EMPIRE telecom
A QualTek Company

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

January 29, 2018

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

NOTICE OF EXEMPT MODIFICATION

60 Industrial Park Road, Vernon, CT 06066

Lat: 41-50-08.21 (41.83561389)
Long. 72-27-17.64 (-72.4549)

Dear Ms. Bachman:

AT&T Wireless currently maintains six (6) antennas on "T" type mounts at the 168-foot level of an existing 175-foot monopole tower located at 60 Industrial Park Road, in Vernon, CT. The tower is owned by the Millenicom, LLC. The property is owned by Lily Max Jack, LLC. AT&T Wireless now seeks to replace three (3) antennas, install three (3) additional antennas, remove three (3) existing Remote Radio Units ("RRU") and install nine (9) new RRUs, and install one (1) new suppression dome behind the Gamma sector antennas, all to be mounted on a proposed new platform at the 168-foot level of the tower. In addition, the applicant intends to install one (1) XMU to the outdoor equipment cabinet and install two (2) new power cables.

The facility was approved by the Connecticut Siting Council in Em-AT&T-146-140114 on February 7, 2014. Five (5) conditions were enumerated in the Council's decision: 1) Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid; 2) Any material changes to the modification as proposed shall require the filing of a new notice with the Council; 3) Within 45 days after the completion of construction the Council shall be notified in writing that the construction has been completed; 4) the validity of the action shall expire one year from the date of the letter; 5) The applicant may file a request an extension of time beyond the one year deadline provided that such a request is submitted to the Council not less than 60 days prior to the expiration.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies section 16-50j-73 for construction that constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2). In accordance with RCSA section 16-50j-73, a copy of this letter and attachments is being sent to

the Honorable Daniel A. Champagne, Mayor of Vernon; Marina Rodriguez, the Vernon Town Planner, as well as to Lily Max Jack, LLC, the property owner, and to Millenicom, LLC, the tower owner.

The planned modifications to the facility fall squarely within those activities expressly provided for in RCSA section 50j-72(b)(2).

1. The proposed modifications will not result in an increase in height of the existing structure.
2. The proposed modifications will not require an 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 will exceed state and local limits.
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.

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

Respectfully submitted,

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Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

Enclosures

cc: Honorable Danial A. Champagne, Mayor of Vernon
Marina Rodriguez, the Vernon Town Planner
Lily Max Jack, LLC, property owner
Millenicom, LLC, tower owner

EMPIRE telecom
A QualTek Company

January 29, 2018

Millenicom, LLC
35 Timber Trail Road
Manchester, CT 06043

RE: AT&T Wireless Modifications to Telecommunication Facility –
60 Industrial Park Road, Vernon, CT 06066

Dear Tower Owner:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains six (6) antennas on at the 168-foot level of an existing 175-foot monopole tower located at 60 Industrial Park Road, in Vernon, CT. The tower is owned by Millenicom, LLC. The property is owned by Lily Max Jack, LLC.

AT&T Wireless now seeks to replace three (3) antennas, install three (3) additional antennas, remove three (3) existing Remote Radio Units ("RRU") and install nine (9) new RRUs, and install one (1) new suppression dome behind the Gamma sector antennas, all to be mounted on a proposed new platform at the 168-foot level of the tower. In addition, the applicant intends to install one (1) XMU to the outdoor equipment cabinet and install two (2) new power cables.

This letter is intended to serve as the required notice to the tower owner. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

10130 Donleigh Drive
Columbia, MD 21046
443-677-0144

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A QualTek Company

The enclosed letter and documents to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

Jack Andrews
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o/b/o AT&T Wireless
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443-677-0144
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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

EMPIRE telecom
A QualTek Company

January 29, 2018

The Honorable Daniel A. Champagne
Vernon Town Hall
Third Floor
14 Park Place, Vernon CT 06268

RE: AT&T Wireless Modifications to Telecommunication Facility –
60 Industrial Park Road, Vernon, CT 06066

Dear Mayor Champagne:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains six (6) antennas on at the 168-foot level of an existing 175-foot monopole tower located at 60 Industrial Park Road, in Vernon, CT. The tower is owned by Millenicom, LLC. The property is owned by Lily Max Jack, LLC.

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This letter is intended to serve as the required notice to the municipality. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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A QualTek Company

January 29, 2018

Lily Max Jack, LLC
60 Industrial Park Rd.
Vernon, CT 06066

RE: AT&T Wireless Modifications to Telecommunication Facility –
60 Industrial Park Road, Vernon, CT 06066

Dear Property Owner:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains six (6) antennas on at the 168-foot level of an existing 175-foot monopole tower located at 60 Industrial Park Road, in Vernon, CT. The tower is owned by Millenicom, LLC. The property is owned by Lily Max Jack, LLC.

AT&T Wireless now seeks to replace three (3) antennas, install three (3) additional antennas, remove three (3) existing Remote Radio Units ("RRU") and install nine (9) new RRUs, and install one (1) new suppression dome behind the Gamma sector antennas, all to be mounted on a proposed new platform at the 168-foot level of the tower. In addition, the applicant intends to install one (1) XMU to the outdoor equipment cabinet and install two (2) new power cables.

This letter is intended to serve as the required notice to the property owner. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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A QualTek Company

January 29, 2018

Marina Rodriguez, Town Planner
Vernon Town Hall
55 West Main Street, 2nd Floor
Vernon, CT 06066

RE: AT&T Wireless Modifications to Telecommunication Facility –
60 Industrial Park Road, Vernon, CT 06066

Dear Ms. Rodriguez:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains six (6) antennas on at the 168-foot level of an existing 175-foot monopole tower located at 60 Industrial Park Road, in Vernon, CT. The tower is owned by the Millenicom, LLC. The property is owned by Lily Max Jack, LLC.

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This letter is intended to serve as the required notice to the municipality's Planning and Zoning Department. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

MASER CONSULTING
— CONNECTICUT —

331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950
www.maserconsulting.com

LTE 3C – MRCTB025594
LET 4C – MRCTB025623
4TXRX RETROFIT – MRCTB025634

Monopole Structural Analysis
Rev 0

Site Name: *Vernon Center*
FA #: *10071292*
Site Number: ***CTL05310***
Site Address: *60 Industrial Park Road*
Vernon Rockville, CT 06066
Tolland County
Maser Project Number: *17963005A*

December 4, 2017

Analysis Type	*Monopole**
Pass/Fail	*Pass*
Utilization	*80.0%*

**Foundation check was not included in this report due to lack of data.*

Petros E. Tsoukalas, P.E.
Connecticut Professional Engineer
PE License # 32577

Objective:

The objective of this report is to determine the capacity of the existing monopole structure at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on November 08, 2017 to verify the existing condition of the structure and to measure the critical structural elements where possible. This structural analysis is only valid for the appurtenances listed in the report. Additionally, Maser Consulting Connecticut has reviewed the following documents in completing this report:

- RFDS 1789144 provided by Smartlink, dated August 16, 2017 for LTE 3C/4C/4TXRX Retrofit scope
- Previous Structural Analysis report, prepared by COM-EX Consultants., Project No. 16069-EMP, dated February 7, 2017.
- Previous Structural Analysis report, prepared by Malouf Engineering INTL., INC., Project No. CT00842M-07V0, dated August 07, 2007
- Previous Construction Drawings, prepared by prepared by COM-EX Consultants., Project No. 16069-EMP, dated May 04, 2017.

The existing **AT&T** equipment is supported on an existing 175' monopole structure. The existing **AT&T** equipment is supported on a proposed Site Pro 1 P/N: QMSP-372 platform at a centerline of approximately 168'-0" above ground level. This report is based upon this information, as well as the information obtained in the field.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing & proposed **AT&T** loading to be as follows:

- **(1) Site Pro 1 P/N: QMSP-372 Platform (Proposed)**
- *(3) Kathrein 80010121 Antennas (Existing)*
- **(3) Quintel QS66512-2 Antennas (Proposed)**
- **(3) CCI HPA-65R-BUU-H6 Antennas (Proposed)**
- *(6) TMAs (Existing)*
- *(3) RRUS 11 (Existing)*
- **(3) RRUS 32 (Proposed)**
- **(3) RRUS 32 B2 (Proposed)**
- **(3) RRUS-4478 B14 (Proposed)**
- *(1) DC6 (Existing)*
- **(1) DC6 (Proposed)**

The overall tower and antenna loading is found in the Appendix A of this report.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, Incorporating The 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Nominal Wind Speed – 96 mph (Ultimate Wind Speed – 124 mph)
    - Ice Wind Speed – 50 mph and Ice thickness – 1.0 in
    - Exposure Category – B
    - Structure Class – II
    - Topographic Category - 1

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing monopole structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

The following assumptions were utilized in this report:

- Existing Monopole section sizes per previous Structural Analysis report prepared by COM-EX Consultants., Project No. 16069-EMP, dated February 7, 2017 was accurate.
- Existing Monopole baseplate and anchor information per previous Structural Analysis report prepared by COM-EX Consultants., Project No. 16069-EMP, dated February 7, 2017 was accurate.
- Existing Monopole foundation is in good condition free of any cracks.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- Proposed equipment and locations should not deviate from the proposed locations noted herein and shown on the associated Maser Consulting Connecticut final Construction Drawings.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing monopole was analyzed for the loading in the applicable codes and standards. The monopole has been determined to be structurally **ADEQUATE** to support the proposed and existing antennas, based upon the aforementioned assumptions.

The monopole has been determined to be stressed to a maximum of **64.5%** of its structural capacity and the baseplate with anchors is stressed to **80.0%** of its structural capacity. Therefore, the proposed **AT&T** installation **CAN** be placed as intended in all sectors, without modifications.

Maser Consulting Connecticut has reviewed the site visit photos about the existing tower foundation above ground level and compared that with previous Structural Analysis report prepared by Malouf Engineering INTL., INC., Project No. CT00842M-07V0, dated August 07, 2007. Based on the comparison, we concluded that the existing tower foundation might have different configuration as provided in the previous Structural Analysis report. Due to lack of actual foundation information and geotechnical data, foundation check was not included in this report. We recommended to perform foundation capacity check upon receiving foundation information and geotechnical data.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
Maser Consulting Connecticut

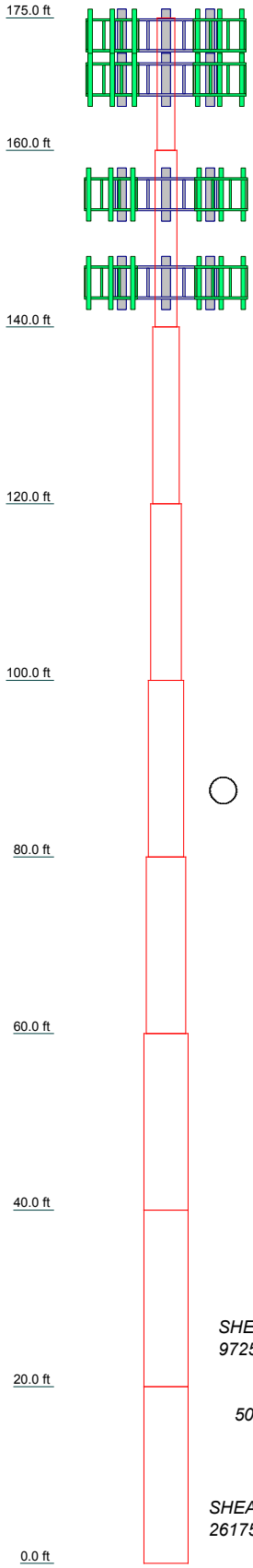
Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Dejian Xu, P.E.
Telecommunications Project Engineer

R:\Projects\2017\17963000A\17963005A\Structural\Monopole Analysis\Rev 0\Word\10071292.CTL5310.Vernon Center.Monopole Analysis.Rev 0.Word.doc

APPENDIX A

Section	Size	Length (ft)	Grade	Weight (lb)
1	P24x3/8	15.00	A53-B-42	1491.7
2	P30x3/8	20.00		2494.0
3	P36x3/8	20.00		2999.1
4	P42x3/8	20.00		3504.2
5	P48x3/8	20.00		4009.3
6	P54x3/8	20.00		4514.4
7	P60x3/8	20.00		5019.5
8	P60x1/2	20.00		6678.7
9	P60x5/8	20.00		8330.8
				39041.8



ALL REACTIONS ARE FACTORED

AXIAL 112276 lb

SHEAR 9725 lb *MOMENT 1236 kip-ft*

TORQUE 0 kip-ft

50 mph WIND - 1.0000 in ICE

AXIAL 64411 lb

SHEAR 26175 lb *MOMENT 3175 kip-ft*

TORQUE 0 kip-ft

REACTIONS - 96 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
RR90-17-02DP	173	RRUS-11 B12	168
Low Platform	173	(2) TMA	168
Kathrein 80010121 w/6ft 2.0 Std pipe	168	(2) TMA	168
Kathrein 80010121 w/6ft 2.0 Std pipe	168	(2) TMA	168
Kathrein 80010121 w/6ft 2.0 Std pipe	168	DC6 Dome	168
Quintel QS66512-2 w/m pipe	168	DC6 Dome	168
Quintel QS66512-2 w/m pipe	168	RRUS 32	168
Quintel QS66512-2 w/m pipe	168	RRUS 32	168
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	168	RRUS 32	168
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	168	RRU-4478-B14	168
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	168	RRU-4478-B14	168
RRUS 32 B2	168	RRU-4478-B14	168
RRUS 32 B2	168	Platform Mount	168
RRUS 32 B2	168	15FT LOW PROFILE PLATFORM	155
RRUS-11 B12	168	DB948F85T2E-M PANELS	155
RRUS-11 B12	168	WPA-80090/4CF PANELS	155
		DB844H90 PANELS	145
		15FT LOW PROFILE PLATFORM	145

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 80%

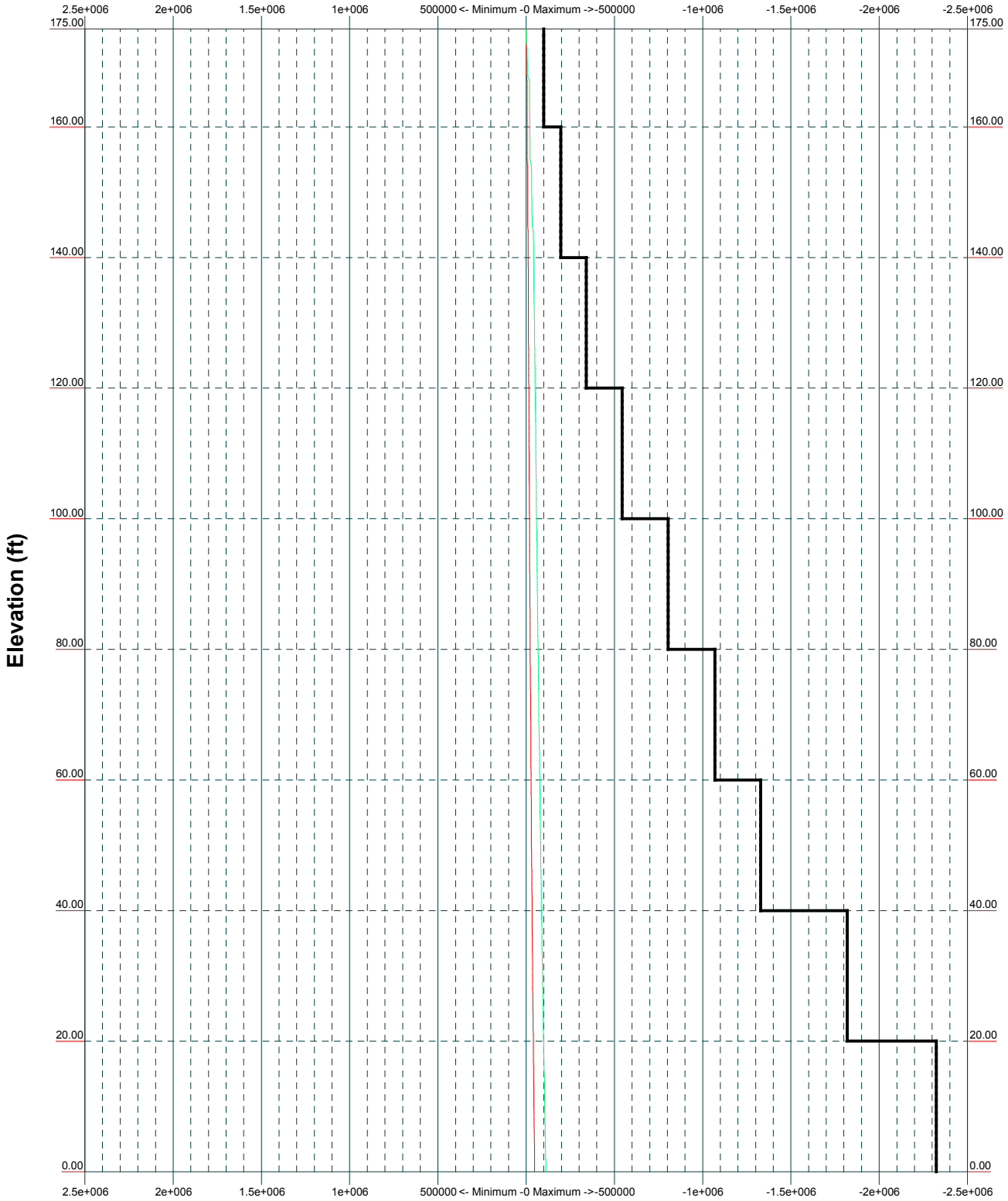
MASER CONSULTING P.A.
Consulting Engineers

Maser Consulting P.A.
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX: (856) 722-1120

Job: ***CTL05310***			
Project: ***17963005A***			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. E-1

TIA-222-G - 96 mph/50 mph 1.0000 in Ice Exposure B

Leg Capacity ——— **Leg Compression (lb)**



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Consulting Engineers

Job: CTL05310			
Project: 17963005A			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. E-3

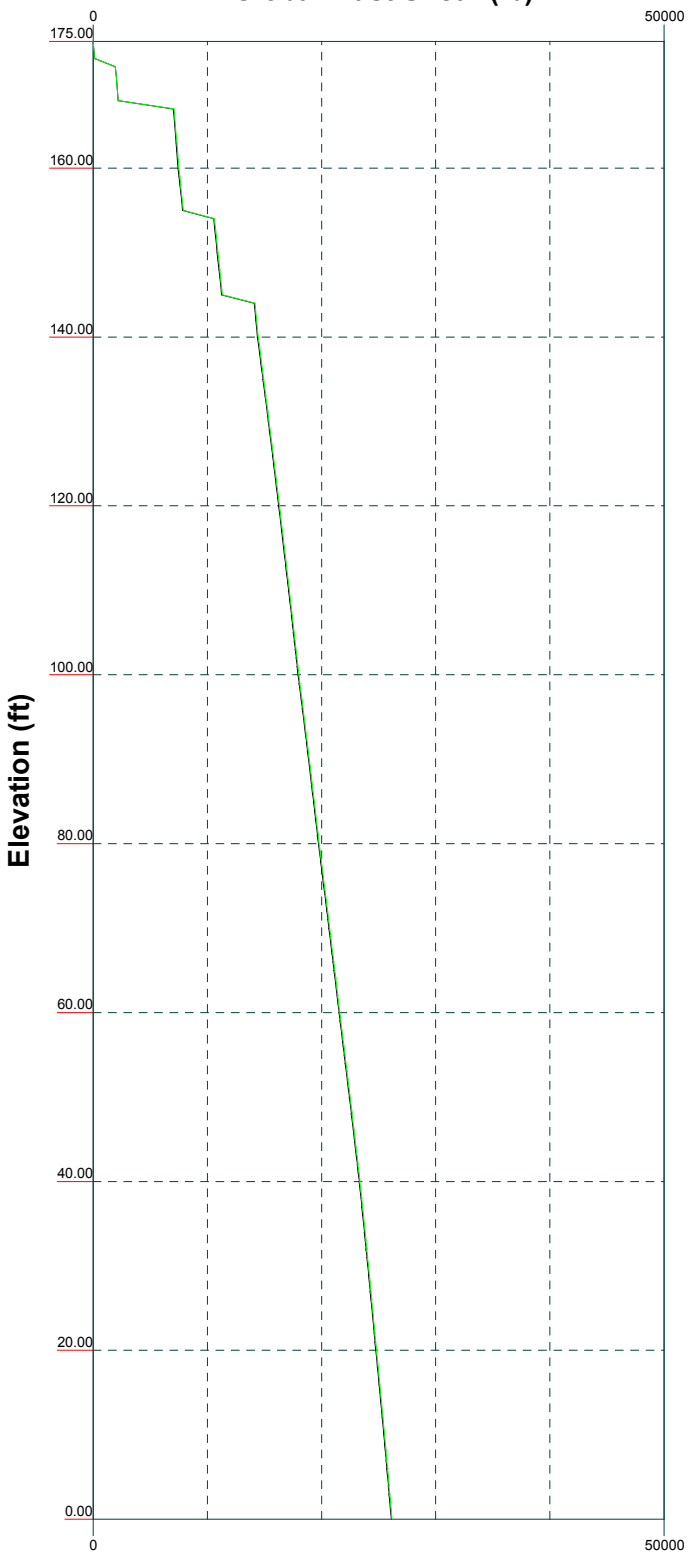
TIA-222-G - 96 mph/50 mph 1.0000 in Ice Exposure B

Vx Vz

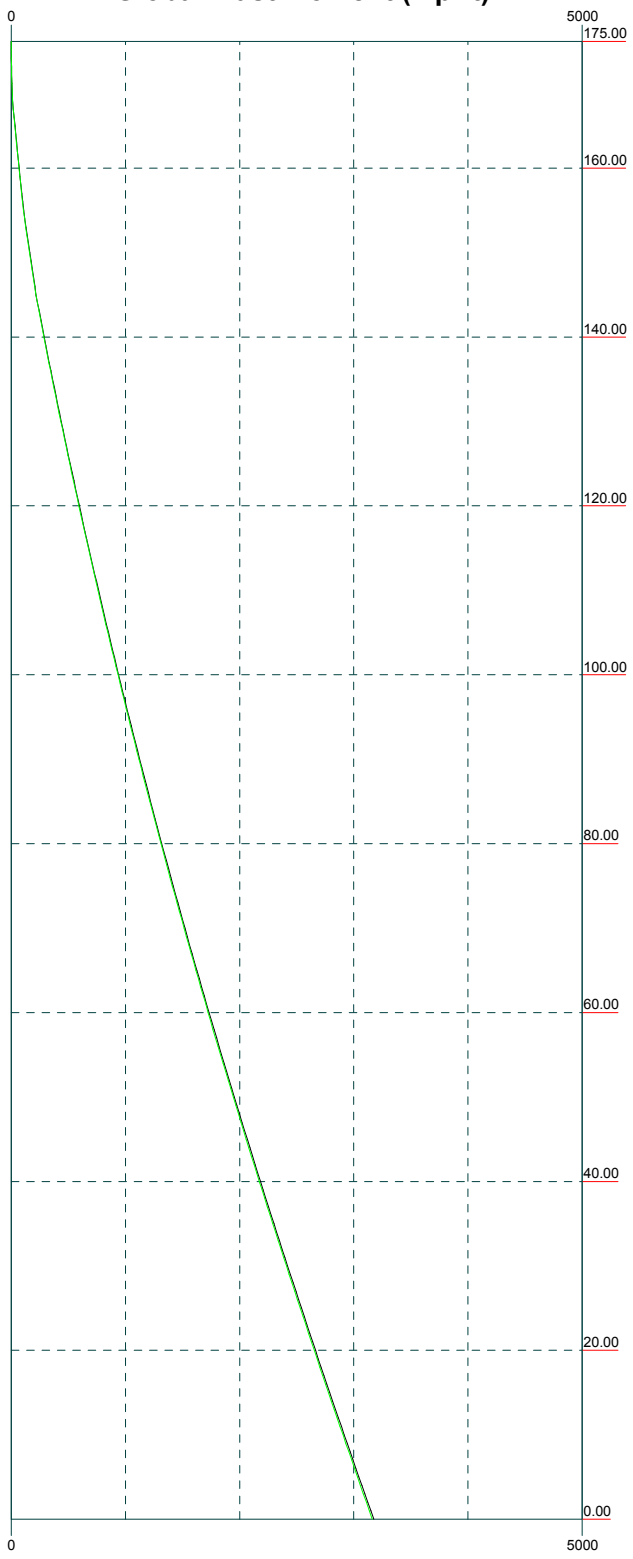
Maximum Values

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (kip-ft)



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Phone: (856) 797-0412
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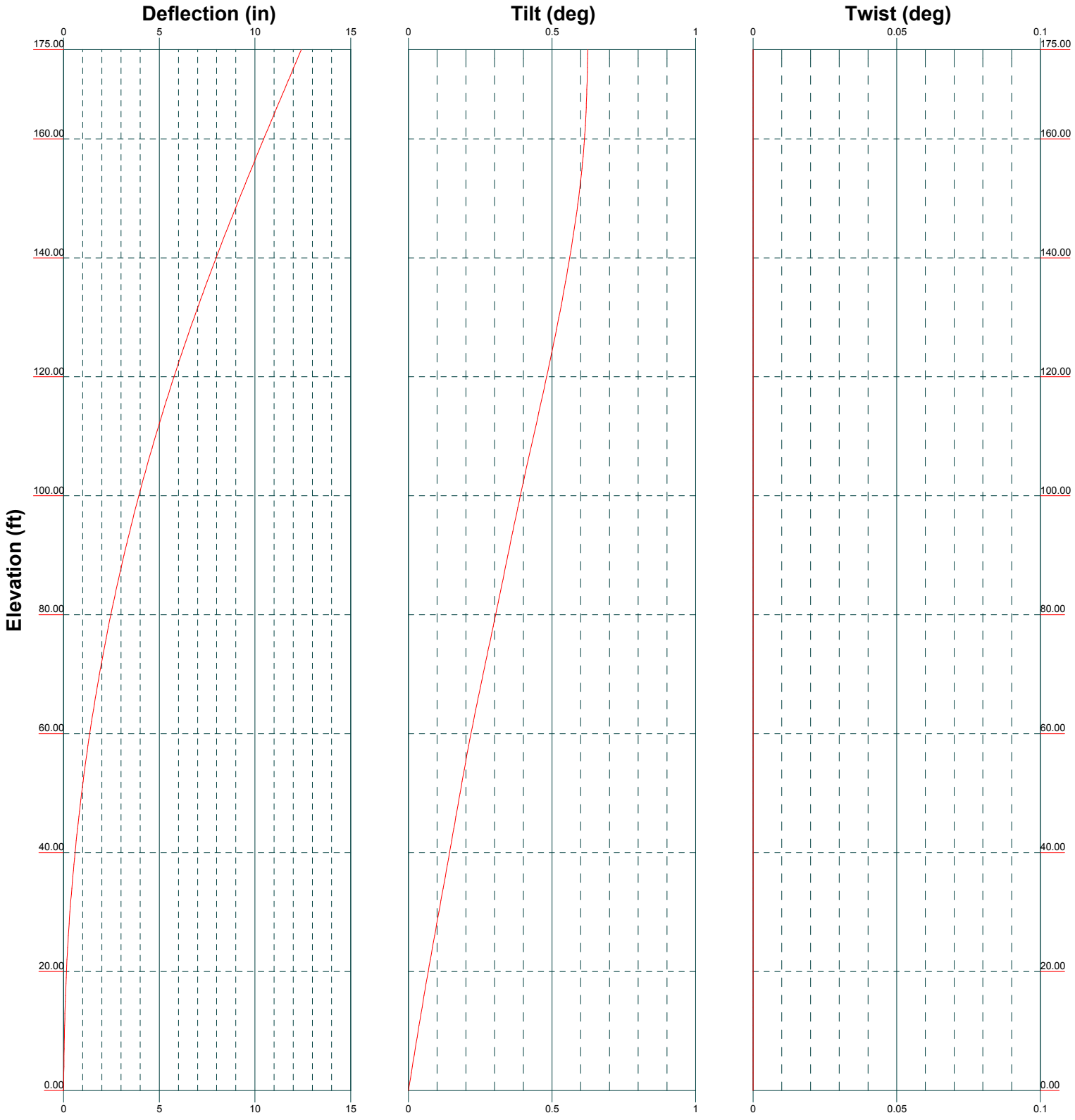
Job: ***CTL05310***			
Project: ***17963005A***			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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Consulting Engineers

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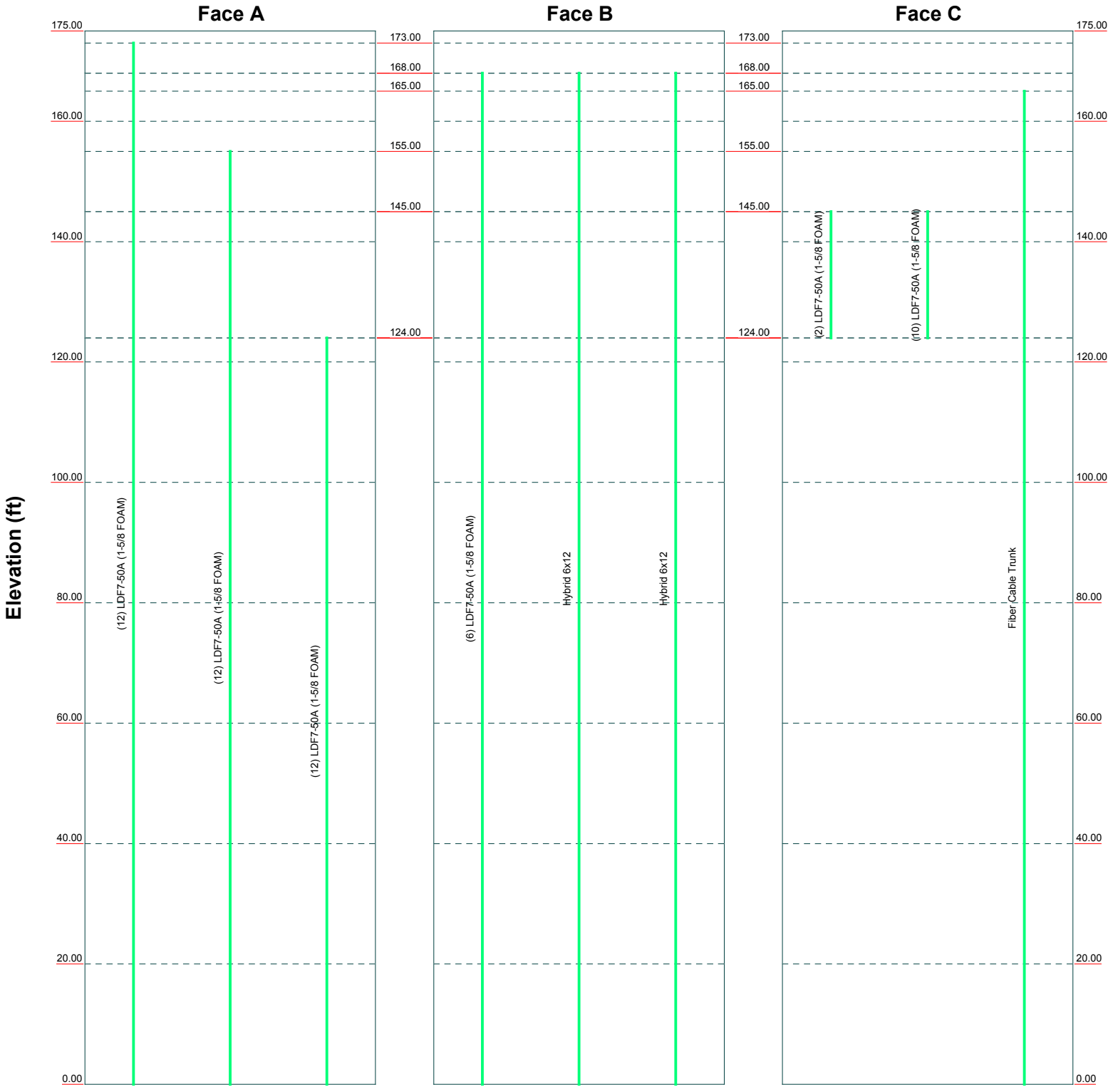
Project: 17963005A			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 175'

Round | Flat | App In Face | App Out Face | Truss Leg



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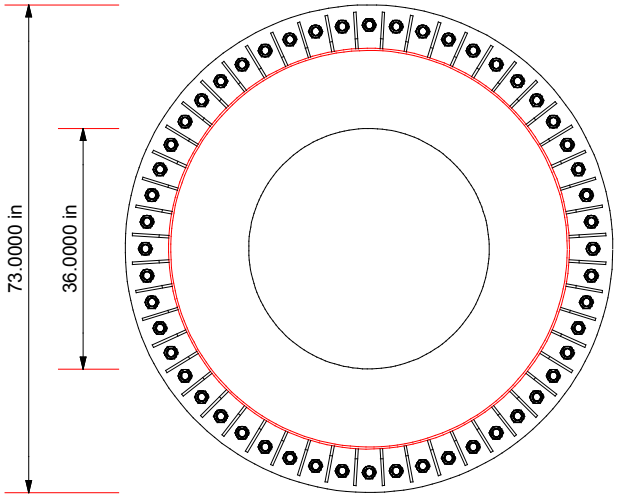
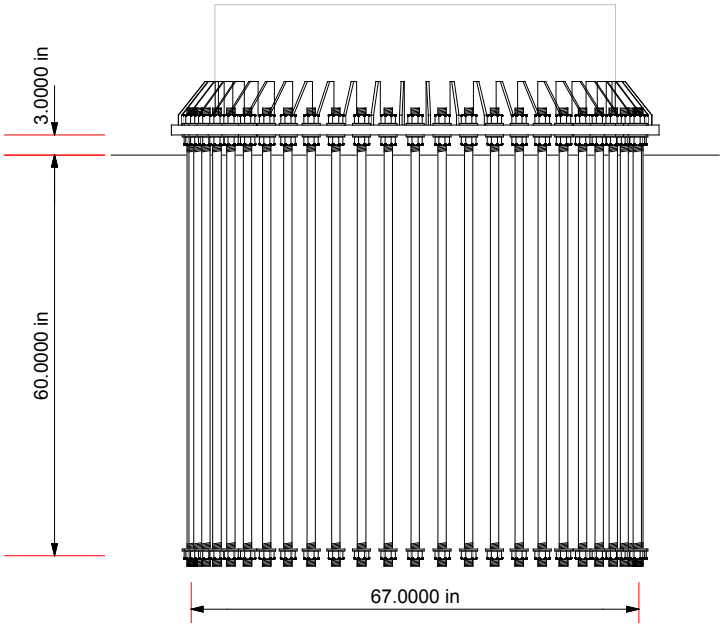
Job: ***CTL05310***			
Project: ***17963005A***			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. E-7





FOUNDATION NOTES

1. Plate thickness is 1.5000 in.
2. Plate grade is A36.
3. Anchor bolt grade is A615-75.
4. f'c is 3 ksi.

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Job: ***CTL05310***			
Project: ***17963005A***			
Client: Smartlink, LLC.	Drawn by: dxu		App'd:
Code: TIA-222-G	Date: 12/04/17		Scale: NTS
Path:			Dwg No. F-1

Tower Input Data

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

Tower is located in Tolland County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 96 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals		Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	175.00-160.00	15.00	P24x3/8	A53-B-42 (42 ksi)	
L2	160.00-140.00	20.00	P30x3/8	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
				(42 ksi)	
L3	140.00-120.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L4	120.00-100.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L5	100.00-80.00	20.00	P48x3/8	A53-B-42 (42 ksi)	
L6	80.00-60.00	20.00	P54x3/8	A53-B-42 (42 ksi)	
L7	60.00-40.00	20.00	P60x3/8	A53-B-42 (42 ksi)	
L8	40.00-20.00	20.00	P60x1/2	A53-B-42 (42 ksi)	
L9	20.00-0.00	20.00	P60x5/8	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 175.00-160.00				1	1	1.05			
L2 160.00-140.00				1	1	1.05			
L3 140.00-120.00				1	1	1.05			
L4 120.00-100.00				1	1	1.05			
L5 100.00-80.00				1	1	1.05			
L6 80.00-60.00				1	1	1.05			
L7 60.00-40.00				1	1	1.05			
L8 40.00-20.00				1	1	1.05			
L9 20.00-0.00				1	1	1.05			

Monopole Base Plate Data

Base Plate Data

Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	1.2500 in
Number of bolts	52
Embedment length	60.0000 in
f'_c	3 ksi
Grout space	3.0000 in
Base plate grade	A36
Base plate thickness	1.5000 in
Bolt circle diameter	67.0000 in
Outer diameter	73.0000 in
Inner diameter	36.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1

Base Plate Data	
Stiffener thickness	0.3750 in
Stiffener height	6.5000 in

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	173.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	155.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	124.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	145.00 - 124.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
LDF7-50A (1-5/8 FOAM)	C	No	CaAa (Out Of Face)	145.00 - 124.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
Fiber Cable Trunk	C	No	Inside Pole	165.00 - 0.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
**********								
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	168.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
Hybrid 6x12	B	No	Inside Pole	168.00 - 0.00	1	No Ice	0.00	1.70
						1/2" Ice	0.00	1.70
						1" Ice	0.00	1.70
Hybrid 6x12	B	No	Inside Pole	168.00 - 0.00	1	No Ice	0.00	1.70
						1/2" Ice	0.00	1.70
						1" Ice	0.00	1.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	175.00-160.00	A	0.000	0.000	0.000	0.000	127.92
		B	0.000	0.000	0.000	0.000	66.56
		C	0.000	0.000	0.000	0.000	5.00
L2	160.00-140.00	A	0.000	0.000	0.000	0.000	344.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	1.980	69.20
L3	140.00-120.00	A	0.000	0.000	0.000	0.000	432.96
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	6.336	177.44
L4	120.00-100.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00
L5	100.00-80.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L6	80.00-60.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00
L7	60.00-40.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00
L8	40.00-20.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00
L9	20.00-0.00	A	0.000	0.000	0.000	0.000	590.40
		B	0.000	0.000	0.000	0.000	166.40
		C	0.000	0.000	0.000	0.000	20.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	175.00-160.00	A	2.353	0.000	0.000	0.000	0.000	127.92
		B		0.000	0.000	0.000	0.000	66.56
		C		0.000	0.000	0.000	0.000	5.00
L2	160.00-140.00	A	2.327	0.000	0.000	0.000	0.000	344.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	6.634	843.95
L3	140.00-120.00	A	2.294	0.000	0.000	0.000	0.000	432.96
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	21.017	2594.77
L4	120.00-100.00	A	2.256	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00
L5	100.00-80.00	A	2.211	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00
L6	80.00-60.00	A	2.156	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00
L7	60.00-40.00	A	2.085	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00
L8	40.00-20.00	A	1.981	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00
L9	20.00-0.00	A	1.775	0.000	0.000	0.000	0.000	590.40
		B		0.000	0.000	0.000	0.000	166.40
		C		0.000	0.000	0.000	0.000	20.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	175.00-160.00	0.0000	0.0000	0.0000	0.0000
L2	160.00-140.00	-0.1237	0.0714	-0.3346	0.1932
L3	140.00-120.00	-0.3722	0.2149	-0.9238	0.5333

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L4	120.00-100.00	0.0000	0.0000	0.0000	0.0000
L5	100.00-80.00	0.0000	0.0000	0.0000	0.0000
L6	80.00-60.00	0.0000	0.0000	0.0000	0.0000
L7	60.00-40.00	0.0000	0.0000	0.0000	0.0000
L8	40.00-20.00	0.0000	0.0000	0.0000	0.0000
L9	20.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RR90-17-02DP	A	None		0.0000	173.00	No Ice	19.00	19.00	81.00
						1/2" Ice	25.30	25.30	375.00
						1" Ice	31.60	31.60	669.00
Low Platform	A	None		0.0000	173.00	No Ice	18.00	18.00	1200.00
						1/2" Ice	25.00	25.00	1765.00
						1" Ice	32.00	32.00	2330.00
DB948F85T2E-M PANELS	C	None		0.0000	155.00	No Ice	15.21	15.21	51.00
						1/2" Ice	20.70	20.70	294.00
						1" Ice	26.19	26.19	537.00
WPA-80090/4CF PANELS	C	None		0.0000	155.00	No Ice	20.72	20.72	72.00
						1/2" Ice	26.26	26.26	424.00
						1" Ice	31.80	31.80	776.00
15FT LOW PROFILE PLATFORM	C	None		0.0000	155.00	No Ice	22.00	22.00	1500.00
						1/2" Ice	30.00	30.00	2030.00
						1" Ice	38.00	38.00	2560.00
DB844H90 PANELS	A	None		0.0000	145.00	No Ice	40.06	40.06	168.00
						1/2" Ice	51.23	51.23	838.00
						1" Ice	62.40	62.40	1508.00
15FT LOW PROFILE PLATFORM	A	None		0.0000	145.00	No Ice	22.00	22.00	1500.00
						1/2" Ice	30.00	30.00	2030.00
						1" Ice	38.00	38.00	2560.00
**********									
Kathrein 80010121 w/6ft 2.0 Std pipe	A	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.51 5.98 6.43	4.72 5.56 6.29	68.20 116.99 172.24
Kathrein 80010121 w/6ft 2.0 Std pipe	B	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.51 5.98 6.43	4.72 5.56 6.29	68.20 116.99 172.24
Kathrein 80010121 w/6ft 2.0 Std pipe	C	From Leg	3.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	5.51 5.98 6.43	4.72 5.56 6.29	68.20 116.99 172.24
Quintel QS66512-2 w/m pipe	A	From Leg	3.00 0.00	0.0000	168.00	No Ice 1/2" Ice	8.85 9.61	8.94 10.33	143.85 224.75

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	10.39	11.73	314.20
Quintel QS66512-2 w/m pipe	B	From Leg	3.00	0.0000	168.00	No Ice	8.85	8.94	143.85
			0.00			1/2" Ice	9.61	10.33	224.75
			0.00			1" Ice	10.39	11.73	314.20
Quintel QS66512-2 w/m pipe	C	From Leg	3.00	0.0000	168.00	No Ice	8.85	8.94	143.85
			0.00			1/2" Ice	9.61	10.33	224.75
			0.00			1" Ice	10.39	11.73	314.20
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	A	From Leg	3.00	0.0000	168.00	No Ice	9.72	7.15	101.05
			0.00			1/2" Ice	10.29	8.33	176.87
			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	B	From Leg	3.00	0.0000	168.00	No Ice	9.72	7.15	101.05
			0.00			1/2" Ice	10.29	8.33	176.87
			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	C	From Leg	3.00	0.0000	168.00	No Ice	9.72	7.15	101.05
			0.00			1/2" Ice	10.29	8.33	176.87
			0.00			1" Ice	10.83	9.23	260.86
RRUS 32 B2	A	From Leg	3.00	0.0000	168.00	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17
RRUS 32 B2	B	From Leg	3.00	0.0000	168.00	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17
RRUS 32 B2	C	From Leg	3.00	0.0000	168.00	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17
RRUS-11 B12	A	From Leg	3.00	0.0000	168.00	No Ice	3.33	1.18	50.00
			0.00			1/2" Ice	3.56	1.33	73.59
			0.00			1" Ice	3.79	1.48	100.43
RRUS-11 B12	B	From Leg	3.00	0.0000	168.00	No Ice	3.33	1.18	50.00
			0.00			1/2" Ice	3.56	1.33	73.59
			0.00			1" Ice	3.79	1.48	100.43
RRUS-11 B12	C	From Leg	3.00	0.0000	168.00	No Ice	3.33	1.18	50.00
			0.00			1/2" Ice	3.56	1.33	73.59
			0.00			1" Ice	3.79	1.48	100.43
(2) TMA	A	From Leg	3.00	0.0000	168.00	No Ice	1.00	0.27	15.00
			0.00			1/2" Ice	1.13	0.34	22.78
			0.00			1" Ice	1.27	0.41	32.50
(2) TMA	B	From Leg	3.00	0.0000	168.00	No Ice	1.00	0.27	15.00
			0.00			1/2" Ice	1.13	0.34	22.78
			0.00			1" Ice	1.27	0.41	32.50
(2) TMA	C	From Leg	3.00	0.0000	168.00	No Ice	1.00	0.27	15.00
			0.00			1/2" Ice	1.13	0.34	22.78
			0.00			1" Ice	1.27	0.41	32.50
DC6 Dome	A	From Leg	3.00	0.0000	168.00	No Ice	1.24	1.24	34.00
			0.00			1/2" Ice	1.94	1.94	56.40
			0.00			1" Ice	2.16	2.16	81.70
DC6 Dome	B	From Leg	3.00	0.0000	168.00	No Ice	1.24	1.24	34.00
			0.00			1/2" Ice	1.94	1.94	56.40
			0.00			1" Ice	2.16	2.16	81.70
RRUS 32	A	From Leg	3.00	0.0000	168.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32	B	From Leg	3.00	0.0000	168.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			0.00			1" Ice	3.19	2.05	98.42
RRUS 32	C	From Leg	3.00	0.0000	168.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11

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* (*lb*)
			0.00			1" Ice	3.19	2.05	98.42
RRU-4478-B14	A	From Leg	3.00	0.0000	168.00	No Ice	1.63	1.00	60.00
			0.00			1/2" Ice	1.78	1.13	74.78
			0.00			1" Ice	1.95	1.27	92.08
RRU-4478-B14	A	From Leg	3.00	0.0000	168.00	No Ice	1.63	1.00	60.00
			0.00			1/2" Ice	1.78	1.13	74.78
			0.00			1" Ice	1.95	1.27	92.08
RRU-4478-B14	A	From Leg	3.00	0.0000	168.00	No Ice	1.63	1.00	60.00
			0.00			1/2" Ice	1.78	1.13	74.78
			0.00			1" Ice	1.95	1.27	92.08
Platform Mount	A	None		0.0000	168.00	No Ice	23.10	23.10	2100.00
						1/2" Ice	26.80	26.80	2500.00
						1" Ice	30.50	30.50	2900.00

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	175 - 160	Pole	Max Tension	2	0.01	0.00	-0.00
			Max. Compression	26	-21097.21	-0.59	2.40
			Max. Mx	8	-7824.90	-68.03	0.93
			Max. My	2	-7819.23	-0.13	69.40
			Max. Vy	20	-7438.95	67.75	0.93
			Max. Vx	2	-7509.08	-0.13	69.40
			Max. Torque	22			-0.61
L2	160 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42166.63	0.40	1.90
			Max. Mx	8	-15186.96	-285.79	0.91
			Max. My	2	-15180.19	-0.07	288.60
			Max. Vy	20	-14393.16	285.64	0.91
			Max. Vx	2	-14464.65	-0.07	288.60
			Max. Torque	22			-0.61
L3	140 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51261.42	3.91	-0.05
			Max. Mx	20	-19738.70	592.43	0.79
			Max. My	2	-19732.93	0.17	596.44
			Max. Vy	20	-16247.06	592.43	0.79
			Max. Vx	2	-16318.65	0.17	596.44
			Max. Torque	20			-0.54
L4	120 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58838.09	3.93	-0.05
			Max. Mx	20	-24935.58	934.52	0.80
			Max. My	2	-24930.76	0.17	939.97
			Max. Vy	20	-17949.57	934.52	0.80
			Max. Vx	2	-18021.07	0.17	939.97
			Max. Torque	18			-0.41
L5	100 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67294.18	3.93	-0.05
			Max. Mx	20	-30757.99	1311.43	0.81
			Max. My	2	-30754.14	0.17	1318.30
			Max. Vy	20	-19730.05	1311.43	0.81
			Max. Vx	2	-19801.25	0.17	1318.30
			Max. Torque	6			0.41
L6	80 - 60	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-76602.29	3.93	-0.05
			Max. Mx	20	-37202.98	1724.20	0.81
			Max. My	2	-37200.10	0.17	1732.50
			Max. Vy	20	-21539.17	1724.20	0.81
			Max. Vx	2	-21609.86	0.17	1732.50
			Max. Torque	6			0.41
L7	60 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-86720.67	3.93	-0.05
			Max. Mx	20	-44268.83	2172.74	0.82
			Max. My	2	-44266.91	0.18	2182.44
			Max. Vy	20	-23306.96	2172.74	0.82
			Max. Vx	2	-23376.92	0.18	2182.44
			Max. Torque	6			0.41
L8	40 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-98667.49	3.93	-0.05
			Max. Mx	20	-53340.15	2653.49	0.82
			Max. My	2	-53339.17	0.18	2664.58
			Max. Vy	20	-24759.11	2653.49	0.82
			Max. Vx	2	-24828.18	0.18	2664.58
			Max. Torque	6			0.41
L9	20 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-112275.79	3.93	-0.05
			Max. Mx	20	-64407.40	3162.36	0.82
			Max. My	2	-64407.38	0.18	3174.82
			Max. Vy	20	-26116.69	3162.36	0.82
			Max. Vx	2	-26184.55	0.18	3174.82
			Max. Torque	6			0.41

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	112275.79	0.00	0.00
	Max. H_x	20	64411.38	26106.88	0.00
	Max. H_z	2	64411.38	0.00	26174.69
	Max. M_x	2	3174.82	0.00	26174.69
	Max. M_z	8	3162.01	-26106.88	0.00
	Max. Torsion	6	0.41	-22609.20	13087.34
	Min. Vert	11	48308.54	-22609.20	-13087.34
	Min. H_x	8	64411.38	-26106.88	0.00
	Min. H_z	14	64411.38	0.00	-26174.69
	Min. M_x	14	-3173.18	0.00	-26174.69
	Min. M_z	20	-3162.36	26106.88	0.00
	Min. Torsion	18	-0.41	22609.20	-13087.34

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	53676.15	0.00	0.00	-0.64	0.14	0.00
1.2 Dead+1.6 Wind 0 deg - No	64411.38	-0.00	-26174.69	-3174.82	0.18	-0.24

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Ice						
0.9 Dead+1.6 Wind 0 deg - No Ice	48308.54	-0.00	-26174.68	-3148.79	0.13	-0.24
1.2 Dead+1.6 Wind 30 deg - No Ice	64411.38	13053.43	-22667.93	-2749.59	-1580.91	-0.37
0.9 Dead+1.6 Wind 30 deg - No Ice	48308.54	13053.43	-22667.93	-2727.01	-1568.11	-0.37
1.2 Dead+1.6 Wind 60 deg - No Ice	64411.38	22609.20	-13087.34	-1587.83	-2738.36	-0.41
0.9 Dead+1.6 Wind 60 deg - No Ice	48308.54	22609.20	-13087.34	-1574.70	-2716.14	-0.40
1.2 Dead+1.6 Wind 90 deg - No Ice	64411.38	26106.88	-0.00	-0.82	-3162.01	-0.34
0.9 Dead+1.6 Wind 90 deg - No Ice	48308.54	26106.86	-0.00	-0.60	-3136.35	-0.33
1.2 Dead+1.6 Wind 120 deg - No Ice	64411.38	22609.20	13087.34	1586.19	-2738.36	-0.17
0.9 Dead+1.6 Wind 120 deg - No Ice	48308.54	22609.20	13087.34	1573.49	-2716.14	-0.16
1.2 Dead+1.6 Wind 150 deg - No Ice	64411.38	13053.43	22667.93	2747.95	-1580.91	0.04
0.9 Dead+1.6 Wind 150 deg - No Ice	48308.54	13053.43	22667.93	2725.81	-1568.11	0.04
1.2 Dead+1.6 Wind 180 deg - No Ice	64411.38	-0.00	26174.69	3173.18	0.18	0.24
0.9 Dead+1.6 Wind 180 deg - No Ice	48308.54	-0.00	26174.68	3147.58	0.13	0.24
1.2 Dead+1.6 Wind 210 deg - No Ice	64411.38	-13053.43	22667.93	2747.95	1581.27	0.37
0.9 Dead+1.6 Wind 210 deg - No Ice	48308.54	-13053.43	22667.93	2725.81	1568.37	0.37
1.2 Dead+1.6 Wind 240 deg - No Ice	64411.38	-22609.20	13087.34	1586.19	2738.71	0.41
0.9 Dead+1.6 Wind 240 deg - No Ice	48308.54	-22609.20	13087.34	1573.49	2716.40	0.40
1.2 Dead+1.6 Wind 270 deg - No Ice	64411.38	-26106.88	-0.00	-0.82	3162.36	0.34
0.9 Dead+1.6 Wind 270 deg - No Ice	48308.54	-26106.86	-0.00	-0.60	3136.61	0.33
1.2 Dead+1.6 Wind 300 deg - No Ice	64411.38	-22609.20	-13087.34	-1587.83	2738.71	0.17
0.9 Dead+1.6 Wind 300 deg - No Ice	48308.54	-22609.20	-13087.34	-1574.70	2716.40	0.16
1.2 Dead+1.6 Wind 330 deg - No Ice	64411.38	-13053.43	-22667.93	-2749.59	1581.27	-0.04
0.9 Dead+1.6 Wind 330 deg - No Ice	48308.54	-13053.43	-22667.93	-2727.02	1568.37	-0.04
1.2 Dead+1.0 Ice+1.0 Temp	112275.79	-0.00	-0.00	0.05	3.93	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	112275.79	-0.00	-9724.56	-1233.83	4.23	-0.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	112275.79	4855.33	-8421.72	-1068.52	-611.43	-0.17
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	112275.79	8409.67	-4862.28	-616.89	-1062.13	-0.14
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	112275.79	9710.66	-0.00	0.05	-1227.10	-0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	112275.79	8409.67	4862.28	616.99	-1062.13	0.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	112275.79	4855.33	8421.72	1068.62	-611.43	0.10
1.2 Dead+1.0 Wind 180	112275.79	-0.00	9724.56	1233.93	4.23	0.16

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	112275.79	-4855.33	8421.72	1068.62	619.89	0.18
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	112275.79	-8409.67	4862.28	616.99	1070.58	0.14
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	112275.79	-9710.66	-0.00	0.05	1235.55	0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	112275.79	-8409.67	-4862.28	-616.89	1070.58	-0.02
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	112275.79	-4855.33	-8421.72	-1068.52	619.89	-0.10
Dead+Wind 0 deg - Service	53676.15	-0.00	-5717.64	-690.46	0.15	0.04
Dead+Wind 30 deg - Service	53676.15	2851.41	-4951.62	-598.05	-343.46	-0.03
Dead+Wind 60 deg - Service	53676.15	4938.79	-2858.82	-345.57	-595.00	-0.09
Dead+Wind 90 deg - Service	53676.15	5702.83	-0.00	-0.68	-687.07	-0.13
Dead+Wind 120 deg - Service	53676.15	4938.79	2858.82	344.22	-595.00	-0.13
Dead+Wind 150 deg - Service	53676.15	2851.41	4951.62	596.70	-343.46	-0.10
Dead+Wind 180 deg - Service	53676.15	-0.00	5717.64	689.11	0.15	-0.04
Dead+Wind 210 deg - Service	53676.15	-2851.41	4951.62	596.70	343.76	0.03
Dead+Wind 240 deg - Service	53676.15	-4938.79	2858.82	344.22	595.30	0.09
Dead+Wind 270 deg - Service	53676.15	-5702.83	-0.00	-0.68	687.37	0.13
Dead+Wind 300 deg - Service	53676.15	-4938.79	-2858.82	-345.57	595.30	0.13
Dead+Wind 330 deg - Service	53676.15	-2851.41	-4951.62	-598.05	343.76	0.10

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-53676.15	0.00	0.00	53676.15	0.00	0.000%
2	0.00	-64411.38	-26174.68	0.00	64411.38	26174.69	0.000%
3	0.00	-48308.54	-26174.68	0.00	48308.54	26174.68	0.000%
4	13053.43	-64411.38	-22667.93	-13053.43	64411.38	22667.93	0.000%
5	13053.43	-48308.54	-22667.93	-13053.43	48308.54	22667.93	0.000%
6	22609.20	-64411.38	-13087.34	-22609.20	64411.38	13087.34	0.000%
7	22609.20	-48308.54	-13087.34	-22609.20	48308.54	13087.34	0.000%
8	26106.86	-64411.38	0.00	-26106.88	64411.38	0.00	0.000%
9	26106.86	-48308.54	0.00	-26106.86	48308.54	0.00	0.000%
10	22609.20	-64411.38	13087.34	-22609.20	64411.38	-13087.34	0.000%
11	22609.20	-48308.54	13087.34	-22609.20	48308.54	-13087.34	0.000%
12	13053.43	-64411.38	22667.93	-13053.43	64411.38	-22667.93	0.000%
13	13053.43	-48308.54	22667.93	-13053.43	48308.54	-22667.93	0.000%
14	0.00	-64411.38	26174.68	0.00	64411.38	-26174.69	0.000%
15	0.00	-48308.54	26174.68	0.00	48308.54	-26174.68	0.000%
16	-13053.43	-64411.38	22667.93	13053.43	64411.38	-22667.93	0.000%
17	-13053.43	-48308.54	22667.93	13053.43	48308.54	-22667.93	0.000%
18	-22609.20	-64411.38	13087.34	22609.20	64411.38	-13087.34	0.000%
19	-22609.20	-48308.54	13087.34	22609.20	48308.54	-13087.34	0.000%
20	-26106.86	-64411.38	0.00	26106.88	64411.38	0.00	0.000%
21	-26106.86	-48308.54	0.00	26106.86	48308.54	0.00	0.000%
22	-22609.20	-64411.38	-13087.34	22609.20	64411.38	13087.34	0.000%
23	-22609.20	-48308.54	-13087.34	22609.20	48308.54	13087.34	0.000%
24	-13053.43	-64411.38	-22667.93	13053.43	64411.38	22667.93	0.000%
25	-13053.43	-48308.54	-22667.93	13053.43	48308.54	22667.93	0.000%
26	0.00	-112275.79	0.00	0.00	112275.79	0.00	0.000%
27	0.00	-112275.79	-9724.54	0.00	112275.79	9724.56	0.000%
28	4855.32	-112275.79	-8421.70	-4855.33	112275.79	8421.72	0.000%
29	8409.66	-112275.79	-4862.27	-8409.67	112275.79	4862.28	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
30	9710.64	-112275.79	0.00	-9710.66	112275.79	0.00	0.000%
31	8409.66	-112275.79	4862.27	-8409.67	112275.79	-4862.28	0.000%
32	4855.32	-112275.79	8421.70	-4855.33	112275.79	-8421.72	0.000%
33	0.00	-112275.79	9724.54	0.00	112275.79	-9724.56	0.000%
34	-4855.32	-112275.79	8421.70	4855.33	112275.79	-8421.72	0.000%
35	-8409.66	-112275.79	4862.27	8409.67	112275.79	-4862.28	0.000%
36	-9710.64	-112275.79	0.00	9710.66	112275.79	0.00	0.000%
37	-8409.66	-112275.79	-4862.27	8409.67	112275.79	4862.28	0.000%
38	-4855.32	-112275.79	-8421.70	4855.33	112275.79	8421.72	0.000%
39	0.00	-53676.15	-5717.64	0.00	53676.15	5717.64	0.000%
40	2851.41	-53676.15	-4951.62	-2851.41	53676.15	4951.62	0.000%
41	4938.79	-53676.15	-2858.82	-4938.79	53676.15	2858.82	0.000%
42	5702.82	-53676.15	0.00	-5702.83	53676.15	0.00	0.000%
43	4938.79	-53676.15	2858.82	-4938.79	53676.15	-2858.82	0.000%
44	2851.41	-53676.15	4951.62	-2851.41	53676.15	-4951.62	0.000%
45	0.00	-53676.15	5717.64	0.00	53676.15	-5717.64	0.000%
46	-2851.41	-53676.15	4951.62	2851.41	53676.15	-4951.62	0.000%
47	-4938.79	-53676.15	2858.82	4938.79	53676.15	-2858.82	0.000%
48	-5702.82	-53676.15	0.00	5702.83	53676.15	0.00	0.000%
49	-4938.79	-53676.15	-2858.82	4938.79	53676.15	2858.82	0.000%
50	-2851.41	-53676.15	-4951.62	2851.41	53676.15	4951.62	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00055436
3	Yes	4	0.00000001	0.00029685
4	Yes	5	0.00000001	0.00057075
5	Yes	5	0.00000001	0.00028265
6	Yes	5	0.00000001	0.00058360
7	Yes	5	0.00000001	0.00028932
8	Yes	4	0.00000001	0.00063970
9	Yes	4	0.00000001	0.00036401
10	Yes	5	0.00000001	0.00056996
11	Yes	5	0.00000001	0.00028264
12	Yes	5	0.00000001	0.00057600
13	Yes	5	0.00000001	0.00028552
14	Yes	4	0.00000001	0.00055366
15	Yes	4	0.00000001	0.00029657
16	Yes	5	0.00000001	0.00058201
17	Yes	5	0.00000001	0.00028866
18	Yes	5	0.00000001	0.00056703
19	Yes	5	0.00000001	0.00028106
20	Yes	4	0.00000001	0.00063982
21	Yes	4	0.00000001	0.00036405
22	Yes	5	0.00000001	0.00058049
23	Yes	5	0.00000001	0.00028764
24	Yes	5	0.00000001	0.00057660
25	Yes	5	0.00000001	0.00028569
26	Yes	4	0.00000001	0.00006644
27	Yes	6	0.00000001	0.00014475
28	Yes	6	0.00000001	0.00016401
29	Yes	6	0.00000001	0.00016399
30	Yes	6	0.00000001	0.00014328

31	Yes	6	0.00000001	0.00016363
32	Yes	6	0.00000001	0.00016384
33	Yes	6	0.00000001	0.00014450
34	Yes	6	0.00000001	0.00016596
35	Yes	6	0.00000001	0.00016564
36	Yes	6	0.00000001	0.00014523
37	Yes	6	0.00000001	0.00016600
38	Yes	6	0.00000001	0.00016612
39	Yes	4	0.00000001	0.00009490
40	Yes	4	0.00000001	0.00020855
41	Yes	4	0.00000001	0.00021602
42	Yes	4	0.00000001	0.00009713
43	Yes	4	0.00000001	0.00020125
44	Yes	4	0.00000001	0.00021567
45	Yes	4	0.00000001	0.00009443
46	Yes	4	0.00000001	0.00021047
47	Yes	4	0.00000001	0.00020341
48	Yes	4	0.00000001	0.00009721
49	Yes	4	0.00000001	0.00021970
50	Yes	4	0.00000001	0.00020479

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	175 - 160	12.420	39	0.6274	0.0008
L2	160 - 140	10.458	39	0.6157	0.0007
L3	140 - 120	7.968	39	0.5613	0.0004
L4	120 - 100	5.768	39	0.4795	0.0003
L5	100 - 80	3.933	39	0.3903	0.0002
L6	80 - 60	2.471	39	0.3028	0.0001
L7	60 - 40	1.368	39	0.2200	0.0001
L8	40 - 20	0.602	39	0.1426	0.0000
L9	20 - 0	0.151	39	0.0702	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
173.00	RR90-17-02DP	39	12.157	0.6265	0.0008	111963
168.00	Kathrein 80010121 w/6ft 2.0 Std pipe	39	11.500	0.6239	0.0008	79974
155.00	DB948F85T2E-M PANELS	39	9.816	0.6063	0.0006	27623
145.00	DB844H90 PANELS	39	8.569	0.5786	0.0005	18176

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	57.111	2	2.8798	0.0030
L2	160 - 140	48.105	2	2.8292	0.0022
L3	140 - 120	36.662	2	2.5822	0.0013
L4	120 - 100	26.544	2	2.2067	0.0008
L5	100 - 80	18.097	2	1.7967	0.0006
L6	80 - 60	11.369	2	1.3938	0.0004
L7	60 - 40	6.293	2	1.0124	0.0002
L8	40 - 20	2.770	2	0.6561	0.0001
L9	20 - 0	0.696	2	0.3231	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
173.00	RR90-17-02DP	2	55.904	2.8765	0.0029	25582
168.00	Kathrein 80010121 w/6ft 2.0 Std pipe	2	52.889	2.8656	0.0026	18272
155.00	DB948F85T2E-M PANELS	2	45.158	2.7871	0.0019	6195
145.00	DB844H90 PANELS	2	39.424	2.6611	0.0015	4004

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.5000	52	1.2500	42501.71 69029.14 0.62	44978.91 114588.36 0.39	18.226 32.400 0.56	25.908 32.400 0.80	Stiff	0.80 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	175 - 160 (1)	P24x3/8	15.00	175.00	251.4	27.8325	-21047.40	99498.70	0.212
L2	160 - 140 (2)	P30x3/8	20.00	175.00	200.5	34.9011	-15180.20	196172.00	0.077
L3	140 - 120 (3)	P36x3/8	20.00	175.00	166.7	41.9697	-19732.90	341118.00	0.058
L4	120 - 100 (4)	P42x3/8	20.00	175.00	142.7	49.0383	-24930.80	544115.00	0.046
L5	100 - 80 (5)	P48x3/8	20.00	175.00	124.7	56.1069	-30754.10	803861.00	0.038
L6	80 - 60 (6)	P54x3/8	20.00	175.00	110.8	63.1755	-37200.10	1069090.00	0.035

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L7	60 - 40 (7)	P60x3/8	20.00	175.00	99.6	70.2440	-44266.90	1329060.00	0.033
L8	40 - 20 (8)	P60x1/2	20.00	175.00	99.8	93.4624	-53339.20	1818800.00	0.029
L9	20 - 0 (9)	P60x5/8	20.00	175.00	100.0	116.583 0	-64407.40	2323900.00	0.028

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	175 - 160 (1)	P24x3/8	28.61	623.72	0.046	0.00	623.72	0.000
L2	160 - 140 (2)	P30x3/8	288.60	947.86	0.304	0.00	947.86	0.000
L3	140 - 120 (3)	P36x3/8	596.44	1338.81	0.446	0.00	1338.81	0.000
L4	120 - 100 (4)	P42x3/8	939.97	1796.56	0.523	0.00	1796.56	0.000
L5	100 - 80 (5)	P48x3/8	1318.30	2321.11	0.568	0.00	2321.11	0.000
L6	80 - 60 (6)	P54x3/8	1732.49	2912.46	0.595	0.00	2912.46	0.000
L7	60 - 40 (7)	P60x3/8	2182.43	3570.61	0.611	0.00	3570.61	0.000
L8	40 - 20 (8)	P60x1/2	2664.57	4860.41	0.548	0.00	4860.41	0.000
L9	20 - 0 (9)	P60x5/8	3174.82	6198.18	0.512	0.00	6198.18	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 160 (1)	P24x3/8	2746.50	526035.00	0.005	0.09	1019.71	0.000
L2	160 - 140 (2)	P30x3/8	14464.60	655528.00	0.022	0.11	1598.37	0.000
L3	140 - 120 (3)	P36x3/8	16318.70	745048.00	0.022	0.24	2189.07	0.000
L4	120 - 100 (4)	P42x3/8	18021.10	834437.00	0.022	0.24	2868.84	0.000
L5	100 - 80 (5)	P48x3/8	19801.20	923745.00	0.021	0.24	3637.70	0.000
L6	80 - 60 (6)	P54x3/8	21609.90	1013000.00	0.021	0.24	4495.63	0.000
L7	60 - 40 (7)	P60x3/8	23376.90	1102210.00	0.021	0.24	5442.62	0.000
L8	40 - 20 (8)	P60x1/2	24828.20	1562840.00	0.016	0.24	7685.07	0.000
L9	20 - 0 (9)	P60x5/8	26184.50	2069580.00	0.013	0.24	10134.58	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 160 (1)	0.212	0.046	0.000	0.005	0.000	0.257 ✔	1.000	4.8.2 ✔
L2	160 - 140 (2)	0.077	0.304	0.000	0.022	0.000	0.382 ✔	1.000	4.8.2 ✔
L3	140 - 120 (3)	0.058	0.446	0.000	0.022	0.000	0.504 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	120 - 100 (4)	0.046	0.523	0.000	0.022	0.000	0.569 ✔	1.000	4.8.2 ✔
L5	100 - 80 (5)	0.038	0.568	0.000	0.021	0.000	0.607 ✔	1.000	4.8.2 ✔
L6	80 - 60 (6)	0.035	0.595	0.000	0.021	0.000	0.630 ✔	1.000	4.8.2 ✔
L7	60 - 40 (7)	0.033	0.611	0.000	0.021	0.000	0.645 ✔	1.000	4.8.2 ✔
L8	40 - 20 (8)	0.029	0.548	0.000	0.016	0.000	0.578 ✔	1.000	4.8.2 ✔
L9	20 - 0 (9)	0.028	0.512	0.000	0.013	0.000	0.540 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	175 - 160	Pole	P24x3/8	1	-21047.40	99498.70	25.7	Pass
L2	160 - 140	Pole	P30x3/8	2	-15180.20	196172.00	38.2	Pass
L3	140 - 120	Pole	P36x3/8	3	-19732.90	341118.00	50.4	Pass
L4	120 - 100	Pole	P42x3/8	4	-24930.80	544115.00	56.9	Pass
L5	100 - 80	Pole	P48x3/8	5	-30754.10	803861.00	60.7	Pass
L6	80 - 60	Pole	P54x3/8	6	-37200.10	1069090.00	63.0	Pass
L7	60 - 40	Pole	P60x3/8	7	-44266.90	1329060.00	64.5	Pass
L8	40 - 20	Pole	P60x1/2	8	-53339.20	1818800.00	57.8	Pass
L9	20 - 0	Pole	P60x5/8	9	-64407.40	2323900.00	54.0	Pass
							Summary	
						Pole (L7)	64.5	Pass
						Base Plate	80.0	Pass
						RATING =	**80.0**	**Pass**

SITE NAME: VERNON CENTER
PROJECT: LTE - 3C/4C/RETROFIT

FA NUMBER: 10071292
SITE NUMBER: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	EMPIRE TELECOM
ADDRESS:	16 ESQUIRE ROAD
CITY, STATE, ZIP:	BILLERICA, MA 01862
CONTACT:	DAVID COOPER
E-MAIL:	DCOOPER@EMPIRETELCOMM.COM

ENGINEER

COMPANY:	MASER CONSULTING CONNECTICUT
ADDRESS:	331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP:	RED BANK, NJ 07701
CONTACT:	MICHAEL CLEARY
PHONE:	(856) 717-0412 x4105
E-MAIL:	MCLEARY@MASERCONSULTING.COM

RF ENGINEER

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE ROAD
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	OMAIR MOHAMMED
E-MAIL:	OM636QA@US.ATT.COM

SITE INFORMATION

APPLICANT/LESSEE

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE RD.
FRAMINGHAM, MA 01701

TOWER OWNER:

NAME:	MILLENICOM, LLC
ADDRESS:	10 QUARRY ROAD, SUITE C
CITY, STATE, ZIP:	BOLTON, CT 06043 C/O MOUNTAINTOP SERVICES P.O. BOX 9219 BOLTON, CT 06043
LATITUDE:	41.8352917° N
LONGITUDE:	72.455° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT SHELTER AND MONOPOLE
ZONING/JURISDICTION:	CITY OF VERNON ROCKVILLE
CURRENT USE/PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP

DRIVING DIRECTIONS

DIRECTIONS FROM AT&T OFFICE AT 550 COCHITUATE ROAD, FRAMINGHAM, MA:

DEPART RT-30 WEST/COCHITUATE ROAD TOWARD BURR STREET. TURN BACK ON RT-30 EAST/COCHITUATE ROAD. TAKE RAMP RIGHT FOR I-90 WEST TOWARD SPRINGFIELD/WORCESTER. AT EXIT 9, TAKE RAMP RIGHT FOR I-84 TOWARD HARTFORD/NEW YORK CITY. AT EXIT 66, TAKE RAMP RIGHT TOWARD BOLTON/TUNNEL ROAD/VERNON. TURN RIGHT ONTO WHITNEY T FERGUSON III ROAD. TURN RIGHT ONTO BOLTON ROAD. TURN LEFT ONTO CLARK ROAD. TURN RIGHT ONTO INDUSTRIAL PARK ROAD. SITE WILL BE ON YOUR RIGHT BEHIND BUILDING.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. CONNECTICUT STATE BUILDING CODE (2016) & ALL SUBSEQUENT AMENDMENTS
2. NATIONAL ELECTRIC CODE 2014
3. NATIONAL FIRE PROTECTION ASSOCIATION 70 - 2015
4. LIGHTNING PROTECTION CODE 2011
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
7. EIA/TIA-222 REVISION G
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275
12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SHEET	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN
A-2	EQUIPMENT PLAN
A-3	ELEVATION VIEW, DETAILS AND ANTENNA SCHEDULE
A-4	ANTENNA LAYOUTS
A-5	DETAILS
A-6	DETAILS
A-7	DETAILS
A-8	RF PLUMBING DIAGRAMS
G-1	GROUNDING DETAILS

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- REMOVE (3) EXISTING ANTENNAS, (1) PER SECTOR
- INSTALL (3) NEW ANTENNAS, (1) PER SECTOR
- REMOVE (3) EXISTING RRUS, (1) PER SECTOR
- INSTALL (9) NEW RRUS, (3) PER SECTOR
- INSTALL (1) DC-6 SURGE SUPPRESSION DOME
- INSTALL (2) 6/C DC POWER CABLES
- INSTALL (1) XMU TO EXISTING 5216 IN OUTDOOR EQUIPMENT
- INSTALL NEW ANTENNA PLATFORM
- INSTALL (1) DC-6 SURGE BOX AT GRADE

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NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	17963005A

REV	DATE	DESCRIPTION	DRWN BY	CHECKED BY
0	12/20/17	FOR CONSTRUCTION	AJC	PET
1	12/07/17	ISS	AJC	RA

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
25971
LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32571

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - EMPIRE TELECOM
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. 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 OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE 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 WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
33. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. 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.
35. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
36. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
50. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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SCALE :	JOB NUMBER :
AS SHOWN	17963005A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	12/20/17	FOR CONSTRUCTION	AJC	PET
1	12/07/17	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32671

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

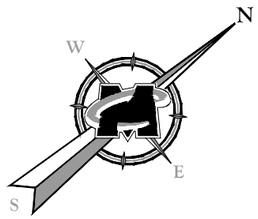
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

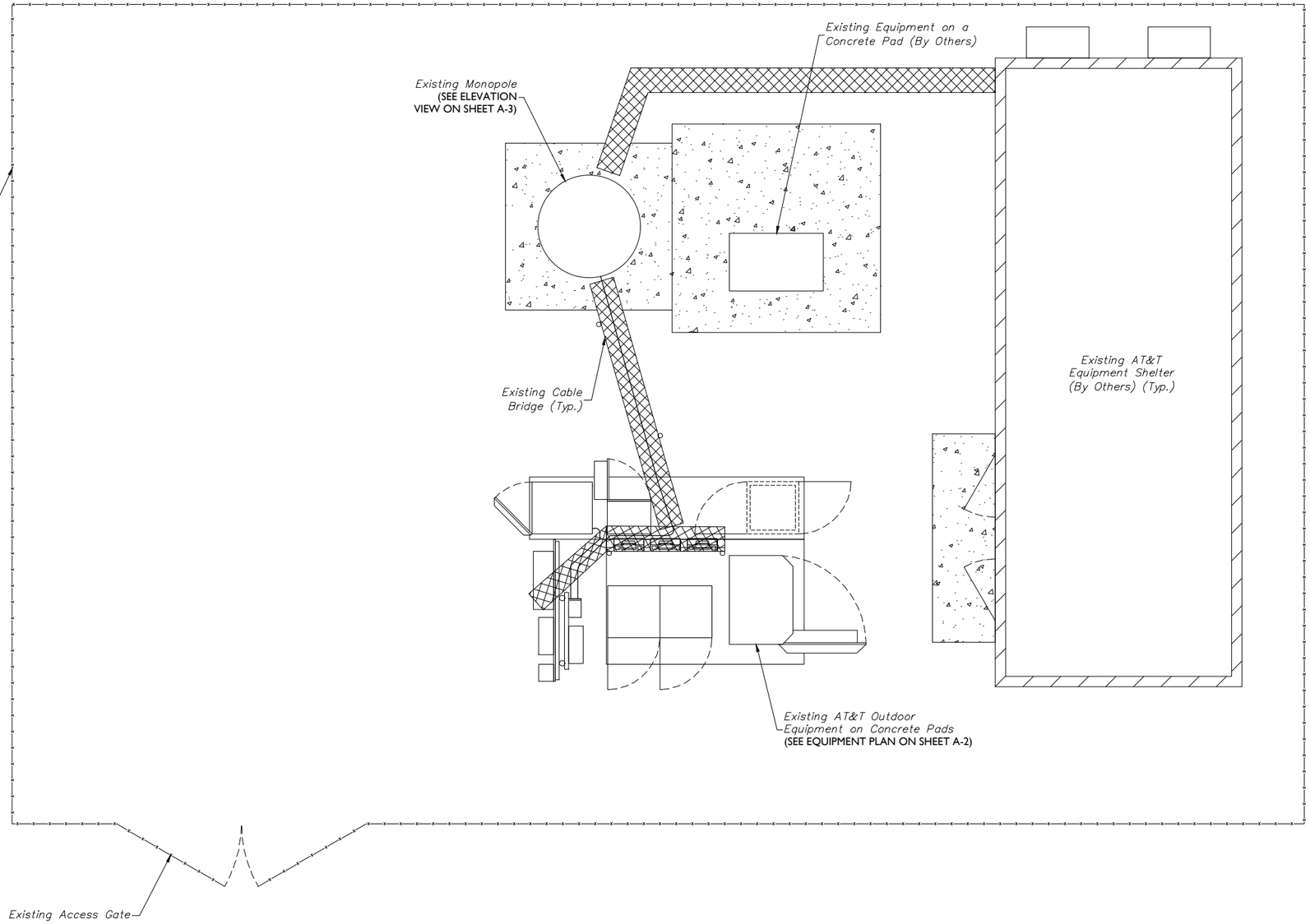
SHEET TITLE :

GENERAL NOTES

SHEET NUMBER :

GN-1





COMPOUND PLAN

GRAPHIC SCALE

4 0 2 4 8

(IN FEET)

SCALE: 1" = 4' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

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STATE OF CONNECTICUT
PETROS T. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28171

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

RED BANK OFFICE
331 Newman Springs Road
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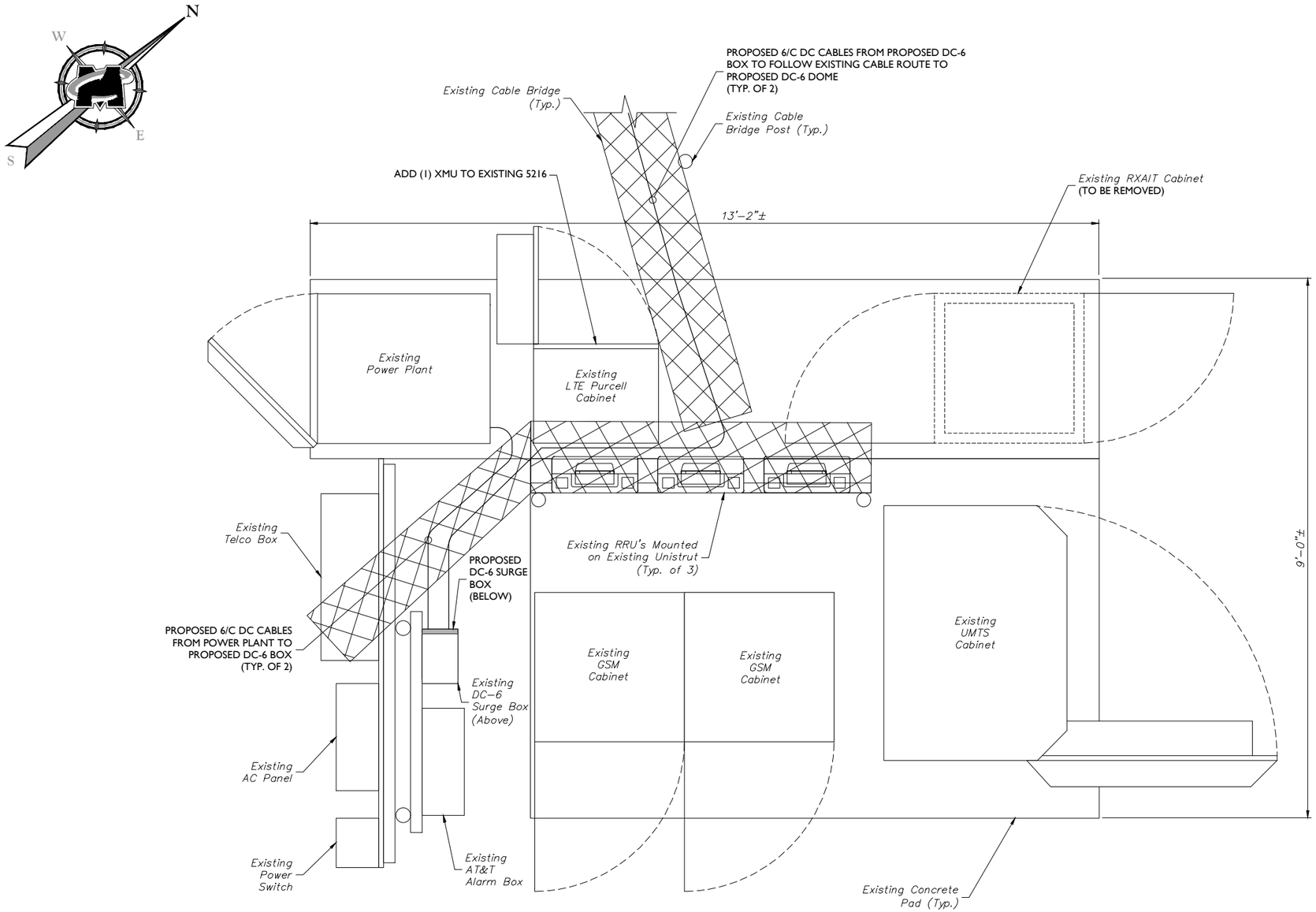
SHEET TITLE :

COMPOUND PLAN

SHEET NUMBER :

A-1



EQUIPMENT PLAN

GRAPHIC SCALE

1 0 .5 1 2

(IN FEET)

SCALE: 1" = 1' FOR 24"X36" DRAWINGS
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STATE OF CONNECTICUT
PETROS T. TSOUKALAS
3237
LICENSED PROFESSIONAL ENGINEER

PETROS T. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0323[illegible]

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

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VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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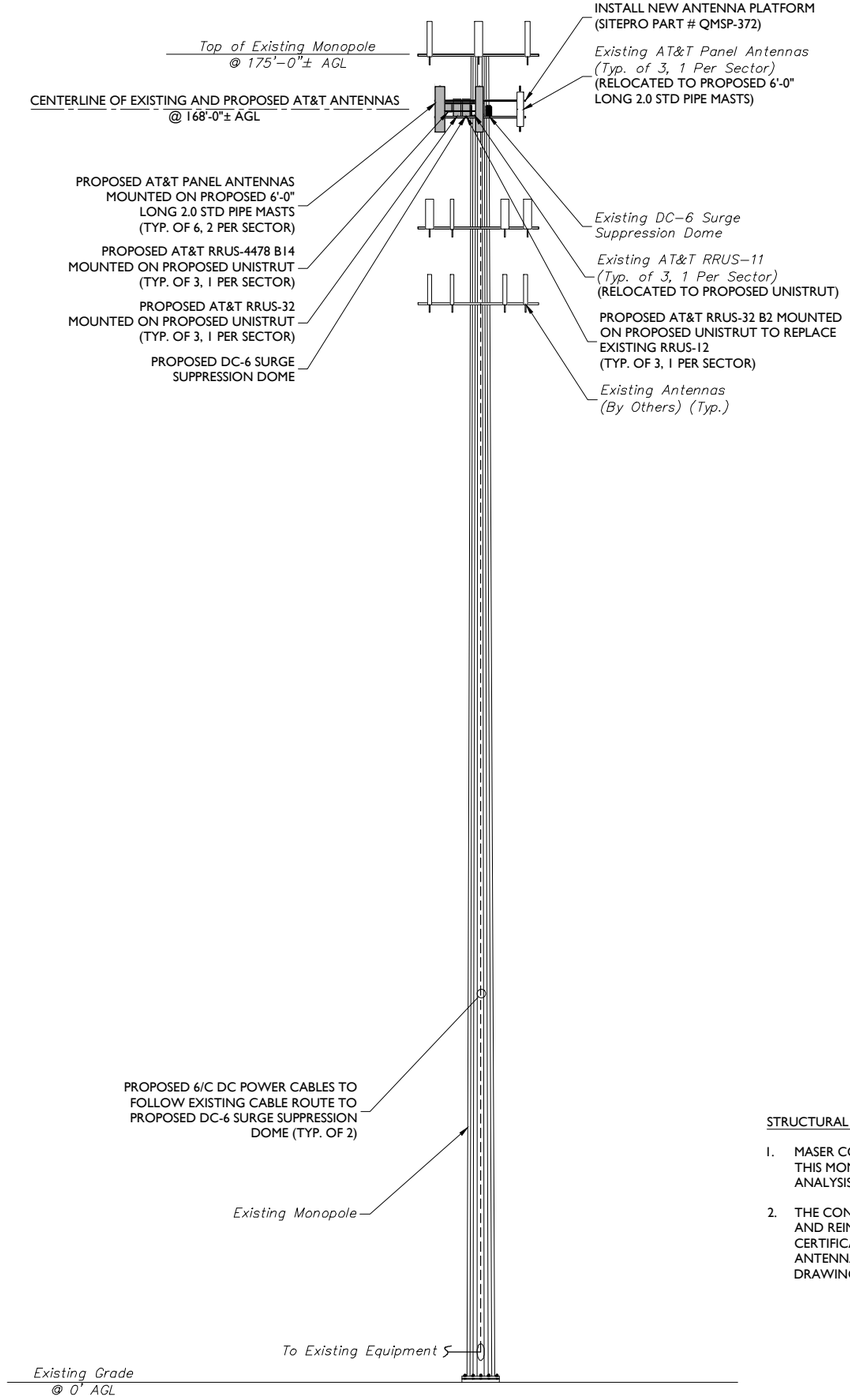
SHEET TITLE :
EQUIPMENT PLAN

SHEET NUMBER :
A-2



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

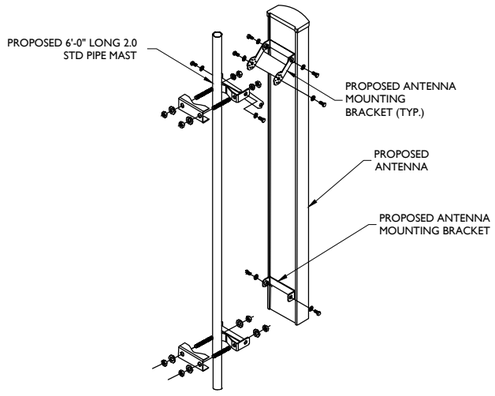
(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

PROPOSED ANTENNA AND RRUS CONFIGURATION

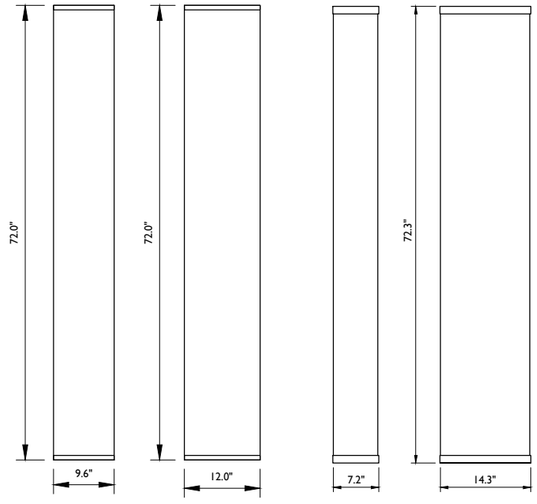
SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Kathrein 80010121	Kathrein 80010121	UMTS	REMAIN	54.50	10.30	5.90	44.10	40°	168'	-	-
	A2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE	NEW	72.00	12.00	9.60	111.00	100°	168'	(1) RRUS-32 B2 (1) RRUS-11	NEW REMAIN
	A3	-	CCI HPA-65R-BUU-H6	LTE	NEW	72.30	14.40	7.30	42.90	100°	168'	(1) RRUS-32 (1) RRUS-4478 B14	NEW NEW
BETA	B1	Kathrein 80010121	Kathrein 80010121	UMTS	REMAIN	54.50	10.30	5.90	44.10	150°	168'	-	-
	B2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE	NEW	72.00	12.00	9.60	111.00	220°	168'	(1) RRUS-32 B2 (1) RRUS-11	NEW REMAIN
	B3	-	CCI HPA-65R-BUU-H6	LTE	NEW	72.30	14.40	7.30	42.90	220°	168'	(1) RRUS-32 (1) RRUS-4478 B14	NEW NEW
GAMMA	C1	Kathrein 80010121	Kathrein 80010121	UMTS	REMAIN	54.50	10.30	5.90	44.10	275°	168'	-	-
	C2	KMW AM-X-CD-16-65-OOT-RET	Quintel QS66512-2	LTE	NEW	72.00	12.00	9.60	111.00	340°	168'	(1) RRUS-32 B2 (1) RRUS-11	NEW REMAIN
	C3	AndrewSBNH-1D6565C	CCI HPA-65R-BUU-H6	LTE	NEW	72.30	14.40	7.30	42.90	340°	168'	(1) RRUS-32 (1) RRUS-4478 B14	NEW NEW

ANTENNA SCHEDULE



ANTENNA MOUNTING DETAIL

NOT TO SCALE



WEIGHT = 111.0 LBS
QUINTEL QS66512-2

WEIGHT = 42.9 LBS
CCI HPA-65R-BUU-H6

ANTENNA DETAILS

STRUCTURAL NOTES:

1. MASER CONSULTING P.A. HAS PERFORMED A STRUCTURAL ANALYSIS ON THIS MONOPOLE. CONTRACTOR TO REFER TO "MONOPOLE STRUCTURAL ANALYSIS" BY MASER CONSULTING P.A. DATED 12/04/2017.
2. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

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SCALE:	JOB NUMBER:
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STATE OF CONNECTICUT
PETROS T. SOUKALAS
25357
LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.25357

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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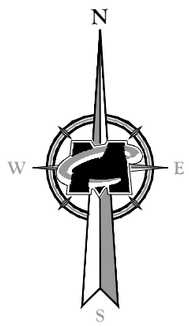
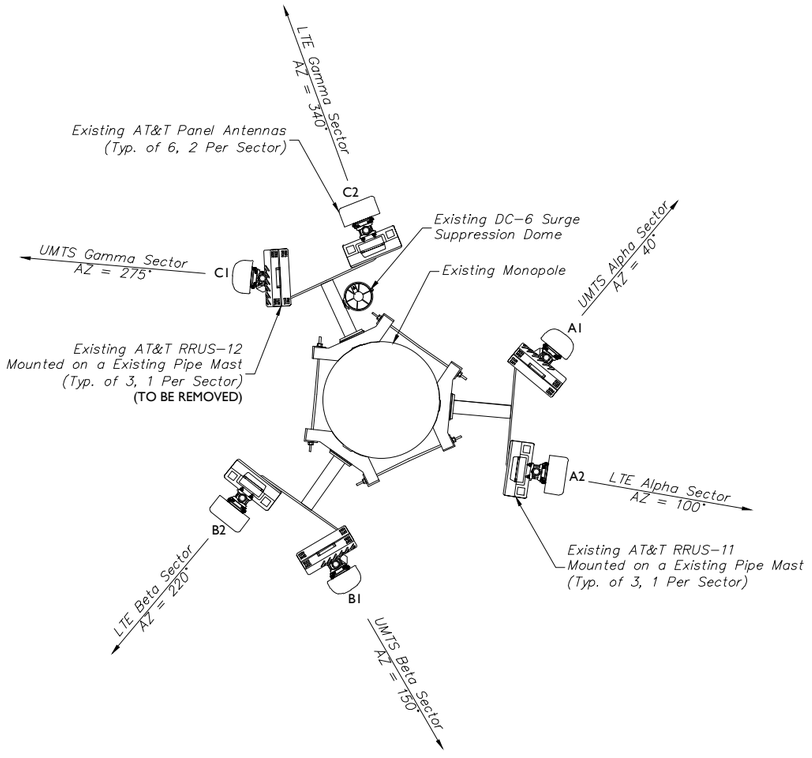
Fax: 732.383.1984

SHEET TITLE:
ELEVATION VIEW, DETAILS AND ANTENNA SCHEDULE

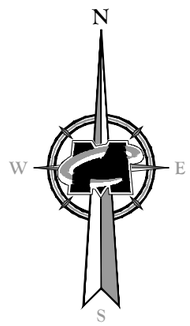
SHEET NUMBER:
A-3

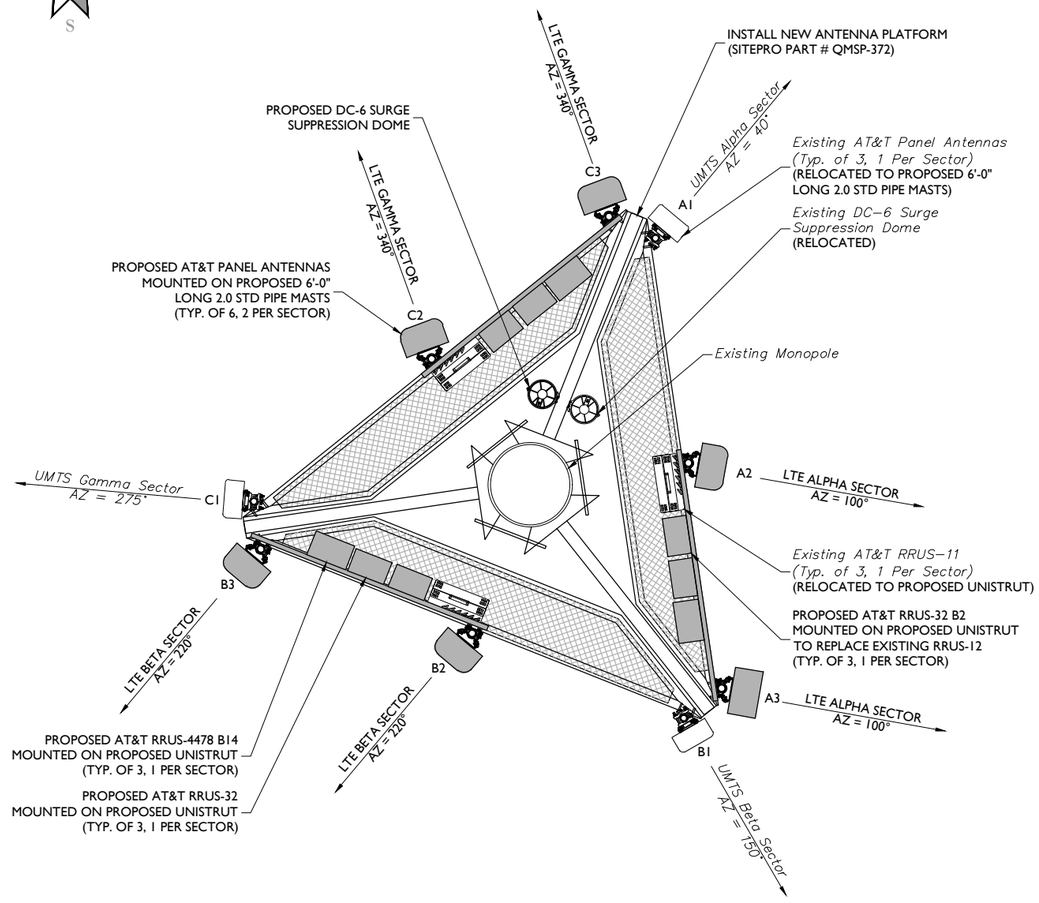




EXISTING - ANTENNA LAYOUT

NOT TO SCALE





PROPOSED - ANTENNA LAYOUT

NOT TO SCALE

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SCALE:	JOB NUMBER:
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REV	DATE	DESCRIPTION	DRWN BY	CHECKED BY
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STATE OF CONNECTICUT
PETROS T. TSOUKALAS
25317
LICENSED PROFESSIONAL ENGINEER

PETROS T. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE/NUMBER: PEN.25317

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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Suite 203
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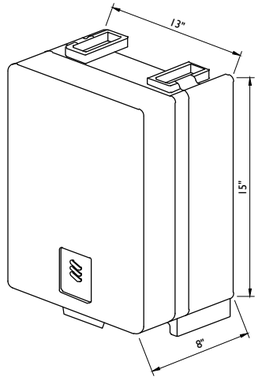
Phone: 732.383.1950
Fax: 732.383.1984

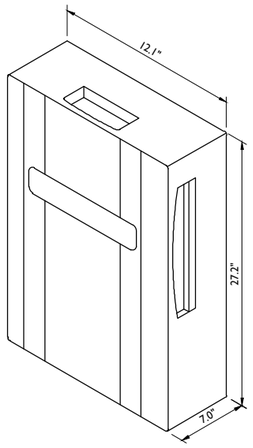
SHEET TITLE:
ANTENNA LAYOUTS

SHEET NUMBER:
A-4



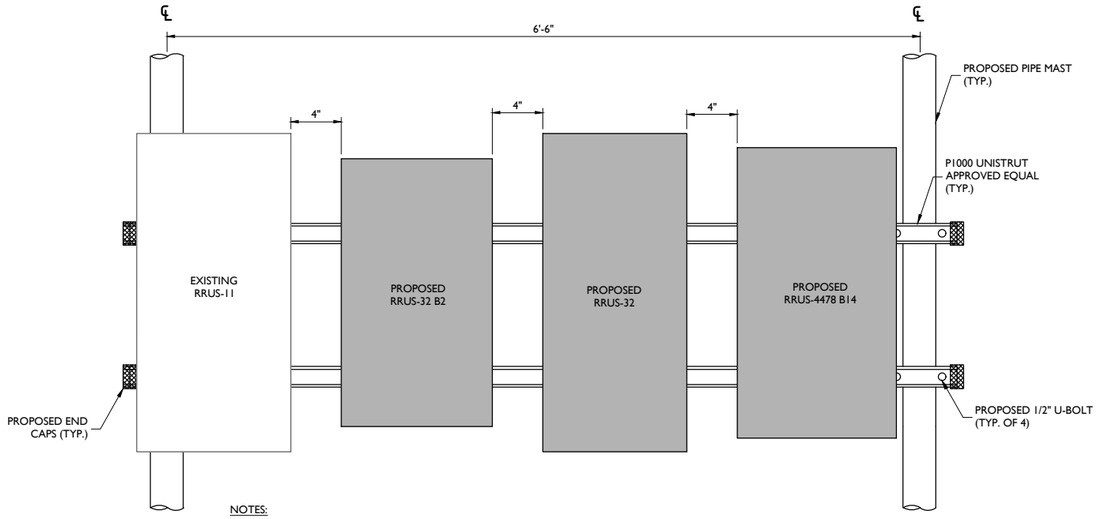
DIMENSIONS (H X W X D): 15"H X 13"W X 8"D (INCLUDES SUNSHIELD)
WEIGHT: 60 LBS

RRU-4478-B14 DETAIL
NOT TO SCALE



RRUS-32 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 DETAIL
NOT TO SCALE



NOTES:

1. INSTALL HORIZONTAL/VERTICAL UNISTRUT CHANNELS AS REQUIRED TO ALIGN FRAME WITH EQUIPMENT MOUNTING HOLES. FASTEN UNISTRUT CHANNELS TOGETHER WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
2. EACH UNISTRUT TO BE MOUNTED ON EXISTING VERTICAL PIPE MASTS USING 1/2" Ø U-BOLTS, MINIMUM ONE AT EACH END OF UNISTRUT.
3. MOUNT RRU'S TO UNISTRUT WITH 3/8"Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS THROUGH EQUIPMENT MOUNTING HOLES. SUBCONTRACTOR SHALL SUPPLY.
4. PAINTING OF THE RRUS SHALL BE IN STRICT CONFORMANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS.
5. ANTENNAS NOT SHOWN FOR CLARITY.

RRU MOUNTING DETAIL
NOT TO SCALE

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1	12/07/17	ISSUED FOR REVIEW	AJC	RA

PETROS T. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32671

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

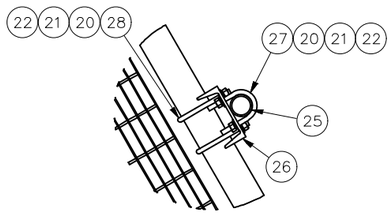
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
DETAILS

SHEET NUMBER :
A-5

(SITEPRO PART # QMSP-372)

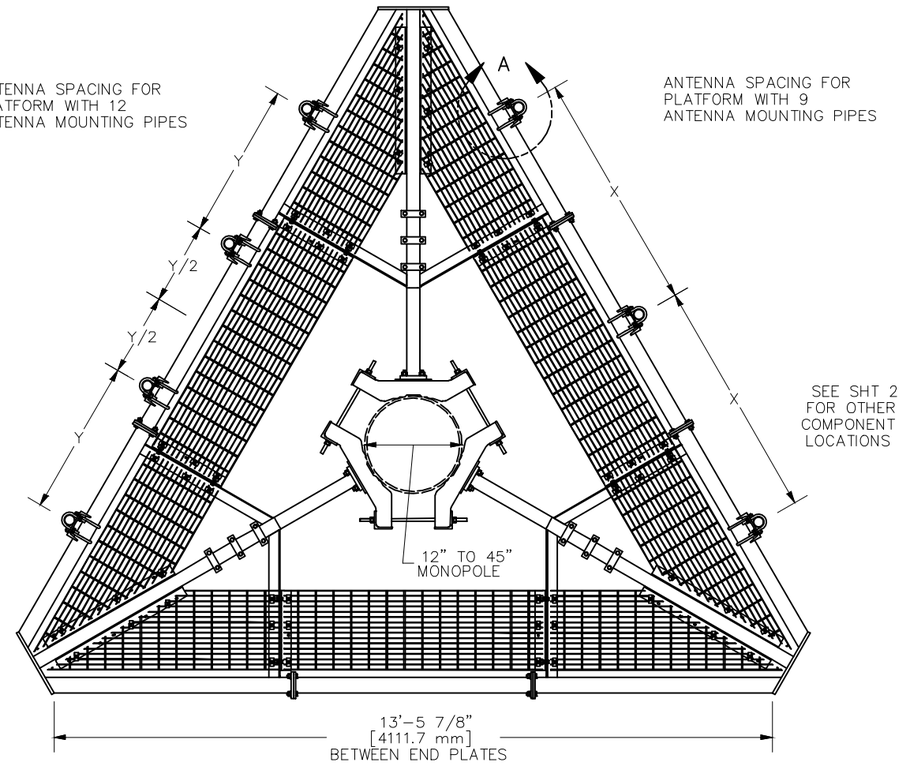
PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-140649	CORNER SECTION FOR LOW PROFILE PLATFORM		218.70	656.10
2	3	X-140498	RAIL PIPE FOR LOW PROFILE PLATFORM		43.20	129.59
3	3	X-140478	SUPPORT BRACKET WELDMENT FOR PLATFORM		50.72	152.17
4	9	X-140490	FLAT CLAMP FOR CORNER SECTION	5.500 in	1.10	9.91
5	3	X-140486	STEEL GRATING (CENTER PIECE)		44.46	133.39
6	3	X-140484	STEEL GRATING, END PIECE (LEFT HAND)		27.94	83.83
7	3	X-140485	STEEL GRATING, END PIECE (RIGHT HAND)		27.94	83.83
8	54	X-140488	GALVANIZED GRATING CLAMP		0.06	3.14
9	3	X-LWRM	UNIVERSAL RING MOUNT WELDMENT		68.81	206.42
10	6	X-140650	SUPPORT ANGLE FOR CENTER GRATING	34.938 in	4.77	28.62
11	24	G1202	1/2" x 2" HDG HEX BOLT GR5	2	0.18	4.22
12	18	G1208	1/2" x 8" HDG HEX BOLT GR5 FULL THREAD	8	0.49	8.88
13	12	G38112	3/8" x 1-1/2" HDG HEX BOLT GR5		0.07	0.85
14	12	G38LW	3/8" HDG LOCKWASHER		0.01	0.08
15	12	G38NUT	3/8" HDG HEAVY 2H HEX NUT		0.03	0.41
16	54	SS14134	1/4" UNC HEX BOLT (GRADE 5)	1.75	0.03	1.79
17	54	SS14FW	1/4" FLATWASHER (S.S.)		0.01	0.30
18	54	SS14LW	1/4" LOCK WASHER		0.00	0.13
19	54	SS14NUT	1/4" NUT (S.S.)		0.01	0.45
20	138	G12FW	1/2" HDG USS FLATWASHER		0.03	4.70
21	138	G12LW	1/2" HDG LOCKWASHER		0.01	1.92
22	138	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	9.88
23	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
24	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
25	B	D	2-3/8" SCH. 40 GALVANIZED PIPE	E	F	G
26	B	X-SP219	SMALL SUPPORT CROSS PLATE	8.25	8.61	103.33
27	C	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)	4.5	0.81	19.47
28	C	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)	6	0.81	19.47
29	18	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.61
30	30	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	3.90
31	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.40	3.59
32	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.40	3.59



DETAIL A

ANTENNA SPACING FOR
PLATFORM WITH 12
ANTENNA MOUNTING PIPES

ANTENNA SPACING FOR
PLATFORM WITH 9
ANTENNA MOUNTING PIPES



SEE SHT 2
FOR OTHER
COMPONENT
LOCATIONS

QMSP-3XX, 9 ANTENNA PIPES							
ASSEMBLY NO.	"A" QTY	"B" QTY	"C" QTY	PART NO. "D"	LENGTH "E"	UNIT WT. "F"	NET WT. "G"	TOTAL WEIGHT
QMSP-363	9	18	18	P263	63"	19.22	172.98	1766.55
QMSP-372	9	18	18	P272	72"	21.97	197.73	1791.03
QMSP-384	9	18	18	P284	84"	25.63	230.67	1824.24
QMSP-396	9	18	18	P296	96"	29.29	263.61	1857.18
QMSP-3126	9	18	18	P2126	126"	40.75	366.75	2005.82

QMSP-4XX, 12 ANTENNA PIPES							
ASSEMBLY NO.	"A" QTY	"B" QTY	"C" QTY	PART NO. "D"	LENGTH "E"	UNIT WT. "F"	NET WT. "G"	TOTAL WEIGHT
QMSP-463	12	24	24	P263	63"	19.22	230.64	1824.21
QMSP-472	12	24	24	P272	72"	21.97	263.64	1857.21
QMSP-484	12	24	24	P284	84"	25.63	307.56	1901.13
QMSP-496	12	24	24	P296	96"	29.29	351.48	1945.05
QMSP-4126	12	24	24	P2126	126"	40.75	489.00	2082.57

PLATFORM DETAIL
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12/20/17
PETROS T. SOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32674
LICENSED PROFESSIONAL ENGINEER

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

60 INDUSTRIAL PARK ROAD
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TOLLAND COUNTY

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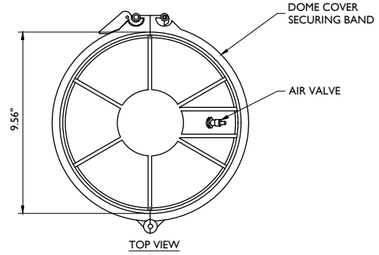
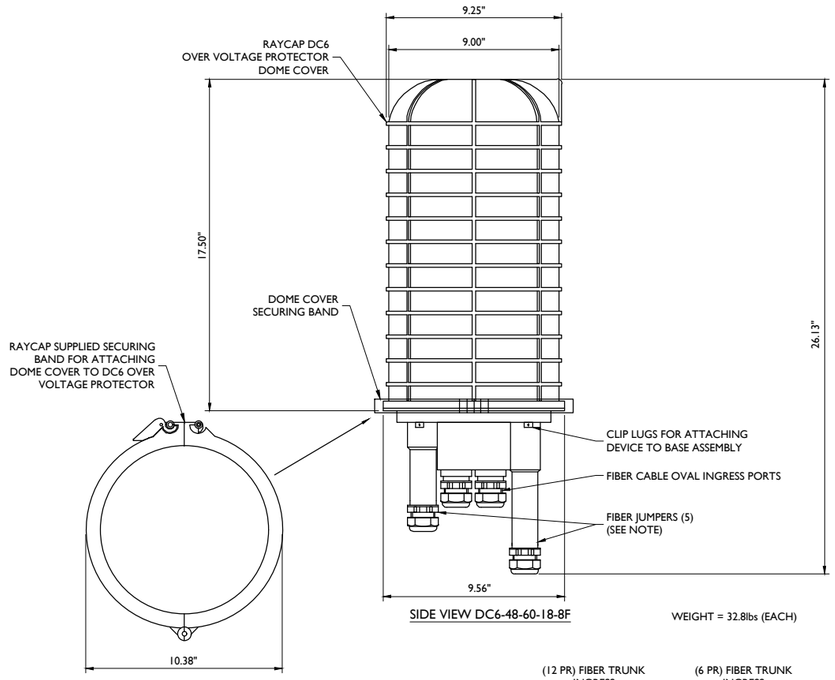
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE:
DETAILS

SHEET NUMBER:
A-6

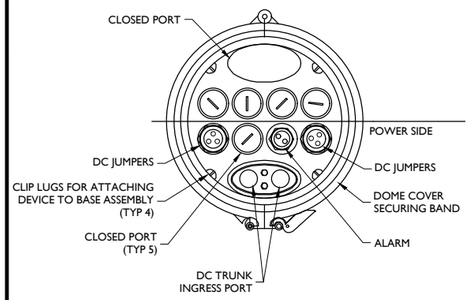


TOP VIEW

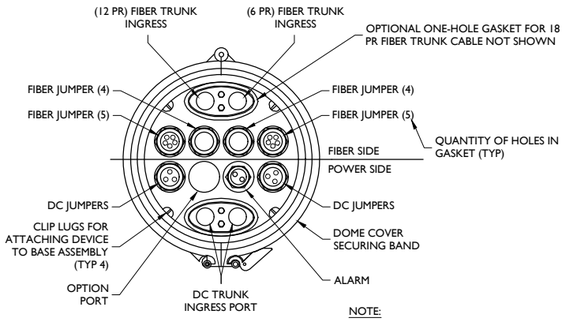


SIDE VIEW DC6-48-60-18-8F

WEIGHT = 32.8lbs (EACH)



BOTTOM VIEW
DC6-48-60-0-8F



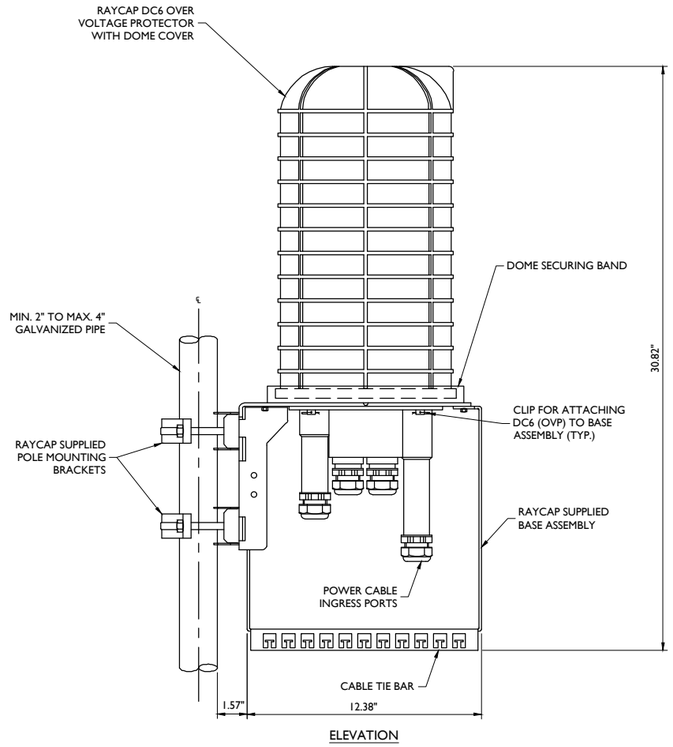
BOTTOM VIEW
DC6-48-60-18-8F

NOTE:

REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE



ELEVATION

NOTES:

RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

RAYCAP DC6-48-60-18-8F & DC6-48-60-0-8F
DC POWER OVER VOLTAGE PROTECTOR (OVP)
POLE MOUNT BASE ASSEMBLY

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CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32671
LICENSED PROFESSIONAL ENGINEER

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

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TOLLAND COUNTY

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SHEET TITLE :

DETAILS

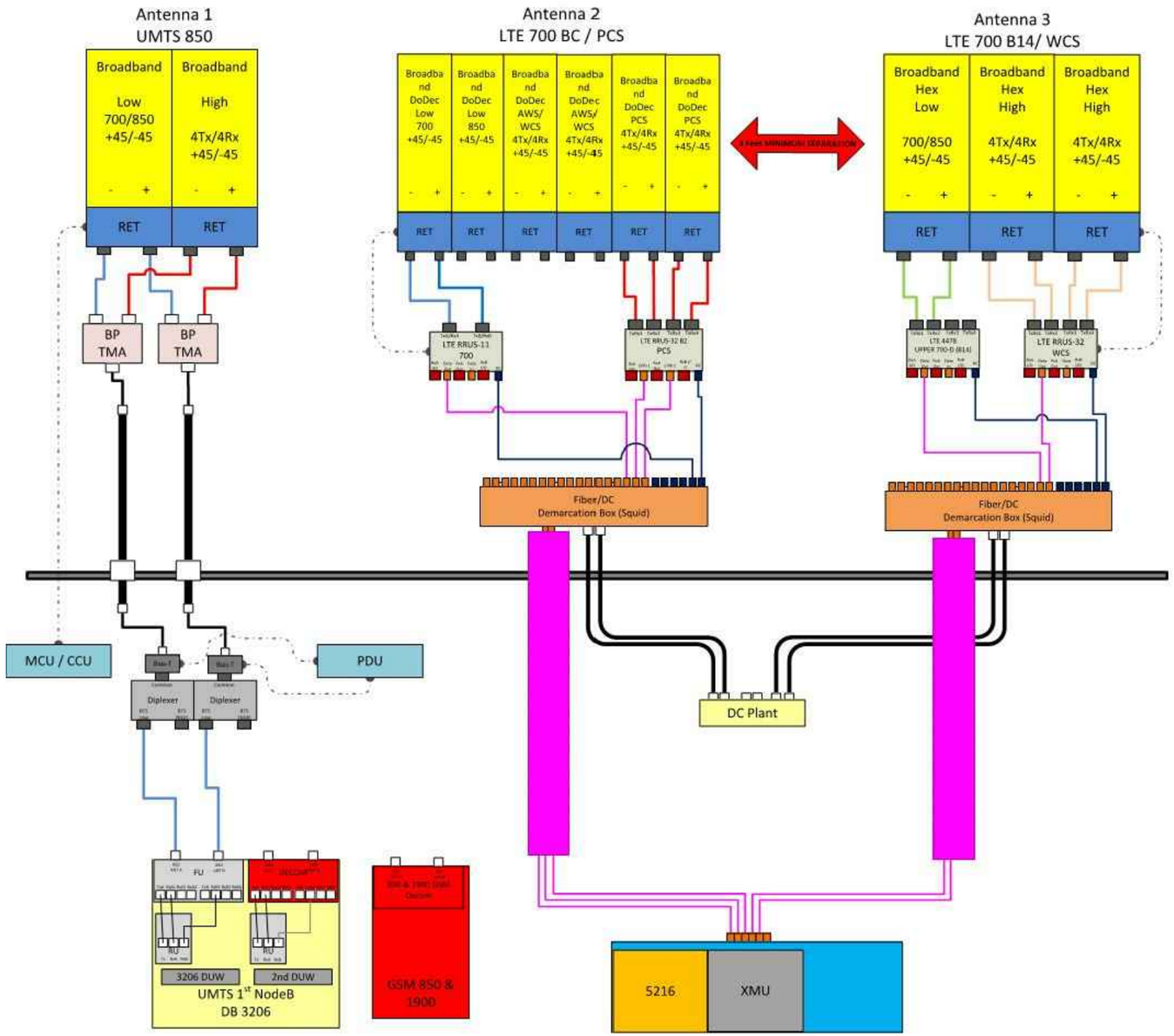
SHEET NUMBER :

A-7

Diagram - Sector A/1 | Diagram File Name - CT5310_A_B_C_Rev.1.vsd

Atoll Site Name - CTL05310 | Location Name - VERNON CENTER | Market - CONNECTICUT | Market Cluster - NEW ENGLAND

Comments:



ALL SECTORS

BASED ON: "NEW-ENGLAND_CONNECTICUT_CTL05310_2018-LTE-Next-Carrier_LTE_ak975u_2051A0DAX6_10071292_25944_05-30-2017_Final-Approved_v1.00" Last Updated: 08/16/17

RF PLUMBING DIAGRAMS

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STATE OF CONNECTICUT
PETROS T. TSOUKALAS
PROFESSIONAL ENGINEER

PETROS T. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32571

SITE NAME:

VERNON CENTER
FA#:10071292
SITE #: CT5310

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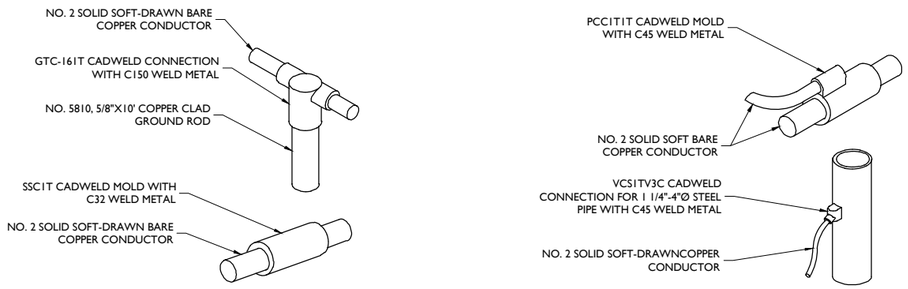
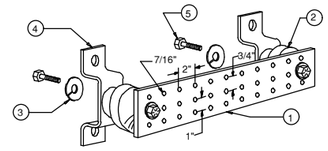
SHEET TITLE :
RF PLUMBING DIAGRAMS

SHEET NUMBER :
A-8



CADWELD DETAILS

NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PRODUCERS

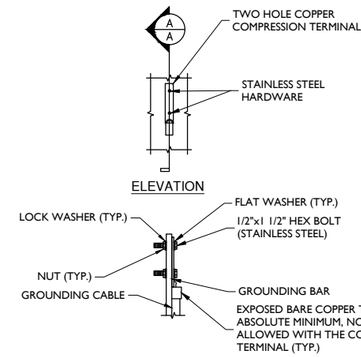
CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

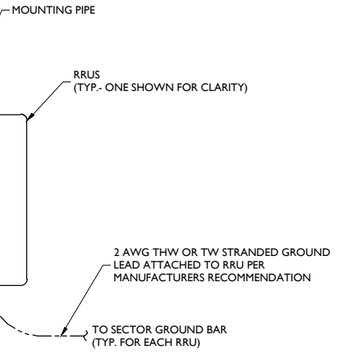
MASTER GROUND BAR

NOT TO SCALE



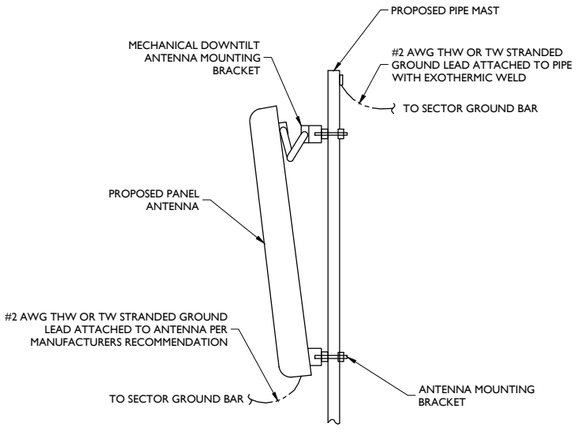
TYPICAL GROUND BAR CONNECTION DETAIL

NOT TO SCALE



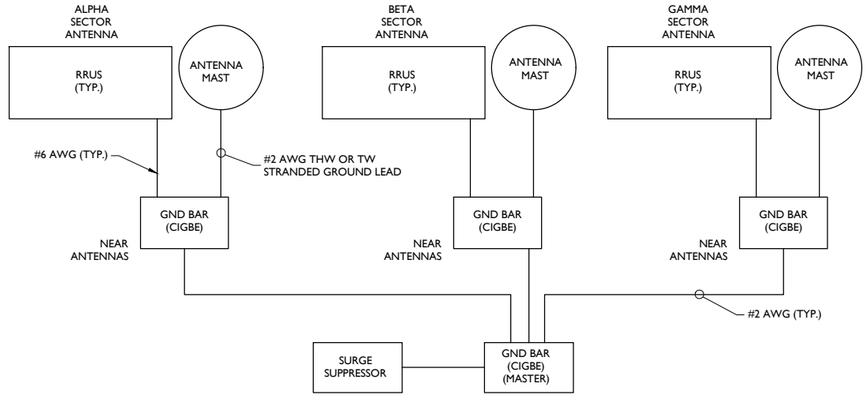
RRU GROUNDING DETAIL

NOT TO SCALE

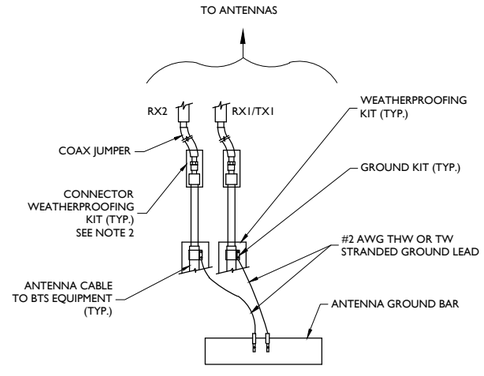


ANTENNA GROUNDING

NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR

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PETROS E. TSOUKALAS
12597
LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32597

SITE NAME:

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FA#:10071292
SITE #: CT5310

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SHEET TITLE :

GROUNDING DETAILS

SHEET NUMBER :

G-1

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5310

Vernon Center
60 Industrial Park Road
Vernon_Rockville, CT 06066

December 14, 2017

Centerline Communications Project Number: 950006-085

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**6.49 %**

December 14, 2017

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

Emissions Analysis for Site: **CT5310 – Vernon Center**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **60 Industrial Park Road, Vernon_Rockville, 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.

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). 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 **60 Industrial Park Road, Vernon_Rockville, 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 (Antenna 1)	850 MHz	2	30
LTE (Antenna 2)	700 MHz	2	60
LTE (Antenna 2)	1900 MHz (PCS)	4	60
LTE (Antenna 3)	700 MHz	2	60
LTE (Antenna 3)	2300 MHz (WCS)	2	60

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, 1900 MHz (PCS) and 2300 MHz (WCS) 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	Kathrein 800-10121	168
A	2	Quintel QS66512-2	168
A	3	CCI HPA-65R-BUU-H6	168
B	1	Kathrein 800-10121	168
B	2	Quintel QS66512-2	168
B	3	CCI HPA-65R-BUU-H6	168
C	1	Kathrein 800-10121	168
C	2	Quintel QS66512-2	168
C	3	CCI HPA-65R-BUU-H6	168

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	Kathrein 800-10121	850 MHz	11.45	2	60	837.82	0.20
Antenna A2	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	360	7,283.29	1.23
Antenna A3	CCI HPA-65R-BUU-H6	700 MHz / 2300 MHz (WCS)	11.95 / 15.25	4	240	5,899.69	1.10
						Sector A Composite MPE%	**2.53**
Antenna B1	Kathrein 800-10121	850 MHz	11.45	2	60	837.82	0.20
Antenna B2	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	360	7,283.29	1.23
Antenna B3	CCI HPA-65R-BUU-H6	700 MHz / 2300 MHz (WCS)	11.95 / 15.25	4	240	5,899.69	1.10
						Sector B Composite MPE%	**2.53**
Antenna C1	Kathrein 800-10121	850 MHz	11.45	2	60	837.82	0.20
Antenna C2	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	360	7,283.29	1.23
Antenna C3	CCI HPA-65R-BUU-H6	700 MHz / 2300 MHz (WCS)	11.95 / 15.25	4	240	5,899.69	1.10
						Sector C Composite MPE%	**2.53**

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	**2.53 %**
Town Antennas	0.00 %
Nextel	0.30 %
Verizon Wireless	2.19 %
T-Mobile	1.47 %
Site Total MPE %:	**6.49 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	2.53 %
AT&T Sector B Total:	2.53 %
AT&T Sector C Total:	2.53 %
Site Total:	6.49 %

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 (All Sectors)	# 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	418.91	168	1.15	850 MHz	567	0.20%
AT&T 700 MHz LTE (Antenna 2)	2	729.71	168	2.00	700 MHz	467	0.43%
AT&T 1900 MHz (PCS) LTE (Antenna 2)	4	1,455.97	168	7.98	1900 MHz (PCS)	1000	0.80%
AT&T 700 MHz LTE (Antenna 3)	2	940.05	168	2.58	700 MHz	467	0.55%
AT&T 2300 MHz (WCS) LTE (Antenna 3)	2	2,009.79	168	5.51	2300 MHz (WCS)	1000	0.55%
						Total:	**2.53%**

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:	2.53 %
Sector B:	2.53 %
Sector C:	2.53 %
AT&T Maximum Total (per sector):	2.53 %
Site Total:	6.49 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.49 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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Raynham, MA 02767

CT5310

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Product Description	Sale Qty	Final Price
PM 2-Day	1	$6.70
Flat Rate Env		
(Domestic)		
(VERNON ROCKVILLE, CT 06066)		
(Flat Rate)		
(Expected Delivery Date)		
(Thursday 02/01/2018)		
(USPS Tracking #)		
(9505 5103 9196 8030 2207 43)		
Insurance	1	$0.00
(Up to $50.00 included)		
PM 2-Day	1	$6.70
Flat Rate Env		
(Domestic)		
(VERNON ROCKVILLE, CT 06066)		
(Flat Rate)		
(Expected Delivery Date)		
(Thursday 02/01/2018)		
(USPS Tracking #)		
(9505 5103 9196 8030 2207 50)		
Insurance	1	$0.00
(Up to $50.00 included)		
PM 2-Day	1	$6.70
Flat Rate Env		
(Domestic)		
(VERNON ROCKVILLE, CT 06066)		
(Flat Rate)		
(Expected Delivery Date)		
(Thursday 02/01/2018)		
(USPS Tracking #)		
(9505 5103 9196 8030 2207 67)		
Insurance	1	$0.00
(Up to $50.00 included)		
PM 2-Day	1	$6.70
Flat Rate Env		
(Domestic)		
(MANCHESTER, CT 06040)		
(Flat Rate)		
(Expected Delivery Date)		
(Thursday 02/01/2018)		
(USPS Tracking #)		
(9505 5103 9196 8030 2207 74)		
Insurance	1	$0.00
(Up to $50.00 included)		
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Debit Card Remit'd		$26.80
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(Approval #:)		
(Transaction #:269)		
(Receipt #:009142)		
(Debit Card Purchase:$26.80)		
(Cash Back:$0.00)		

Includes up to $50 insurance

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1 FEBRUARY 2018 ⓘ by **8:00pm** ⓘ

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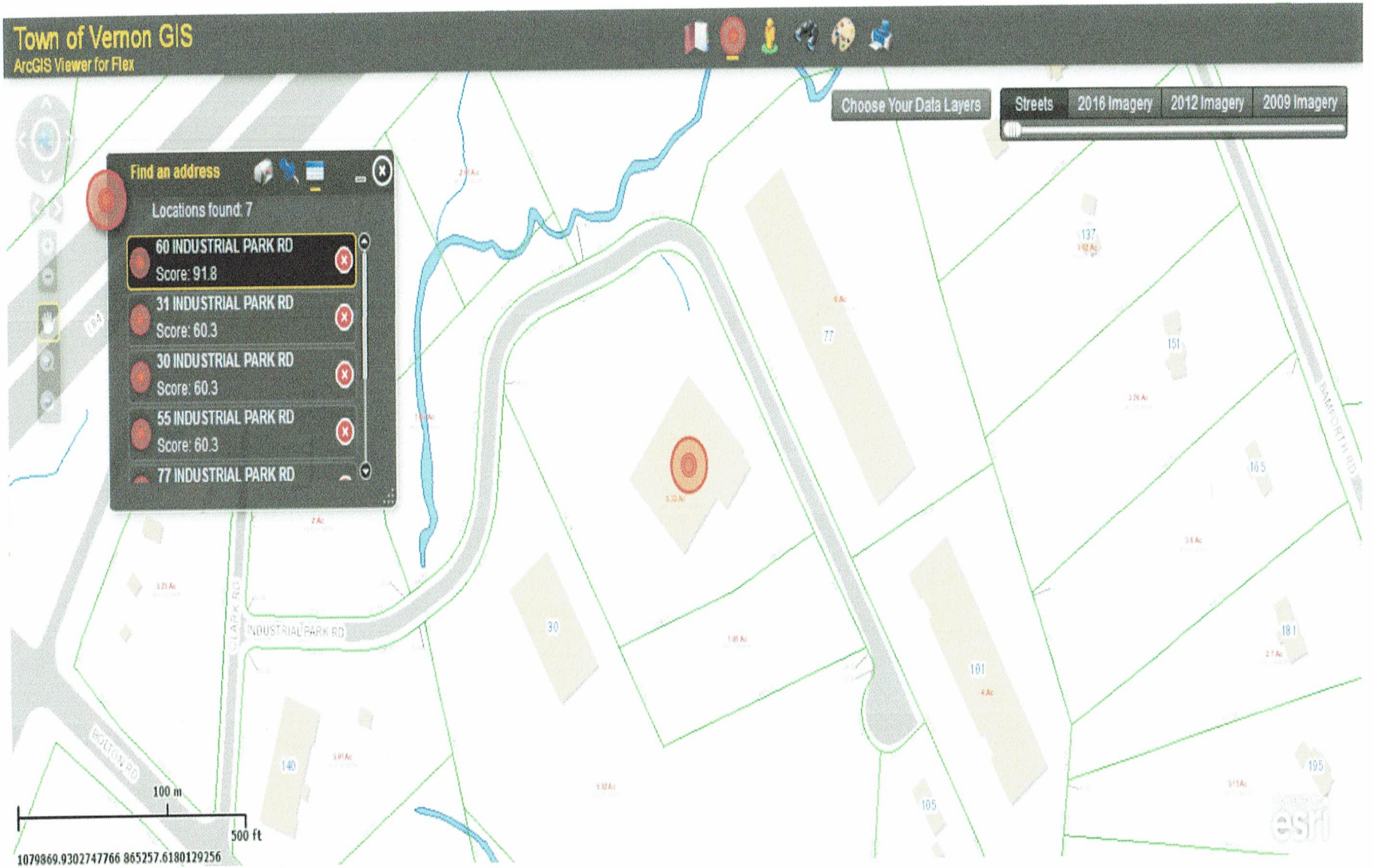
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Score: 60.3
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CLARK RD
BOLTON RD
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