIFIED WITH A METAL ID TAG MADE OF STAINLESS STEEL OR BRASS. THE TAG SHALL BE 1' 1-1/2" IN DIAMETER WITH ¼" STAMPED LETTERS AND NUMBERS INDICATING THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER. THE ID MARKING LOCATIONS SHOULD BE AS PER "CABLE MARKING LOCATIONS TABLE". THE TAG SHOULD BE ATTACHED WITH CORROSION PROOF WIRE AROUND THE CABLE AT THE SAME LOCATIONS AS DEFINED ABOVE. THE TAG SHOULD BE LABELED AS SHOWN ON THE "GSM AND UMTS LINE TAG" DETAIL.

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

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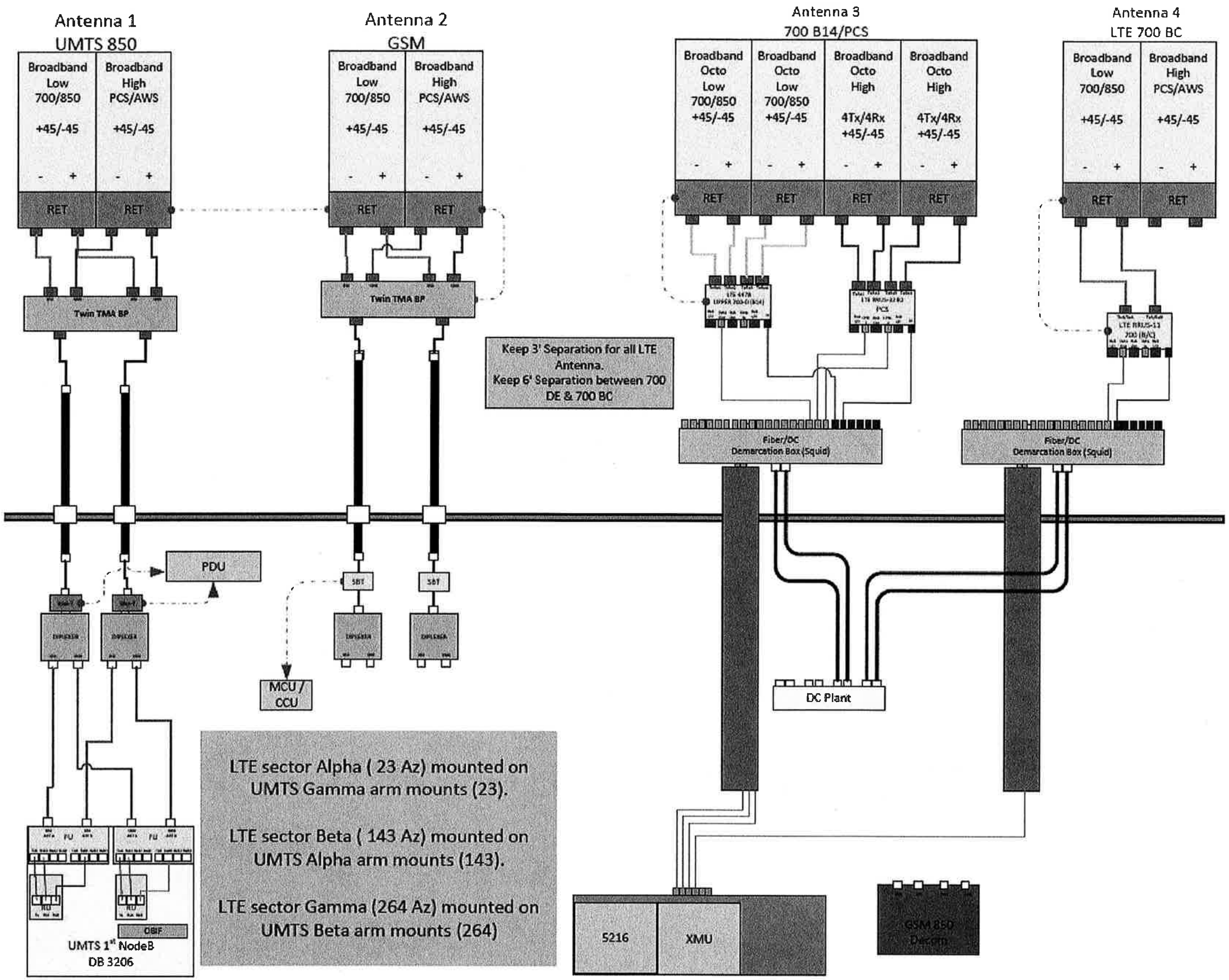
Drawing Title
SCHEMATICS, DIAGRAMS & NOTES

Drawing Number
C8



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

CONTRACTOR TO REFER TO LATEST RFDS PROVIDED BY AT&T FOR FINAL CONFIGURATION.

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1033 Watervliet Shaker Rd
Albany, NY 12205
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at&t

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No. 24705
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Drawing Title
PLUMBING DIAGRAM

Drawing Number
C9