App No: 2020101311

Revised 11.17.20 J.C.

Application General Infomation

Applicant Name	Site Link Wireless, LLC	Updated	10/20/2020
Application Type	Minor Modification	Ann. Plan?	Yes
Carrier	T-Mobile	Will site be used to support government telecommunications facilities or other equipment for government use?	No
Solution Type	Macro		
Existing	Existing	Gvt. Use Desc.	

Application Description

T-Mobile proposes to relocate (9) existing antennas, install (3) new panel antennas, remove and replace (6) RRUs, remove (1) existing cabinet and install (2) new cabinets at the existing telecom monopole site.

Site Infomation

Site Id	299	Zoning	R-60
Structure Type	Monopole	Latitude	39.059453
Address	12501 Dalewood Rd, Silver Spring	Longitude	-77.066497
County Site Name	Wheaton High School	Ground Elevation	371
Carrier Site Name	7WAN235A	City	Silver Spring
Site Owner	MCPS	Lease Status	Leased
Structure Owner	MCPS	Does the structure require an antenna structure registration under FCC Title 47	Yes
Existing Structure Height	100		
Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)		Distance to Residential Property (New, Replacement, Colocation Only)	
		Distance to Commercial Property (New, Replacement, Colocation Only)	

Justification of why this site was selected:

NearbySites (New, Replacement Apps Only):

Wednesday, October 21, 2020

8:46:04 AM

App No: 2020101311

Screening considerations(New, Colocations, Replacement Apps Only):

Wednesday, October 21, 2020

8:46:06 AM

App No: 2020101311

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only): Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater? No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet? No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet? No

More than four Equipment Cabinets? YN: No

Will the proposed installation require excavation or expansion outside the current boundaries of the site? No

Does the structure or current installation have concealment elements/measures? No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater? No

If yes, describe how the proposed installation does not defeat the existing concealment.

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility? No

Is the structure 10% taller than adjacent structures?

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet: 24

Please list adjacent structure heights

Tribal Lands? No

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

ROW Information

PROW? No

Pole Number

ROW owner

ROW width

Wednesday, October 21, 2020

8:46:06 AM

App No: 2020101311

Antenna Infomation

Antenna Compliance	Yes
Compliance Desc	
Antenna Location	No
Antenna Loc. Desc.	
Env. Assessment	
Cat. Excluded?	
Routine Env. Evaluation	checked

Antenna Model	Ericsson AIR 6449 B41						
Frequency	2496-2690 MHz						
RAD Center	102	Max ERP	5984.6	Antenna Dimensions	33.1"x20.6"x8.6"	Quantity	3

Wednesday, October 21, 2020

8:46:06 AM

Montgomery County Zoning

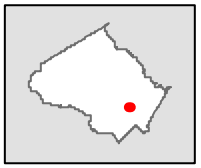
Date: 10/20/2020

Montgomery County Planning Department
ITI Division

Account #	00953838
Address	12601 DALEWOOD DR SILVER SPRING, 20906
Zone	R-60
Overlay Zone	N/A
TDR Overlay Zone	N/A
Landuse	Institutional/Community Facility
Parcel, Lot, Block	P472 , N/A , N/A
WSSC Grid	216NW03
Map Amendments	G-642 G-956

Parking District	N/A
CBD	N/A
Special Protection Area	N/A
Urban District	N/A
Enterprise Zone	N/A
Arts & Ent. District	N/A
Special Tax District	N/A
Legal Description	HERMITAGE

Bike/Ped Priority Area	N/A
Urban Renewal Area	N/A
Metro Station Policy Area	N/A
Priority Funding Area	Yes
Septic Tier	Tier 1: Sewer existing
Municipality	N/A
Master Plan	MASTER PLAN FOR KENSINGTON WHEATON
Historic Site/District	N/A
Water/Sewer Categories	W-1 / S-1



1 inch = 218 feet

New Product Introduction

Massive MIMO Mid-Band
AIR6449 B41
New Product Introduction Notification

ERICSSON

(Refresh: Voltage Booster PSU 4813 is added in Ancillary Materials)

PURPOSE

Ericsson's next generation AIR6449 B41 massive MIMO (M-MIMO) single band product provides additional RF power and has full band IBW sufficient to transmit 180MHz of 4G/5G carrier bandwidth (vs. AIR6488 60+60MHz carrier bandwidth). The AIR6449 also offers enhanced RF performance via a 192 element antenna array (vs. AIR6488 with 128).

BACKGROUND

The AIR6449 has a combined antenna/radio with 64 TRX. It has advantages over the previous AIR6488 model such as:

- Full 194 MHz IBW and can support NR+LTE mixed mode vs. 100 MHz on AIR6488
- Smaller dimensions (in height and width) and lighter in weight
- 25 Gbps eCPRI support

AIR 6488 vs. AIR 6449 comparison is available at this link.

USAGE GUIDELINES

- AIR6449 is planned to replace AIR6488 on a go forward basis once available
- Full Anchor Design (2.5GHz + PCS) or 2.5GHz Only (AKA "Skinny")
- All markets except New York Boroughs
    - Use existing AIR6488 if entitlement is complete or expected to complete before July 1st, 2020 (see AIR6488 NPI)
    - Use existing AIR6488 if site is expected to be on-air before July 1st, 2020 (see AIR6488 NPI)
    - Use AIR6449 if entitlement complete is forecasted after July 1st, 2020
- NY Boroughs
    - Continue to use existing AIR6488M (see AIR6488 NPI)

TIMELINES

- Lab Entry: April 2020
- GA: June 30th, 2020
- New RFDS Templates for Anchor PORs reflecting AIR6449 have been created.
- This next generation hardware is expected to be available in commercial quantities in July 2020.

AFFECTED CONFIGURATIONS

Sites must be on an Anchor POR to use the AIR6449.

Site configurations that are designed with AIR6449 B41 will have a "**5A**" (5 for 2.5GHz + A for AIR6449) after the low-band indicator and/or before L19 indicator in the naming convention e.g., 67D92DB => 67D**5A**992DB, 92DB => **5A**992DB, etc.

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192
Output RF Power	300 W (=64 TRX x 4.6875W)
Data Ports	4 x 25Gb/s CPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling (vs. active cooling on AIR32 DB)
Dimensions (H x W x D)	33.1" x 20.6" x 8.6" inches (=841 x 524 x 217 mm)
Weight	104 lbs (=47 kg)
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees
HW/SW Availability	July 2020
Material SAP #	34105 – AIR 6449 B41

WARRANTY: 1 Year

SPARES: 2% of install base. Additional units can be requested as per need.

Baseband Requirements

For a typical 3-sector site,

- LTE: one dedicated BB6630 per site
- NR: one dedicated BB6648 (see its NPI) per site

Supplementary/Ancillary Materials

SKU	Description	Qty
34106	AIR6449 mandatory install kit	1 per AIR6449
34110	AIR6449 25G SFP	8 per AIR6449

The AIR6449 requires a voltage booster (i.e., PSU 4813) in almost all cases when using the current HCS 6x12. Please refer to Voltage Booster design doc for its usage guidance (depending on the HCS length and gauge). Note the installation kit is different for each cabinet type.

SKU	Description	Qty
34132	PSU 4813 main unit	1
34133	PSU installation kit for RBS61xx	Choose 1 per cabinet type
34134	PSU installation kit for PBC6200	
34135	PSU installation kit for E6x60/P6230	

LINKS

- Ericsson New T-Mobile Anchor Network Playbook
- AIR 6488 vs. AIR 6449 Comparison

CONTACTS

Kyuho Son	Principal Engineer, RAN Architecture
Weston Berry	Engineer, RAN Architecture

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

Monopole Analysis

Existing Monopole:

Result of Analysis	**Passing**
Monopole Critical Demand Capacity Ratio:	**97%**
Foundation Critical Demand Capacity Ratio:	**105%**

7WAN235A

BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Proposed T-Mobile Installation

Revision 1

August 28, 2020

Prepared For:

Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

MRA Job Number: 19851.038

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

August 28, 2020

Mr. Drew Montgomery
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Re: 7WAN235A
BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Latitude: 39° 03' 35.53" N, Longitude: 77° 04' 1.20" W
MRA Job No 19851.038
Monopole Analysis for Proposed T-Mobile Installation – Revision 1

Dear Drew :

As requested, Morris & Ritchie Associates, Inc. (MRA) has completed our structural analysis of the existing 96'-0" monopole located at the above referenced site. The objective of MRA's analysis was to determine if the monopole can structurally support the proposed T-Mobile installation, in addition to the existing appurtenances, and meet the requirements of the 2018 International Building Code (IBC 2018), the ANSI/TIA-222-H-2017 Standard, and the AISC Manual of Steel Construction, Load and Resistance Factored Design.

The structural analysis of the monopole has been based upon the following information:

- Construction drawings, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Mount Analysis Report, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Information obtained during site visit, performed by MRA, on July 1, 2020.
- RF configuration and plumbing diagram, prepared by T-Mobile, dated April 22, 2020.
- Construction drawings, prepared by NB+C Engineering Services, for T-Mobile, Site Number: 7WAN235A, dated November 26, 2018.
- Tower Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 21, 2018.
- Mount Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 15, 2018.
- Assembly Drawings for "12' Low Profile Antenna Platform H" (Part#: K12443), provided by EEI, dated November 22, 2016.
- Assembly Drawings for "Platform Reinforcement on a 12" to 45" Pole 4'-6" Angle" (Part#: PRK-1245L), provided by SitePro1, dated April 10, 2014.

For a complete list of all existing and proposed appurtenances used in this analysis, refer to the table on page 5, appended to this report. All appurtenances listed as "to be removed" shall be removed from the tower prior to the installation of any proposed appurtenances.

Several assumptions were made in order to perform the analysis of the monopole. Each of these is considered by MRA to be both reasonable and consistent with current standards of practice.

- All monopole structure information and existing loading were obtained from the original design drawings and/or documents described in the information provided above, are assumed to be accurate.
- The monopole and its foundation were manufactured and constructed in accordance with the EEI original design drawings.
- The monopole base plate has sufficient capacity to support the original design reactions.
- The slip jointed splices were assembled in accordance with the manufacturer's specifications.
- All structural components are in "like new" condition.
- The monopole is modeled as a cantilever beam, with a fixed connection at its base.
- The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
- The monopole and its foundation have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
- The analysis provided in this report only addresses the capacity of the monopole and its foundation; capacities of individual standoffs, mounting frames, etc. are not included in this analysis and are assumed to have adequate capacity to resist loads applied by the appurtenances they support.
- Any and all documentation regarding any previous monopole and/or foundation modifications has been provided to MRA.

The results of this analysis are influenced by the assumptions listed above. MRA should be notified of any additional information that potentially contradicts the above assumptions to determine the effect on the analysis results.

The wind speed and radial ice thickness required by the IBC 2018 and TIA-222-H for this specific location and risk category is in accordance with the wind speed and radial ice thickness maps from ASCE 7-16. Section 2.6.4 of the TIA-222-H Standard states, "It shall be permissible to determine site-specific basic wind speeds and design ice thicknesses from the ASCE 7 online Hazard tool based on ASCE 7-16" to assist in automated interpolation of the wind speed and radial ice thickness maps provided in Annex B of TIA-222-H.

In addition to wind and ice, TIA-222-H requires consideration of earthquake loading effects based on site-specific seismic parameters, aside from Risk Category I structures (earthquake effects could be ignored if S_s was less than or equal to 1.00 in the TIA-222-G Standard).

Due to lack of detailed information provided in TIA-222-H, MRA used the provisions of ASCE 7-16 Chapter C26.7 for exposure category determination. In addition, since TIA-222-H does not recognize wind sectors, but rather defines a wind exposure category for the entire site for all wind directions, it is MRA's professional opinion that a sector of 45 degrees or more of a specific surface roughness, evaluated throughout the extended upwind fetch (greater of 20 times the height of the tower and 2,600 ft), be used for determining the overall site exposure category. Based on this evaluation, we determined that this site is Exposure Category C.

Since this structure does not represent a substantial hazard to human life and/or damage to property in the event of failure, we have determined this structure to be a Risk Category II.

Based on the surrounding topography using satellite imagery and guidelines provided in TIA-222-H, the Topographic Category was determined to be Category 1 due to no abrupt changes in the general topography.

Since the soil properties are not known in sufficient detail to determine the site-specific site class, the default Site Class D was used.

We understand that the structure has designated periodic inspection evaluations in accordance with a site-specific management plan, in addition to the condition assessments as recommended by TIA-222-H; therefore, the Existing Structure Load Modification Factors, K_{es}, were utilized.

In accordance with TIA-222-H, the following loading conditions were considered:

Basic Wind Speed without Ice:	113 mph Wind (3-second gust) + No Ice
Basic Wind Speed with Ice:	40 mph Wind (3-second gust) + 1" Radial Ice
Exposure Category:	C
Risk Category:	II
Topographic Category:	1
Load Modification Factors:	F_w=0.95, t_i=0.85, E_v=1.00, E_h=1.00
Spectral Response Accelerations:	S_s = 0.134 g & S_1 = 0.043 g
Seismic Response Coefficient:	C_s = 0.0715 g
Site Class:	D (by default)
Antenna Rad Center:	102'-0"
Ground Elevation (NAVD 88):	371 ft

The total weight of the existing structure and existing, proposed appurtenances (W) times the seismic response coefficient (C_s) is considerably smaller than the effective projected wind area (EPA) times the wind pressure ($q_z G_h$); therefore, by inspection, we have determined a complete detailed seismic analysis of the existing structure is not necessary as wind loading effects will vastly exceed earthquake loading effects.

As a result of our analysis, we have calculated the critical demand-capacity ratio in the pole shaft to be **97%**.

We have also calculated the maximum factored foundation reactions, and compared them to the original foundation design reactions calculated by Engineered Endeavors, Inc. (EEI) (multiplied by a 1.35 factor, per TIA-222-H 15.6.2), as follows:

REACTION TYPE	ORIGINAL DESIGN REACTION	REACTION FROM CURRENT ANALYSIS	PERCENTAGE
Axial	15.3 k	15.1 k	99%
Shear	13.1 k	11.5 k	88%
Moment	923.1 k-ft	966.3 k-ft	105%

The original design reactions are multiplied by a factor of 1.35 so that a consistent comparison could be made between the reactions from the original EEI design drawings (which were based on service loads) and those from the analysis (which are based on factored loads). Please note that the original design reactions listed above are not the capacities of the foundation itself, but the reactions used to design the foundation. Based on the comparison in the table above, we have determined that the existing foundation, base plate and anchor bolts have sufficient capacity to support the reactions from the current analysis.

As stated in TIA-222-H, the standard allows a comprehensive structural analysis to be limited to a maximum demand-capacity ratio of 105%. This is primarily due to the statistical probability of attaining the maximum wind loading condition, the variability associated with non-linear analysis, and the conservatism in the wind load calculations from the standard.

Our structural analysis indicates that, under the conditions noted above, the existing 96'-0" monopole has sufficient structural capacity to support the proposed T-Mobile installation, in addition to the existing appurtenances, as described herein. No problems for the pole or its foundation, base plate, or anchor bolts are anticipated, and no modifications are necessary.

Any further changes to the appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

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,
MORRIS & RITCHIE ASSOCIATES, INC.

Finny Joy, P.E.
Structural Engineer

Richard J. Dyer, P.E., S.E., S.E.C.B.
Principal

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

V:\Bg_PROJECTS\19800-19899\19851 - Site Link Wireless\19851038 7WAN235A (BOE - Richard D. Riddle School)\Analysis & Design\Revision 1\Monopole Analysis\7WAN235A (BOE - RDRS) - Monopole Analysis Report.Docm

Contents

STANDARD CONDITIONS FOR FURNISHING PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY MORRIS & RITCHIE ASSOCIATES, INC.

In rendering the engineering services described in our proposal or agreement we may rely on the following:

- Information supplied by the client regarding the structure, its foundations, soil conditions, antenna and feedline loading on the structure and its components.

- Information from reports and drawings in the possession of Morris & Ritchie Associates, Inc. (MRA) or generated by field inspection or measurements of the structure.

- Other documents and matters as we deemed necessary and appropriate to render the engineering services described in this proposal or agreement.

All engineering services are performed subject to the following:

That all information supplied by or through the client and owner is current and correct. It is the responsibility of the client to ensure that the information provided to MRA and used in the performance of our engineering services is correct and complete.

In the absence of specific written information to the contrary, we assume the following: (1) the structure was constructed in accordance with the drawings and specifications, (2) the structure has not been modified, (3) the structure is not corroded and has not otherwise deteriorated, and (4) the capacity of the structure has not significantly changed from the "as new" condition.

All services will be rendered with reference to the codes specified by the client. We make no representations with respect to compliance with any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of TIA/EIA-222.

All documents submitted to us for our review as originals are authentic, all documents submitted to us as certified or photostat copies conform to the original documents and all signatures on all documents submitted to us for review are genuine and that all public records are accurate and complete.

We assume no obligation to supplement reports or plans if any applicable codes or laws change after the date thereof.

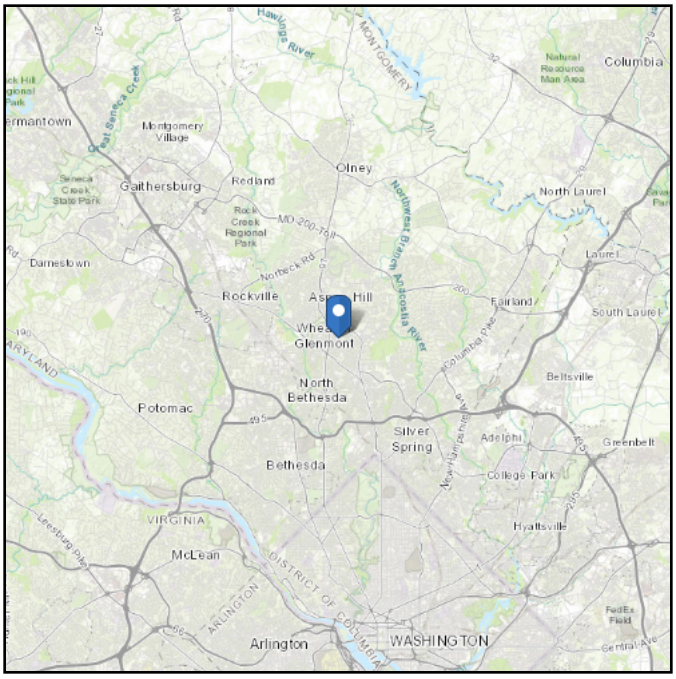
Services rendered are solely for the use of the Client. These reports, plans and specifications may not be relied upon by any person or persons without our prior written consent. Our services constitute professional services rendered in our capacity as professional engineers. Services rendered pursuant to this proposal or agreement do not give rise to or constitute warranties, certifications or guarantees giving rise to an obligation to indemnify anyone against any loss resulting from any inaccuracy contained therein. Our sole undertaking is to render such services in accordance with generally accepted engineering principles and practices. MRA is not responsible for the conclusions, opinions and recommendations made by others based upon the information we supply.

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 370.83 ft (NAVD 88)
Latitude: 39.05987
Longitude: -77.067



Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Sun May 17 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

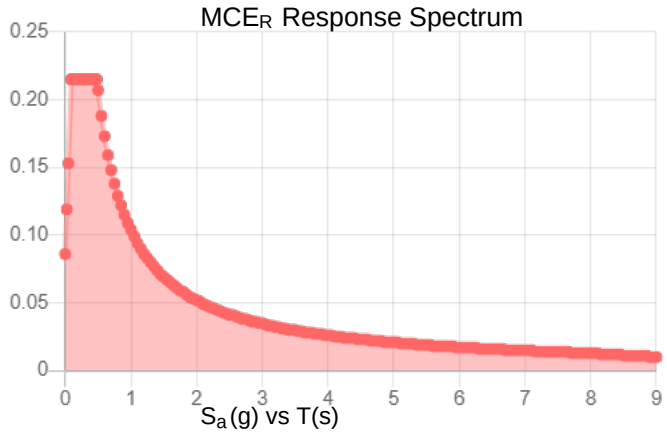
Seismic

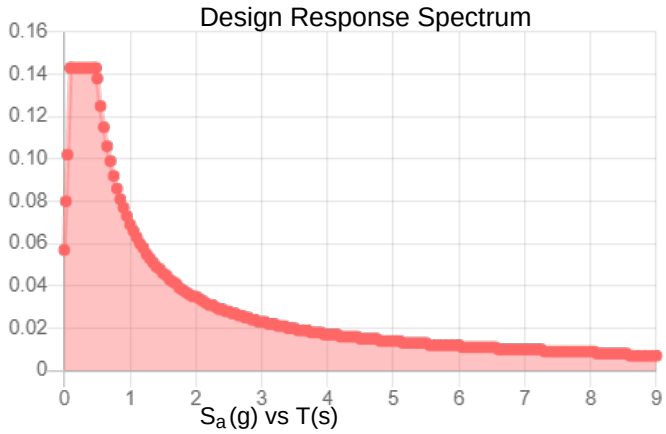
Site Soil Class: D - Stiff Soil

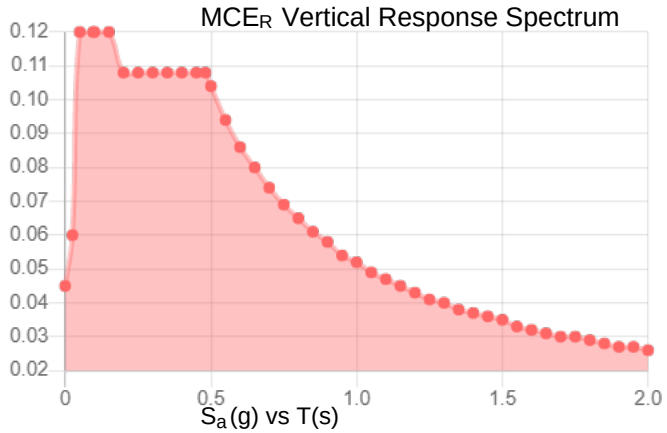
Results:

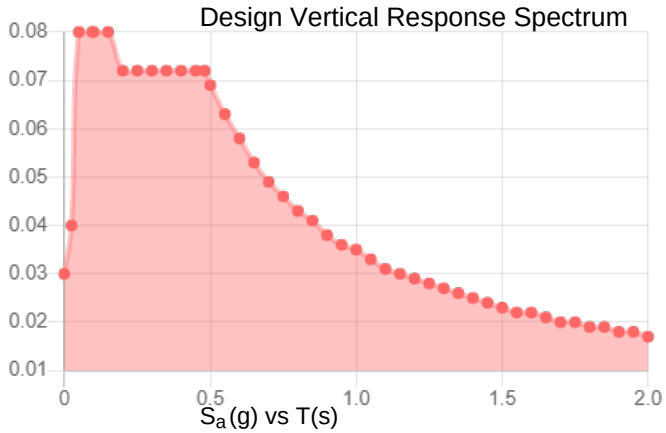
S_S :	0.134	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.07
F_v :	2.4	PGA_M :	0.111
S_{MS} :	0.215	F_{PGA} :	1.6
S_{M1} :	0.104	I_e :	1
S_{DS} :	0.143	C_v :	0.7

Seismic Design Category B









Data Accessed: Sun May 17 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

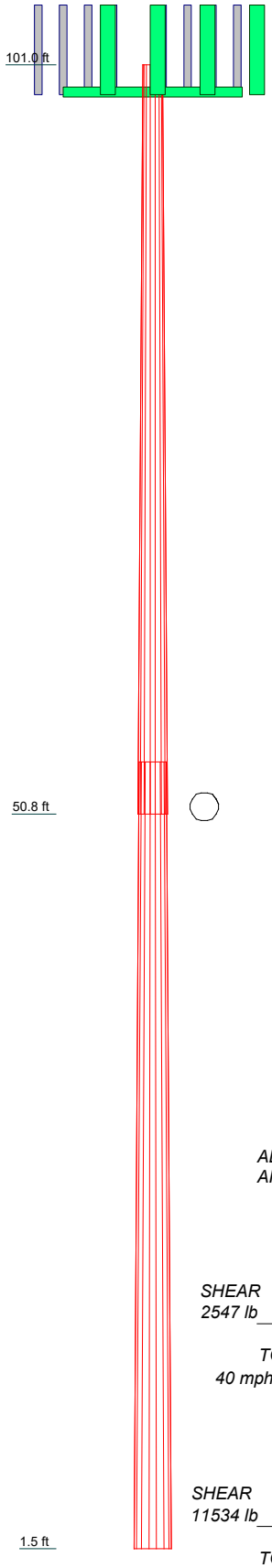
Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sun May 17 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	50.21	18	0.1875	3.42	16.0000	23.0500	A572-65	2064.5
2	52.71	18	0.2500		22.1948	30.0000		3862.6
								5927.2



ALL REACTIONS ARE FACTORED

AXIAL 22329 lb

SHEAR 2547 lb *MOMENT 225110 lb-ft*

TORQUE 225 lb-ft
40 mph WIND - 1.0000 in ICE

AXIAL 15080 lb

SHEAR 11534 lb *MOMENT 966299 lb-ft*

TORQUE 702 lb-ft
REACTIONS - 113 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Commscope 2HH-38A-R4 (T-Mobile)	102	Commscope 2HH-38A-R4 (T-Mobile)	102
8' Mount Pipe (T-Mobile)	102	8' Mount Pipe (T-Mobile)	102
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
		RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	Andrew SO 101-1 (Other)	69
		Andrew SO 101-1 (Other)	69
8' Mount Pipe (T-Mobile)	102	Andrew SO 101-1 (Other)	69

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Montgomery County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 113 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 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 Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 97%

Morris & Ritchie Associates, Inc.
1220 E Joppa Rd #505
Towson, MD 21286
Phone: 410-821-1690
FAX:

Job: *7WAN235A (BOE - Richard D. Riddle School)*			
Project: *19851.038*			
Client: Site Link Wireless	Drawn by: FJoy	App'd:	
Code: TIA-222-H	Date: 10/13/20	Scale: NTS	
Path:		Dwg No. E-1	

Morris and Ritchie Associates
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
(410) 821-1690

Project Name: 7WAN235A (BOE - Richard D. Riddle School)
Project Location: Silver Spring, Montgomery County, MD

LEGEND
Existing
To Be Removed
Proposed
Reserved

APPURTENANCES

** Appurtenance types and elevations are approximations used for obtaining gravity & wind loads only. **

Appurtenance	***Carrier***	***Approximate Elevation (AGL)***	***Mount***	***Feedline Size***	***Notes***
(6) CommScope 2HH-38A-R4-V2	**T-Mobile**	102' (CL)	EEI 12' Low Profile Platform 'H' Part: K12443 w/ SitePro1 platform reinforcing kit (PRK- 1245L)	(4) Existing Hybriflex & (1) Proposed Hybriflex (Internal)	Existing
(3) RFS APXVAARR24_43-U-NA20					
(6) Ericsson 4415 B66A					
(3) RRUS01 B2					
(3) Ericsson Radio 4449 B71+B85					
(6) Radio 4415 B25					*To be removed*
(3) Ericsson AIR6449 B41					**Proposed**
(6) Ericsson RRU 4424 B25					
Double Pipe Supports	N/A	69' (CL)	(3) Andrew SO 101-1	-	Existing

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Montgomery County, Maryland.
Tower base elevation above sea level: 372.50 ft.
Basic wind speed of 113 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
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 40 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.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	101.00-50.79	50.21	3.42	18	16.0000	23.0500	0.1875	0.5625	A572-65 (65 ksi)
L2	50.79-1.50	52.71		18	22.1948	30.0000	0.2500	1.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.2237	9.4104	297.2674	5.6134	8.1280	36.5733	594.9259	4.7061	2.5520	13.611
	23.3824	13.6060	898.4973	8.1162	11.7094	76.7330	1798.1770	6.8043	3.7928	20.228
L2	23.0129	17.4132	1059.4466	7.7904	11.2750	93.9646	2120.2873	8.7083	3.4663	13.865
	30.4242	23.6066	2639.6436	10.5612	15.2400	173.2050	5282.7605	11.8056	4.8400	19.36

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 101.00-50.79				1.03	1.03	1.05			
L2 50.79-1.50				1.03	1.03	1.05			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8 (Unknown)	C	No	No	CaAa (Out Of Face)	101.00 - 1.50	1	No Ice	0.04	0.00
							1/2" Ice	0.14	0.00
							1" Ice	0.24	0.00
9x18 HCS (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 6AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	1.50 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00

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	101.00-50.79	A	0.000	0.000	0.000	0.000	151.63
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.883	11.05
L2	50.79-1.50	A	0.000	0.000	0.000	0.000	148.86
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.848	10.84

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	101.00-50.79	A	0.923	0.000	0.000	0.000	0.000	151.63
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.147	60.14

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
L2	50.79-1.50	A	0.831	0.000	0.000	0.000	0.000	148.86
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.943	59.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	101.00-50.79	-0.2480	0.1432	-0.7656	0.4420
L2	50.79-1.50	-0.2500	0.1443	-0.8054	0.4650

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	A	None		0.0000	99.50	No Ice	29.35	29.35	2000.00
						1/2" Ice	70.00	70.00	3000.00
						1" Ice	110.65	110.65	4000.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Ericsson AIR6449 B41 (T-Mobile)	A	From Face	4.17 -2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	5.68 5.98 6.29	2.49 2.72 2.95	119.00 158.12 201.46
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RFS APXVAARR24_43-U-NA20 (T-Mobile)	A	From Face	4.17 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	20.24 20.85 21.46	8.89 9.39 9.89	153.00 283.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	A	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	A	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			1.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	B	From Face	4.17	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			1.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	B	From Face	4.17	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	B	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	B	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	C	From Face	4.67	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	C	From Face	4.67	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	A	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	C	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	C	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
Andrew SO 101-1	A	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	B	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	C	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00

222-H Verification Constants

Constant	Value
K_d	0.95
Ice Thickness Importance Factor	1
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	0.987

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
L1 101.00-50.79	1	TP23.05x16x0.1875	202.118	78.212		1	1	85.345	93.297	85.345	93.297
							Sum:	85.345	93.297	85.345	93.297
L2 50.79-1.50	2	TP30x22.1948x0.25	241.837	90.981		1	1	113.039	120.845	113.039	120.067
							Sum:	113.039	120.845	113.039	120.067

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82		1.191	1	1		34.5		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		27.2		1	113.039

222-H Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82	75.90	1.191	1	1	0.9225	4.3		1	93.297
L2 50.79-1.50	26.21	26.15	0.955	1	1	0.8306	3.4		1	120.067

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 101.00-50.79	74.82		1.191	1	1		9.2		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		7.2		1	113.039

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	34.5	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883
L2 50.79-1.50	26.21	0.955	27.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 101.00-50.79	74.82	1.191	4.3	0.9225	90.579	A	0.000	93.297	93.297	100.00	0.000	0.000
						B	0.000	93.297		100.00	0.000	0.000
						C	0.000	93.297		100.00	0.000	11.147
L2 50.79-1.50	26.21	0.955	3.4	0.8306	117.325	A	0.000	120.845	120.845	100.00	0.000	0.000
						B	0.000	120.845		100.00	0.000	0.000
						C	0.000	120.845		100.00	0.000	10.943

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	9.2	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2 50.79-1.50	26.21	0.955	7.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	36.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
	Sum Weight:	6317.00							

Discrete Appurtenance Pressures - With Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	3898.37	0.00	0.00	99.50	1.264	4.6	106.52	106.52	0.9492
Commscope 2HH-38A-R4	300.0000	408.83	-7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-6.76	3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	300.0000	197.26	-5.19	-0.69	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	300.0000	400.40	-3.19	-4.15	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	300.0000	408.83	-1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	300.0000	77.48	-6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	300.0000	77.42	-6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	300.0000	96.63	-3.01	-3.47	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	300.0000	110.12	-3.01	-3.47	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	300.0000	77.48	-0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	300.0000	77.42	-0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	60.0000	408.83	1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	60.0000	197.26	3.19	-4.15	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	60.0000	61.35	4.26	-1.30	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	60.0000	400.40	5.19	-0.69	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	60.0000	408.83	7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	60.0000	77.48	0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
RRU 4424 B25	60.0000	77.42	0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	60.0000	96.63	4.51	-0.87	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	60.0000	110.12	5.01	-0.01	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	60.0000	77.48	6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	60.0000	77.42	6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	180.0000	408.83	6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	180.0000	197.26	2.00	5.34	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	180.0000	400.40	-2.00	5.34	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	180.0000	408.83	-6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	180.0000	77.48	6.00	4.35	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	180.0000	77.42	6.00	4.35	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	180.0000	96.63	-1.50	4.35	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	180.0000	110.12	-2.50	4.35	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
	Sum Weight:	10830.46								

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	9.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
	Sum Weight:	6317.00							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	5927.16					
Bracing Weight	0.00					
Total Member Self-Weight	5927.16			524.69	236.51	
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - No Ice		0.00	-11534.21	-883683.98	236.51	-517.09
Wind 30 deg - No Ice		5767.10	-9988.92	-765222.48	-441867.87	-240.61
Wind 60 deg - No Ice		9988.92	-5767.10	-441579.64	-765510.74	100.33
Wind 90 deg - No Ice		11534.21	0.00	524.69	-883972.25	414.40
Wind 120 deg - No Ice		9988.92	5767.10	442629.02	-765510.74	617.42
Wind 150 deg - No Ice		5767.10	9988.92	766271.86	-441867.87	655.01
Wind 180 deg - No Ice		0.00	11534.21	884733.36	236.51	517.09
Wind 210 deg - No Ice		-5767.10	9988.92	766271.86	442340.88	240.61
Wind 240 deg - No Ice		-9988.92	5767.10	442629.02	765983.75	-100.33
Wind 270 deg - No Ice		-11534.21	0.00	524.69	884445.26	-414.40
Wind 300 deg - No Ice		-9988.92	-5767.10	-441579.64	765983.75	-617.42
Wind 330 deg - No Ice		-5767.10	-9988.92	-765222.48	442340.88	-655.01
Member Ice	2542.67					
Total Weight Ice	19719.97			832.74	537.38	
Wind 0 deg - Ice		0.00	-2546.41	-191325.50	537.38	-174.95
Wind 30 deg - Ice		1273.20	-2205.25	-165581.18	-95541.75	-105.79
Wind 60 deg - Ice		2205.25	-1273.20	-95246.38	-165876.55	-8.28
Wind 90 deg - Ice		2546.41	0.00	832.74	-191620.88	91.44
Wind 120 deg - Ice		2205.25	1273.20	96911.87	-165876.55	166.67
Wind 150 deg - Ice		1273.20	2205.25	167246.67	-95541.75	197.23
Wind 180 deg - Ice		0.00	2546.41	192990.99	537.38	174.95
Wind 210 deg - Ice		-1273.20	2205.25	167246.67	96616.51	105.79
Wind 240 deg - Ice		-2205.25	1273.20	96911.87	166951.31	8.28
Wind 270 deg - Ice		-2546.41	0.00	832.74	192695.64	-91.44
Wind 300 deg - Ice		-2205.25	-1273.20	-95246.38	166951.31	-166.67
Wind 330 deg - Ice		-1273.20	-2205.25	-165581.18	96616.51	-197.23
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - Service		0.00	-3062.70	-234271.70	218.41	-137.30
Wind 30 deg - Service		1531.35	-2652.38	-202816.35	-117174.57	-63.89
Wind 60 deg - Service		2652.38	-1531.35	-116878.73	-203112.20	26.64
Wind 90 deg - Service		3062.70	0.00	514.24	-234567.55	110.04
Wind 120 deg - Service		2652.38	1531.35	117907.22	-203112.20	163.95
Wind 150 deg - Service		1531.35	2652.38	203844.84	-117174.57	173.93
Wind 180 deg - Service		0.00	3062.70	235300.19	218.41	137.30
Wind 210 deg - Service		-1531.35	2652.38	203844.84	117611.40	63.89
Wind 240 deg - Service		-2652.38	1531.35	117907.22	203549.03	-26.64
Wind 270 deg - Service		-3062.70	0.00	514.24	235004.38	-110.04
Wind 300 deg - Service		-2652.38	-1531.35	-116878.73	203549.03	-163.95
Wind 330 deg - Service		-1531.35	-2652.38	-202816.35	117611.40	-173.93

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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
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 lb-ft	Minor Axis Moment lb-ft
L1	101 - 50.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15690.99	656.70	-1130.87
			Max. Mx	20	-9110.37	399110.67	-689.49
			Max. My	14	-9109.75	285.53	-399505.00
			Max. Vy	20	-9781.34	399110.67	-689.49
			Max. Vx	14	9781.93	285.53	-399505.00
			Max. Torque	24			644.37
L2	50.79 - 1.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22328.58	749.91	-1219.52
			Max. Mx	20	-15052.38	965817.31	-730.89
			Max. My	14	-15052.37	315.25	-966221.74
			Max. Vy	20	-11570.03	965817.31	-730.89
			Max. Vx	14	11570.05	315.25	-966221.74
			Max. Torque	24			702.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	33	22328.58	0.00	-2546.54
	Max. H_x	20	15079.85	11534.21	-0.00
	Max. H_z	2	15079.85	0.00	11534.21
	Max. M_x	2	964754.58	0.00	11534.21
	Max. M_z	8	965159.26	-11534.21	-0.00
	Max. Torsion	24	702.40	5767.10	9988.92
	Min. Vert	19	11309.88	9988.92	-5767.10
	Min. H_x	8	15079.85	-11534.21	-0.00
	Min. H_z	14	15079.85	0.00	-11534.21
	Min. M_x	14	-966221.74	0.00	-11534.21
	Min. M_z	20	-965817.31	11534.21	-0.00
	Min. Torsion	12	-702.29	-5767.10	-9988.92

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	12566.54	-0.00	0.00	586.46	263.45	-0.01
1.2 Dead+1.0 Wind 0 deg - No Ice	15079.85	-0.00	-11534.21	-964754.58	314.95	-532.14
0.9 Dead+1.0 Wind 0 deg - No Ice	11309.88	-0.00	-11534.21	-941828.03	226.45	-524.32
1.2 Dead+1.0 Wind 30 deg - No Ice	15079.84	5767.10	-9988.92	-835407.42	-482429.67	-219.18
0.9 Dead+1.0 Wind 30 deg - No Ice	11309.88	5767.10	-9988.92	-815574.40	-470948.40	-223.40
1.2 Dead+1.0 Wind 60 deg - No Ice	15079.84	9988.92	-5767.10	-482011.94	-835819.65	152.40

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	11309.88	9988.92	-5767.10	-470649.16	-815869.80	137.27
1.2 Dead+1.0 Wind 90 deg - No Ice	15079.85	11534.21	0.00	730.57	-965159.26	483.24
0.9 Dead+1.0 Wind 90 deg - No Ice	11309.88	11534.21	0.00	524.20	-942118.14	461.26
1.2 Dead+1.0 Wind 120 deg - No Ice	15079.84	9988.92	5767.10	483474.50	-835822.36	684.47
0.9 Dead+1.0 Wind 120 deg - No Ice	11309.88	9988.92	5767.10	471698.63	-815871.71	661.61
1.2 Dead+1.0 Wind 150 deg - No Ice	15079.84	5767.10	9988.92	836873.05	-482432.40	702.29
0.9 Dead+1.0 Wind 150 deg - No Ice	11309.88	5767.10	9988.92	816626.05	-470950.33	684.59
1.2 Dead+1.0 Wind 180 deg - No Ice	15079.85	-0.00	11534.21	966221.74	314.87	532.04
0.9 Dead+1.0 Wind 180 deg - No Ice	11309.88	-0.00	11534.21	942880.76	226.41	524.26
1.2 Dead+1.0 Wind 210 deg - No Ice	15079.84	-5767.10	9988.92	836885.32	483069.11	219.16
0.9 Dead+1.0 Wind 210 deg - No Ice	11309.88	-5767.10	9988.92	816634.66	471408.10	223.43
1.2 Dead+1.0 Wind 240 deg - No Ice	15079.84	-9988.92	5767.10	483486.75	836473.29	-152.44
0.9 Dead+1.0 Wind 240 deg - No Ice	11309.88	-9988.92	5767.10	471707.24	816339.45	-137.34
1.2 Dead+1.0 Wind 270 deg - No Ice	15079.85	-11534.21	0.00	730.54	965817.31	-483.22
0.9 Dead+1.0 Wind 270 deg - No Ice	11309.88	-11534.21	0.00	524.19	942590.87	-461.24
1.2 Dead+1.0 Wind 300 deg - No Ice	15079.84	-9988.92	-5767.10	-482024.25	836470.65	-684.45
0.9 Dead+1.0 Wind 300 deg - No Ice	11309.88	-9988.92	-5767.10	-470657.79	816337.57	-661.55
1.2 Dead+1.0 Wind 330 deg - No Ice	15079.84	-5767.10	-9988.92	-835419.72	483066.51	-702.40
0.9 Dead+1.0 Wind 330 deg - No Ice	11309.88	-5767.10	-9988.92	-815583.02	471406.23	-684.71
1.2 Dead+1.0 Ice+1.0 Temp	22328.58	-0.01	0.01	1219.52	749.91	-0.01
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	-2546.54	-222375.13	762.31	-190.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	-2205.27	-192443.42	-111062.50	-104.76
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	-1273.21	-110581.61	-192923.48	8.81
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	22328.58	2546.54	0.00	1242.72	-222853.90	119.99
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	1273.22	113067.75	-192923.62	199.07
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	2205.27	194929.66	-111062.66	224.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	2546.54	224860.72	762.24	190.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	2205.27	194931.22	112588.39	104.73
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	1273.22	113069.29	194451.18	-8.85
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	22328.58	-2546.54	0.00	1242.69	224382.00	-120.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	-1273.21	-110583.20	194451.11	-199.09

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	-2205.27	-192445.00	112588.35	-224.80
Dead+Wind 0 deg - Service	12566.54	-0.00	-3062.71	-252802.89	271.65	-144.24
Dead+Wind 30 deg - Service	12566.54	1531.35	-2652.38	-218852.13	-126432.95	-60.75
Dead+Wind 60 deg - Service	12566.54	2652.38	-1531.35	-126097.85	-219186.92	38.99
Dead+Wind 90 deg - Service	12566.54	3062.71	0.00	606.62	-253137.25	128.30
Dead+Wind 120 deg - Service	12566.54	2652.38	1531.35	127311.18	-219187.09	183.23
Dead+Wind 150 deg - Service	12566.54	1531.35	2652.38	220065.64	-126433.12	189.05
Dead+Wind 180 deg - Service	12566.54	-0.00	3062.71	254016.49	271.64	144.22
Dead+Wind 210 deg - Service	12566.54	-1531.35	2652.38	220066.35	126976.81	60.75
Dead+Wind 240 deg - Service	12566.54	-2652.38	1531.35	127311.89	219731.61	-39.01
Dead+Wind 270 deg - Service	12566.54	-3062.71	0.00	606.61	253682.19	-128.31
Dead+Wind 300 deg - Service	12566.54	-2652.38	-1531.35	-126098.56	219731.46	-183.23
Dead+Wind 330 deg - Service	12566.54	-1531.35	-2652.38	-218852.85	126976.66	-189.07

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	-12566.54	0.00	0.00	12566.54	-0.00	0.000%
2	0.00	-15079.84	-11534.21	0.00	15079.85	11534.21	0.000%
3	0.00	-11309.88	-11534.21	0.00	11309.88	11534.21	0.000%
4	5767.10	-15079.84	-9988.92	-5767.10	15079.84	9988.92	0.000%
5	5767.10	-11309.88	-9988.92	-5767.10	11309.88	9988.92	0.000%
6	9988.92	-15079.84	-5767.10	-9988.92	15079.84	5767.10	0.000%
7	9988.92	-11309.88	-5767.10	-9988.92	11309.88	5767.10	0.000%
8	11534.21	-15079.84	0.00	-11534.21	15079.85	-0.00	0.000%
9	11534.21	-11309.88	0.00	-11534.21	11309.88	-0.00	0.000%
10	9988.92	-15079.84	5767.10	-9988.92	15079.84	-5767.10	0.000%
11	9988.92	-11309.88	5767.10	-9988.92	11309.88	-5767.10	0.000%
12	5767.10	-15079.84	9988.92	-5767.10	15079.84	-9988.92	0.000%
13	5767.10	-11309.88	9988.92	-5767.10	11309.88	-9988.92	0.000%
14	0.00	-15079.84	11534.21	0.00	15079.85	-11534.21	0.000%
15	0.00	-11309.88	11534.21	0.00	11309.88	-11534.21	0.000%
16	-5767.10	-15079.84	9988.92	5767.10	15079.84	-9988.92	0.000%
17	-5767.10	-11309.88	9988.92	5767.10	11309.88	-9988.92	0.000%
18	-9988.92	-15079.84	5767.10	9988.92	15079.84	-5767.10	0.000%
19	-9988.92	-11309.88	5767.10	9988.92	11309.88	-5767.10	0.000%
20	-11534.21	-15079.84	0.00	11534.21	15079.85	-0.00	0.000%
21	-11534.21	-11309.88	0.00	11534.21	11309.88	-0.00	0.000%
22	-9988.92	-15079.84	-5767.10	9988.92	15079.84	5767.10	0.000%
23	-9988.92	-11309.88	-5767.10	9988.92	11309.88	5767.10	0.000%
24	-5767.10	-15079.84	-9988.92	5767.10	15079.84	9988.92	0.000%
25	-5767.10	-11309.88	-9988.92	5767.10	11309.88	9988.92	0.000%
26	0.00	-22328.58	0.00	0.01	22328.58	-0.01	0.000%
27	0.00	-22328.58	-2546.41	0.00	22328.58	2546.54	0.001%
28	1273.20	-22328.58	-2205.25	-1273.21	22328.58	2205.27	0.000%
29	2205.25	-22328.58	-1273.20	-2205.27	22328.58	1273.21	0.000%
30	2546.41	-22328.58	0.00	-2546.54	22328.58	-0.00	0.001%
31	2205.25	-22328.58	1273.20	-2205.27	22328.58	-1273.22	0.000%
32	1273.20	-22328.58	2205.25	-1273.21	22328.58	-2205.27	0.000%
33	0.00	-22328.58	2546.41	0.00	22328.58	-2546.54	0.001%
34	-1273.20	-22328.58	2205.25	1273.22	22328.58	-2205.27	0.000%
35	-2205.25	-22328.58	1273.20	2205.27	22328.58	-1273.22	0.000%
36	-2546.41	-22328.58	0.00	2546.54	22328.58	-0.00	0.001%
37	-2205.25	-22328.58	-1273.20	2205.27	22328.58	1273.21	0.000%
38	-1273.20	-22328.58	-2205.25	1273.22	22328.58	2205.27	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
39	0.00	-12566.54	-3062.70	0.00	12566.54	3062.71	0.000%
40	1531.35	-12566.54	-2652.38	-1531.35	12566.54	2652.38	0.000%
41	2652.38	-12566.54	-1531.35	-2652.38	12566.54	1531.35	0.000%
42	3062.70	-12566.54	0.00	-3062.71	12566.54	-0.00	0.000%
43	2652.38	-12566.54	1531.35	-2652.38	12566.54	-1531.35	0.000%
44	1531.35	-12566.54	2652.38	-1531.35	12566.54	-2652.38	0.000%
45	0.00	-12566.54	3062.70	0.00	12566.54	-3062.71	0.000%
46	-1531.35	-12566.54	2652.38	1531.35	12566.54	-2652.38	0.000%
47	-2652.38	-12566.54	1531.35	2652.38	12566.54	-1531.35	0.000%
48	-3062.70	-12566.54	0.00	3062.71	12566.54	-0.00	0.000%
49	-2652.38	-12566.54	-1531.35	2652.38	12566.54	1531.35	0.000%
50	-1531.35	-12566.54	-2652.38	1531.35	12566.54	2652.38	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001492
2	Yes	5	0.00000001	0.00042141
3	Yes	5	0.00000001	0.00016829
4	Yes	7	0.00000001	0.00013139
5	Yes	6	0.00000001	0.00038376
6	Yes	7	0.00000001	0.00013167
7	Yes	6	0.00000001	0.00038496
8	Yes	5	0.00000001	0.00042563
9	Yes	5	0.00000001	0.00016227
10	Yes	7	0.00000001	0.00013657
11	Yes	6	0.00000001	0.00039950
12	Yes	7	0.00000001	0.00012960
13	Yes	6	0.00000001	0.00037778
14	Yes	5	0.00000001	0.00042241
15	Yes	5	0.00000001	0.00016848
16	Yes	7	0.00000001	0.00013435
17	Yes	6	0.00000001	0.00039256
18	Yes	7	0.00000001	0.00013405
19	Yes	6	0.00000001	0.00039131
20	Yes	5	0.00000001	0.00042609
21	Yes	5	0.00000001	0.00016236
22	Yes	7	0.00000001	0.00012934
23	Yes	6	0.00000001	0.00037737
24	Yes	7	0.00000001	0.00013632
25	Yes	6	0.00000001	0.00039912
26	Yes	4	0.00000001	0.00003559
27	Yes	5	0.00019689	0.00058663
28	Yes	6	0.00000001	0.00020603
29	Yes	6	0.00000001	0.00020812
30	Yes	5	0.00019705	0.00058598
31	Yes	6	0.00000001	0.00022284
32	Yes	6	0.00000001	0.00020974
33	Yes	5	0.00019755	0.00060202
34	Yes	6	0.00000001	0.00022373
35	Yes	6	0.00000001	0.00022110
36	Yes	5	0.00019741	0.00059493
37	Yes	6	0.00000001	0.00020714
38	Yes	6	0.00000001	0.00022050
39	Yes	5	0.00000001	0.00003296

40	Yes	5	0.00000001	0.00028552
41	Yes	5	0.00000001	0.00028692
42	Yes	5	0.00000001	0.00003245
43	Yes	5	0.00000001	0.00031891
44	Yes	5	0.00000001	0.00027995
45	Yes	5	0.00000001	0.00003334
46	Yes	5	0.00000001	0.00030750
47	Yes	5	0.00000001	0.00030575
48	Yes	5	0.00000001	0.00003263
49	Yes	5	0.00000001	0.00027639
50	Yes	5	0.00000001	0.00031552

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	29.275	46	2.5825	0.0073
L2	54.21 - 1.5	8.244	46	1.4629	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	46	29.275	2.5825	0.0074	12745
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	46	28.497	2.5479	0.0072	12745
69.00	Andrew SO 101-1	46	13.718	1.8321	0.0034	1990

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	111.200	14	9.8198	0.0274
L2	54.21 - 1.5	31.377	14	5.5744	0.0074

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	14	111.200	9.8198	0.0274	3488
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	14	108.250	9.6890	0.0266	3488
69.00	Andrew SO 101-1	14	52.160	6.9765	0.0126	538

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	101 - 50.79 (1)	TP23.05x16x0.1875	50.21	0.00	0.0	13.3203	-9109.55	779235.00	0.012
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	52.71	0.00	0.0	23.6066	-15052.40	1380990.00	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	399570.00	427494.17	0.935	0.00	427494.17	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	966300.00	1007983.33	0.959	0.00	1007983.33	0.000

Pole Shear Design Data

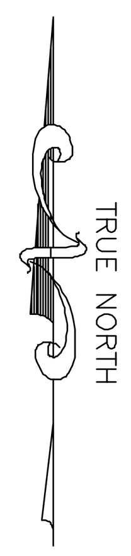
Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	9782.16	233771.00	0.042	188.81	458220.83	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	11570.10	414296.00	0.028	219.16	1079391.67	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	101 - 50.79 (1)	0.012	0.935	0.000	0.042	0.000	0.948 ✔	1.000	4.8.2 ✔
L2	50.79 - 1.5 (2)	0.011	0.959	0.000	0.028	0.000	0.970 ✔	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	101 - 50.79	Pole	TP23.05x16x0.1875	1	-9109.55	779235.00	94.8	Pass
L2	50.79 - 1.5	Pole	TP30x22.1948x0.25	2	-15052.40	1380990.00	97.0	Pass
							Summary	
						Pole (L2)	97.0	Pass
						RATING =	**97.0**	**Pass**



T-MOBILE NORTHEAST LLC
SITE ID: 7WAN235A
SITE NAME: BOE - RICHARD D. RIDDLE SCHOOL
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
T-MOBILE ANCHOR PROJECT

DESIGN BASED ON FINAL RFDS:
7WAN235A_ANCHOR_RFDS_FINAL_11_2020-08-28

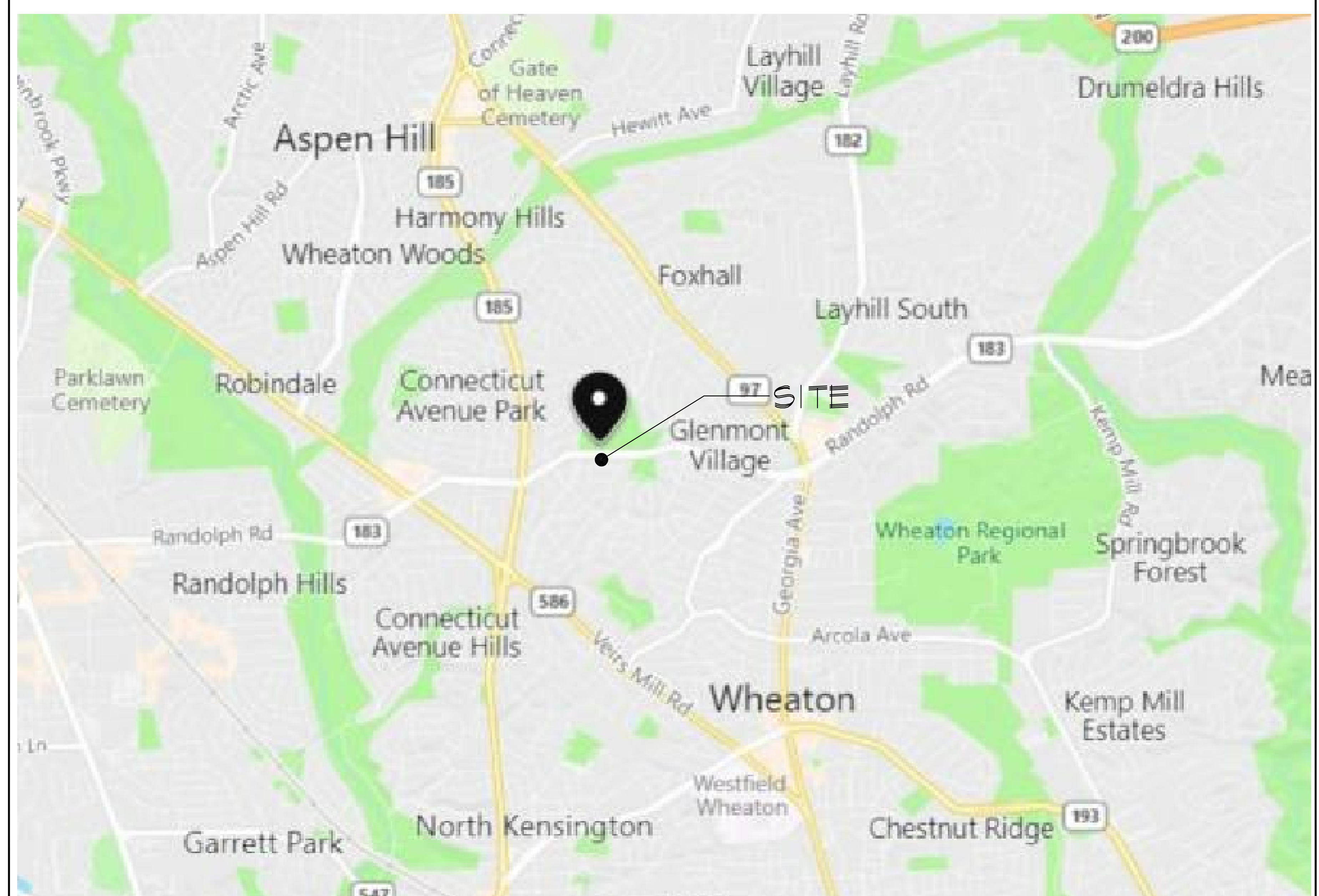
NOTE TO GENERAL CONTRACTOR

NO WORK IS TO BE PERFORMED ON THIS SITE WITHOUT REVIEW OF THE APPROVED STRUCTURAL ANALYSIS. IF ANY DISCREPANCIES ARE FOUND THE GENERAL CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING. AT NO TIME WILL ANY ADDITIONAL ANTENNAS BE INSTALLED WITHOUT WRITTEN CONSENT FROM TOWER ENGINEER.

SITE INFORMATION

SCOPE OF WORK:	(9) EXISTING ANTENNAS TO BE RELOCATED (3) PROPOSED AIR6449 B41 ANTENNAS TO BE INSTALLED (6) 4415 B25 RADIOS TO BE REMOVED (6) 4424 B25 RADIOS TO BE INSTALLED (12) EXISTING RADIOS TO BE RELOCATED (1) 6X12 HYBRID CABLE TO BE INSTALLED (1) RBS 2106 CABINET TO BE REMOVED (1) RBS 6131 CABINET TO REMAIN (1) 6160 CABINET TO BE ADDED (1) B160 CABİNET TO BE ADDED
PROJECT DESIGN:	T-MOBILE CONSTRUCTION
SITE ID NUMBER:	7WAN235A
911 SITE ADDRESS:	12501-A DALEWOOD DRIVE SILVER SPRING, MD 20906
CENTROID OF (6) SECTORS:	LAT. = 39° 03' 35.53" , LONG. = -77° 04' 1.20"
JURISDICTION:	MONTGOMERY, MD
ZONING:	R-60
ACCOUNT ID :	DISTRICT - 13 ACCOUNT NUMBER - 00953838
	MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE:	/01570/ 00082
GROUND ELEVATION:	371'± (NAVD 88)
STRUCTURE HEIGHT:	96' -0" ± AGL

VICINITY PLAN



INDEX OF DRAWINGS

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

PROJECT TEAM

APPLICANT:	T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610
PROJECT MANAGEMENT FIRM:	SITE LINK WIRELESS, LLC. 3620 COMMERCE DRIVE, SUITE 707 BALTIMORE, MD 21227 (410) 309-4949
ENGINEERING FIRMS:	TELEGENT ENGINEERING INC. 2216 COMMERCE ROAD, SUITE 1 FOREST HILL, MD 21050 (410) 692-5816
	MORRIS & RITCHIE ASSOCIATES, INC. 1220-C EAST JOPPA ROAD, SUITE 505 TOWSON, MD 21286 (410) 821-1690

CODE ANALYSIS

APPLICABLE BUILDING CODE:	IBC 2018
APPLICABLE ELECTRIC CODE:	NFPA 2017
USE GROUP:	UTILITY (U)

DIRECTIONS TO SITE

FROM BELTSVILLE:

1. HEAD SOUTHWEST TOWARD BALTIMORE AVE
2. TURN RIGHT TO MERGE ONTO I-495 W/I-95 N
3. MERGE ONTO I-495 W/I-95 N
4. CONTINUE TO FOLLOW I-495 W
5. TAKE EXIT 31 FOR MD-97/GEORGIA AVE TOWARD SILVER SPRING/WHEATON
6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR MD-97 N AND MERGE ONTO MD-97 N/GEORGIA AVE
7. MERGE ONTO MD-97 N/GEORGIA AVE
8. USE THE LEFT 2 LANES TO TURN SLIGHTLY LEFT ONTO VEIRS MILL RD
9. TURN RIGHT ONTO CONNECTICUT AVE
10. KEEP RIGHT TO CONTINUE TOWARD RANDOLPH RD
11. SLIGHT RIGHT ONTO RANDOLPH RD
12. TURN LEFT ONTO DALEWOOD DR
13. TURN RIGHT AT EVERTON ST

DESTINATION WILL BE ON THE RIGHT

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	DISAPPROVED/ REVISE
PROPERTY OWNER	DATE	☐	☐	☐
SITE ACQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
ZONING	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Cover Sheet

SHEET NUMBER

CS-1

STRUCTURAL NOTES:

CODES

ALL CONSTRUCTION SHALL CONFORM WITH THE:

A. INTERNATIONAL BUILDING CODE 2018 (IBC 2018)

B. ANSI/TIA-222-H-2017 "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS", AND ALL SUBSEQUENT SUPPLEMENTS

C. IN ADDITION, ALL CONSTRUCTION SHALL CONFORM WITH THE GOVERNING LOCAL BUILDING CODE.

DESIGN DATA

A. MOUNT MODIFICATIONS HAVE BEEN DESIGNED TO SUPPORT THE APPURTENANCES LISTED IN THE ANTENNA MOUNT ANALYSIS BY MORRIS & RITCHIE ASSOCIATES, JOB NO, 19851.038 - REVISION 1, DATED AUGUST 28, 2020,

B.

C. WIND LOAD DESIGN DATA

ULTIMATE WIND SPEED (NO ICE):	Vult = 113 MPH
BASIC WIND SPEED (WITH ICE):	VI = 40 MPH
DESIGN RADIAL ICE THICKNESS:	1" (ICE THICKNESS INCREASES WITH HEIGHT)
RISK CATEGORY:	II
EXPOSURE CATEGORY:	C
TOPOGRAPHIC CATEGORY:	1

D. EARTHQUAKE LOAD DESIGN DATA

SHORT PERIOD ACCELERATION, Ss:	0.134 g
ONE SECOND PERIOD ACCELERATION,S1:	0.043 g
SITE CLASS:	D (BY DEFAULT)
DAMPED SHORT PERIOD ACCELERATION, S_{DS}:	0.144 g
RESPONSE MODIFICATION FACTOR, R	2.0
SEISMIC RESPONSE COEFFICIENT, Cs:	0.0715 g
SEISMIC DESIGN CATEGORY:	B

E. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF TEMPORARY BRACING AND CONSTRUCTION SUPPORTS FOR THE EXISTING STRUCTURE, AS REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR THE METHOD OF CONSTRUCTION AND SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE STRUCTURE AND TO SUPPORT CONSTRUCTION LOADS DURING CONSTRUCTION.

EXISTING STRUCTURE

A. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

B. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS OR OTHER APPURTENANCES, AS NEEDED, DURING CONSTRUCTION.

C. CONTRACTOR SHALL PROTECT ALL EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.

D. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE MOUNT UNTIL THE REINFORCING WORK IS COMPLETE.

E. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE AND CONDITION OF ALL EXISTING MOUNT ELEMENTS. SHOULD THE SIZE OR CONDITION OF THE EXISTING ELEMENTS DIFFER FROM THAT SHOWN ON THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

F. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS, TO THE COMPLETE SATISFACTION OF THE OWNER, OF ANY STRUCTURAL ELEMENTS WHICH ARE TO REMAIN AND THAT HAVE BEEN DAMAGED . THE REPAIRS SHALL BE AT NO EXPENSE TO THE OWNER. ALL REPAIR WORK SHALL BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE THAT THE PROJECT IS LOCATED AND SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO COMMENCING REPAIR WORK.

G. DO NOT PERMIT PORTIONS OF THE STRUCTURE TO FALL NOR DEBRIS TO DROP EXCEPT BY METHODS WHICH WILL INSURE INTEGRITY OF THE STRUCTURE.

MISCELLANEOUS

A. ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 20 MPH.

B. SHOP DRAWINGS FOR ALL STRUCTURAL ELEMENTS SHOWN ON THE CONTRACT DOCUMENTS MUST BE SUBMITTED FOR REVIEW BY THE ENGINEER. IF THE SHOP DRAWINGS ARE NOT SUBMITTED FOR REVIEW, THE ENGINEER WILL NOT BE RESPONSIBLE FOR STRUCTURAL CERTIFICATION AND DESIGN OF THE PROJECT. THE SHOP DRAWINGS SHALL INDICATE ANY DEVIATIONS OR OMISSIONS FROM THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION AND MAKE ALL CORRECTIONS DEEMED NECESSARY.

C. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES AND OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

D. SCALES SHOWN ON THE STRUCTURAL CONTRACT DRAWINGS ARE FOR GENERAL INFORMATION ONLY. DIMENSIONAL INFORMATION SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

E. THE CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURE DURING CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF AREAS EXHIBITING DISTRESS OR FAILURE.

STRUCTURAL AND MISCELLANEOUS STEEL

A. ALL STEEL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (ANSI/AISC 360) AND THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

B. ALL PIPE SHALL CONFORM TO ASTM A53, GRADE B (Fy = 35 KSI),

C. ALL HSS RECTANGULAR TUBE SHALL CONFORM TO ASTM A500 GRADE B, (Fy = 46 KSI).

D. ALL ANGLES, PLATES & CHANNELS SHALL CONFORM TO ASTM A36 (Fy = 36 KSI),

E. ALL BOLT SHALL CONFORM TO ASTM F3125 GRADE A325 (Fu = 120 KSI), UNLESS OTHERWISE NOTED.

F. ALL U-BOLT SHALL CONFORM TO SAE J429 GRADE 2 WITH SAE J995 NUTS AND WASHERS.

G. ALL WASHER SHALL CONFORM TO ASTM F436.

H. ALL SHOP WELDED CONNECTION SHALL USE E70XX ELECTRODES. FIELD WELDING IS NOT PERMITTED.

I. ALL SHOP WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS AND CONFORM TO THE AMERICAN WELDING SOCIETY CODE FOR BUILDINGS AWS D1.1. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.

J. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

K. ALL STEEL MEMBERS, FABRICATIONS AND ASSEMBLIES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION. ALL BOLTS, WASHERS & NUTS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

L. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

M. AN INDEPENDENT INSPECTION AGENCY SHALL INSPECT ALL STRUCTURAL STEEL AND VERIFY THAT IT CONFORMS TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. FIELD INSPECTION REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 5 DAYS OF THE INSPECTION. THE CONTRACTOR SHALL NOTIFY THE INSPECTION AGENCY OF ALL PHASES OF STEEL CONSTRUCTION AND WELDING.

POST-MODIFICATION INSPECTION

A. A POST-MODIFICATION INSPECTION REPORT IS REQUIRED AND SHALL BE INCLUDED IN THE CONTRACTOR'S BID. A POST-MODIFICATION INSPECTION IS A VISUAL INSPECTION OF THE MOUNT MODIFICATIONS AND APPURTENANCE CONFIGURATION AND A REVIEW OF MATERIAL SUBMITTALS OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MOUNT MODIFICATION DRAWINGS.

B. THE POST-MODIFICATION INSPECTION REPORT SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.

C. THE INTENT OF THE POST-MODIFICATION INSPECTION REPORT IS TO CONFIRM INSTALLATION AND CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF.

D. TO ENSURE THAT THE REQUIREMENTS OF THE POST-MODIFICATION INSPECTION REPORT ARE MET, IT IS VITAL THAT THE CONTRACTOR AND POST-MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A P.O. IS RECEIVED.

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

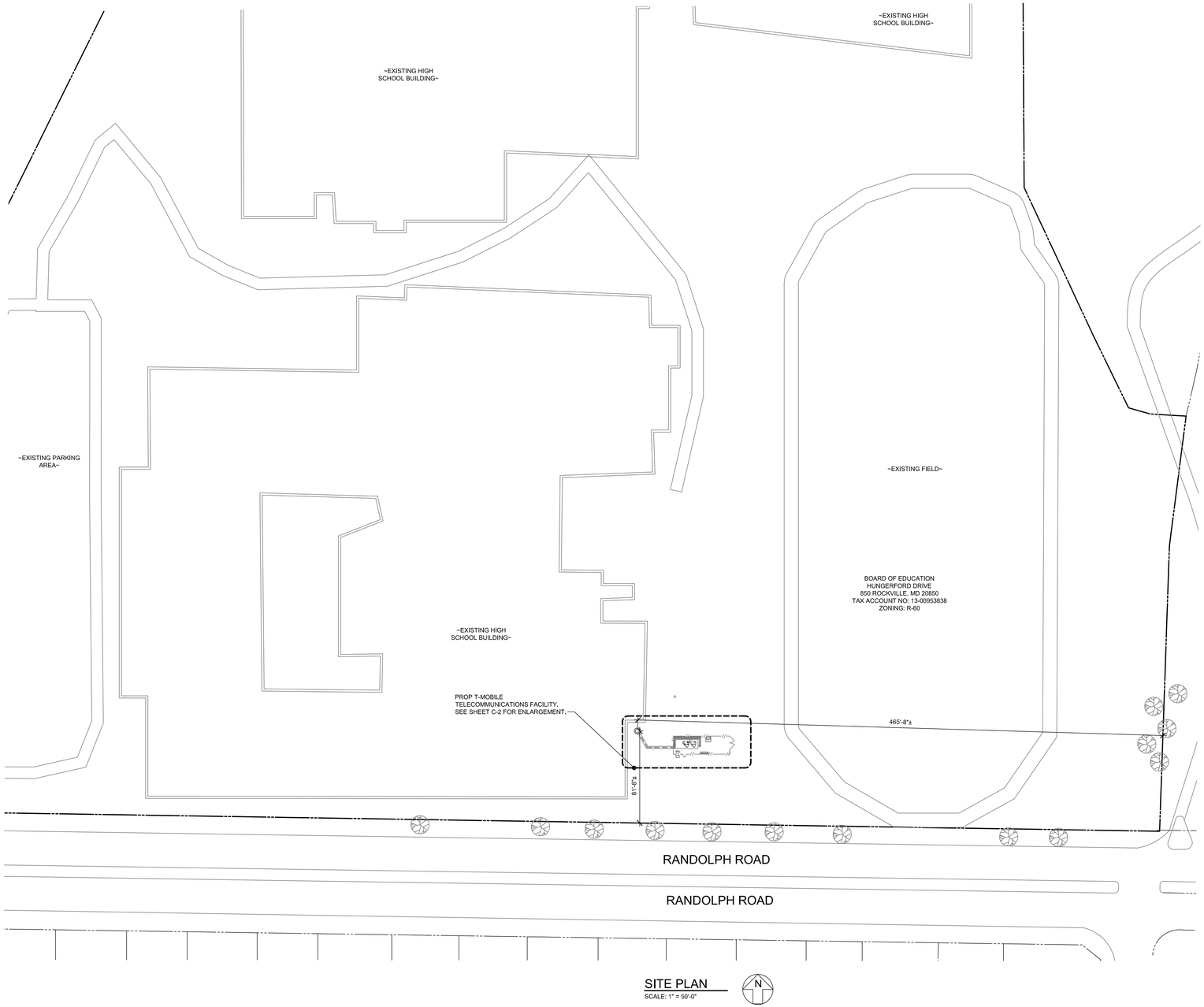
Know what's **below.**
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
General Structural Notes

SHEET NUMBER
GN-1



SITE PLAN
SCALE: 1" = 50'-0"

VICINITY MAP
SCALE: 1" = 2500'-0"

SITE NOTES:

1. APPLICANT: T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705
TEL (240) 264-8600
FAX (240) 264-8610
2. PROPERTY OWNER: BOARD OF EDUCATION
850 HUNGERFORD DRIVE
ROCKVILLE, MD 20850
3. SITE DATA: MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE: 01570/ 00062
ACCOUNT NUMBER: 00953838
TRACT AREA: 25.7700 AC
DISTRICT: 13
ADDRESS: 12601 DALEWOOD DR
SILVER SPRING 20906-0000
EXISTING USE: TELECOMMUNICATIONS
4. ZONING: R-60
5. HORIZONTAL AND VERTICAL CONTROL SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY T-MOBILE RF DATA SHEET:
LATITUDE: N39° 03' 35.53" GROUND ELEVATION: 371.00' (±) AGL (NAVD 88)
LONGITUDE: W77° 04' 1.20" EXISTING STRUCTURE HEIGHT: 96.00' (±) AGL
TOTAL ELEVATION: 467.00' (±) AGL (NAVD 88)
6. TOTAL DISTURBED AREA = 0 SF (ANTENNA WORK ONLY)
7. THIS PROJECT INVOLVES ADDING THREE (3) ANTENNAS, ONE (1) AT EACH SECTOR AND REMOVING SIX (6) REMOTE RADIO HEADS (RRH), TWO (2) FROM EACH SECTOR AND ADDING SIX (6) REMOTE RADIO HEADS, TWO (2) AT EACH SECTOR AND ADDING (1) 6x12 HYBRID. THIS PROJECT ALSO INVOLVES REMOVING ONE (1) EXISTING EQUIPMENT CABINET AND INSTALLING (2) PROPOSED EQUIPMENT CABINETS.
8. THE STRUCTURE WILL NOT SUPPORT LIGHTS OR SIGNS UNLESS REQUIRED FOR AIRCRAFT WARNING OR OTHER SAFETY RECORDS.
9. THE APPLICANT WILL PROVIDE A CERTIFICATION FROM A REGISTERED ENGINEER THAT THE STRUCTURE WILL MEET THE APPLICABLE DESIGN STANDARDS FOR WIND LOADS PER THE REQUIREMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION.
10. IF THE ANTENNAS ARE NO LONGER USED FOR TELECOMMUNICATIONS PURPOSES FOR A CONTINUOUS PERIOD OF ONE (1) YEAR, THEY SHALL BE REMOVED BY THE ANTENNA OWNER AT OWNER'S EXPENSE.
11. NO WATER OR SANITARY UTILITIES ARE REQUIRED FOR THE OPERATION OF THIS FACILITY.
12. STORMWATER MANAGEMENT NOTE: NO STORMWATER MANAGEMENT IS REQUIRED FOR THIS SITE.
13. BOUNDARY SHOWN PER COUNTY RECORDS.
14. THIS PLAN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT. PLAN IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
15. ALL DETAILS SHOWN ARE "STANDARD" OR "TYPICAL" FOR REFERENCE ONLY. FOR ACTUAL DETAILS, SEE ARCHITECTURAL, STRUCTURAL, OR CONSTRUCTION PLANS BY OTHERS.
16. STRUCTURAL ANALYSIS/DESIGN TO BE PERFORMED BY OTHERS AT CLIENT AND/OR OWNER'S DISCRETION PRIOR TO COMMENCEMENT OF ANY WORK.
17. THE COMMUNICATION SHELTER SHALL BE UNMANNED, WITH INFREQUENT VISITS (FOUR OR FEWER PER YEAR) BY MAINTENANCE PERSONNEL, AND WITH ACCESS AND PARKING FOR NO MORE THAN ONE VEHICLE. THE PROPOSED FACILITY IS NOT FOR HUMAN HABITATION AND THEREFORE HANDICAP ACCESS IS NOT REQUIRED.
18. THE PROPOSED TOWER RELATED EQUIPMENT COMPOUND, EQUIPMENT CABINETS AND PROPOSED PANEL ANTENNAS SHALL COMPLY WITH ALL DESIGN STANDARDS IN SECTION 3.5.2.C.(2) OF THE REVISED MONTGOMERY COUNTY ZONING REGULATIONS THAT WENT INTO EFFECT ON OCTOBER 30, 2014.

GENERAL NOTES:

1. CONTRACTOR SHALL NOTIFY "MISS UTILITY" (811) 48 HOURS PRIOR TO DOING ANY EXCAVATION IN THIS AREA. CONTRACTOR SHALL CONTACT A SUBSURFACE UTILITY LOCATOR FOR LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS BY TEST PIT AS NECESSARY. LOCATION OF UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR PLANNING PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. DAMAGE TO UTILITIES OR PROPERTY OF OTHER BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND ORDINANCES, THE LATEST EDITION THEREOF.
3. ANY PERMITS WHICH MUST BE OBTAINED SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM ALL APPLICABLE GOVERNMENTAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
4. CONTRACTOR SHALL COORDINATE ALL UTILITY CONNECTIONS WITH APPROPRIATE UTILITY OWNERS.
5. THESE PLANS ARE NOT FOR RECORDATION OR CONVEYANCE.
6. EXISTING PAVEMENT AND OTHER SURFACES DISTURBED BY CONTRACTOR (WHICH ARE NOT TO BE REMOVED) SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.

MONTGOMERY COUNTY NOTES:

PER SECTION 59-A-6.12

A) A PRIVATE TELECOMMUNICATIONS ANTENNA MAY BE ATTACHED AS A MATTER OF RIGHT TO AN EXISTING STRUCTURE OWNED OR OPERATED BY A COUNTY, BI-COUNTY, STATE OR FEDERAL AGENCY.

B) ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD APPROVED UNDER CHAPTER 21 IS NOT OWNED OR CONTROLLED BY A COUNTY AGENCY FOR PURPOSES OF THIS SECTION AND REQUIRES A SPECIAL EXCEPTION. ANY TELECOMMUNICATION FACILITY CONSTRUCTED AS OF NOVEMBER 21, 1995 ON ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD IS NOT A NONCONFORMING USE.

C) AN UNMANNED EQUIPMENT BUILDING OR CABINET ASSOCIATED WITH A TELECOMMUNICATION FACILITY LOCATED ON PUBLICLY OWNED LAND OR ATTACHED TO A PUBLICLY OWNED STRUCTURE MUST NOT EXCEED 560 SQUARE FEET AND 12 FEET IN HEIGHT, EXCEPT A SINGLE EQUIPMENT BUILDING IN EXCESS OF 560 SQUARE FEET MAY BE USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER, IF:

i) THE OVERALL SQUARE FOOTAGE DOES NOT EXCEED 1500 SQUARE FEET AND 12 FEET IN HEIGHT,
ii) THE BUILDING IS USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER OPERATING FROM THE SAME MONOPOLE OR TOWER; AND
iii) THE BUILDING IS REVIEWED BY THE TELECOMMUNICATIONS TRANSMISSION FACILITY COORDINATING GROUP IN ACCORDANCE WITH SEC 2-58E OF THE COUNTY CODE.

IF THE NEAREST ADJOINING PROPERTY IS CLASSIFIED IN A RESIDENTIAL ZONE, THE EQUIPMENT BUILDING OR CABINET MUST BE FACED WITH BRICK OR OTHER SUITABLE MATERIAL ON ALL SIDES AND LANDSCAPED TO A HEIGHT OF AT LEAST 3 FEET.

D) ANY PRIVATE TELECOMMUNICATION FACILITY ON PUBLICLY OWNED LAND THAT IS NOT PERMITTED UNDER SUBSECTIONS A), OR C) MUST OBTAIN A SPECIAL EXCEPTION FROM THE BOARD OF APPEALS.

T-Mobile
T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

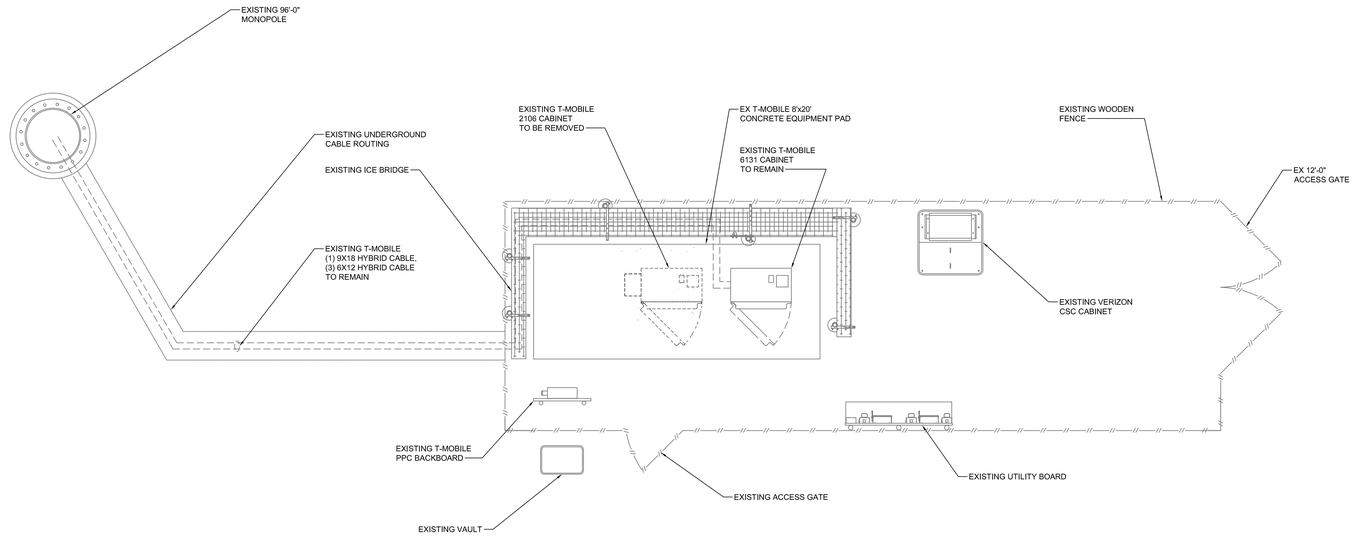
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

811
Know what's below.
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

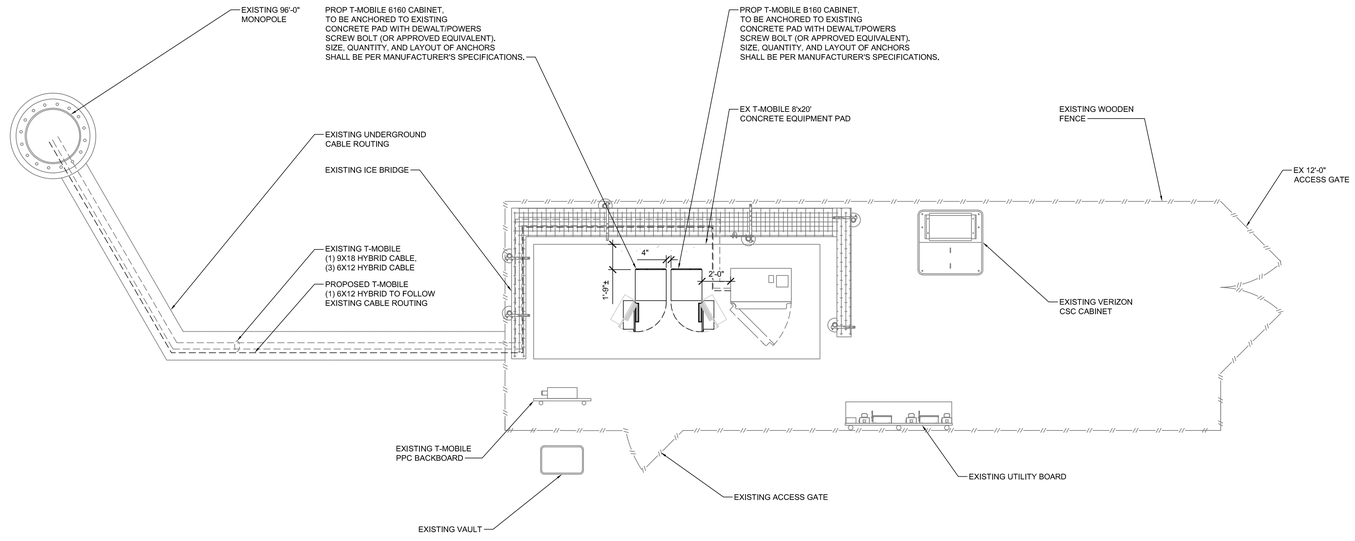
SHEET TITLE
Site Plan

SHEET NUMBER
C-1



EXISTING ENLARGED COMPOUND PLAN

SCALE: 1" = 15'-0"



PROPOSED ENLARGED COMPOUND PLAN

SCALE: 1" = 5'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below. Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

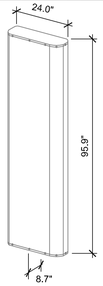
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

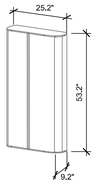
SHEET TITLE

Enlarged Compound Plan

SHEET NUMBER

C-2

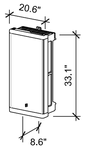




RFS APXVAARR24_43-U-NA20 COMMSCOPE 2HH-38A-R4

EXISTING T-MOBILE ANTENNA DETAILS

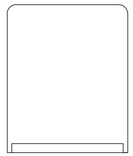
SCALE: NOT TO SCALE



ERICSSON
AIR6449 B41

PROPOSED T-MOBILE ANTENNA DETAILS

SCALE: NOT TO SCALE



RADIO 4424 B25: REMOTE RADIO UNIT:	
MANUFACTURER:	ERICSSON
POWER SUPPLY:	-48VDC
DIMENSIONS:	16.5"H x 13.4"W x 5.9"D
WEIGHT:	56 LBS

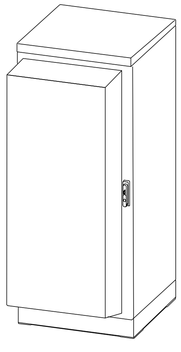
NOTES:

1. INSTALL RRU PER MANUFACTURERS RECOMMENDATIONS.
2. FIBER, DC POWER & GROUND CONNECTIONS NOT SHOWN.

ERICSSON RADIO 4424 B25 (PROPOSED)

T-MOBILE EQUIPMENT DETAILS

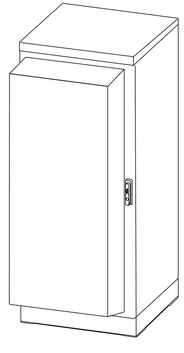
NOT TO SCALE



ERICSSON B160 BATTERY CABINET

NOT TO SCALE

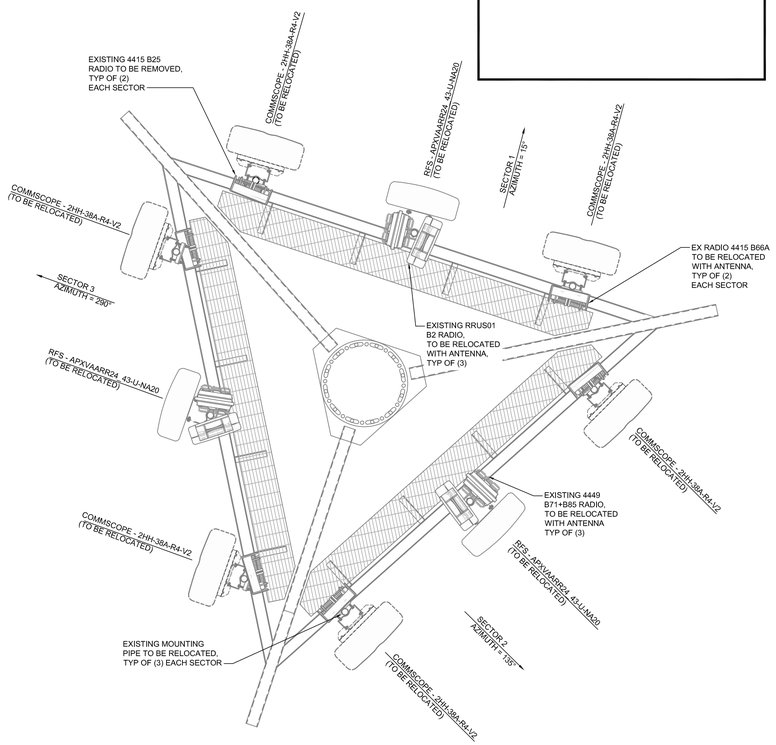
B160 BATTERY CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	295 LBS
WEIGHT (FULL):	2,000 LBS



ERICSSON 6160 EQUIPMENT CABINET

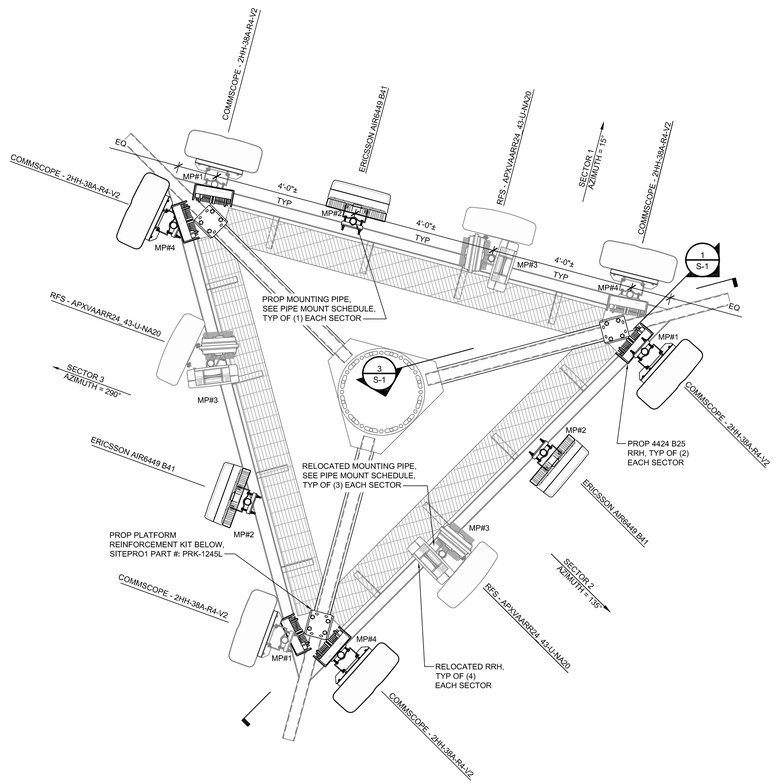
NOT TO SCALE

6160 EQUIPMENT CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	320 LBS
WEIGHT (FULL):	1,500 LBS



EXISTING ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"



PROPOSED ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"

ANTENNA SCHEDULE

SECTOR	STATUS	POS	MANUFACTURER	MODEL #	ANTENNA DIMENSIONS	AZIMUTH	RAD CENTER (FT)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	TMA / RRH QUANTITY & MODEL NO	CABLE QUANTITY & TYPE	CABLE LENGTH
SECTOR 1	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	(1) EXISTING ERICSSON 9X18 HCS (2) EXISTING ERICSSON 6X12 HCS 6AWG (1) EXISTING ERICSSON 6X12 HCS 4AWG (1) PROPOSED ERICSSON 6X12 HCS 4AWG	(±) 200'-0"
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	15°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	15°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 2	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	135°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	135°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 3	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	290°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	290°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 4	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 1	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 5	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 2	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 6	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 3	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

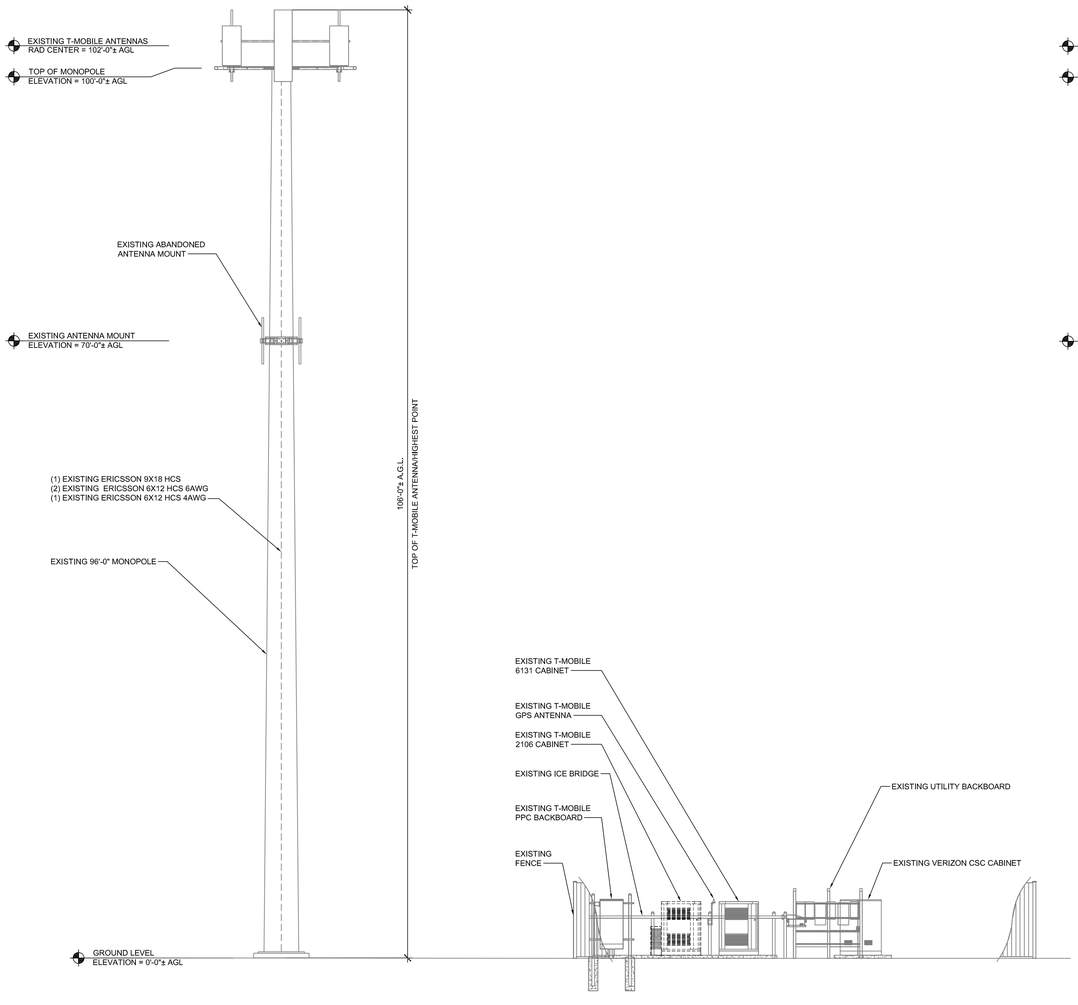
811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Antenna Sector Plans, Schedule & Details

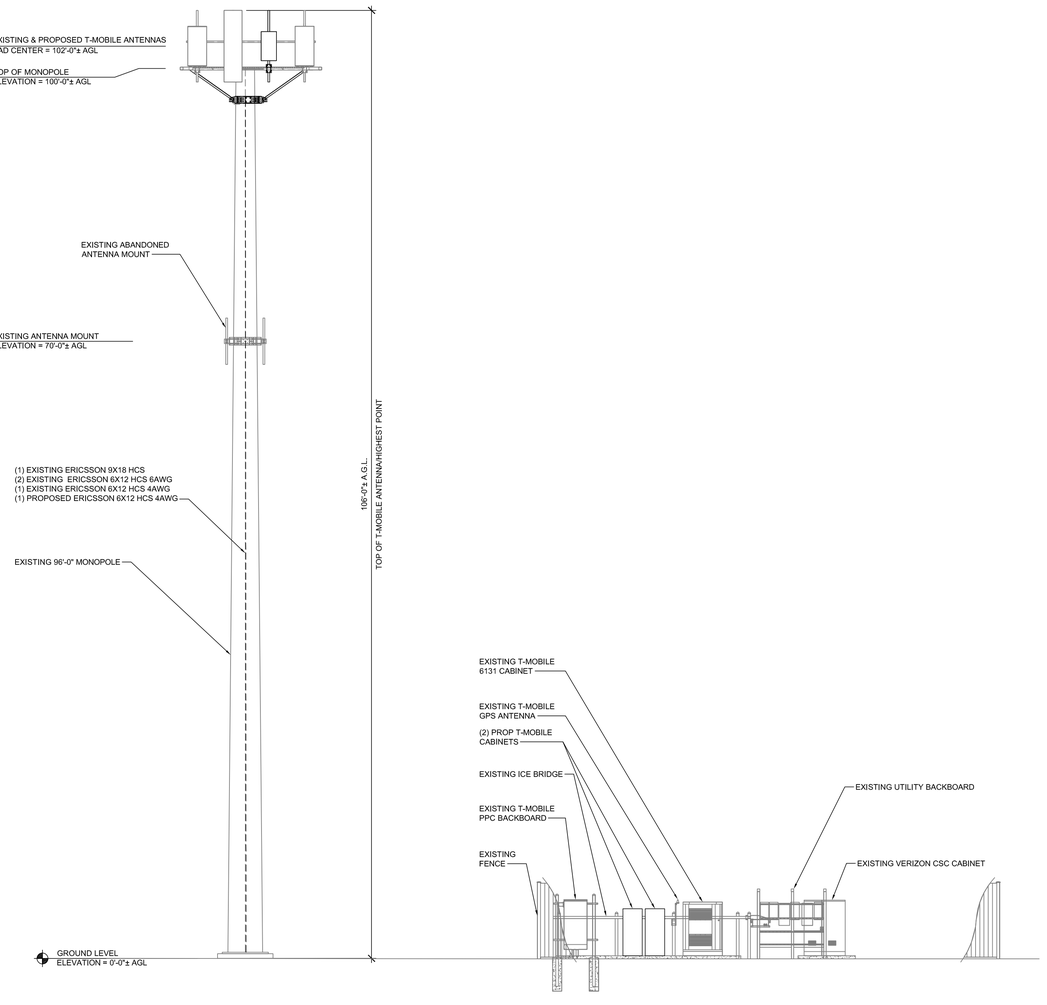
SHEET NUMBER

C-3



EXISTING MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"



PROPOSED MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below.
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

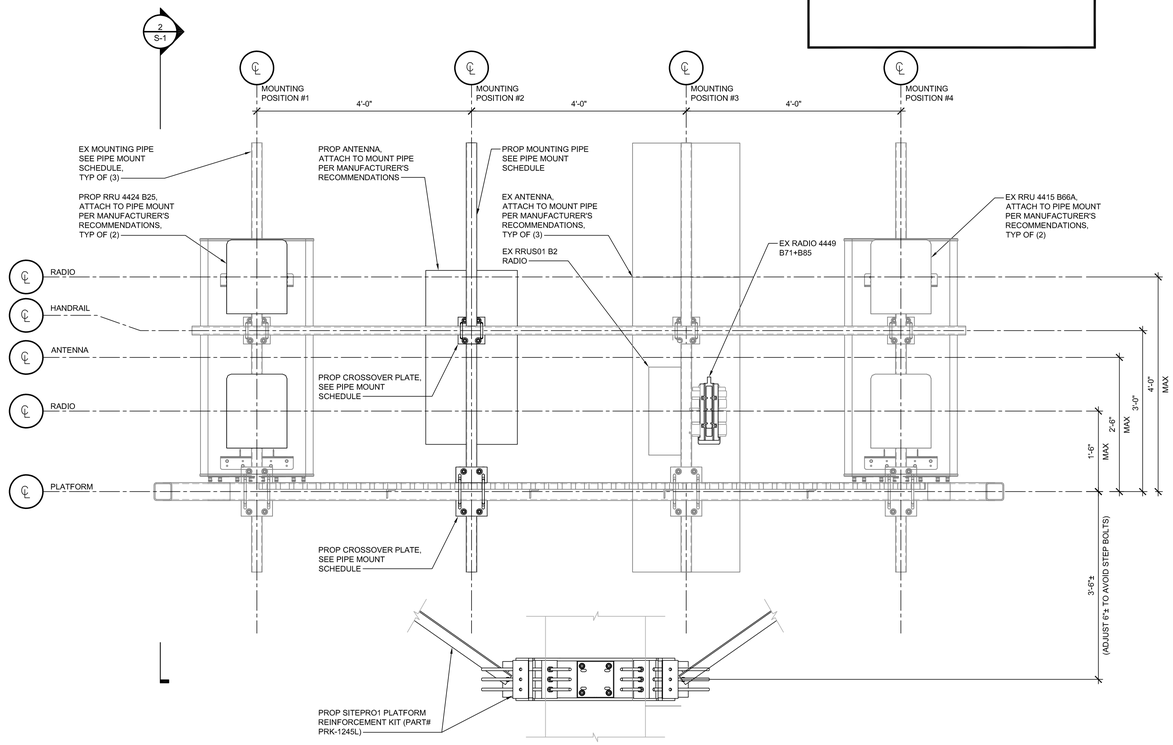
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Tower Elevations

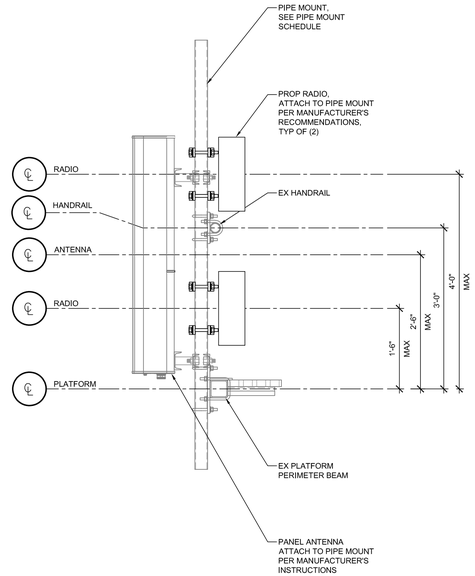
SHEET NUMBER

C-4



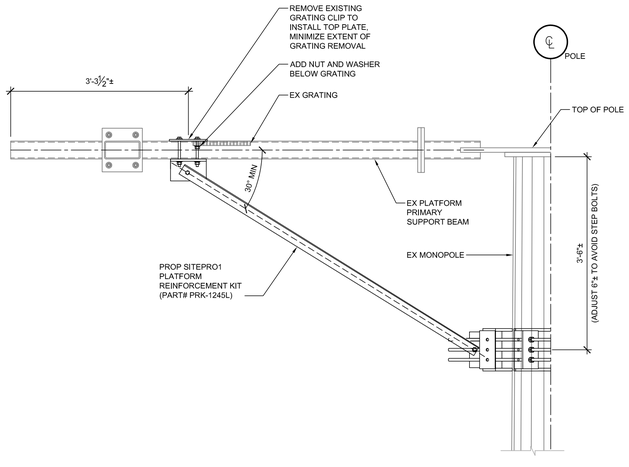
1 C-3 ANTENNA SECTOR REAR ELEVATION

SCALE: 3/4" = 1'-0"



2 S-1 TYPICAL ANTENNA & EQUIPMENT MOUNT

SCALE: 3/4" = 1'-0"



3 C-3 TYPICAL PLATFORM REINFORCEMENT

SCALE: 3/4" = 1'-0"

PIPE MOUNT SCHEDULE						
MOUNTING POSITION	PIPE O.D.	PIPE LENGTH	THICKNESS	HANDRAIL CONNECTION	BOTTOM CONNECTION	EXISTING/ PROPOSED
MP#1	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#2	2½"	96"	SCH. 40	SITEPRO1 SCX1-K	SITEPRO1 SQCX4-K	PROPOSED
MP#3	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#4	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING

NOTES:

1. COORDINATE PIPE MOUNT SCHEDULE w/ PLANS, SECTIONS, DETAILS, & NOTES.

A PIPE MOUNT SCHEDULE

TYPICAL BOLT ASSEMBLIES						
TYPE	GRADE	DIA.	FINISH	WASHER[4]	NUT	TIGHTENING TORQUE (FT-LB)[2,3]
U-BOLT	SAE J429 GRADE 2	½"	GALV.	ASTM F436/F844	EXISTING	61
STRUCTURAL	ASTM F3125 GR A325	¾"	GALV.	ASTM F436	ASTM A563	175

NOTES:

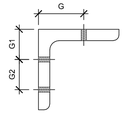
1. TIGHTENING TORQUES CORRESPOND TO AISC SNUG-TIGHTENED JOINTS.
2. CONTRACTOR SHALL VERIFY THAT ALL EXISTING BOLTS ARE TIGHTENED ACCORDING TO THIS TABLE. THREADED PARTS AND BOLTS MUST BE CORRECTLY IDENTIFIED PRIOR TO RE-TIGHTENING AND THE THREADED COMPONENTS SHALL NOT BE OVERTIGHTENED, OTHERWISE THEY NEED TO BE SAFELY REMOVED AND REPLACED. EXCEPTION: TIGHTENING TORQUES DO NOT APPLY TO THREADED COMPONENTS OF COLLAR MOUNTS AND/OR TOWER LEG ATTACHMENT POINTS (IF APPLICABLE).
3. TIGHTENING SHALL STOP WHEN THE SPECIFIED INSTALLATION TORQUE IS REACHED OR AT THE FIRST SIGN OF DEFORMATION.
4. WASHER SHALL BE PROVIDED UNDER ELEMENT THAT IS TURNED (NUT OR HEAD).

B TYPICAL BOLT ASSEMBLIES

MOUNT MODIFICATION BILL OF MATERIALS						
ITEM #	DESCRIPTION	PART MANUFACTURER	PART MODEL #	QUANTITY	MATERIAL	COMMENTS
1	PLATFORM REINFORCEMENT KIT	SITEPRO1	PRK-1245L	1	VARIES (GALV.)	SECTION 1/C-3 ON S-1 & 3/C-3 ON S-1
2a	2½" O.D. SCH 40 PIPE MOUNT x 8'-0" LONG	-	-	3	GALV. ASTM A53 GR B	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2b	CROSSOVER PLATE KIT W/ SQUARE U-BOLTS AND STD. U-BOLTS	SITEPRO1	SQCX4-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2c	CROSSOVER PLATE KIT	SITEPRO1	SCX1-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE

C MOUNT MODIFICATION BILL OF MATERIALS

WORKABLE GAUGE IN ANGLE LEGS														
LEG	8	7	6	5	4	3½	3	2½	2	1¾	1½	1⅜	1¼	1
G	4½	4	3½	3	2½	2	1¾	1⅜	1⅛	1	⅞	⅝	¾	⅝
G1	3	2½	2¼	2										
G2	3	3	2½	1¾										



NOMINAL HOLE DIMENSIONS, MINIMUM EDGE DISTANCE, & MINIMUM BOLT HOLE SPACING			
BOLT DIAMETER	STANDARD HOLE	MINIMUM EDGE DISTANCE	MINIMUM BOLT HOLE SPACING
½"	9/16"	¾", U.N.O.	2½", U.N.O.
⅝"	11/16"	⅞", U.N.O.	2⅝", U.N.O.

NOTE: ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EX CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.

D TYP CONNECTION REQUIREMENTS

T-Mobile
T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

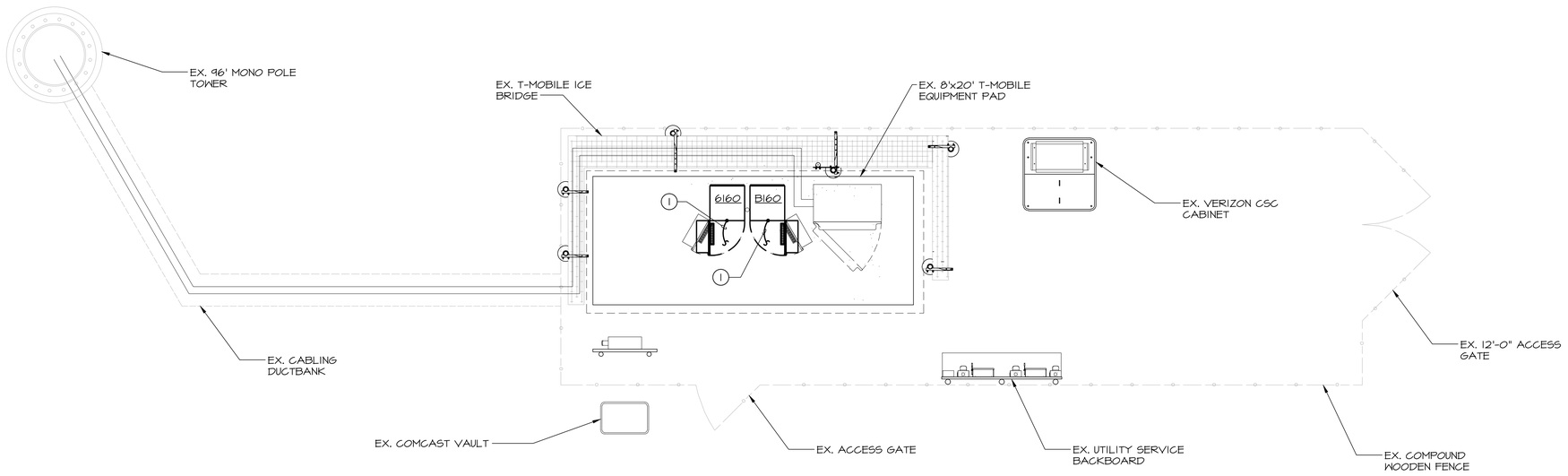
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Structural Details

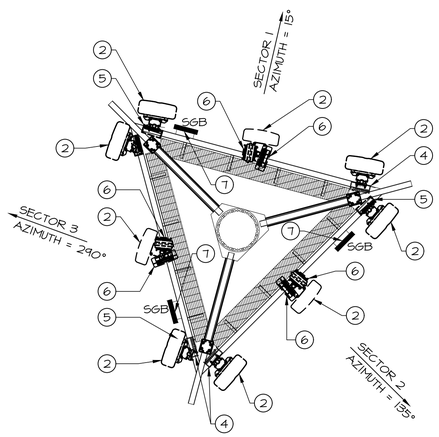
SHEET NUMBER

S-1



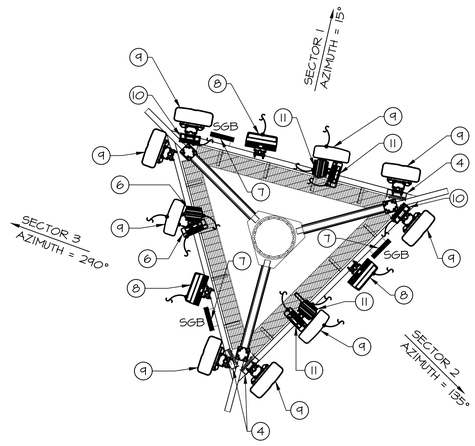
COMPOUND GROUNDING PLAN

SCALE: 1/4"=1'-0"



⑫ DEMOLITION ANTENNA PLAN

NO SCALE



⑫ ANTENNA PLAN

NO SCALE

GROUNDING NOTES

1. BOND NEW T-MOBILE B160 BATTERY CABINET AND NEW T-MOBILE 6160 POWER CABINET TO EXISTING GROUND RING USING 1#2AWG BARE TINNED COPPER CONDUCTOR.
2. REMOVE AND RELOCATE EXISTING MAST MOUNTED ANTENNA. DISCONNECT EXISTING ANTENNA JUMPERS AND ASSOCIATED GROUNDING AND SAVE FOR RECONNECTION TO NEW LOCATION IN NEW WORK PHASE.
3. NOT USED.
4. EXISTING RADIO HEAD (RRH) TO REMAIN.
5. REMOVE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING JUMPER CABLES AND ASSOCIATED GROUNDING.
6. REMOVE AND RELOCATE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING RADIO HEAD (RRH) JUMPERS AND ASSOCIATED GROUNDING.
7. EXISTING COPPER SECTOR GROUND BAR TO REMAIN.
8. PROVIDE NEW ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
9. RELOCATED ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
10. PROVIDE NEW RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
11. RELOCATED RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
12. REMOVE ALL EXISTING **UNUSED** COAX CABLING. PROVIDE (1) NEW 6x12 HYBRID FIBER CABLING.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND
TIMOTHY SMIDT
21585
REGISTERED
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

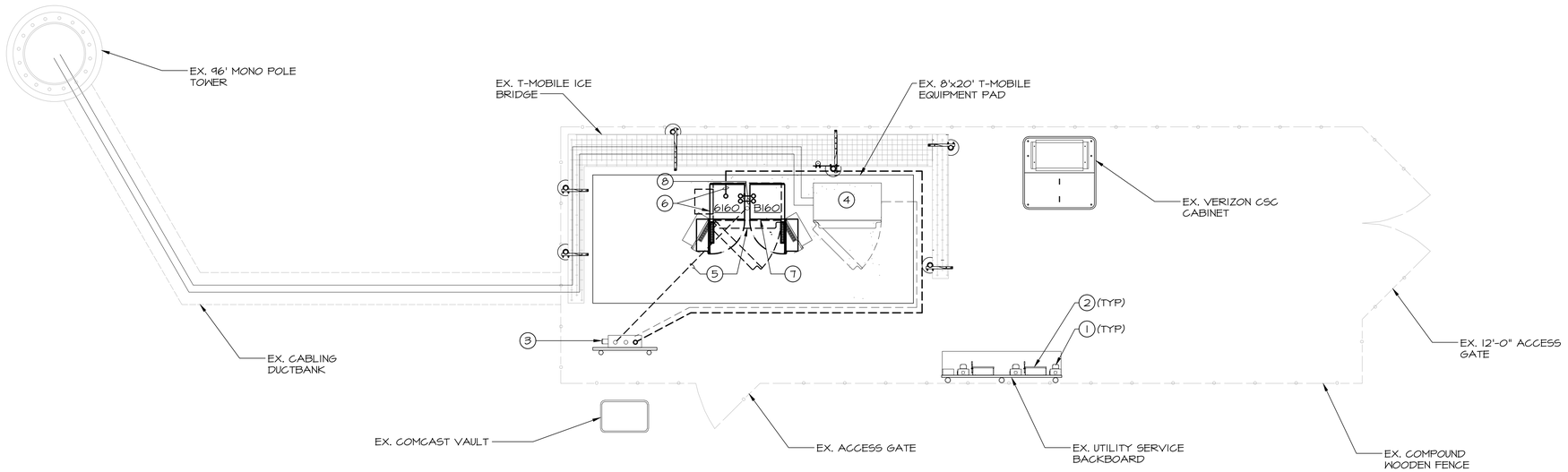
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811
Know what's **below.**
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Grounding Compound Plan, Antenna Plans and Notes

SHEET NUMBER
G-1



COMPOUND POWER PLAN

SCALE: 1/4"=1'-0"

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET, DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET, EXTEND 3#1+#8GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND · TIMOTHY SMIDT · 21585 · REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Compound Power Plan and Notes

SHEET NUMBER
E-1

(EXISTING) ③ PANEL T ⟨1⟩

120/240 VOLTS 1Φ 3 WIRE 200 AMP MCB

DESCRIPTION	BRKR	CKT	CKT	BRKR	DESCRIPTION
SURGE	60	1	2	150	6131 CABINET
		3	4		
SPARE (5)	50	5	6		
		7	8		
LIGHT/RECEPTACLE	20	9	10	20	SPARE (5)
SPACE	-	11	12	100	6160 CABINET (4)
SPACE	-	13	14		
SPACE	-	15	16	-	SPACE
SPACE	-	17	18	-	SPACE
SPACE	-	19	20	-	SPACE
SPACE	-	21	22	-	SPACE
SPACE	-	23	24	-	SPACE

LOAD CALCULATION:

PROPOSED EQUIPMENT LOAD: 40Ax240V =	9.6 KVA
LIGHT/RECEPTACLES LOAD:	0.20 KVA
EXISTING EQUIPMENT LOAD:	31.5 KVA
TOTAL:	41.3 KVA
TOTAL LOAD:	41.3 KVA = 172.1 AMPS @ 120/240V, 1Φ

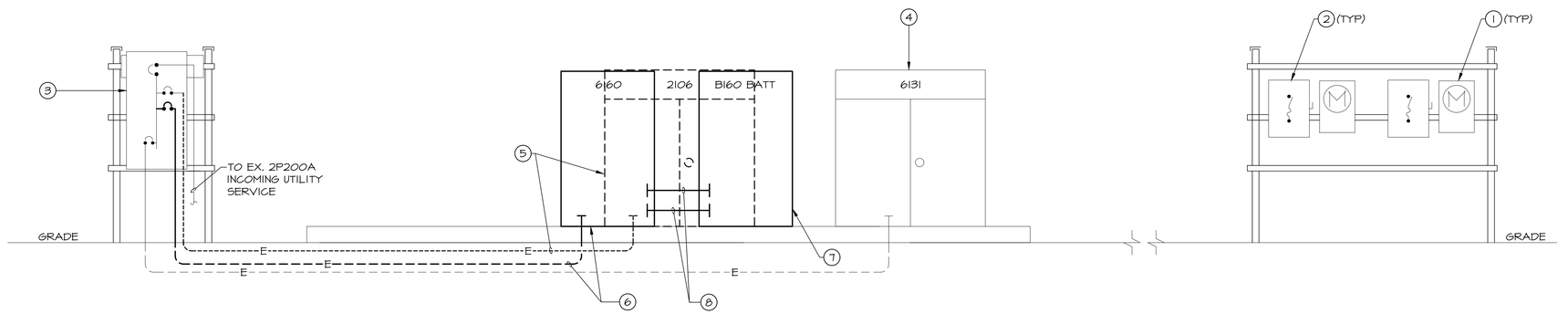
* PANELBOARD FEEDERS ARE SIZED FOR MAIN OVERCURRENT DEVICE PER N.E.C. ARTICLE 215-2
** ALL LOADS ARE BASED UPON N.E.C. ARTICLE 220

NOTES:

⟨1⟩ CONTRACTOR SHALL PROVIDE UPDATED, TYPED PANEL DIRECTORY WITH RESPECTIVE CIRCUIT NAMES AFTER PROJECT COMPLETION, **PER N.E.C. ARTICLE 408.4.**

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET. EXTEND 3#1+#8 GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.



POWER RISER
NO SCALE

ELECTRICAL SPECIFICATIONS

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE IN STRICT ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODES. ALL WORK IS SUBJECT TO THE APPROVAL OF THE T-MOBILE REPRESENTATIVE.
2. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND SHALL PAY ALL ASSOCIATED CHARGES. CONTRACTOR SHALL ARRANGE FOR ALL INSPECTIONS.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL SPECIFIED MATERIALS AND EQUIPMENT. ALL MATERIALS SHALL BE U.L. LISTED.
4. CONDUIT SHALL BE RIGID STEEL (HEAVY WALL) OR SEALTIGHT FOR WORK EXPOSED TO WEATHER. NO ALUMINUM CONDUIT OR CONDUCTORS PERMITTED.
5. WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THWN/THHN INSULATION FOR EXTERIOR USE. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED. CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 98% CONDUCTIVITY.
6. THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDED USING DOUBLE LOCKNUTS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTORS.
7. ALL ELECTRICAL EQUIPMENT INCULDING THE PANEL, SWITCH GEAR AND DISCONNECT SHALL BE IDENTIFIED WITH ENGRAVED BAKELITE NAMEPLATES.
8. ALL ELECTRICAL EQUIPMENT EXPOSED TO WEATHER SHALL BE PROTECTED IN NEMA 3R ENCLOSURES.
9. ALL DISCONNECTS SHALL BE SQUARE D NEMA 3R FUSIBLE.
10. **CONTRACTOR SHALL COORDINATE FINAL SERVICE TERMINATION LOCATIONS WITH TELEPHONE AND ELECTRIC UTILITY COMPANIES IN THE FIELD.**
11. CONTRACTOR SHALL UPDATE PANEL SCHEDULES AND IDENTIFY ALL MISCELLANEOUS CIRCUITS NOT INDICATED ON SCHEDULES.

ELECTRICAL SYMBOLS LIST

NOTE: ALL MOUNTING HEIGHTS ARE TO CENTER LINE OF THE OUTLET BOX UNLESS OTHERWISE INDICATED.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
◀	EQUIPMENT FRONT	●R	GROUND ROD
M	METER	◉R	GROUND TEST ROD
(5)	DRAWING NOTE	--- T ---	TELEPHONE CONDUIT
—⏚—	GROUND CONNECTION	--- E ---	ELECTRIC CONDUIT
⟶ ⟶	CONDUIT-DOWN, UP	--- G ---	GROUND CONDUCTOR
▨	120/240V, 1Φ ELECTRIC PANEL		

ABBREVIATIONS

AFF	- ABOVE FINISHED FLOOR	MTD	- MOUNTED
C, CDT	- CONDUIT	UG	- UNDERGROUND
DN	- DOWN	V	- VOLTS
GRD	- GROUND	W	- WITH
MH	- MOUNTING HEIGHT	WP	- WEATHERPROOF

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND — TIMOTHY SMIDT — 21585 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Power Riser, Panel Schedule, Symbols List and Notes

SHEET NUMBER
E-2

Montgomery County Department of Permitting
Executive Office Building
101 Monroe Street, 2nd Floor
Rockville, MD 20850

RE: MC2020101311 – T-Mobile site 7WAN235A
12501 Dalewood Road, Silver Spring, MD

To Whom It May Concern,

I write on behalf of the T-Mobile Northeast, LLC ("T-Mobile") concerning the above referenced application, which has been submitted to the Montgomery County Telecommunications Transmission Facility Coordinating Group (the "County"). In connection with that application, the County has requested a full EME report for the site. We believe this request goes beyond what is required under Sec. 2-58E of the County's code, which simply requires confirmation that the "… antenna installation be in compliance with the maximum permissible RF exposure limits set forth in § 1.1310 of the FCC Rules and Regulations."

It is T-Mobile's position the full EME reports contain sensitive and confidential T-Mobile business information, which is why we typically provide compliance summaries based on the full reports. The summaries are prepared by the same RF engineering and regulatory compliance experts as the underlying reports. While we believe such summaries would fully satisfy the code requirements, in the interest of working with the County we have enclosed the full report for the above referenced site. We submit the full report in the spirt of cooperation and are not waiving our rights to object to such requirements in the future.

We appreciate your prompt attention to our application. Please let me know if you have any questions about the enclosed information or the underlying application. You can reach me at William.Brown54@t-mobile.com or by phone at 443-850-8838.

Sincerely,

William G. Brown
Development Manager, DC Market

SITESAFE
RF COMPLIANCE EXPERTS

8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

Site Link Wireless, LLC on behalf of T-Mobile
Site ID – 7WAN235A
Assessment Purpose – TMO Anchor
Site Name – BOE - Richard D. Riddle School
Site Compliance Report

12501-A Dalewood Drive
Silver Spring, MD 20906

Latitude: N39-3-35.53
Longitude: W77-4-01.20
Structure Type: Monopole

Report generated date: November 13, 2020
Report by: Sophie Thein
Customer Contact: James Marquez

T-Mobile will be compliant upon completion of the remediation identified in Section 3.2.

Site Link Wireless, LLC on behalf of T-Mobile
BOE - Richard D. Riddle School - 7WAN235A
Radio Frequency (RF) Site Compliance Report

12501-A Dalewood Drive, Silver Spring, MD 20906

8618 Westwood Center Drive • Suite 315 • Vienna, VA 22182
703.276.1100 • info@sitesafe.com

Table of Contents

1 Executive Summary

T-Mobile has contracted with Site Safe, LLC (Sitesafe), an independent Radio Frequency (RF) regulatory and engineering consulting firm, to determine whether the communications site, 7WAN235A - BOE - Richard D. Riddle School, located at 12501-A Dalewood Drive, Silver Spring, MD, is in compliance with Federal Communication Commission (FCC) Rules and Regulations for RF emissions.

This report contains a detailed summary of the RF environment at the site including:

- Diagram of the site
- Inventory of the make / model of all antennas
- Theoretical MPE based on modeling

This report addresses exposure to radio frequency electromagnetic fields in accordance with the FCC Rules and Regulations for all individuals, classified in two groups, "Occupational or Controlled" and "General Public or Uncontrolled." **T-Mobile will be compliant** with the FCC rules and regulations, as described in OET Bulletin 65 **upon implementation of the proposed remediation.** The corrective actions needed to make this site compliant are located in Section 3.2.

T-Mobile proposes to make modifications to an existing site. The proposed antennas are noted as "proposed" in the antenna table under Section 6.

This document and the conclusions herein are based on the information provided by T-Mobile.

If you have any questions regarding RF safety and regulatory compliance, please do not hesitate to contact Sitesafe's Customer Support Department at (703) 276-1100.

2 Regulatory Basis

2.1 FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for evaluating the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

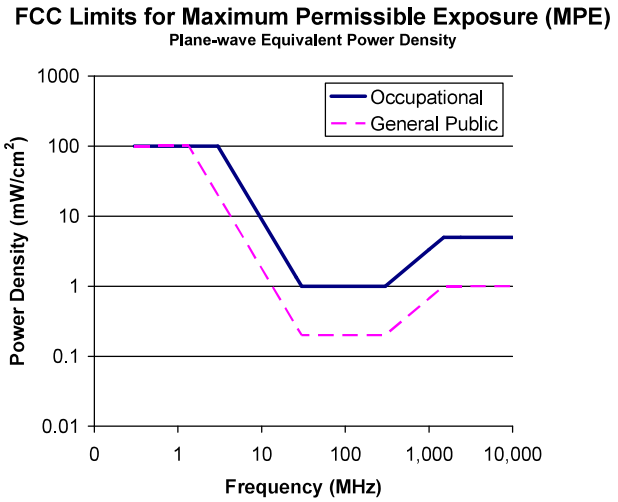
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

2.2 OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic lockout/tagout procedure aimed to control the unexpected energization or startup of machines when maintenance or service is being performed.

3 Site Compliance

3.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, Sitesafe has determined that:
T-Mobile will be compliant with the FCC rules and regulations, as described in OET Bulletin 65 **upon implementation of the proposed remediation.** The corrective actions needed to make this site compliant are located in Section 3.2.

The compliance determination is based on theoretical modeling, RF signage placement recommendations, and the level of restricted access to the antennas at the site.

3.2 Actions for Site Compliance

Based on common industry practice and our understanding of FCC and OSHA requirements, this section provides a statement of recommendations for site compliance. If required, RF alert signage recommendations have been proposed based on theoretical analysis of MPE levels. Where applicable, barriers can consist of locked doors, fencing, railing, rope, chain, paint striping or tape, combined with RF alert signage.

The site will be made compliant if the following changes are implemented:

Monopole Base Location

Ensure that a Warning sign is installed.
Ensure that an RF Guideline sign is installed.

Note: The construction drawing used to create this report may not have shown all or any of the roof access points. A Notice sign and an RF Guideline sign will be required at every access point in order for the site to be in compliance.

All roof access points must be locked or restricted for the site to be in compliance.

4 Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a worker's understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet-based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3-foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The farther away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram(s): Section 5 of this report contains RF Diagram(s) that outline various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst-case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

5 Analysis

5.1 RF Emissions Diagram

The RF diagram(s) below display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix B.

The key at the bottom of each diagram indicates if percentages displayed are referenced to FCC **General Public** Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

This table displays the maximum theoretical percentage of the FCC's General Public MPE limits:

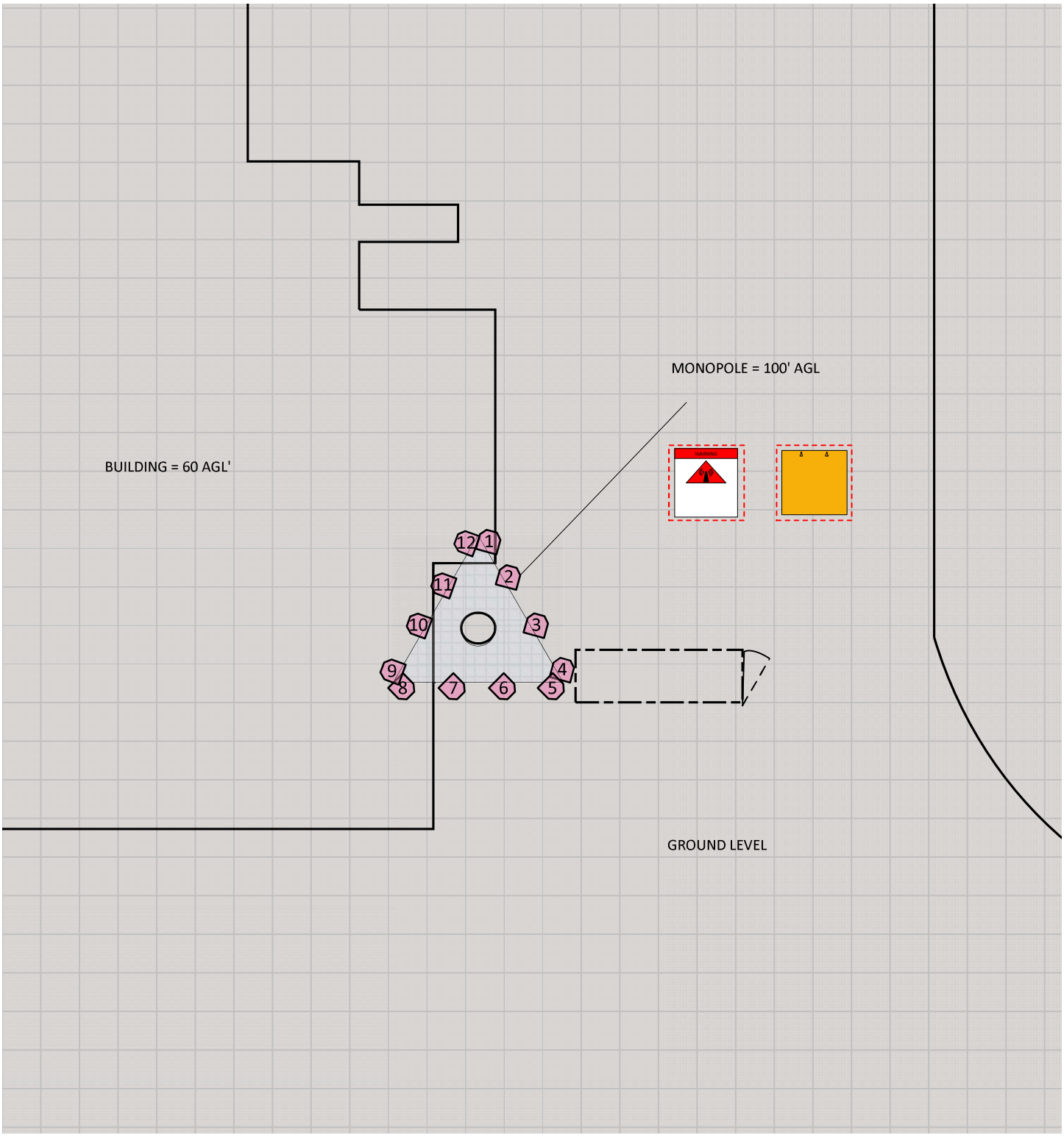
	General Public Levels:	
Exposure Type:	**Spatial Average**	**Spatial Average**
Reference Level:	**Rooftop**	**Ground**
T-Mobile:	<1.0%	<1.0%
Composite:	<1.0%	<1.0%

Note: On the diagrams shown below, each level is marked with a height. For all diagrams that are marked as *Spatial average 0' – 6'*, the modeling program will spatially average the emissions within the area six feet above each set level. This provides an accurate spatial average of the percentage of the FCC's MPE limits within an accessible area.

In the RF exposure simulations below, all heights are reflected with respect to the main site level. In most rooftop cases, this is the height of the main rooftop, and in other cases, this may be ground level. Each different area, rooftop, or platform level is labeled with its height relative to the main site level. Exposure is calculated appropriately based on the relative height and location of that area to all antennas. The analyzed elevations in the RF exposure simulations are as follows:

- GROUND LEVEL = 0'
- MONOPOLE = 100'

RF Exposure Simulation For: BOE - Richard D. Riddle School
Composite View



% of FCC Public Exposure Limit
Single Level (0)

% of FCC Public Exposure Limit

0-5	5-100	100-500	500-5000	5000+

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Existing Barrier ——— Proposed Barrier/Sign — — — Remove Sign X Locked Ladder

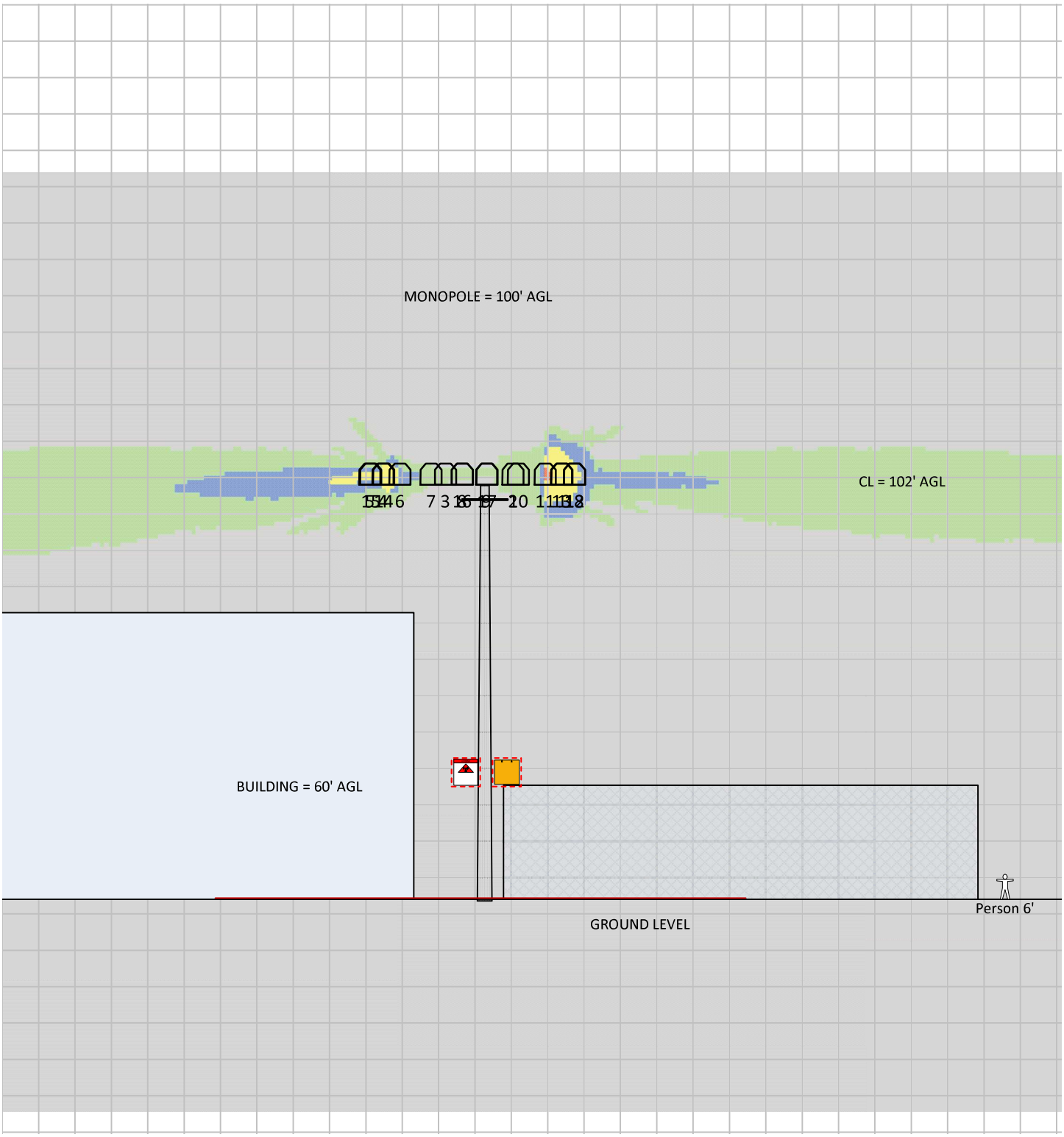
(Feet)

0 21.9 43.8

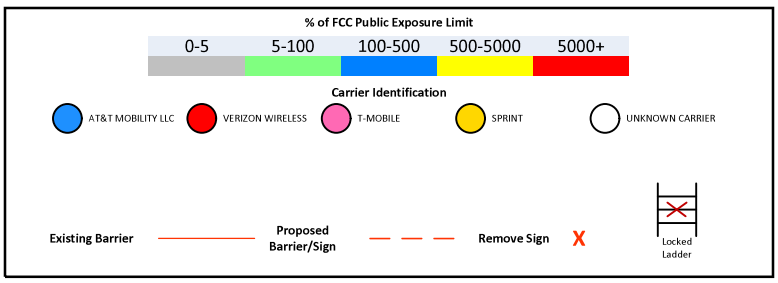
www.sitesafe.com
11/13/2020 2:34:43 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

RF Exposure Simulation For: BOE - Richard D. Riddle School
Elevation View



% of FCC Public Exposure Limit
Single Level (0)



(Feet)
0 17 34

www.sitesafe.com
11/13/2020 2:30:08 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

6 Antenna Inventory

The Antenna Inventory shows all transmitting antennas at the site. This inventory was provided by the customer and was utilized by Sitesafe to perform theoretical modeling of RF emissions. The inventory coincides with the site diagrams in this report, identifying each antenna's location at 7WAN235A - BOE - Richard D. Riddle School. The antenna information collected includes the following information:

- Licensee or wireless operator name
- Frequency or frequency band
- Transmitter power – Transmitter Power Output ("TPO"), Effective Radiated Power ("ERP"), or Equivalent Isotropic Radiated Power ("EIRP")
- Antenna manufacturer make, model, and gain

For other carriers at this site, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information with regard to carrier, their FCC license and/or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.

The following antenna inventory was provided by the customer and was utilized to create the site model diagrams:

Antenna Inventory																	
Ant #	Operator	Antenna Make and Model	Ant Type	Len (ft)	TX Freq (MHz)	Tech	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power BW (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z(ft) AGL	MDT	EDT
1	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	2100	LTE/AWS	15	17.85	34	80	TPO	Watt	1	4876.3	102	0	3
1	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	2100	LTE	15	17.72	34	80	TPO	Watt	1	4732.5	102	0	3
2	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	LTE	15	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
2	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	5G	15	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
3	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	700	LTE	15	13.39	62	160	TPO	Watt	1	3492.4	102	0	4
3	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	LTE	15	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
3	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	5G	15	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
3	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	UMTS	15	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
3	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	GSM	15	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
4	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	1900	LTE	15	17.03	36	80	TPO	Watt	1	4037.3	102	0	3
4	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	1900	LTE	15	17.27	36	80	TPO	Watt	1	4266.7	102	0	3
5	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	2100	LTE/AWS	135	17.85	34	80	TPO	Watt	1	4876.3	102	0	3
5	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	2100	LTE/AWS	135	17.72	34	80	TPO	Watt	1	4732.5	102	0	3
6	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	LTE	135	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
6	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	5G	135	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
7	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	700	LTE	135	13.39	62	160	TPO	Watt	1	3492.4	102	0	4
7	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	LTE	135	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
7	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	5G	135	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
7	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	UMTS	135	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
7	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	GSM	135	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
8	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	1900	LTE	135	17.03	36	80	TPO	Watt	1	4037.3	102	0	3
8	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	1900	LTE	135	17.27	36	80	TPO	Watt	1	4266.7	102	0	3
9	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	1900	LTE	290	17.03	36	80	TPO	Watt	1	4037.3	102	0	3

Antenna Inventory																	
Ant #	Operator	Antenna Make and Model	Ant Type	Len (ft)	TX Freq (MHz)	Tech	Az (Deg)	Antenna Gain (dBd)	Horizontal Half Power BW (Deg)	Power	Power Type	Power Units	# of Trans	ERP (Watts)	Z(ft) AGL	MDT	EDT
9	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	1900	LTE	290	17.27	36	80	TPO	Watt	1	4266.7	102	0	3
10	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	LTE	290	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
10	T-MOBILE (Proposed)	Ericsson AIR 6449*	Panel	3.2	2500	5G	290	14.76	62.95	100	TPO	Watt	1	2992.3	102	0	4
11	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	700	LTE	290	13.39	62	160	TPO	Watt	1	3492.4	102	0	4
11	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	LTE	290	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
11	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	600	5G	290	13.2	62.76	60	TPO	Watt	1	1253.6	102	0	4
11	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	UMTS	290	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
11	T-MOBILE	RFS APXVAARR24_43-U-NA20	Panel	8	1900	GSM	290	14.91	60.03	40	TPO	Watt	1	1239	102	0	4
12	T-MOBILE	Commscope 2HH-38A-R4 (Left Beam)	Panel	4.4	2100	LTE/AWS	290	17.85	34	80	TPO	Watt	1	4876.3	102	0	3
12	T-MOBILE	Commscope 2HH-38A-R4 (Right Beam)	Panel	4.4	2100	LTE/AWS	290	17.72	34	80	TPO	Watt	1	4732.5	102	0	3

Note: The Z reference indicates antenna height above the ground site level unless otherwise indicated. ERP values provided by the client and used in the modeling may be greater than are currently deployed. For additional modeling information, refer to Appendix B. Proposed equipment is tagged as *(Proposed)* under *Operator* or *Antenna Make and Model*.

7 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Site Safe, LLC, in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Sophie Thein.

November 13, 2020

Young Min Kim

Appendix A – Statement of Limiting Conditions

Sitesafe will not be responsible for matters of a legal nature that affect the site or property.

Due to the complexity of some wireless sites, Sitesafe performed this analysis and created this report utilizing best industry practices and due diligence. Sitesafe cannot be held accountable or responsible for anomalies or discrepancies due to actual site conditions (i.e., mislabeling of antennas or equipment, inaccessible cable runs, inaccessible antennas or equipment, etc.) or information or data supplied by T-Mobile, the site manager, or their affiliates, subcontractors or assigns.

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, observed during the survey of the subject property or that Sitesafe became aware of during the normal research involved in performing this survey. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data provided by a second party and physical data collected by Sitesafe, the physical data will be used.

Appendix B – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest MPE, resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible for taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

Gain (of an antenna) – The ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation. Gain may be considered for a specified polarization. Gain may be referenced to an isotropic antenna (dBi) or a half-wave dipole (dBd) antenna.

General Population/Uncontrolled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are *unaware* of the potential for exposure and who have no control over their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use its industry specific knowledge of antenna models to select a worst-case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of RF exposure on humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy a 6-foot tall human body will absorb while present in an electromagnetic field of energy.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix C – Rules & Regulations

Explanation of Applicable Rules and Regulations

The FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Specific regulations regarding this topic are listed in Part 1, Subpart I, of Title 47 in the Code of Federal Regulations. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC and OSHA Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations. Individual licensees that contribute less than 5% MPE to any total area out of compliance are not responsible for corrective actions.

OSHA has adopted and enforces the FCC's exposure guidelines. A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- are exposed to RF energy as a consequence of their employment;
- have been made aware of the possibility of exposure; and
- can exercise control over their exposure.

OSHA guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

All T-Mobile employees who require access to this site must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

Appendix D – General Safety Recommendations

The following are *general recommendations* appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site (or the area indicated to be in excess of General Public MPE) should wear a personal protective monitor (PPM), successfully complete proper RF Safety Awareness training, and have and be trained in the use of appropriate personal protective equipment.

2. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.

3. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:

- adding new antennas that may have been located on the site
- removing of any existing antennas
- changes in the radiating power or number of RF emitters

4. Post the appropriate **NOTICE**, **CAUTION,** or **WARNING** sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in Section 5.1 to inform <u>everyone</u> who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. In addition to RF Advisory Signage, a RF Guideline Signage is recommended to be posted at the main site access point(s). The signs below are examples of signs meeting FCC guidelines.

5. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.

6. For a General Public environment the five color levels identified in this analysis can be interpreted in the following manner:

- Gray represents areas predicted to be at 5% or less of the General Public MPE limits. *The General Public can access these areas with no restrictions.*

- Green represents areas predicted to be between 5% and 100% of the General Public MPE limits. *The General Public can access these areas with no restrictions.*
- Blue represents areas predicted to be between 100% and 500% of the General Public MPE limits. *The General Public should be restricted from accessing these areas.*
- Yellow represents areas predicted to be between 500% and 5000% of the General Public MPE limits. *The General Public should be restricted from accessing these areas.*
- Red represents areas predicted to be greater than 5000% of the General Public MPE limits. *The General Public should be restricted from accessing these areas.*

7. For an Occupational environment the five color levels identified in this analysis can be interpreted in the following manner:

- Gray represents areas predicted to be at 1% or less of the Occupational MPE limits. *Workers can access these areas with no restrictions.*
- Green represents areas predicted to be between 1% and 20% of the Occupational MPE limits. *Workers can access these areas with no restrictions.*
- Blue represents areas predicted to be between 20% and 100% of the Occupational MPE limits. *Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and understand how to limit their exposure.*
- Yellow represents areas predicted to be between 100% and 1000% of the Occupational MPE limits. *Workers can access these areas assuming they have basic understanding of EME awareness and RF safety procedures and understand how to limit their exposure. Transmitter power reduction and/or time-averaging may be required.*
- Red represents areas predicted to be greater than 1000% of the Occupational MPE limits. *These areas are not safe for workers to be in for prolonged periods of time. Special procedures must be adhered to, such as lockout/tagout or transmitter power reduction, to minimize worker exposure to EME.*

8. Use of a Personal Protective Monitor (PPM): When working around antennas, Sitesafe strongly recommends the use of a PPM. Wearing a PPM will properly forewarn the individual prior to entering an RF exposure area.

Keep a copy of this report available for all persons who must access the site. They should read this report and be aware of the potential hazards with regards to RF and MPE limits.

Additional Information

Additional RF information is available at the following sites:
https://www.fcc.gov/general/radio-frequency-safety-0
https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety

OSHA has additional information available at:
https://www.osha.gov/SLTC/radiofrequencyradiation/index.html

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

Monopole Analysis

Existing Monopole:

Result of Analysis	**Passing**
Monopole Critical Demand Capacity Ratio:	**97%**
Foundation Critical Demand Capacity Ratio:	**105%**

7WAN235A

BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Proposed T-Mobile Installation

Revision 1

August 28, 2020

Prepared For:

Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

MRA Job Number: 19851.038

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

August 28, 2020

Mr. Drew Montgomery
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Re: 7WAN235A
BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Latitude: 39° 03' 35.53" N, Longitude: 77° 04' 1.20" W
MRA Job No 19851.038
Monopole Analysis for Proposed T-Mobile Installation – Revision 1

Dear Drew :

As requested, Morris & Ritchie Associates, Inc. (MRA) has completed our structural analysis of the existing 100'-0" monopole located at the above referenced site. The objective of MRA's analysis was to determine if the monopole can structurally support the proposed T-Mobile installation, in addition to the existing appurtenances, and meet the requirements of the 2018 International Building Code (IBC 2018), the ANSI/TIA-222-H-2017 Standard, and the AISC Manual of Steel Construction, Load and Resistance Factored Design.

The structural analysis of the monopole has been based upon the following information:

- Construction drawings, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Mount Analysis Report, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Information obtained during site visit, performed by MRA, on July 1, 2020.
- RF configuration and plumbing diagram, prepared by T-Mobile, dated April 22, 2020.
- Construction drawings, prepared by NB+C Engineering Services, for T-Mobile, Site Number: 7WAN235A, dated November 26, 2018.
- Tower Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 21, 2018.
- Mount Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 15, 2018.
- Assembly Drawings for "12' Low Profile Antenna Platform H" (Part#: K12443), provided by EEI, dated November 22, 2016.
- Assembly Drawings for "Platform Reinforcement on a 12" to 45" Pole 4'-6" Angle" (Part#: PRK-1245L), provided by SitePro1, dated April 10, 2014.

For a complete list of all existing and proposed appurtenances used in this analysis, refer to the table on page 5, appended to this report. All appurtenances listed as "to be removed" shall be removed from the tower prior to the installation of any proposed appurtenances.

Several assumptions were made in order to perform the analysis of the monopole. Each of these is considered by MRA to be both reasonable and consistent with current standards of practice.

- All monopole structure information and existing loading were obtained from the original design drawings and/or documents described in the information provided above, are assumed to be accurate.
- The monopole and its foundation were manufactured and constructed in accordance with the EEI original design drawings.
- The monopole base plate has sufficient capacity to support the original design reactions.
- The slip jointed splices were assembled in accordance with the manufacturer's specifications.
- All structural components are in "like new" condition.
- The monopole is modeled as a cantilever beam, with a fixed connection at its base.
- The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
- The monopole and its foundation have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
- The analysis provided in this report only addresses the capacity of the monopole and its foundation; capacities of individual standoffs, mounting frames, etc. are not included in this analysis and are assumed to have adequate capacity to resist loads applied by the appurtenances they support.
- Any and all documentation regarding any previous monopole and/or foundation modifications has been provided to MRA.

The results of this analysis are influenced by the assumptions listed above. MRA should be notified of any additional information that potentially contradicts the above assumptions to determine the effect on the analysis results.

The wind speed and radial ice thickness required by the IBC 2018 and TIA-222-H for this specific location and risk category is in accordance with the wind speed and radial ice thickness maps from ASCE 7-16. Section 2.6.4 of the TIA-222-H Standard states, "It shall be permissible to determine site-specific basic wind speeds and design ice thicknesses from the ASCE 7 online Hazard tool based on ASCE 7-16" to assist in automated interpolation of the wind speed and radial ice thickness maps provided in Annex B of TIA-222-H.

In addition to wind and ice, TIA-222-H requires consideration of earthquake loading effects based on site-specific seismic parameters, aside from Risk Category I structures (earthquake effects could be ignored if S_s was less than or equal to 1.00 in the TIA-222-G Standard).

Due to lack of detailed information provided in TIA-222-H, MRA used the provisions of ASCE 7-16 Chapter C26.7 for exposure category determination. In addition, since TIA-222-H does not recognize wind sectors, but rather defines a wind exposure category for the entire site for all wind directions, it is MRA's professional opinion that a sector of 45 degrees or more of a specific surface roughness, evaluated throughout the extended upwind fetch (greater of 20 times the height of the tower and 2,600 ft), be used for determining the overall site exposure category. Based on this evaluation, we determined that this site is Exposure Category C.

Since this structure does not represent a substantial hazard to human life and/or damage to property in the event of failure, we have determined this structure to be a Risk Category II.

Based on the surrounding topography using satellite imagery and guidelines provided in TIA-222-H, the Topographic Category was determined to be Category 1 due to no abrupt changes in the general topography.

Since the soil properties are not known in sufficient detail to determine the site-specific site class, the default Site Class D was used.

We understand that the structure has designated periodic inspection evaluations in accordance with a site-specific management plan, in addition to the condition assessments as recommended by TIA-222-H; therefore, the Existing Structure Load Modification Factors, K_{es}, were utilized.

In accordance with TIA-222-H, the following loading conditions were considered:

Basic Wind Speed without Ice:	113 mph Wind (3-second gust) + No Ice
Basic Wind Speed with Ice:	40 mph Wind (3-second gust) + 1" Radial Ice
Exposure Category:	C
Risk Category:	II
Topographic Category:	1
Load Modification Factors:	F_w=0.95, t_i=0.85, E_v=1.00, E_h=1.00
Spectral Response Accelerations:	S_s = 0.134 g & S_1 = 0.043 g
Seismic Response Coefficient:	C_s = 0.0715 g
Site Class:	D (by default)
Antenna Rad Center:	102'-0"
Ground Elevation (NAVD 88):	371 ft

The total weight of the existing structure and existing, proposed appurtenances (W) times the seismic response coefficient (C_s) is considerably smaller than the effective projected wind area (EPA) times the wind pressure ($q_z G_h$); therefore, by inspection, we have determined a complete detailed seismic analysis of the existing structure is not necessary as wind loading effects will vastly exceed earthquake loading effects.

As a result of our analysis, we have calculated the critical demand-capacity ratio in the pole shaft to be **97%**.

We have also calculated the maximum factored foundation reactions, and compared them to the original foundation design reactions calculated by Engineered Endeavors, Inc. (EEI) (multiplied by a 1.35 factor, per TIA-222-H 15.6.2), as follows:

REACTION TYPE	ORIGINAL DESIGN REACTION	REACTION FROM CURRENT ANALYSIS	PERCENTAGE
Axial	15.3 k	15.1 k	99%
Shear	13.1 k	11.5 k	88%
Moment	923.1 k-ft	966.3 k-ft	105%

The original design reactions are multiplied by a factor of 1.35 so that a consistent comparison could be made between the reactions from the original EEI design drawings (which were based on service loads) and those from the analysis (which are based on factored loads). Please note that the original design reactions listed above are not the capacities of the foundation itself, but the reactions used to design the foundation. Based on the comparison in the table above, we have determined that the existing foundation, base plate and anchor bolts have sufficient capacity to support the reactions from the current analysis.

As stated in TIA-222-H, the standard allows a comprehensive structural analysis to be limited to a maximum demand-capacity ratio of 105%. This is primarily due to the statistical probability of attaining the maximum wind loading condition, the variability associated with non-linear analysis, and the conservatism in the wind load calculations from the standard.

Our structural analysis indicates that, under the conditions noted above, the existing 100'-0" monopole has sufficient structural capacity to support the proposed T-Mobile installation, in addition to the existing appurtenances, as described herein. No problems for the pole or its foundation, base plate, or anchor bolts are anticipated, and no modifications are necessary.

Any further changes to the appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

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,
MORRIS & RITCHIE ASSOCIATES, INC.

Finny Joy, P.E.
Structural Engineer

Richard J. Dyer, P.E., S.E., S.E.C.B.
Principal

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

V:\Bg_PROJECTS\19800-19899\19851 - Site Link Wireless\19851038 7WAN235A (BOE - Richard D. Riddle School)\Analysis & Design\Revision 1\Monopole Analysis\7WAN235A (BOE - RDRS) - Monopole Analysis Report.Docm

Contents

STANDARD CONDITIONS FOR FURNISHING PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY MORRIS & RITCHIE ASSOCIATES, INC.

In rendering the engineering services described in our proposal or agreement we may rely on the following:

- Information supplied by the client regarding the structure, its foundations, soil conditions, antenna and feedline loading on the structure and its components.

- Information from reports and drawings in the possession of Morris & Ritchie Associates, Inc. (MRA) or generated by field inspection or measurements of the structure.

- Other documents and matters as we deemed necessary and appropriate to render the engineering services described in this proposal or agreement.

All engineering services are performed subject to the following:

That all information supplied by or through the client and owner is current and correct. It is the responsibility of the client to ensure that the information provided to MRA and used in the performance of our engineering services is correct and complete.

In the absence of specific written information to the contrary, we assume the following: (1) the structure was constructed in accordance with the drawings and specifications, (2) the structure has not been modified, (3) the structure is not corroded and has not otherwise deteriorated, and (4) the capacity of the structure has not significantly changed from the "as new" condition.

All services will be rendered with reference to the codes specified by the client. We make no representations with respect to compliance with any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of TIA/EIA-222.

All documents submitted to us for our review as originals are authentic, all documents submitted to us as certified or photostat copies conform to the original documents and all signatures on all documents submitted to us for review are genuine and that all public records are accurate and complete.

We assume no obligation to supplement reports or plans if any applicable codes or laws change after the date thereof.

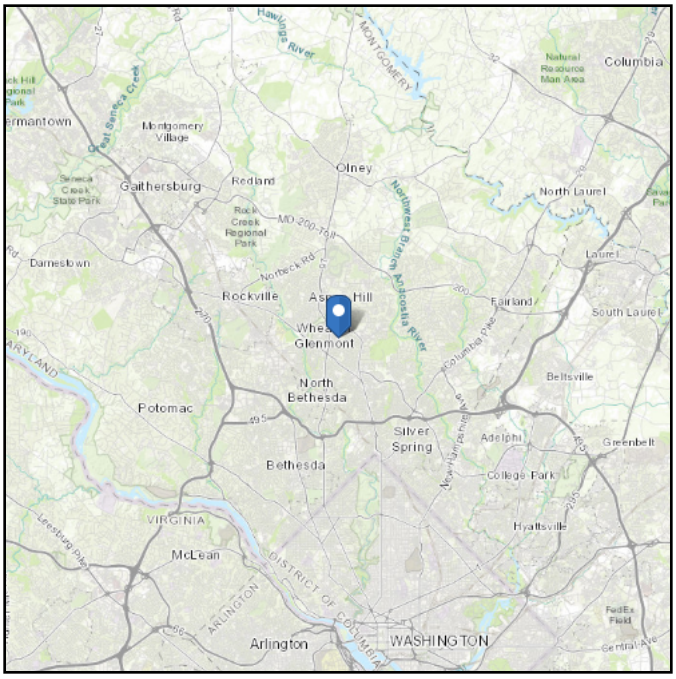
Services rendered are solely for the use of the Client. These reports, plans and specifications may not be relied upon by any person or persons without our prior written consent. Our services constitute professional services rendered in our capacity as professional engineers. Services rendered pursuant to this proposal or agreement do not give rise to or constitute warranties, certifications or guarantees giving rise to an obligation to indemnify anyone against any loss resulting from any inaccuracy contained therein. Our sole undertaking is to render such services in accordance with generally accepted engineering principles and practices. MRA is not responsible for the conclusions, opinions and recommendations made by others based upon the information we supply.

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 370.83 ft (NAVD 88)
Latitude: 39.05987
Longitude: -77.067



Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Sun May 17 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

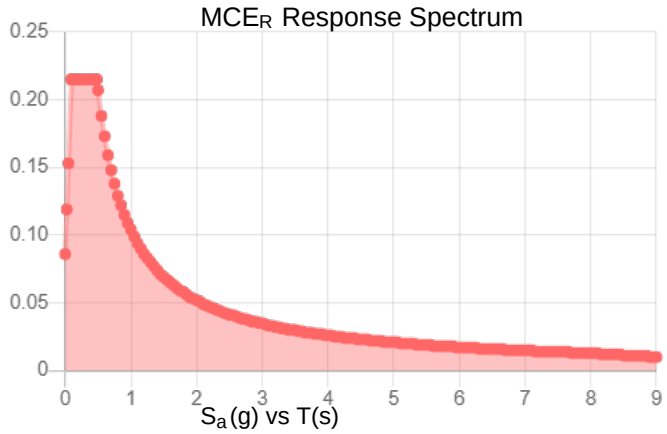
Seismic

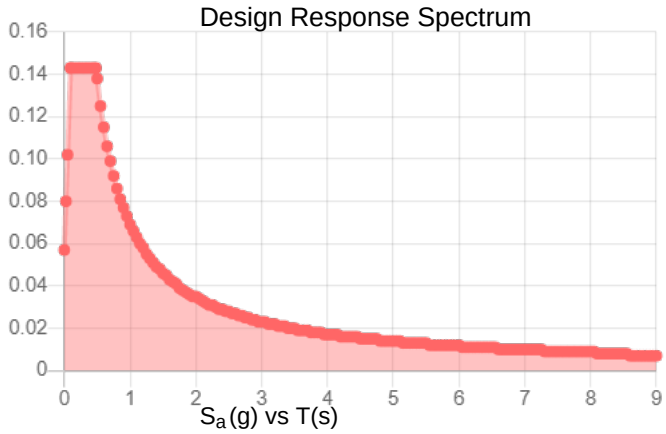
Site Soil Class: D - Stiff Soil

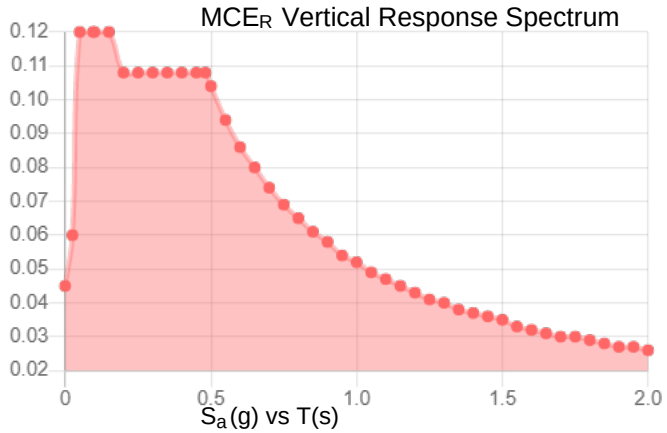
Results:

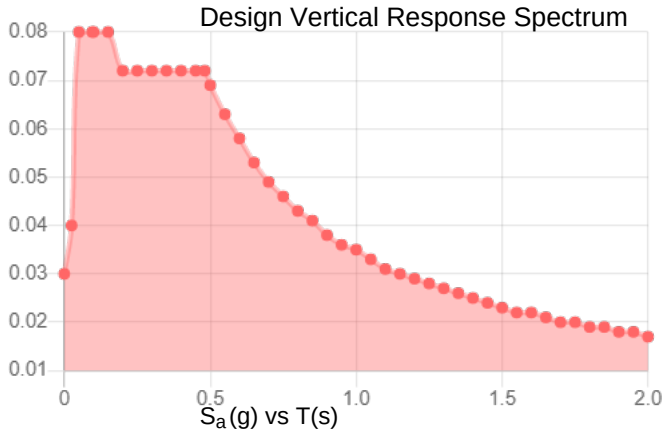
S_S :	0.134	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.07
F_v :	2.4	PGA_M :	0.111
S_{MS} :	0.215	F_{PGA} :	1.6
S_{M1} :	0.104	I_e :	1
S_{DS} :	0.143	C_v :	0.7

Seismic Design Category B









Data Accessed: Sun May 17 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

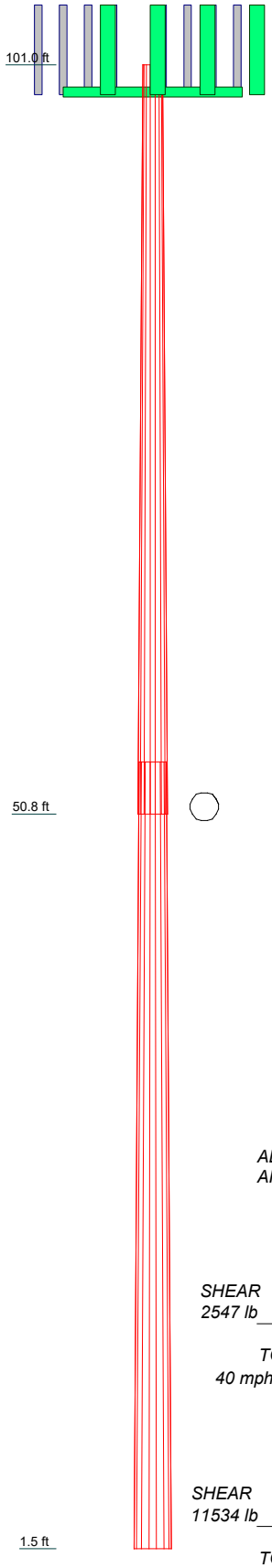
Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sun May 17 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	50.21	18	0.1875	3.42	16.0000	23.0500	A572-65	2064.5
2	52.71	18	0.2500		22.1948	30.0000		3862.6
								5927.2



ALL REACTIONS ARE FACTORED

AXIAL 22329 lb

SHEAR 2547 lb *MOMENT 225110 lb-ft*

TORQUE 225 lb-ft
40 mph WIND - 1.0000 in ICE

AXIAL 15080 lb

SHEAR 11534 lb *MOMENT 966299 lb-ft*

TORQUE 702 lb-ft
REACTIONS - 113 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Commscope 2HH-38A-R4 (T-Mobile)	102	Commscope 2HH-38A-R4 (T-Mobile)	102
8' Mount Pipe (T-Mobile)	102	8' Mount Pipe (T-Mobile)	102
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	Andrew SO 101-1 (Other)	69
		Andrew SO 101-1 (Other)	69
		Andrew SO 101-1 (Other)	69

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Montgomery County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 113 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 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 Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 97%

Morris & Ritchie Associates, Inc.
1220 E Joppa Rd #505
Towson, MD 21286
Phone: 410-821-1690
FAX:

Job: ***7WAN235A (BOE - Richard D. Riddle School)***
Project: ***19851.038***
Client: Site Link Wireless | Drawn by: FJoy | App'd:
Code: TIA-222-H | Date: 10/13/20 | Scale: NTS
Path: | Dwg No. E-1

Morris and Ritchie Associates
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
(410) 821-1690

Project Name: 7WAN235A (BOE - Richard D. Riddle School)
Project Location: Silver Spring, Montgomery County, MD

LEGEND
Existing
To Be Removed
Proposed
Reserved

APPURTENANCES

** Appurtenance types and elevations are approximations used for obtaining gravity & wind loads only. **

Appurtenance	***Carrier***	***Approximate Elevation (AGL)***	***Mount***	***Feedline Size***	***Notes***
(6) CommScope 2HH-38A-R4-V2	**T-Mobile**	102' (CL)	EEI 12' Low Profile Platform 'H' Part: K12443 w/ SitePro1 platform reinforcing kit (PRK- 1245L)	(4) Existing Hybriflex & (1) Proposed Hybriflex (Internal)	Existing
(3) RFS APXVAARR24_43-U-NA20					
(6) Ericsson 4415 B66A					
(3) RRUS01 B2					
(3) Ericsson Radio 4449 B71+B85					
(6) Radio 4415 B25					*To be removed*
(3) Ericsson AIR6449 B41					**Proposed**
(6) Ericsson RRU 4424 B25					
Double Pipe Supports	N/A	69' (CL)	(3) Andrew SO 101-1	-	Existing

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Montgomery County, Maryland.
Tower base elevation above sea level: 372.50 ft.
Basic wind speed of 113 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
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 40 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.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	101.00-50.79	50.21	3.42	18	16.0000	23.0500	0.1875	0.5625	A572-65 (65 ksi)
L2	50.79-1.50	52.71		18	22.1948	30.0000	0.2500	1.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.2237	9.4104	297.2674	5.6134	8.1280	36.5733	594.9259	4.7061	2.5520	13.611
	23.3824	13.6060	898.4973	8.1162	11.7094	76.7330	1798.1770	6.8043	3.7928	20.228
L2	23.0129	17.4132	1059.4466	7.7904	11.2750	93.9646	2120.2873	8.7083	3.4663	13.865
	30.4242	23.6066	2639.6436	10.5612	15.2400	173.2050	5282.7605	11.8056	4.8400	19.36

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 101.00-50.79				1.03	1.03	1.05			
L2 50.79-1.50				1.03	1.03	1.05			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8 (Unknown)	C	No	No	CaAa (Out Of Face)	101.00 - 1.50	1	No Ice	0.04	0.00
							1/2" Ice	0.14	0.00
							1" Ice	0.24	0.00
9x18 HCS (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 6AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	1.50 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00

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	101.00-50.79	A	0.000	0.000	0.000	0.000	151.63
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.883	11.05
L2	50.79-1.50	A	0.000	0.000	0.000	0.000	148.86
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.848	10.84

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	101.00-50.79	A	0.923	0.000	0.000	0.000	0.000	151.63
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.147	60.14

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
L2	50.79-1.50	A	0.831	0.000	0.000	0.000	0.000	148.86
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.943	59.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	101.00-50.79	-0.2480	0.1432	-0.7656	0.4420
L2	50.79-1.50	-0.2500	0.1443	-0.8054	0.4650

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	A	None		0.0000	99.50	No Ice	29.35	29.35	2000.00
						1/2" Ice	70.00	70.00	3000.00
						1" Ice	110.65	110.65	4000.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Ericsson AIR6449 B41 (T-Mobile)	A	From Face	4.17 -2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	5.68 5.98 6.29	2.49 2.72 2.95	119.00 158.12 201.46
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RFS APXVAARR24_43-U-NA20 (T-Mobile)	A	From Face	4.17 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	20.24 20.85 21.46	8.89 9.39 9.89	153.00 283.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	A	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	A	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			1.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	B	From Face	4.17	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			1.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	B	From Face	4.17	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	B	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	B	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	C	From Face	4.67	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	C	From Face	4.67	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	A	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	C	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	C	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
Andrew SO 101-1	A	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	B	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	C	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00

222-H Verification Constants

Constant	Value
K_d	0.95
Ice Thickness Importance Factor	1
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	0.987

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
L1 101.00-50.79	1	TP23.05x16x0.1875	202.118	78.212		1	1	85.345	93.297	85.345	93.297
							Sum:	85.345	93.297	85.345	93.297
L2 50.79-1.50	2	TP30x22.1948x0.25	241.837	90.981		1	1	113.039	120.845	113.039	120.067
							Sum:	113.039	120.845	113.039	120.067

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82		1.191	1	1		34.5		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		27.2		1	113.039

222-H Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82	75.90	1.191	1	1	0.9225	4.3		1	93.297
L2 50.79-1.50	26.21	26.15	0.955	1	1	0.8306	3.4		1	120.067

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 101.00-50.79	74.82		1.191	1	1		9.2		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		7.2		1	113.039

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	34.5	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883
L2 50.79-1.50	26.21	0.955	27.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 101.00-50.79	74.82	1.191	4.3	0.9225	90.579	A	0.000	93.297	93.297	100.00	0.000	0.000
						B	0.000	93.297		100.00	0.000	0.000
						C	0.000	93.297		100.00	0.000	11.147
L2 50.79-1.50	26.21	0.955	3.4	0.8306	117.325	A	0.000	120.845	120.845	100.00	0.000	0.000
						B	0.000	120.845		100.00	0.000	0.000
						C	0.000	120.845		100.00	0.000	10.943

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	9.2	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2 50.79-1.50	26.21	0.955	7.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	36.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
	Sum Weight:	6317.00							

Discrete Appurtenance Pressures - With Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	3898.37	0.00	0.00	99.50	1.264	4.6	106.52	106.52	0.9492
Commscope 2HH-38A-R4	300.0000	408.83	-7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-6.76	3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	300.0000	197.26	-5.19	-0.69	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	300.0000	400.40	-3.19	-4.15	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	300.0000	408.83	-1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	300.0000	77.48	-6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	300.0000	77.42	-6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	300.0000	96.63	-3.01	-3.47	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	300.0000	110.12	-3.01	-3.47	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	300.0000	77.48	-0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	300.0000	77.42	-0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	60.0000	408.83	1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	60.0000	197.26	3.19	-4.15	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	60.0000	61.35	4.26	-1.30	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	60.0000	400.40	5.19	-0.69	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	60.0000	408.83	7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	60.0000	77.48	0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
RRU 4424 B25	60.0000	77.42	0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	60.0000	96.63	4.51	-0.87	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	60.0000	110.12	5.01	-0.01	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	60.0000	77.48	6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	60.0000	77.42	6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	180.0000	408.83	6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	180.0000	197.26	2.00	5.34	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	180.0000	400.40	-2.00	5.34	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	180.0000	408.83	-6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	180.0000	77.48	6.00	4.35	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	180.0000	77.42	6.00	4.35	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	180.0000	96.63	-1.50	4.35	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	180.0000	110.12	-2.50	4.35	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
	Sum Weight:	10830.46								

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	9.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
	Sum Weight:	6317.00							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	5927.16					
Bracing Weight	0.00					
Total Member Self-Weight	5927.16			524.69	236.51	
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - No Ice		0.00	-11534.21	-883683.98	236.51	-517.09
Wind 30 deg - No Ice		5767.10	-9988.92	-765222.48	-441867.87	-240.61
Wind 60 deg - No Ice		9988.92	-5767.10	-441579.64	-765510.74	100.33
Wind 90 deg - No Ice		11534.21	0.00	524.69	-883972.25	414.40
Wind 120 deg - No Ice		9988.92	5767.10	442629.02	-765510.74	617.42
Wind 150 deg - No Ice		5767.10	9988.92	766271.86	-441867.87	655.01
Wind 180 deg - No Ice		0.00	11534.21	884733.36	236.51	517.09
Wind 210 deg - No Ice		-5767.10	9988.92	766271.86	442340.88	240.61
Wind 240 deg - No Ice		-9988.92	5767.10	442629.02	765983.75	-100.33
Wind 270 deg - No Ice		-11534.21	0.00	524.69	884445.26	-414.40
Wind 300 deg - No Ice		-9988.92	-5767.10	-441579.64	765983.75	-617.42
Wind 330 deg - No Ice		-5767.10	-9988.92	-765222.48	442340.88	-655.01
Member Ice	2542.67					
Total Weight Ice	19719.97			832.74	537.38	
Wind 0 deg - Ice		0.00	-2546.41	-191325.50	537.38	-174.95
Wind 30 deg - Ice		1273.20	-2205.25	-165581.18	-95541.75	-105.79
Wind 60 deg - Ice		2205.25	-1273.20	-95246.38	-165876.55	-8.28
Wind 90 deg - Ice		2546.41	0.00	832.74	-191620.88	91.44
Wind 120 deg - Ice		2205.25	1273.20	96911.87	-165876.55	166.67
Wind 150 deg - Ice		1273.20	2205.25	167246.67	-95541.75	197.23
Wind 180 deg - Ice		0.00	2546.41	192990.99	537.38	174.95
Wind 210 deg - Ice		-1273.20	2205.25	167246.67	96616.51	105.79
Wind 240 deg - Ice		-2205.25	1273.20	96911.87	166951.31	8.28
Wind 270 deg - Ice		-2546.41	0.00	832.74	192695.64	-91.44
Wind 300 deg - Ice		-2205.25	-1273.20	-95246.38	166951.31	-166.67
Wind 330 deg - Ice		-1273.20	-2205.25	-165581.18	96616.51	-197.23
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - Service		0.00	-3062.70	-234271.70	218.41	-137.30
Wind 30 deg - Service		1531.35	-2652.38	-202816.35	-117174.57	-63.89
Wind 60 deg - Service		2652.38	-1531.35	-116878.73	-203112.20	26.64
Wind 90 deg - Service		3062.70	0.00	514.24	-234567.55	110.04
Wind 120 deg - Service		2652.38	1531.35	117907.22	-203112.20	163.95
Wind 150 deg - Service		1531.35	2652.38	203844.84	-117174.57	173.93
Wind 180 deg - Service		0.00	3062.70	235300.19	218.41	137.30
Wind 210 deg - Service		-1531.35	2652.38	203844.84	117611.40	63.89
Wind 240 deg - Service		-2652.38	1531.35	117907.22	203549.03	-26.64
Wind 270 deg - Service		-3062.70	0.00	514.24	235004.38	-110.04
Wind 300 deg - Service		-2652.38	-1531.35	-116878.73	203549.03	-163.95
Wind 330 deg - Service		-1531.35	-2652.38	-202816.35	117611.40	-173.93

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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
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 lb-ft	Minor Axis Moment lb-ft
L1	101 - 50.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15690.99	656.70	-1130.87
			Max. Mx	20	-9110.37	399110.67	-689.49
			Max. My	14	-9109.75	285.53	-399505.00
			Max. Vy	20	-9781.34	399110.67	-689.49
			Max. Vx	14	9781.93	285.53	-399505.00
			Max. Torque	24			644.37
L2	50.79 - 1.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22328.58	749.91	-1219.52
			Max. Mx	20	-15052.38	965817.31	-730.89
			Max. My	14	-15052.37	315.25	-966221.74
			Max. Vy	20	-11570.03	965817.31	-730.89
			Max. Vx	14	11570.05	315.25	-966221.74
			Max. Torque	24			702.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	33	22328.58	0.00	-2546.54
	Max. H_x	20	15079.85	11534.21	-0.00
	Max. H_z	2	15079.85	0.00	11534.21
	Max. M_x	2	964754.58	0.00	11534.21
	Max. M_z	8	965159.26	-11534.21	-0.00
	Max. Torsion	24	702.40	5767.10	9988.92
	Min. Vert	19	11309.88	9988.92	-5767.10
	Min. H_x	8	15079.85	-11534.21	-0.00
	Min. H_z	14	15079.85	0.00	-11534.21
	Min. M_x	14	-966221.74	0.00	-11534.21
	Min. M_z	20	-965817.31	11534.21	-0.00
	Min. Torsion	12	-702.29	-5767.10	-9988.92

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	12566.54	-0.00	0.00	586.46	263.45	-0.01
1.2 Dead+1.0 Wind 0 deg - No Ice	15079.85	-0.00	-11534.21	-964754.58	314.95	-532.14
0.9 Dead+1.0 Wind 0 deg - No Ice	11309.88	-0.00	-11534.21	-941828.03	226.45	-524.32
1.2 Dead+1.0 Wind 30 deg - No Ice	15079.84	5767.10	-9988.92	-835407.42	-482429.67	-219.18
0.9 Dead+1.0 Wind 30 deg - No Ice	11309.88	5767.10	-9988.92	-815574.40	-470948.40	-223.40
1.2 Dead+1.0 Wind 60 deg - No Ice	15079.84	9988.92	-5767.10	-482011.94	-835819.65	152.40

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	11309.88	9988.92	-5767.10	-470649.16	-815869.80	137.27
1.2 Dead+1.0 Wind 90 deg - No Ice	15079.85	11534.21	0.00	730.57	-965159.26	483.24
0.9 Dead+1.0 Wind 90 deg - No Ice	11309.88	11534.21	0.00	524.20	-942118.14	461.26
1.2 Dead+1.0 Wind 120 deg - No Ice	15079.84	9988.92	5767.10	483474.50	-835822.36	684.47
0.9 Dead+1.0 Wind 120 deg - No Ice	11309.88	9988.92	5767.10	471698.63	-815871.71	661.61
1.2 Dead+1.0 Wind 150 deg - No Ice	15079.84	5767.10	9988.92	836873.05	-482432.40	702.29
0.9 Dead+1.0 Wind 150 deg - No Ice	11309.88	5767.10	9988.92	816626.05	-470950.33	684.59
1.2 Dead+1.0 Wind 180 deg - No Ice	15079.85	-0.00	11534.21	966221.74	314.87	532.04
0.9 Dead+1.0 Wind 180 deg - No Ice	11309.88	-0.00	11534.21	942880.76	226.41	524.26
1.2 Dead+1.0 Wind 210 deg - No Ice	15079.84	-5767.10	9988.92	836885.32	483069.11	219.16
0.9 Dead+1.0 Wind 210 deg - No Ice	11309.88	-5767.10	9988.92	816634.66	471408.10	223.43
1.2 Dead+1.0 Wind 240 deg - No Ice	15079.84	-9988.92	5767.10	483486.75	836473.29	-152.44
0.9 Dead+1.0 Wind 240 deg - No Ice	11309.88	-9988.92	5767.10	471707.24	816339.45	-137.34
1.2 Dead+1.0 Wind 270 deg - No Ice	15079.85	-11534.21	0.00	730.54	965817.31	-483.22
0.9 Dead+1.0 Wind 270 deg - No Ice	11309.88	-11534.21	0.00	524.19	942590.87	-461.24
1.2 Dead+1.0 Wind 300 deg - No Ice	15079.84	-9988.92	-5767.10	-482024.25	836470.65	-684.45
0.9 Dead+1.0 Wind 300 deg - No Ice	11309.88	-9988.92	-5767.10	-470657.79	816337.57	-661.55
1.2 Dead+1.0 Wind 330 deg - No Ice	15079.84	-5767.10	-9988.92	-835419.72	483066.51	-702.40
0.9 Dead+1.0 Wind 330 deg - No Ice	11309.88	-5767.10	-9988.92	-815583.02	471406.23	-684.71
1.2 Dead+1.0 Ice+1.0 Temp	22328.58	-0.01	0.01	1219.52	749.91	-0.01
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	-2546.54	-222375.13	762.31	-190.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	-2205.27	-192443.42	-111062.50	-104.76
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	-1273.21	-110581.61	-192923.48	8.81
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	22328.58	2546.54	0.00	1242.72	-222853.90	119.99
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	1273.22	113067.75	-192923.62	199.07
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	2205.27	194929.66	-111062.66	224.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	2546.54	224860.72	762.24	190.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	2205.27	194931.22	112588.39	104.73
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	1273.22	113069.29	194451.18	-8.85
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	22328.58	-2546.54	0.00	1242.69	224382.00	-120.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	-1273.21	-110583.20	194451.11	-199.09

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	-2205.27	-192445.00	112588.35	-224.80
Dead+Wind 0 deg - Service	12566.54	-0.00	-3062.71	-252802.89	271.65	-144.24
Dead+Wind 30 deg - Service	12566.54	1531.35	-2652.38	-218852.13	-126432.95	-60.75
Dead+Wind 60 deg - Service	12566.54	2652.38	-1531.35	-126097.85	-219186.92	38.99
Dead+Wind 90 deg - Service	12566.54	3062.71	0.00	606.62	-253137.25	128.30
Dead+Wind 120 deg - Service	12566.54	2652.38	1531.35	127311.18	-219187.09	183.23
Dead+Wind 150 deg - Service	12566.54	1531.35	2652.38	220065.64	-126433.12	189.05
Dead+Wind 180 deg - Service	12566.54	-0.00	3062.71	254016.49	271.64	144.22
Dead+Wind 210 deg - Service	12566.54	-1531.35	2652.38	220066.35	126976.81	60.75
Dead+Wind 240 deg - Service	12566.54	-2652.38	1531.35	127311.89	219731.61	-39.01
Dead+Wind 270 deg - Service	12566.54	-3062.71	0.00	606.61	253682.19	-128.31
Dead+Wind 300 deg - Service	12566.54	-2652.38	-1531.35	-126098.56	219731.46	-183.23
Dead+Wind 330 deg - Service	12566.54	-1531.35	-2652.38	-218852.85	126976.66	-189.07

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	-12566.54	0.00	0.00	12566.54	-0.00	0.000%
2	0.00	-15079.84	-11534.21	0.00	15079.85	11534.21	0.000%
3	0.00	-11309.88	-11534.21	0.00	11309.88	11534.21	0.000%
4	5767.10	-15079.84	-9988.92	-5767.10	15079.84	9988.92	0.000%
5	5767.10	-11309.88	-9988.92	-5767.10	11309.88	9988.92	0.000%
6	9988.92	-15079.84	-5767.10	-9988.92	15079.84	5767.10	0.000%
7	9988.92	-11309.88	-5767.10	-9988.92	11309.88	5767.10	0.000%
8	11534.21	-15079.84	0.00	-11534.21	15079.85	-0.00	0.000%
9	11534.21	-11309.88	0.00	-11534.21	11309.88	-0.00	0.000%
10	9988.92	-15079.84	5767.10	-9988.92	15079.84	-5767.10	0.000%
11	9988.92	-11309.88	5767.10	-9988.92	11309.88	-5767.10	0.000%
12	5767.10	-15079.84	9988.92	-5767.10	15079.84	-9988.92	0.000%
13	5767.10	-11309.88	9988.92	-5767.10	11309.88	-9988.92	0.000%
14	0.00	-15079.84	11534.21	0.00	15079.85	-11534.21	0.000%
15	0.00	-11309.88	11534.21	0.00	11309.88	-11534.21	0.000%
16	-5767.10	-15079.84	9988.92	5767.10	15079.84	-9988.92	0.000%
17	-5767.10	-11309.88	9988.92	5767.10	11309.88	-9988.92	0.000%
18	-9988.92	-15079.84	5767.10	9988.92	15079.84	-5767.10	0.000%
19	-9988.92	-11309.88	5767.10	9988.92	11309.88	-5767.10	0.000%
20	-11534.21	-15079.84	0.00	11534.21	15079.85	-0.00	0.000%
21	-11534.21	-11309.88	0.00	11534.21	11309.88	-0.00	0.000%
22	-9988.92	-15079.84	-5767.10	9988.92	15079.84	5767.10	0.000%
23	-9988.92	-11309.88	-5767.10	9988.92	11309.88	5767.10	0.000%
24	-5767.10	-15079.84	-9988.92	5767.10	15079.84	9988.92	0.000%
25	-5767.10	-11309.88	-9988.92	5767.10	11309.88	9988.92	0.000%
26	0.00	-22328.58	0.00	0.01	22328.58	-0.01	0.000%
27	0.00	-22328.58	-2546.41	0.00	22328.58	2546.54	0.001%
28	1273.20	-22328.58	-2205.25	-1273.21	22328.58	2205.27	0.000%
29	2205.25	-22328.58	-1273.20	-2205.27	22328.58	1273.21	0.000%
30	2546.41	-22328.58	0.00	-2546.54	22328.58	-0.00	0.001%
31	2205.25	-22328.58	1273.20	-2205.27	22328.58	-1273.22	0.000%
32	1273.20	-22328.58	2205.25	-1273.21	22328.58	-2205.27	0.000%
33	0.00	-22328.58	2546.41	0.00	22328.58	-2546.54	0.001%
34	-1273.20	-22328.58	2205.25	1273.22	22328.58	-2205.27	0.000%
35	-2205.25	-22328.58	1273.20	2205.27	22328.58	-1273.22	0.000%
36	-2546.41	-22328.58	0.00	2546.54	22328.58	-0.00	0.001%
37	-2205.25	-22328.58	-1273.20	2205.27	22328.58	1273.21	0.000%
38	-1273.20	-22328.58	-2205.25	1273.22	22328.58	2205.27	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
39	0.00	-12566.54	-3062.70	0.00	12566.54	3062.71	0.000%
40	1531.35	-12566.54	-2652.38	-1531.35	12566.54	2652.38	0.000%
41	2652.38	-12566.54	-1531.35	-2652.38	12566.54	1531.35	0.000%
42	3062.70	-12566.54	0.00	-3062.71	12566.54	-0.00	0.000%
43	2652.38	-12566.54	1531.35	-2652.38	12566.54	-1531.35	0.000%
44	1531.35	-12566.54	2652.38	-1531.35	12566.54	-2652.38	0.000%
45	0.00	-12566.54	3062.70	0.00	12566.54	-3062.71	0.000%
46	-1531.35	-12566.54	2652.38	1531.35	12566.54	-2652.38	0.000%
47	-2652.38	-12566.54	1531.35	2652.38	12566.54	-1531.35	0.000%
48	-3062.70	-12566.54	0.00	3062.71	12566.54	-0.00	0.000%
49	-2652.38	-12566.54	-1531.35	2652.38	12566.54	1531.35	0.000%
50	-1531.35	-12566.54	-2652.38	1531.35	12566.54	2652.38	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001492
2	Yes	5	0.00000001	0.00042141
3	Yes	5	0.00000001	0.00016829
4	Yes	7	0.00000001	0.00013139
5	Yes	6	0.00000001	0.00038376
6	Yes	7	0.00000001	0.00013167
7	Yes	6	0.00000001	0.00038496
8	Yes	5	0.00000001	0.00042563
9	Yes	5	0.00000001	0.00016227
10	Yes	7	0.00000001	0.00013657
11	Yes	6	0.00000001	0.00039950
12	Yes	7	0.00000001	0.00012960
13	Yes	6	0.00000001	0.00037778
14	Yes	5	0.00000001	0.00042241
15	Yes	5	0.00000001	0.00016848
16	Yes	7	0.00000001	0.00013435
17	Yes	6	0.00000001	0.00039256
18	Yes	7	0.00000001	0.00013405
19	Yes	6	0.00000001	0.00039131
20	Yes	5	0.00000001	0.00042609
21	Yes	5	0.00000001	0.00016236
22	Yes	7	0.00000001	0.00012934
23	Yes	6	0.00000001	0.00037737
24	Yes	7	0.00000001	0.00013632
25	Yes	6	0.00000001	0.00039912
26	Yes	4	0.00000001	0.00003559
27	Yes	5	0.00019689	0.00058663
28	Yes	6	0.00000001	0.00020603
29	Yes	6	0.00000001	0.00020812
30	Yes	5	0.00019705	0.00058598
31	Yes	6	0.00000001	0.00022284
32	Yes	6	0.00000001	0.00020974
33	Yes	5	0.00019755	0.00060202
34	Yes	6	0.00000001	0.00022373
35	Yes	6	0.00000001	0.00022110
36	Yes	5	0.00019741	0.00059493
37	Yes	6	0.00000001	0.00020714
38	Yes	6	0.00000001	0.00022050
39	Yes	5	0.00000001	0.00003296

40	Yes	5	0.00000001	0.00028552
41	Yes	5	0.00000001	0.00028692
42	Yes	5	0.00000001	0.00003245
43	Yes	5	0.00000001	0.00031891
44	Yes	5	0.00000001	0.00027995
45	Yes	5	0.00000001	0.00003334
46	Yes	5	0.00000001	0.00030750
47	Yes	5	0.00000001	0.00030575
48	Yes	5	0.00000001	0.00003263
49	Yes	5	0.00000001	0.00027639
50	Yes	5	0.00000001	0.00031552

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	29.275	46	2.5825	0.0073
L2	54.21 - 1.5	8.244	46	1.4629	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	46	29.275	2.5825	0.0074	12745
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	46	28.497	2.5479	0.0072	12745
69.00	Andrew SO 101-1	46	13.718	1.8321	0.0034	1990

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	111.200	14	9.8198	0.0274
L2	54.21 - 1.5	31.377	14	5.5744	0.0074

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	14	111.200	9.8198	0.0274	3488
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	14	108.250	9.6890	0.0266	3488
69.00	Andrew SO 101-1	14	52.160	6.9765	0.0126	538

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	101 - 50.79 (1)	TP23.05x16x0.1875	50.21	0.00	0.0	13.3203	-9109.55	779235.00	0.012
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	52.71	0.00	0.0	23.6066	-15052.40	1380990.00	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	399570.00	427494.17	0.935	0.00	427494.17	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	966300.00	1007983.33	0.959	0.00	1007983.33	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 lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	9782.16	233771.00	0.042	188.81	458220.83	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	11570.10	414296.00	0.028	219.16	1079391.67	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	101 - 50.79 (1)	0.012	0.935	0.000	0.042	0.000	0.948 ✔	1.000	4.8.2 ✔
L2	50.79 - 1.5 (2)	0.011	0.959	0.000	0.028	0.000	0.970 ✔	1.000	4.8.2 ✔

Section Capacity Table

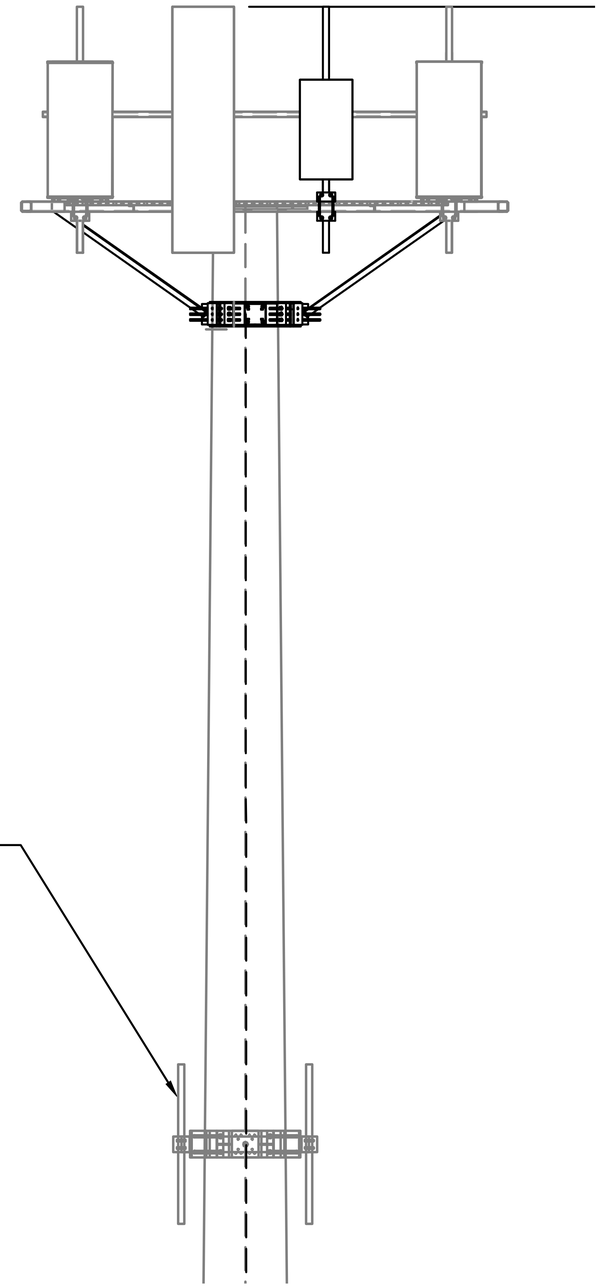
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	101 - 50.79	Pole	TP23.05x16x0.1875	1	-9109.55	779235.00	94.8	Pass
L2	50.79 - 1.5	Pole	TP30x22.1948x0.25	2	-15052.40	1380990.00	97.0	Pass
							Summary	
						Pole (L2)	97.0	Pass
						RATING =	**97.0**	**Pass**

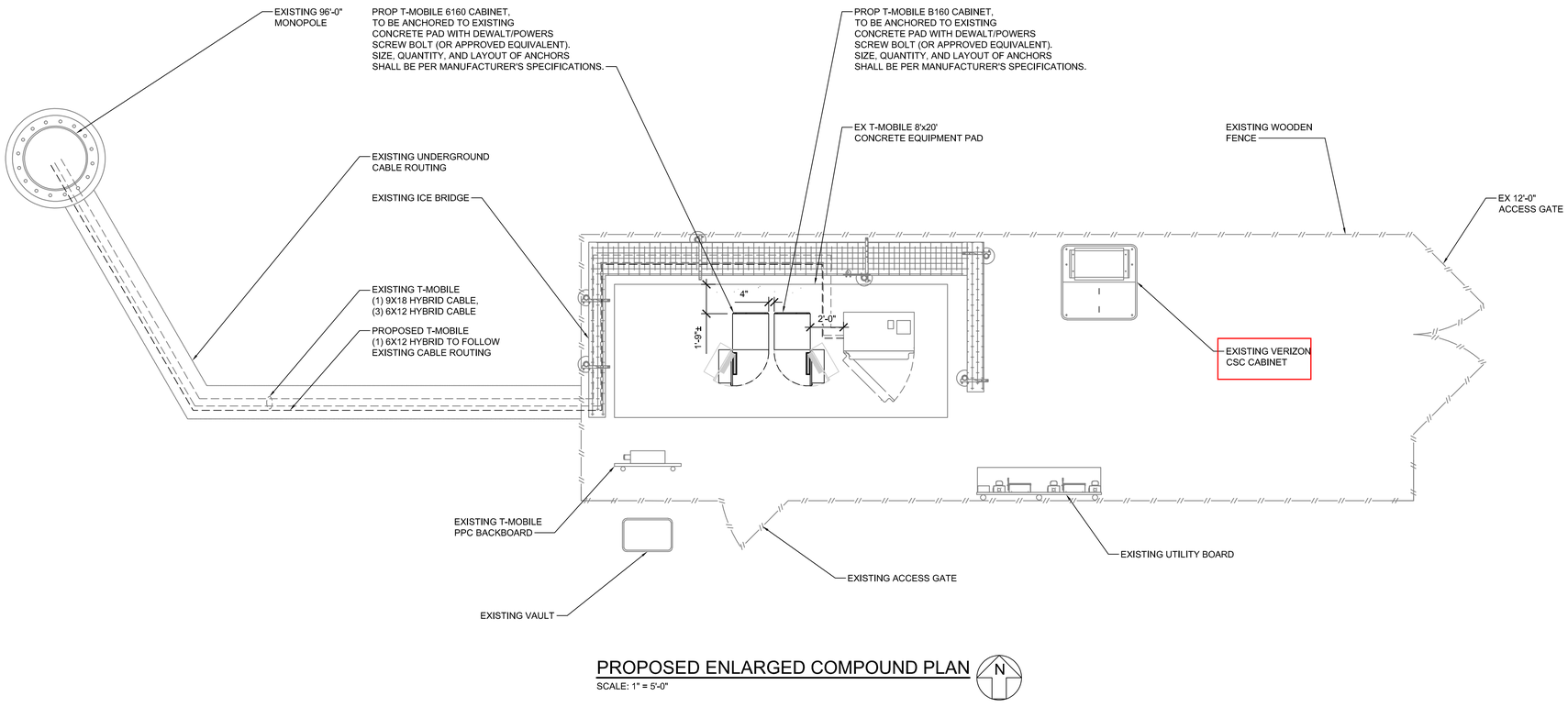
EXISTING & PROPOSED T-MOBILE ANTENNAS
RAD CENTER = 102'-0"± AGL

TOP OF MONOPOLE
ELEVATION = 100'-0"± AGL

EXISTING ABANDONED
ANTENNA MOUNT

EXISTING ANTENNA MOUNT
ELEVATION = 70'-0"± AGL





PROPOSED ENLARGED COMPOUND PLAN

SCALE: 1" = 5'-0"

T-MOBILE NORTHEAST LLC
SITE ID: 7WAN235A
SITE NAME: BOE - RICHARD D. RIDDLE SCHOOL
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
T-MOBILE ANCHOR PROJECT

TRUE NORTH

DESIGN BASED ON FINAL RFDS:
7WAN235A_ANCHOR_RFDS_FINAL_11_2020-08-28

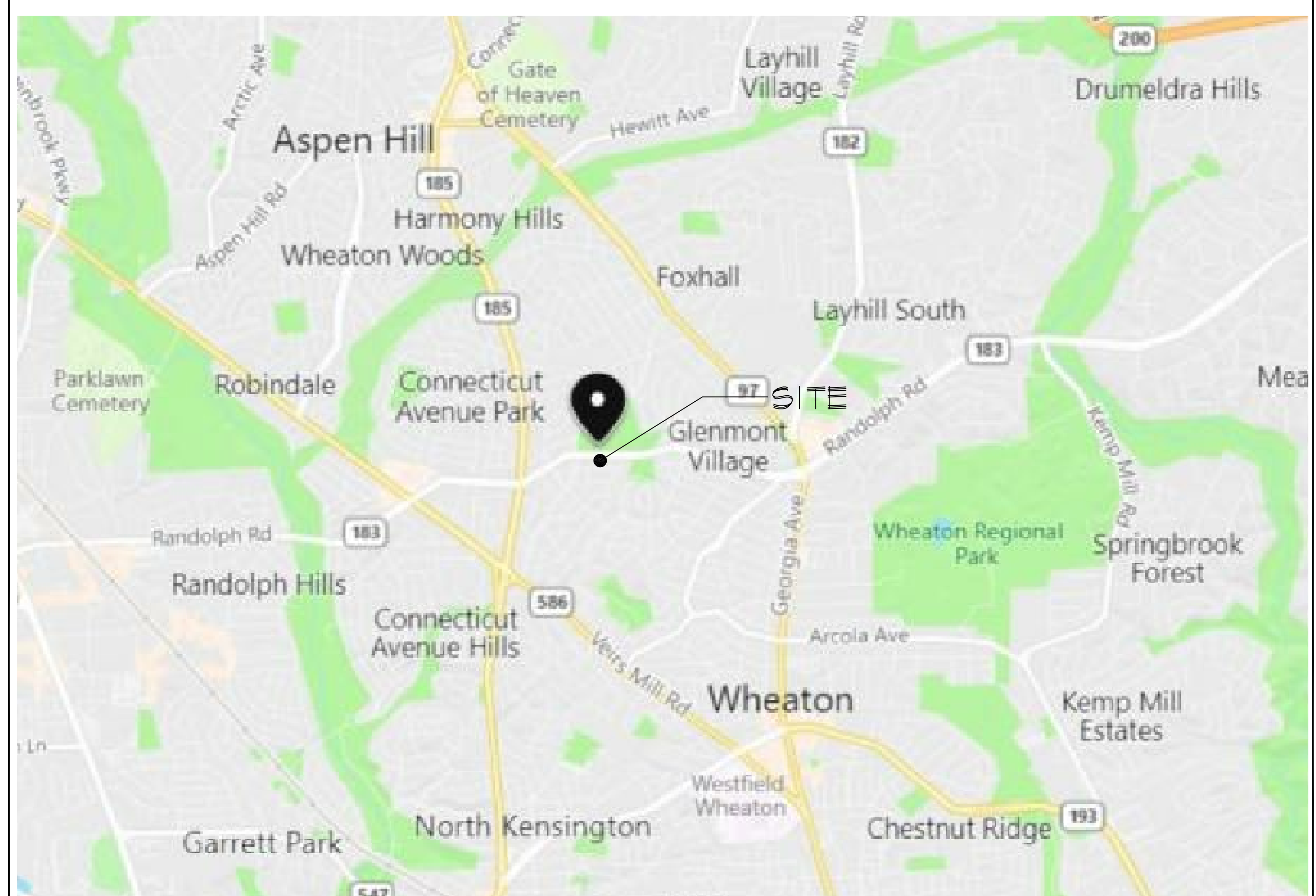
NOTE TO GENERAL CONTRACTOR

NO WORK IS TO BE PERFORMED ON THIS SITE WITHOUT REVIEW OF THE APPROVED STRUCTURAL ANALYSIS. IF ANY DISCREPANCIES ARE FOUND THE GENERAL CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING. AT NO TIME WILL ANY ADDITIONAL ANTENNAS BE INSTALLED WITHOUT WRITTEN CONSENT FROM TOWER ENGINEER.

SITE INFORMATION

SCOPE OF WORK:	(9) EXISTING ANTENNAS TO BE RELOCATED (3) PROPOSED AIR6449 B41 ANTENNAS TO BE INSTALLED (6) 4415 B25 RADIOS TO BE REMOVED (6) 4424 B25 RADIOS TO BE INSTALLED (12) EXISTING RADIOS TO BE RELOCATED (1) 6X12 HYBRID CABLE TO BE INSTALLED (1) RBS 2106 CABINET TO BE REMOVED (1) RBS 6131 CABINET TO REMAIN (1) 6160 CABINET TO BE ADDED (1) B160 CABİNET TO BE ADDED
PROJECT DESIGN:	T-MOBILE CONSTRUCTION
SITE ID NUMBER:	7WAN235A
911 SITE ADDRESS:	12501-A DALEWOOD DRIVE SILVER SPRING, MD 20906
CENTROID OF (6) SECTORS:	LAT. = 39° 03' 35.53" , LONG. = -77° 04' 1.20"
JURISDICTION:	MONTGOMERY, MD
ZONING:	R-60
ACCOUNT ID :	DISTRICT - 13 ACCOUNT NUMBER - 00953838
	MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE:	/01570/ 00082
GROUND ELEVATION:	371'± (NAVD 88)
STRUCTURE HEIGHT:	100' -0" ± AGL

VICINITY PLAN



PROJECT TEAM

APPLICANT:	T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610
PROJECT MANAGEMENT FIRM:	SITE LINK WIRELESS, LLC. 3620 COMMERCE DRIVE, SUITE 707 BALTIMORE, MD 21227 (410) 309-4949
ENGINEERING FIRMS:	TELEGENT ENGINEERING INC. 2216 COMMERCE ROAD, SUITE 1 FOREST HILL, MD 21050 (410) 692-5816
	MORRIS & RITCHIE ASSOCIATES, INC. 1220-C EAST JOPPA ROAD, SUITE 505 TOWSON, MD 21286 (410) 821-1690

CODE ANALYSIS

APPLICABLE BUILDING CODE:	IBC 2018
APPLICABLE ELECTRIC CODE:	NFPA 2017
USE GROUP:	UTILITY (U)

DIRECTIONS TO SITE

FROM BELTSVILLE:

1. HEAD SOUTHWEST TOWARD BALTIMORE AVE
2. TURN RIGHT TO MERGE ONTO I-495 W/I-95 N
3. MERGE ONTO I-495 W/I-95 N
4. CONTINUE TO FOLLOW I-495 W
5. TAKE EXIT 31 FOR MD-97/GEORGIA AVE TOWARD SILVER SPRING/WHEATON
6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR MD-97 N AND MERGE ONTO MD-97 N/GEORGIA AVE
7. MERGE ONTO MD-97 N/GEORGIA AVE
8. USE THE LEFT 2 LANES TO TURN SLIGHTLY LEFT ONTO VEIRS MILL RD
9. TURN RIGHT ONTO CONNECTICUT AVE
10. KEEP RIGHT TO CONTINUE TOWARD RANDOLPH RD
11. SLIGHT RIGHT ONTO RANDOLPH RD
12. TURN LEFT ONTO DALEWOOD DR
13. TURN RIGHT AT EVERTON ST

DESTINATION WILL BE ON THE RIGHT

INDEX OF DRAWINGS

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	DISAPPROVED/ REVISE
PROPERTY OWNER	DATE	☐	☐	☐
SITE ACQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
ZONING	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Cover Sheet

SHEET NUMBER

CS-1

STRUCTURAL NOTES:

CODES

ALL CONSTRUCTION SHALL CONFORM WITH THE:

A. INTERNATIONAL BUILDING CODE 2018 (IBC 2018)

B. ANSI/TIA-222-H-2017 "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS", AND ALL SUBSEQUENT SUPPLEMENTS

C. IN ADDITION, ALL CONSTRUCTION SHALL CONFORM WITH THE GOVERNING LOCAL BUILDING CODE.

DESIGN DATA

A. MOUNT MODIFICATIONS HAVE BEEN DESIGNED TO SUPPORT THE APPURTENANCES LISTED IN THE ANTENNA MOUNT ANALYSIS BY MORRIS & RITCHIE ASSOCIATES, JOB NO, 19851.038 - REVISION 1, DATED AUGUST 28, 2020,

B.

C. WIND LOAD DESIGN DATA

ULTIMATE WIND SPEED (NO ICE):	Vult = 113 MPH
BASIC WIND SPEED (WITH ICE):	VI = 40 MPH
DESIGN RADIAL ICE THICKNESS:	1" (ICE THICKNESS INCREASES WITH HEIGHT)
RISK CATEGORY:	II
EXPOSURE CATEGORY:	C
TOPOGRAPHIC CATEGORY:	1

D. EARTHQUAKE LOAD DESIGN DATA

SHORT PERIOD ACCELERATION, Ss:	0.134 g
ONE SECOND PERIOD ACCELERATION,S1:	0.043 g
SITE CLASS:	D (BY DEFAULT)
DAMPED SHORT PERIOD ACCELERATION, S_{DS}:	0.144 g
RESPONSE MODIFICATION FACTOR, R	2.0
SEISMIC RESPONSE COEFFICIENT, Cs:	0.0715 g
SEISMIC DESIGN CATEGORY:	B

E. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF TEMPORARY BRACING AND CONSTRUCTION SUPPORTS FOR THE EXISTING STRUCTURE, AS REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR THE METHOD OF CONSTRUCTION AND SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE STRUCTURE AND TO SUPPORT CONSTRUCTION LOADS DURING CONSTRUCTION.

EXISTING STRUCTURE

A. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

B. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS OR OTHER APPURTENANCES, AS NEEDED, DURING CONSTRUCTION.

C. CONTRACTOR SHALL PROTECT ALL EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.

D. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE MOUNT UNTIL THE REINFORCING WORK IS COMPLETE.

E. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE AND CONDITION OF ALL EXISTING MOUNT ELEMENTS. SHOULD THE SIZE OR CONDITION OF THE EXISTING ELEMENTS DIFFER FROM THAT SHOWN ON THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

F. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS, TO THE COMPLETE SATISFACTION OF THE OWNER, OF ANY STRUCTURAL ELEMENTS WHICH ARE TO REMAIN AND THAT HAVE BEEN DAMAGED . THE REPAIRS SHALL BE AT NO EXPENSE TO THE OWNER. ALL REPAIR WORK SHALL BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE THAT THE PROJECT IS LOCATED AND SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO COMMENCING REPAIR WORK.

G. DO NOT PERMIT PORTIONS OF THE STRUCTURE TO FALL NOR DEBRIS TO DROP EXCEPT BY METHODS WHICH WILL INSURE INTEGRITY OF THE STRUCTURE.

MISCELLANEOUS

A. ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 20 MPH.

B. SHOP DRAWINGS FOR ALL STRUCTURAL ELEMENTS SHOWN ON THE CONTRACT DOCUMENTS MUST BE SUBMITTED FOR REVIEW BY THE ENGINEER. IF THE SHOP DRAWINGS ARE NOT SUBMITTED FOR REVIEW, THE ENGINEER WILL NOT BE RESPONSIBLE FOR STRUCTURAL CERTIFICATION AND DESIGN OF THE PROJECT. THE SHOP DRAWINGS SHALL INDICATE ANY DEVIATIONS OR OMISSIONS FROM THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION AND MAKE ALL CORRECTIONS DEEMED NECESSARY.

C. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES AND OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

D. SCALES SHOWN ON THE STRUCTURAL CONTRACT DRAWINGS ARE FOR GENERAL INFORMATION ONLY. DIMENSIONAL INFORMATION SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

E. THE CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURE DURING CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF AREAS EXHIBITING DISTRESS OR FAILURE.

STRUCTURAL AND MISCELLANEOUS STEEL

A. ALL STEEL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (ANSI/AISC 360) AND THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

B. ALL PIPE SHALL CONFORM TO ASTM A53, GRADE B (Fy = 35 KSI),

C. ALL HSS RECTANGULAR TUBE SHALL CONFORM TO ASTM A500 GRADE B, (Fy = 46 KSI).

D. ALL ANGLES, PLATES & CHANNELS SHALL CONFORM TO ASTM A36 (Fy = 36 KSI),

E. ALL BOLT SHALL CONFORM TO ASTM F3125 GRADE A325 (Fu = 120 KSI), UNLESS OTHERWISE NOTED.

F. ALL U-BOLT SHALL CONFORM TO SAE J429 GRADE 2 WITH SAE J995 NUTS AND WASHERS.

G. ALL WASHER SHALL CONFORM TO ASTM F436.

H. ALL SHOP WELDED CONNECTION SHALL USE E70XX ELECTRODES. FIELD WELDING IS NOT PERMITTED.

I. ALL SHOP WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS AND CONFORM TO THE AMERICAN WELDING SOCIETY CODE FOR BUILDINGS AWS D1.1. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.

J. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

K. ALL STEEL MEMBERS, FABRICATIONS AND ASSEMBLIES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION. ALL BOLTS, WASHERS & NUTS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

L. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

M. AN INDEPENDENT INSPECTION AGENCY SHALL INSPECT ALL STRUCTURAL STEEL AND VERIFY THAT IT CONFORMS TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. FIELD INSPECTION REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 5 DAYS OF THE INSPECTION. THE CONTRACTOR SHALL NOTIFY THE INSPECTION AGENCY OF ALL PHASES OF STEEL CONSTRUCTION AND WELDING.

POST-MODIFICATION INSPECTION

A. A POST-MODIFICATION INSPECTION REPORT IS REQUIRED AND SHALL BE INCLUDED IN THE CONTRACTOR'S BID. A POST-MODIFICATION INSPECTION IS A VISUAL INSPECTION OF THE MOUNT MODIFICATIONS AND APPURTENANCE CONFIGURATION AND A REVIEW OF MATERIAL SUBMITTALS OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MOUNT MODIFICATION DRAWINGS.

B. THE POST-MODIFICATION INSPECTION REPORT SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.

C. THE INTENT OF THE POST-MODIFICATION INSPECTION REPORT IS TO CONFIRM INSTALLATION AND CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF.

D. TO ENSURE THAT THE REQUIREMENTS OF THE POST-MODIFICATION INSPECTION REPORT ARE MET, IT IS VITAL THAT THE CONTRACTOR AND POST-MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A P.O. IS RECEIVED.

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

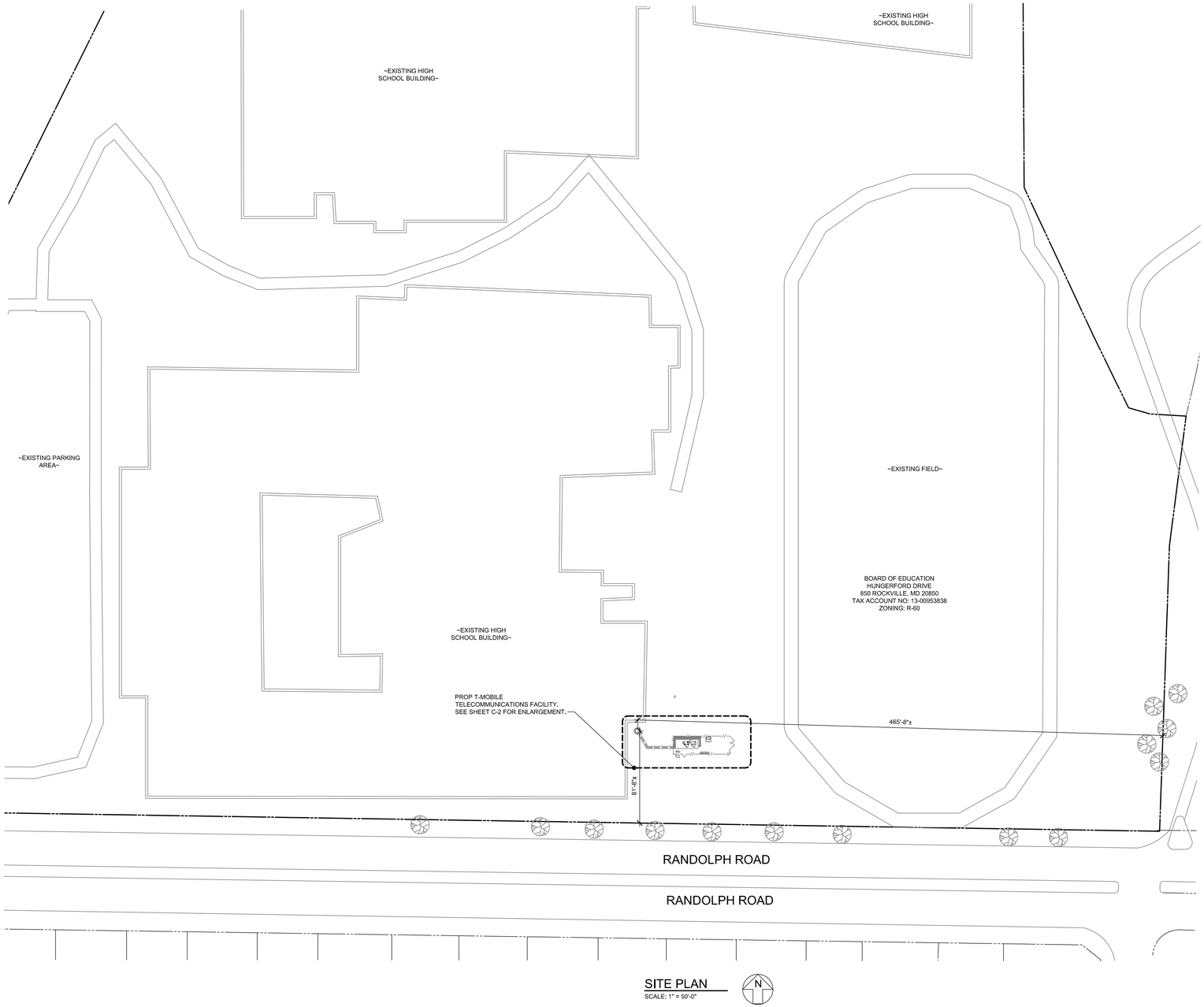
Know what's **below.**
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
General Structural Notes

SHEET NUMBER
GN-1



SITE PLAN
SCALE: 1" = 50'-0"

VICINITY MAP
SCALE: 1" = 2500'-0"

SITE NOTES:

1. APPLICANT: T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705
TEL (240) 264-8600
FAX (240) 264-8610
2. PROPERTY OWNER: BOARD OF EDUCATION
850 HUNGERFORD DRIVE
ROCKVILLE, MD 20850
3. SITE DATA: MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE: 01570/ 00062
ACCOUNT NUMBER: 00953838
TRACT AREA: 25.7700 AC
DISTRICT: 13
ADDRESS: 12601 DALEWOOD DR
SILVER SPRING 20906-0000
EXISTING USE: TELECOMMUNICATIONS
4. ZONING: R-60
5. HORIZONTAL AND VERTICAL CONTROL SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY T-MOBILE RF DATA SHEET:
LATITUDE: N39° 03' 35.53" GROUND ELEVATION: 371.00' (±) AGL (NAVD 88)
LONGITUDE: W77° 04' 1.20" EXISTING STRUCTURE HEIGHT: 96.00' (±) AGL
TOTAL ELEVATION: 467.00' (±) AGL (NAVD 88)
6. TOTAL DISTURBED AREA = 0 SF (ANTENNA WORK ONLY)
7. THIS PROJECT INVOLVES ADDING THREE (3) ANTENNAS, ONE (1) AT EACH SECTOR AND REMOVING SIX (6) REMOTE RADIO HEADS (RRH), TWO (2) FROM EACH SECTOR AND ADDING SIX (6) REMOTE RADIO HEADS, TWO (2) AT EACH SECTOR AND ADDING (1) 6x12 HYBRID. THIS PROJECT ALSO INVOLVES REMOVING ONE (1) EXISTING EQUIPMENT CABINET AND INSTALLING (2) PROPOSED EQUIPMENT CABINETS.
8. THE STRUCTURE WILL NOT SUPPORT LIGHTS OR SIGNS UNLESS REQUIRED FOR AIRCRAFT WARNING OR OTHER SAFETY RECORDS.
9. THE APPLICANT WILL PROVIDE A CERTIFICATION FROM A REGISTERED ENGINEER THAT THE STRUCTURE WILL MEET THE APPLICABLE DESIGN STANDARDS FOR WIND LOADS PER THE REQUIREMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION.
10. IF THE ANTENNAS ARE NO LONGER USED FOR TELECOMMUNICATIONS PURPOSES FOR A CONTINUOUS PERIOD OF ONE (1) YEAR, THEY SHALL BE REMOVED BY THE ANTENNA OWNER AT OWNER'S EXPENSE.
11. NO WATER OR SANITARY UTILITIES ARE REQUIRED FOR THE OPERATION OF THIS FACILITY.
12. STORMWATER MANAGEMENT NOTE: NO STORMWATER MANAGEMENT IS REQUIRED FOR THIS SITE.
13. BOUNDARY SHOWN PER COUNTY RECORDS.
14. THIS PLAN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT. PLAN IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
15. ALL DETAILS SHOWN ARE "STANDARD" OR "TYPICAL" FOR REFERENCE ONLY. FOR ACTUAL DETAILS, SEE ARCHITECTURAL, STRUCTURAL, OR CONSTRUCTION PLANS BY OTHERS.
16. STRUCTURAL ANALYSIS/DESIGN TO BE PERFORMED BY OTHERS AT CLIENT AND/OR OWNER'S DISCRETION PRIOR TO COMMENCEMENT OF ANY WORK.
17. THE COMMUNICATION SHELTER SHALL BE UNMANNED, WITH INFREQUENT VISITS (FOUR OR FEWER PER YEAR) BY MAINTENANCE PERSONNEL, AND WITH ACCESS AND PARKING FOR NO MORE THAN ONE VEHICLE. THE PROPOSED FACILITY IS NOT FOR HUMAN HABITATION AND THEREFORE HANDICAP ACCESS IS NOT REQUIRED.
18. THE PROPOSED TOWER RELATED EQUIPMENT COMPOUND, EQUIPMENT CABINETS AND PROPOSED PANEL ANTENNAS SHALL COMPLY WITH ALL DESIGN STANDARDS IN SECTION 3.5.2.C.(2) OF THE REVISED MONTGOMERY COUNTY ZONING REGULATIONS THAT WENT INTO EFFECT ON OCTOBER 30, 2014.

GENERAL NOTES:

1. CONTRACTOR SHALL NOTIFY "MISS UTILITY" (811) 48 HOURS PRIOR TO DOING ANY EXCAVATION IN THIS AREA. CONTRACTOR SHALL CONTACT A SUBSURFACE UTILITY LOCATOR FOR LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS BY TEST PIT AS NECESSARY. LOCATION OF UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR PLANNING PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. DAMAGE TO UTILITIES OR PROPERTY OF OTHER BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND ORDINANCES, THE LATEST EDITION THEREOF.
3. ANY PERMITS WHICH MUST BE OBTAINED SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM ALL APPLICABLE GOVERNMENTAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
4. CONTRACTOR SHALL COORDINATE ALL UTILITY CONNECTIONS WITH APPROPRIATE UTILITY OWNERS.
5. THESE PLANS ARE NOT FOR RECORDATION OR CONVEYANCE.
6. EXISTING PAVEMENT AND OTHER SURFACES DISTURBED BY CONTRACTOR (WHICH ARE NOT TO BE REMOVED) SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.

MONTGOMERY COUNTY NOTES:

PER SECTION 59-A-6.12

A) A PRIVATE TELECOMMUNICATIONS ANTENNA MAY BE ATTACHED AS A MATTER OF RIGHT TO AN EXISTING STRUCTURE OWNED OR OPERATED BY A COUNTY, BI-COUNTY, STATE OR FEDERAL AGENCY.

B) ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD APPROVED UNDER CHAPTER 21 IS NOT OWNED OR CONTROLLED BY A COUNTY AGENCY FOR PURPOSES OF THIS SECTION AND REQUIRES A SPECIAL EXCEPTION. ANY TELECOMMUNICATION FACILITY CONSTRUCTED AS OF NOVEMBER 21, 1995 ON ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD IS NOT A NONCONFORMING USE.

C) AN UNMANNED EQUIPMENT BUILDING OR CABINET ASSOCIATED WITH A TELECOMMUNICATION FACILITY LOCATED ON PUBLICLY OWNED LAND OR ATTACHED TO A PUBLICLY OWNED STRUCTURE MUST NOT EXCEED 560 SQUARE FEET AND 12 FEET IN HEIGHT, EXCEPT A SINGLE EQUIPMENT BUILDING IN EXCESS OF 560 SQUARE FEET MAY BE USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER, IF:

i) THE OVERALL SQUARE FOOTAGE DOES NOT EXCEED 1500 SQUARE FEET AND 12 FEET IN HEIGHT,
ii) THE BUILDING IS USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER OPERATING FROM THE SAME MONOPOLE OR TOWER; AND
iii) THE BUILDING IS REVIEWED BY THE TELECOMMUNICATIONS TRANSMISSION FACILITY COORDINATING GROUP IN ACCORDANCE WITH SEC 2-58E OF THE COUNTY CODE.

IF THE NEAREST ADJOINING PROPERTY IS CLASSIFIED IN A RESIDENTIAL ZONE, THE EQUIPMENT BUILDING OR CABINET MUST BE FACED WITH BRICK OR OTHER SUITABLE MATERIAL ON ALL SIDES AND LANDSCAPED TO A HEIGHT OF AT LEAST 3 FEET.

D) ANY PRIVATE TELECOMMUNICATION FACILITY ON PUBLICLY OWNED LAND THAT IS NOT PERMITTED UNDER SUBSECTIONS A), OR C) MUST OBTAIN A SPECIAL EXCEPTION FROM THE BOARD OF APPEALS.

T-Mobile
T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

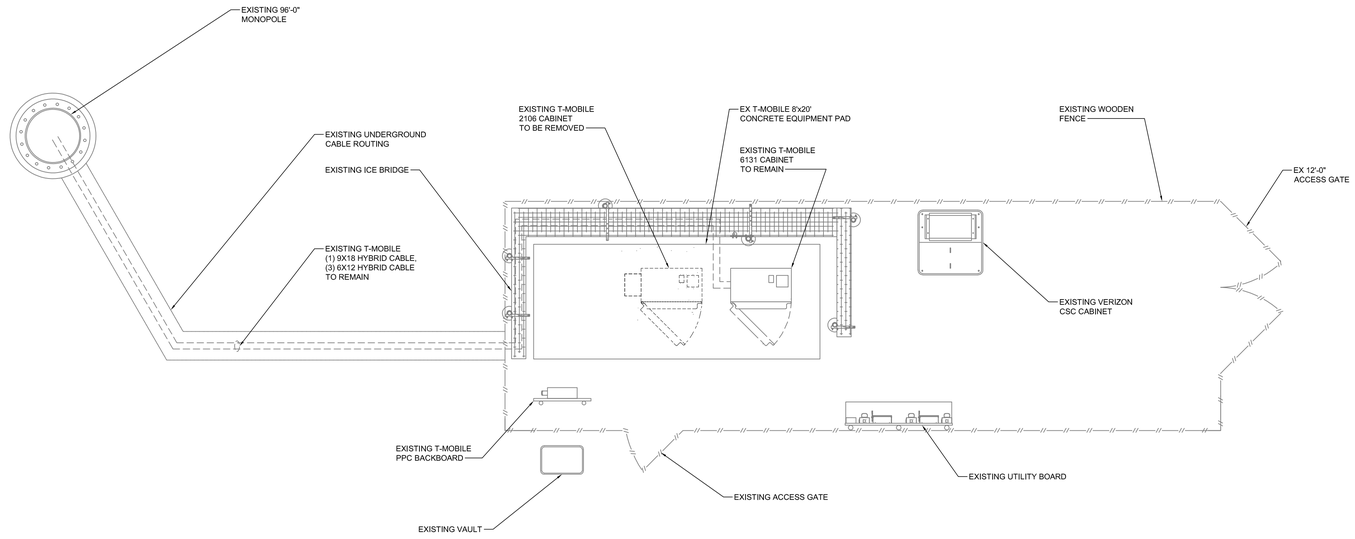
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

811
Know what's below.
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

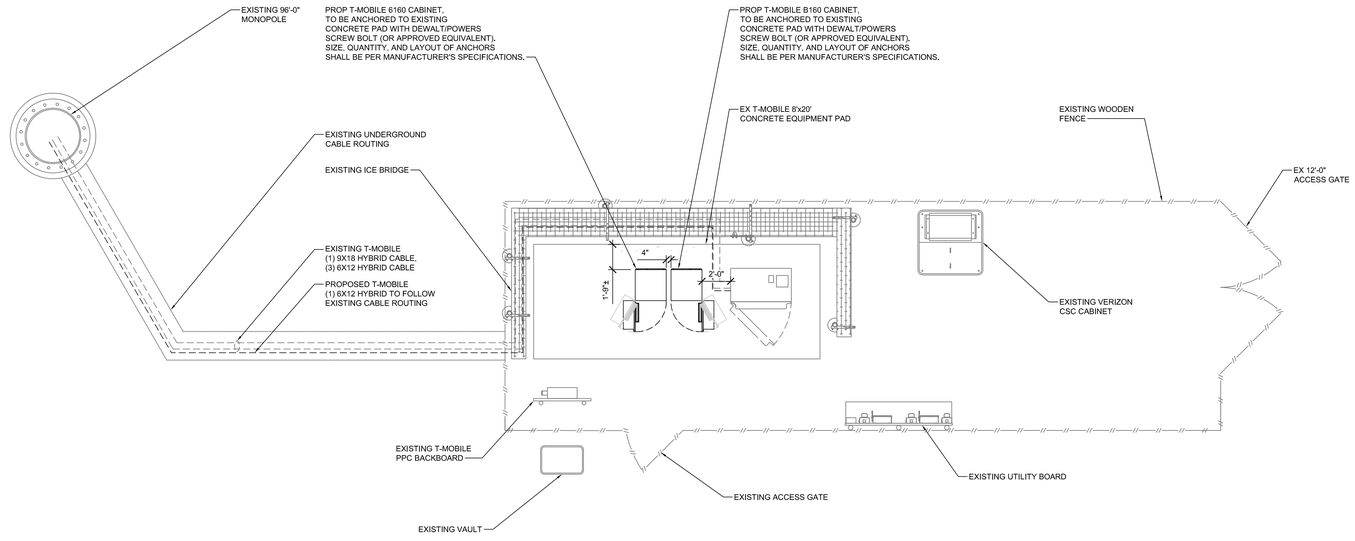
SHEET TITLE
Site Plan

SHEET NUMBER
C-1



EXISTING ENLARGED COMPOUND PLAN

SCALE: 1" = 15'-0"



PROPOSED ENLARGED COMPOUND PLAN

SCALE: 1" = 5'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below. Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

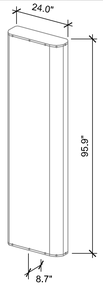
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

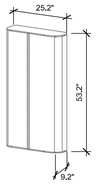
SHEET TITLE

Enlarged Compound Plan

SHEET NUMBER

C-2

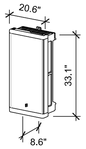




RFS APXVAARR24_43-U-NA20 COMMSCOPE 2HH-38A-R4

EXISTING T-MOBILE ANTENNA DETAILS

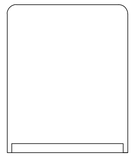
SCALE: NOT TO SCALE



ERICSSON
AIR6449 B41

PROPOSED T-MOBILE ANTENNA DETAILS

SCALE: NOT TO SCALE



RADIO 4424 B25: REMOTE RADIO UNIT:	
MANUFACTURER:	ERICSSON
POWER SUPPLY:	-48VDC
DIMENSIONS:	16.5"H x 13.4"W x 5.9"D
WEIGHT:	56 LBS

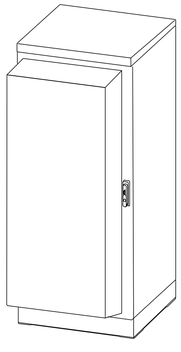
NOTES:

1. INSTALL RRU PER MANUFACTURERS RECOMMENDATIONS.
2. FIBER, DC POWER & GROUND CONNECTIONS NOT SHOWN.

ERICSSON RADIO 4424 B25 (PROPOSED)

T-MOBILE EQUIPMENT DETAILS

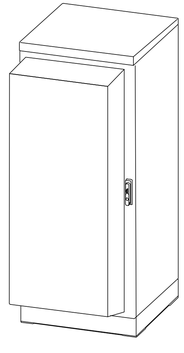
NOT TO SCALE



ERICSSON B160 BATTERY CABINET

NOT TO SCALE

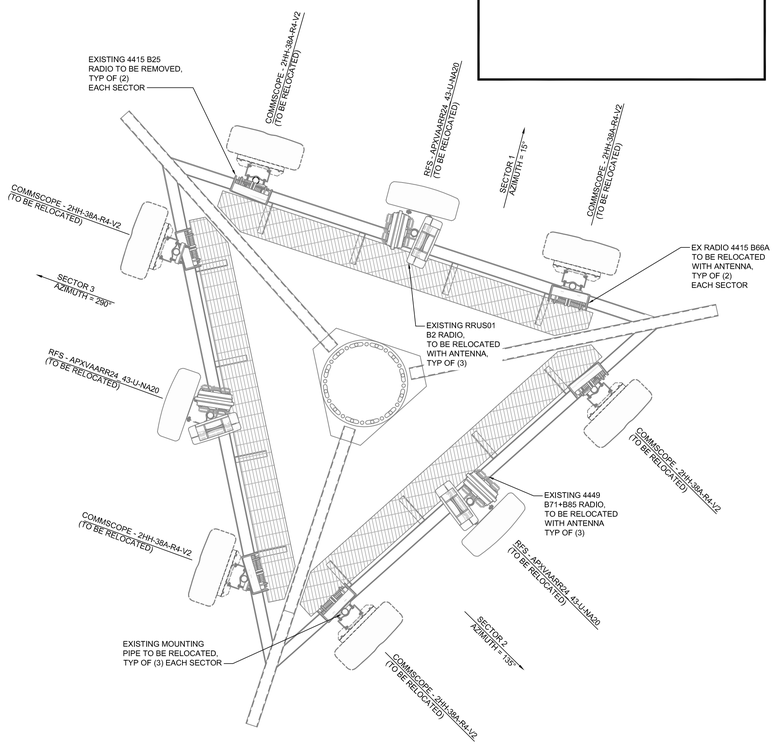
B160 BATTERY CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	295 LBS
WEIGHT (FULL):	2,000 LBS



ERICSSON 6160 EQUIPMENT CABINET

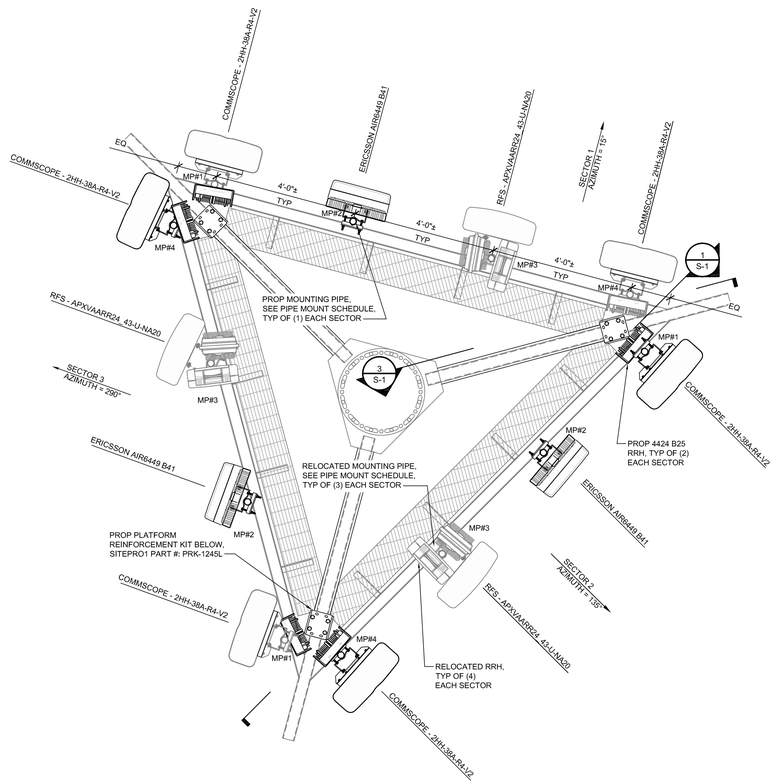
NOT TO SCALE

6160 EQUIPMENT CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	320 LBS
WEIGHT (FULL):	1,500 LBS



EXISTING ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"



PROPOSED ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"

ANTENNA SCHEDULE

SECTOR	STATUS	POS	MANUFACTURER	MODEL #	ANTENNA DIMENSIONS	AZIMUTH	RAD CENTER (FT)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	TMA / RRH QUANTITY & MODEL NO	CABLE QUANTITY & TYPE	CABLE LENGTH
SECTOR 1	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	(1) EXISTING ERICSSON 9X18 HCS (2) EXISTING ERICSSON 6X12 HCS 6AWG (1) EXISTING ERICSSON 6X12 HCS 4AWG (1) PROPOSED ERICSSON 6X12 HCS 4AWG	(±) 200'-0"
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	15°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	15°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 2	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	135°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	135°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 3	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	290°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	290°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 4	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 1	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 5	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 2	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 6	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 3	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

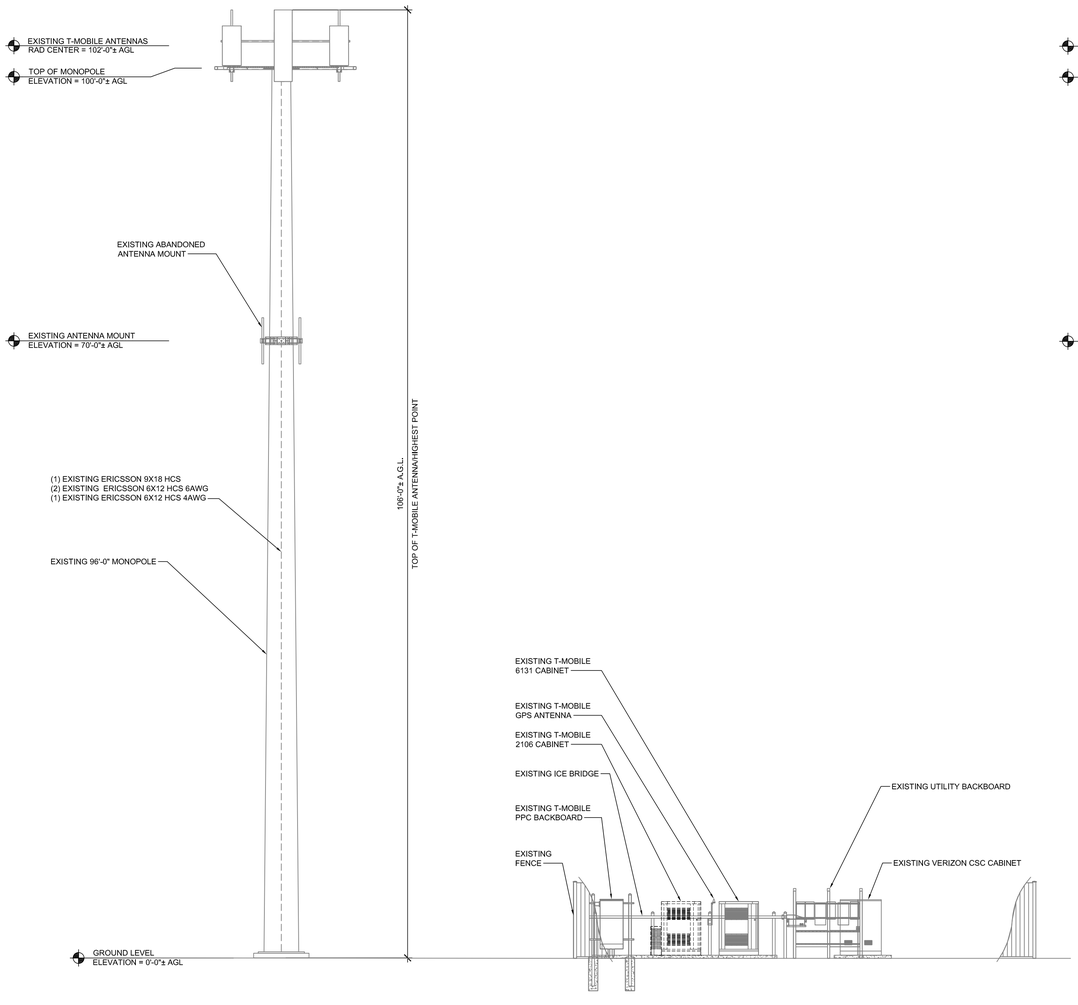
811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Antenna Sector Plans, Schedule & Details

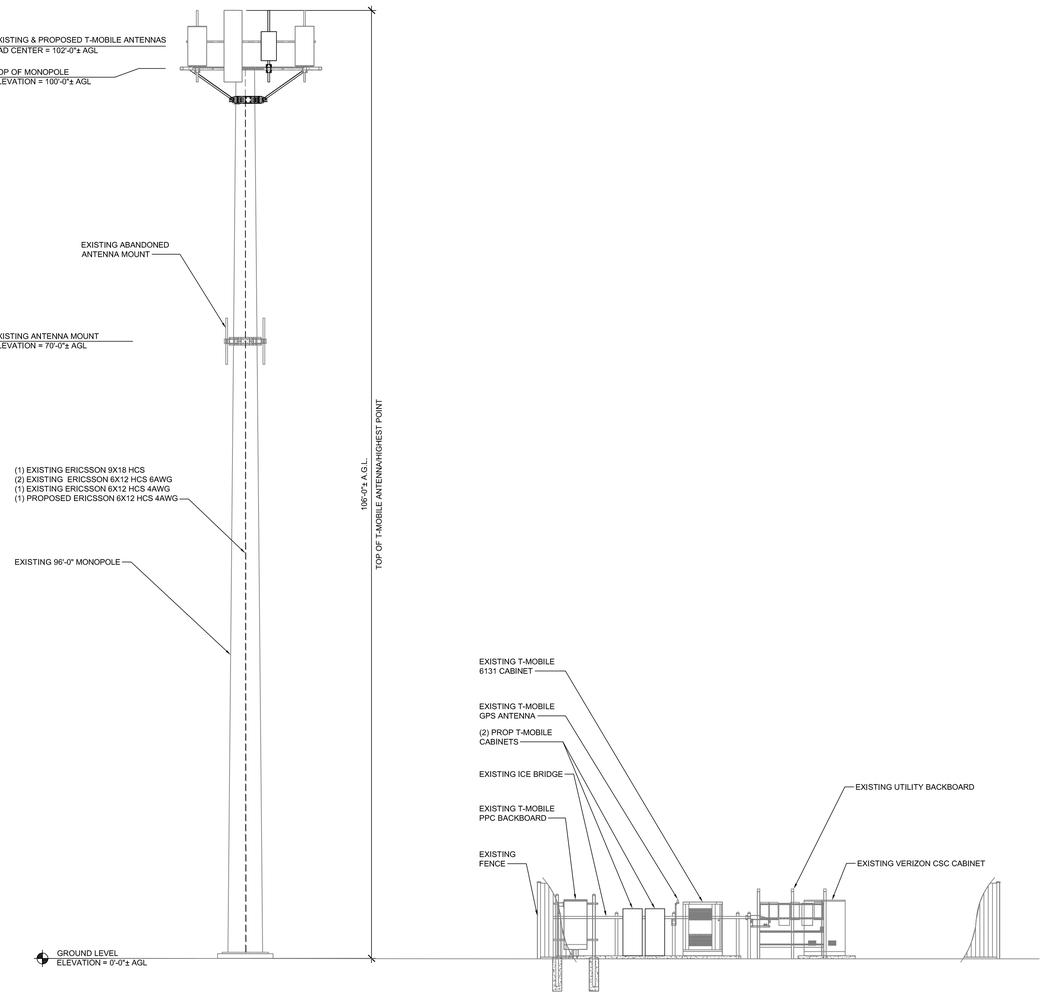
SHEET NUMBER

C-3



EXISTING MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"



PROPOSED MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below.
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

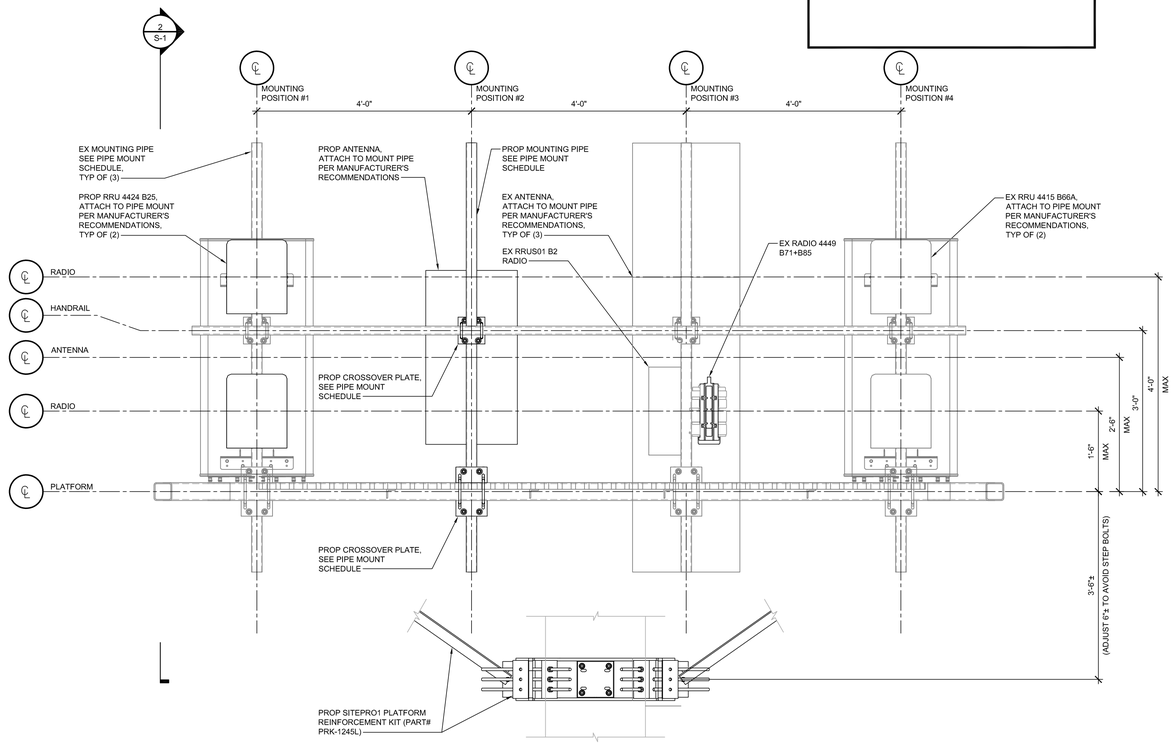
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Tower Elevations

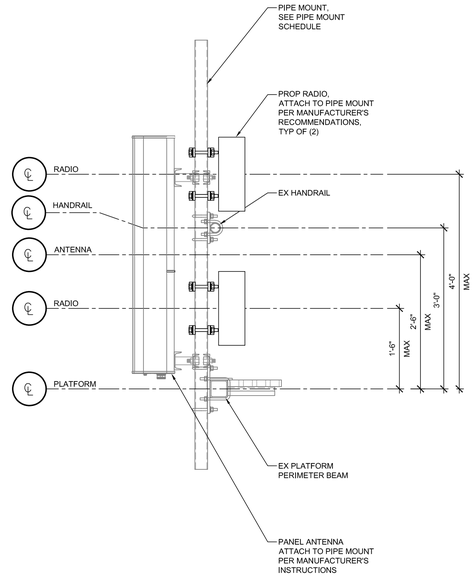
SHEET NUMBER

C-4



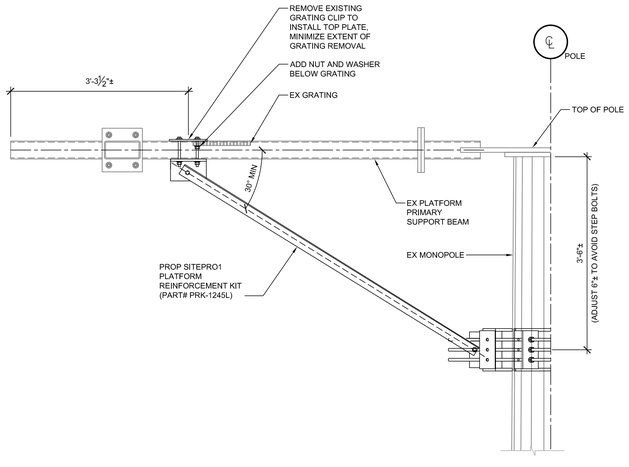
1 C-3 ANTENNA SECTOR REAR ELEVATION

SCALE: 3/4" = 1'-0"



2 S-1 TYPICAL ANTENNA & EQUIPMENT MOUNT

SCALE: 3/4" = 1'-0"



3 C-3 TYPICAL PLATFORM REINFORCEMENT

SCALE: 3/4" = 1'-0"

PIPE MOUNT SCHEDULE						
MOUNTING POSITION	PIPE O.D.	PIPE LENGTH	THICKNESS	HANDRAIL CONNECTION	BOTTOM CONNECTION	EXISTING/ PROPOSED
MP#1	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#2	2½"	96"	SCH. 40	SITEPRO1 SCX1-K	SITEPRO1 SQCX4-K	PROPOSED
MP#3	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#4	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING

NOTES:

1. COORDINATE PIPE MOUNT SCHEDULE w/ PLANS, SECTIONS, DETAILS, & NOTES.

A PIPE MOUNT SCHEDULE

TYPICAL BOLT ASSEMBLIES						
TYPE	GRADE	DIA.	FINISH	WASHER[4]	NUT	TIGHTENING TORQUE (FT-LB)[2,3]
U-BOLT	SAE J429 GRADE 2	½"	GALV.	ASTM F436/F844	EXISTING	61
STRUCTURAL	ASTM F3125 GR A325	¾"	GALV.	ASTM F436	ASTM A563	175

NOTES:

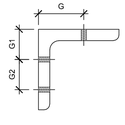
1. TIGHTENING TORQUES CORRESPOND TO AISC SNUG-TIGHTENED JOINTS.
2. CONTRACTOR SHALL VERIFY THAT ALL EXISTING BOLTS ARE TIGHTENED ACCORDING TO THIS TABLE. THREADED PARTS AND BOLTS MUST BE CORRECTLY IDENTIFIED PRIOR TO RE-TIGHTENING AND THE THREADED COMPONENTS SHALL NOT BE OVERTIGHTENED, OTHERWISE THEY NEED TO BE SAFELY REMOVED AND REPLACED. EXCEPTION: TIGHTENING TORQUES DO NOT APPLY TO THREADED COMPONENTS OF COLLAR MOUNTS AND/OR TOWER LEG ATTACHMENT POINTS (IF APPLICABLE).
3. TIGHTENING SHALL STOP WHEN THE SPECIFIED INSTALLATION TORQUE IS REACHED OR AT THE FIRST SIGN OF DEFORMATION.
4. WASHER SHALL BE PROVIDED UNDER ELEMENT THAT IS TURNED (NUT OR HEAD).

B TYPICAL BOLT ASSEMBLIES

MOUNT MODIFICATION BILL OF MATERIALS						
ITEM #	DESCRIPTION	PART MANUFACTURER	PART MODEL #	QUANTITY	MATERIAL	COMMENTS
1	PLATFORM REINFORCEMENT KIT	SITEPRO1	PRK-1245L	1	VARIES (GALV.)	SECTION 1/C-3 ON S-1 & 3/C-3 ON S-1
2a	2½" O.D. SCH 40 PIPE MOUNT x 8'-0" LONG	-	-	3	GALV. ASTM A53 GR B	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2b	CROSSOVER PLATE KIT W/ SQUARE U-BOLTS AND STD. U-BOLTS	SITEPRO1	SQCX4-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2c	CROSSOVER PLATE KIT	SITEPRO1	SCX1-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE

C MOUNT MODIFICATION BILL OF MATERIALS

WORKABLE GAUGE IN ANGLE LEGS														
LEG	8	7	6	5	4	3½	3	2½	2	1¾	1½	1⅜	1¼	1
G	4½	4	3½	3	2½	2	1¾	1⅜	1⅛	1	⅞	⅝	¾	⅝
G1	3	2½	2¼	2										
G2	3	3	2½	1¾										



NOMINAL HOLE DIMENSIONS, MINIMUM EDGE DISTANCE, & MINIMUM BOLT HOLE SPACING			
BOLT DIAMETER	STANDARD HOLE	MINIMUM EDGE DISTANCE	MINIMUM BOLT HOLE SPACING
½"	9/16"	¾", U.N.O.	2½", U.N.O.
⅝"	11/16"	⅞", U.N.O.	2⅝", U.N.O.

NOTE: ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EX CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.

D TYP CONNECTION REQUIREMENTS

T-Mobile
T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

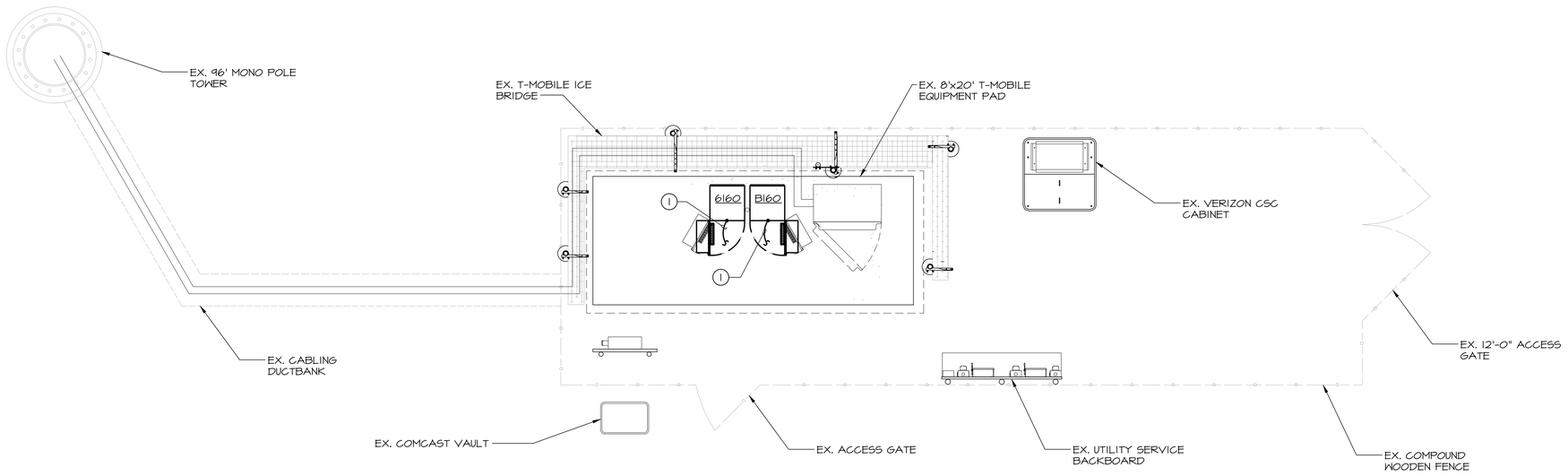
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Structural Details

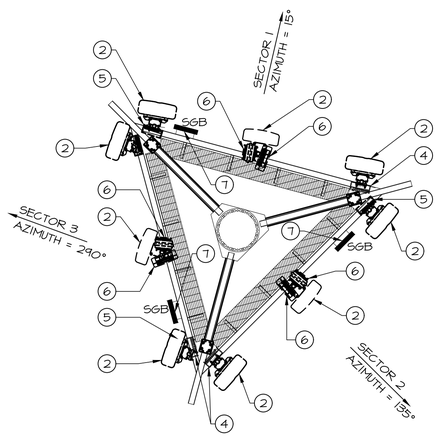
SHEET NUMBER

S-1



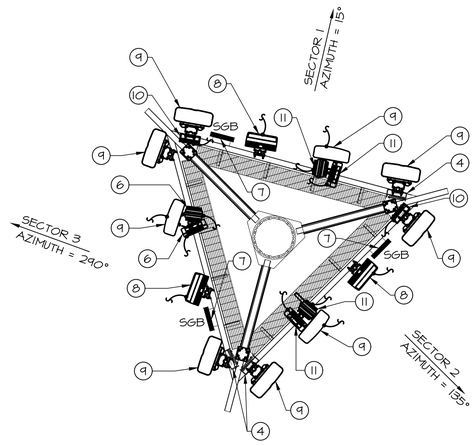
COMPOUND GROUNDING PLAN

SCALE: 1/4"=1'-0"



⑫ DEMOLITION ANTENNA PLAN

NO SCALE



⑫ ANTENNA PLAN

NO SCALE

GROUNDING NOTES

1. BOND NEW T-MOBILE B160 BATTERY CABINET AND NEW T-MOBILE 6160 POWER CABINET TO EXISTING GROUND RING USING 1#2AWG BARE TINNED COPPER CONDUCTOR.
2. REMOVE AND RELOCATE EXISTING MAST MOUNTED ANTENNA. DISCONNECT EXISTING ANTENNA JUMPERS AND ASSOCIATED GROUNDING AND SAVE FOR RECONNECTION TO NEW LOCATION IN NEW WORK PHASE.
3. NOT USED.
4. EXISTING RADIO HEAD (RRH) TO REMAIN.
5. REMOVE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING JUMPER CABLES AND ASSOCIATED GROUNDING.
6. REMOVE AND RELOCATE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING RADIO HEAD (RRH) JUMPERS AND ASSOCIATED GROUNDING.
7. EXISTING COPPER SECTOR GROUND BAR TO REMAIN.
8. PROVIDE NEW ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
9. RELOCATED ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
10. PROVIDE NEW RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
11. RELOCATED RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
12. REMOVE ALL EXISTING **UNUSED** COAX CABLING. PROVIDE (1) NEW 6x12 HYBRID FIBER CABLING.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND
TIMOTHY SMIDT
21585
REGISTERED
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

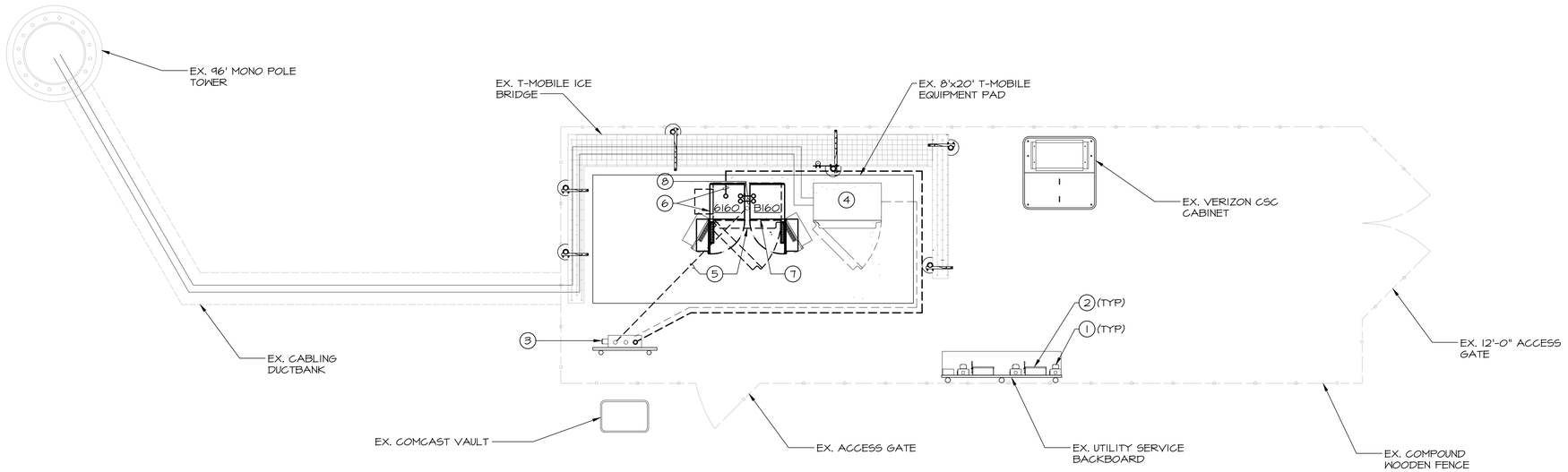
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811
Know what's **below.**
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Grounding Compound Plan, Antenna Plans and Notes

SHEET NUMBER
G-1



COMPOUND POWER PLAN

SCALE: 1/4"=1'-0"

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET, DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET, EXTEND 3#1+#8GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND · TIMOTHY SMIDT · 21585 · REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Compound Power Plan and Notes

SHEET NUMBER
E-1

(EXISTING) ③ PANEL T ⟨1⟩

120/240 VOLTS 1Φ 3 WIRE 200 AMP MCB

DESCRIPTION	BRKR	CKT	CKT	BRKR	DESCRIPTION
SURGE	60	1	2	150	6131 CABINET
		3	4		
SPARE (5)	50	5	6		
		7	8		
LIGHT/RECEPTACLE	20	9	10	20	SPARE (5)
SPACE	-	11	12	100	6160 CABINET (4)
SPACE	-	13	14		
SPACE	-	15	16	-	SPACE
SPACE	-	17	18	-	SPACE
SPACE	-	19	20	-	SPACE
SPACE	-	21	22	-	SPACE
SPACE	-	23	24	-	SPACE

LOAD CALCULATION:

PROPOSED EQUIPMENT LOAD: 40Ax240V =	9.6 KVA
LIGHT/RECEPTACLES LOAD:	0.20 KVA
EXISTING EQUIPMENT LOAD:	31.5 KVA
TOTAL:	41.3 KVA
TOTAL LOAD:	41.3 KVA = 172.1 AMPS @ 120/240V, 1Φ

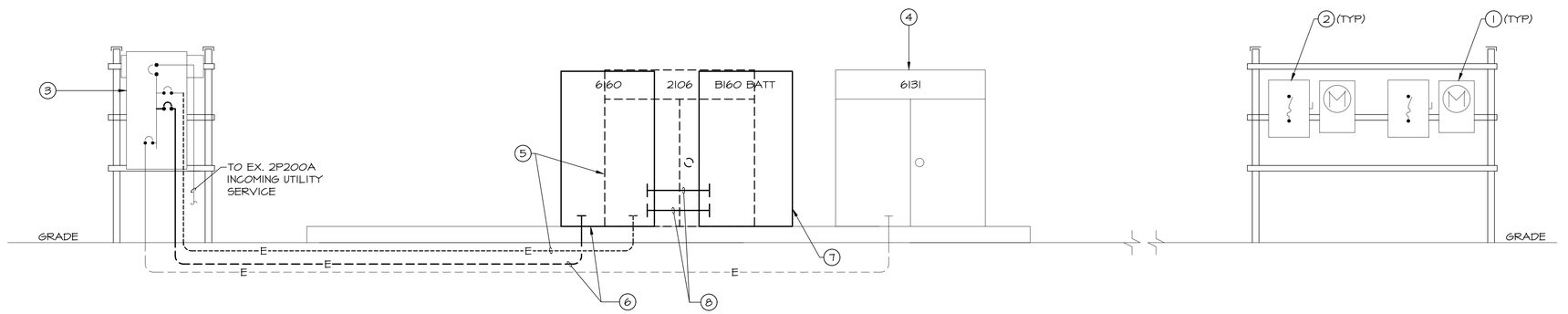
* PANELBOARD FEEDERS ARE SIZED FOR MAIN OVERCURRENT DEVICE PER N.E.C. ARTICLE 215-2
** ALL LOADS ARE BASED UPON N.E.C. ARTICLE 220

NOTES:

⟨1⟩ CONTRACTOR SHALL PROVIDE UPDATED, TYPED PANEL DIRECTORY WITH RESPECTIVE CIRCUIT NAMES AFTER PROJECT COMPLETION, **PER N.E.C. ARTICLE 408.4.**

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET. EXTEND 3#1+#8 GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.



POWER RISER
NO SCALE

ELECTRICAL SPECIFICATIONS

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE IN STRICT ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODES. ALL WORK IS SUBJECT TO THE APPROVAL OF THE T-MOBILE REPRESENTATIVE.
2. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND SHALL PAY ALL ASSOCIATED CHARGES. CONTRACTOR SHALL ARRANGE FOR ALL INSPECTIONS.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL SPECIFIED MATERIALS AND EQUIPMENT. ALL MATERIALS SHALL BE U.L. LISTED.
4. CONDUIT SHALL BE RIGID STEEL (HEAVY WALL) OR SEALTIGHT FOR WORK EXPOSED TO WEATHER. NO ALUMINUM CONDUIT OR CONDUCTORS PERMITTED.
5. WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THWN/THHN INSULATION FOR EXTERIOR USE. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED. CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 98% CONDUCTIVITY.
6. THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDED USING DOUBLE LOCKNUTS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTORS.
7. ALL ELECTRICAL EQUIPMENT INCULDING THE PANEL, SWITCH GEAR AND DISCONNECT SHALL BE IDENTIFIED WITH ENGRAVED BAKELITE NAMEPLATES.
8. ALL ELECTRICAL EQUIPMENT EXPOSED TO WEATHER SHALL BE PROTECTED IN NEMA 3R ENCLOSURES.
9. ALL DISCONNECTS SHALL BE SQUARE D NEMA 3R FUSIBLE.
10. **CONTRACTOR SHALL COORDINATE FINAL SERVICE TERMINATION LOCATIONS WITH TELEPHONE AND ELECTRIC UTILITY COMPANIES IN THE FIELD.**
11. CONTRACTOR SHALL UPDATE PANEL SCHEDULES AND IDENTIFY ALL MISCELLANEOUS CIRCUITS NOT INDICATED ON SCHEDULES.

ELECTRICAL SYMBOLS LIST

NOTE: ALL MOUNTING HEIGHTS ARE TO CENTER LINE OF THE OUTLET BOX UNLESS OTHERWISE INDICATED.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
◀	EQUIPMENT FRONT	●R	GROUND ROD
M	METER	◉R	GROUND TEST ROD
(5)	DRAWING NOTE	--- T ---	TELEPHONE CONDUIT
—⏚—	GROUND CONNECTION	--- E ---	ELECTRIC CONDUIT
⟶ ⟶	CONDUIT-DOWN, UP	--- G ---	GROUND CONDUCTOR
▨	120/240V, 1Φ ELECTRIC PANEL		

ABBREVIATIONS

AFF	- ABOVE FINISHED FLOOR	MTD	- MOUNTED
C, CDT	- CONDUIT	UG	- UNDERGROUND
DN	- DOWN	V	- VOLTS
GRD	- GROUND	W	- WITH
MH	- MOUNTING HEIGHT	WP	- WEATHERPROOF

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND — TIMOTHY SMIDT — 21585 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Power Riser, Panel Schedule, Symbols List and Notes

SHEET NUMBER
E-2

App No: 2020101311

Application General Infomation

Applicant Name	Site Link Wireless, LLC	Updated	10/20/2020
Application Type	Minor Modification	Ann. Plan?	Yes
Carrier	T-Mobile	Will site be used to support government telecommunications facilities or other equipment for government use?	No
Solution Type	Macro		
Existing	Existing	Gvt. Use Desc.	

Application Description

T-Mobile proposes to relocate (9) existing antennas, install (3) new panel antennas, remove and replace (6) RRUs, remove (1) existing cabinet and install (2) new cabinets at the existing telecom monopole site.

Site Infomation

Site Id	299	Zoning	R-60
Structure Type	Monopole	Latitude	39.059453
Address	12501 Dalewood Rd, Silver Spring	Longitude	-77.066497
County Site Name	Wheaton High School	Ground Elevation	371
Carrier Site Name	7WAN235A	City	Silver Spring
Site Owner	MCPS	Lease Status	Leased
Structure Owner	MCPS	Does the structure require an antenna structure registration under FCC Title 47	Yes
Existing Structure Height	100	Distance to Residential Property (New, Replacement, Colocation Only)	
Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)		Distance to Commercial Property (New, Replacement, Colocation Only)	

Justification of why this site was selected:

NearbySites (New, Replacement Apps Only):

App No: 2020101311

Screening considerations(New, Colocations, Replacement Apps Only):

Wednesday, October 21, 2020

8:46:06 AM

App No: 2020101311

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only): Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater? No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet? No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet? No

More than four Equipment Cabinets? YN: No

Will the proposed installation require excavation or expansion outside the current boundaries of the site? No

Does the structure or current installation have concealment elements/measures? No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater? No

If yes, describe how the proposed installation does not defeat the existing concealment.

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility? No

Is the structure 10% taller than adjacent structures?

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet: 24

Please list adjacent structure heights

Tribal Lands? No

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

ROW Information

PROW? No

Pole Number

ROW owner

ROW width

Wednesday, October 21, 2020

8:46:06 AM

App No: 2020101311

Antenna Infomation

Antenna Compliance	Yes
Compliance Desc	
Antenna Location	No
Antenna Loc. Desc.	
Env. Assessment	
Cat. Excluded?	checked
Routine Env. Evaluation	

Antenna Model	Ericsson AIR 6449 B41						
Frequency	2496-2690 MHz						
RAD Center	102	Max ERP	250	Antenna Dimensions	33.1"x20.6"x8.6"	Quantity	3

Wednesday, October 21, 2020

8:46:06 AM

Montgomery County Zoning

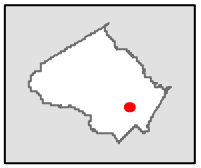
Date: 10/20/2020

Montgomery County Planning Department
ITI Division

Account #	00953838
Address	12601 DALEWOOD DR SILVER SPRING, 20906
Zone	R-60
Overlay Zone	N/A
TDR Overlay Zone	N/A
Landuse	Institutional/Community Facility
Parcel, Lot, Block	P472 , N/A , N/A
WSSC Grid	216NW03
Map Amendments	G-642 G-956

Parking District	N/A
CBD	N/A
Special Protection Area	N/A
Urban District	N/A
Enterprise Zone	N/A
Arts & Ent. District	N/A
Special Tax District	N/A
Legal Description	HERMITAGE

Bike/Ped Priority Area	N/A
Urban Renewal Area	N/A
Metro Station Policy Area	N/A
Priority Funding Area	Yes
Septic Tier	Tier 1: Sewer existing
Municipality	N/A
Master Plan	MASTER PLAN FOR KENSINGTON WHEATON
Historic Site/District	N/A
Water/Sewer Categories	W-1 / S-1



1 inch = 218 feet

New Product Introduction

Massive MIMO Mid-Band
AIR6449 B41
New Product Introduction Notification

ERICSSON

(Refresh: Voltage Booster PSU 4813 is added in Ancillary Materials)

PURPOSE

Ericsson's next generation AIR6449 B41 massive MIMO (M-MIMO) single band product provides additional RF power and has full band IBW sufficient to transmit 180MHz of 4G/5G carrier bandwidth (vs. AIR6488 60+60MHz carrier bandwidth). The AIR6449 also offers enhanced RF performance via a 192 element antenna array (vs. AIR6488 with 128).

BACKGROUND

The AIR6449 has a combined antenna/radio with 64 TRX. It has advantages over the previous AIR6488 model such as:

- Full 194 MHz IBW and can support NR+LTE mixed mode vs. 100 MHz on AIR6488
- Smaller dimensions (in height and width) and lighter in weight
- 25 Gbps eCPRI support

AIR 6488 vs. AIR 6449 comparison is available at this link.

USAGE GUIDELINES

- AIR6449 is planned to replace AIR6488 on a go forward basis once available
- Full Anchor Design (2.5GHz + PCS) or 2.5GHz Only (AKA "Skinny")
- All markets except New York Boroughs
    - Use existing AIR6488 if entitlement is complete or expected to complete before July 1st, 2020 (see AIR6488 NPI)
    - Use existing AIR6488 if site is expected to be on-air before July 1st, 2020 (see AIR6488 NPI)
    - Use AIR6449 if entitlement complete is forecasted after July 1st, 2020
- NY Boroughs
    - Continue to use existing AIR6488M (see AIR6488 NPI)

TIMELINES

- Lab Entry: April 2020
- GA: June 30th, 2020
- New RFDS Templates for Anchor PORs reflecting AIR6449 have been created.
- This next generation hardware is expected to be available in commercial quantities in July 2020.

AFFECTED CONFIGURATIONS

Sites must be on an Anchor POR to use the AIR6449.

Site configurations that are designed with AIR6449 B41 will have a "**5A**" (5 for 2.5GHz + A for AIR6449) after the low-band indicator and/or before L19 indicator in the naming convention e.g., 67D92DB => 67D**5A**992DB, 92DB => **5A**992DB, etc.

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192
Output RF Power	300 W (=64 TRX x 4.6875W)
Data Ports	4 x 25Gb/s CPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling (vs. active cooling on AIR32 DB)
Dimensions (H x W x D)	33.1" x 20.6" x 8.6" inches (=841 x 524 x 217 mm)
Weight	104 lbs (=47 kg)
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees
HW/SW Availability	July 2020
Material SAP #	34105 – AIR 6449 B41

WARRANTY: 1 Year

SPARES: 2% of install base. Additional units can be requested as per need.

Baseband Requirements

For a typical 3-sector site,

- LTE: one dedicated BB6630 per site
- NR: one dedicated BB6648 (see its NPI) per site

Supplementary/Ancillary Materials

SKU	Description	Qty
34106	AIR6449 mandatory install kit	1 per AIR6449
34110	AIR6449 25G SFP	8 per AIR6449

The AIR6449 requires a voltage booster (i.e., PSU 4813) in almost all cases when using the current HCS 6x12. Please refer to Voltage Booster design doc for its usage guidance (depending on the HCS length and gauge). Note the installation kit is different for each cabinet type.

SKU	Description	Qty
34132	PSU 4813 main unit	1
34133	PSU installation kit for RBS61xx	Choose 1 per cabinet type
34134	PSU installation kit for PBC6200	
34135	PSU installation kit for E6x60/P6230	

LINKS

- Ericsson New T-Mobile Anchor Network Playbook
- AIR 6488 vs. AIR 6449 Comparison

CONTACTS

Kyuho Son	Principal Engineer, RAN Architecture
Weston Berry	Engineer, RAN Architecture

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

Monopole Analysis

Existing Monopole:

Result of Analysis	**Passing**
Monopole Critical Demand Capacity Ratio:	**97%**
Foundation Critical Demand Capacity Ratio:	**105%**

7WAN235A

BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Proposed T-Mobile Installation

Revision 1

August 28, 2020

Prepared For:

Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

MRA Job Number: 19851.038

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

August 28, 2020

Mr. Drew Montgomery
Site Link Wireless, LLC
3620 Commerce Drive, Suite 707
Baltimore, Maryland 21227

Re: 7WAN235A
BOE - Richard D. Riddle School
12501-A Dalewood Drive
Silver Spring, Montgomery County, Maryland 20906
Latitude: 39° 03' 35.53" N, Longitude: 77° 04' 1.20" W
MRA Job No 19851.038
Monopole Analysis for Proposed T-Mobile Installation – Revision 1

Dear Drew :

As requested, Morris & Ritchie Associates, Inc. (MRA) has completed our structural analysis of the existing 96'-0" monopole located at the above referenced site. The objective of MRA's analysis was to determine if the monopole can structurally support the proposed T-Mobile installation, in addition to the existing appurtenances, and meet the requirements of the 2018 International Building Code (IBC 2018), the ANSI/TIA-222-H-2017 Standard, and the AISC Manual of Steel Construction, Load and Resistance Factored Design.

The structural analysis of the monopole has been based upon the following information:

- Construction drawings, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Mount Analysis Report, prepared by MRA for T-Mobile, Job No: 19851.038 – Revision 1, dated August 28, 2020.
- Information obtained during site visit, performed by MRA, on July 1, 2020.
- RF configuration and plumbing diagram, prepared by T-Mobile, dated April 22, 2020.
- Construction drawings, prepared by NB+C Engineering Services, for T-Mobile, Site Number: 7WAN235A, dated November 26, 2018.
- Tower Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 21, 2018.
- Mount Structural Analysis Report, prepared by NB+C Engineering Services, for T-Mobile, Project No: 100282, dated August 15, 2018.
- Assembly Drawings for "12' Low Profile Antenna Platform H" (Part#: K12443), provided by EEI, dated November 22, 2016.
- Assembly Drawings for "Platform Reinforcement on a 12" to 45" Pole 4'-6" Angle" (Part#: PRK-1245L), provided by SitePro1, dated April 10, 2014.

For a complete list of all existing and proposed appurtenances used in this analysis, refer to the table on page 5, appended to this report. All appurtenances listed as "to be removed" shall be removed from the tower prior to the installation of any proposed appurtenances.

Several assumptions were made in order to perform the analysis of the monopole. Each of these is considered by MRA to be both reasonable and consistent with current standards of practice.

- All monopole structure information and existing loading were obtained from the original design drawings and/or documents described in the information provided above, are assumed to be accurate.
- The monopole and its foundation were manufactured and constructed in accordance with the EEI original design drawings.
- The monopole base plate has sufficient capacity to support the original design reactions.
- The slip jointed splices were assembled in accordance with the manufacturer's specifications.
- All structural components are in "like new" condition.
- The monopole is modeled as a cantilever beam, with a fixed connection at its base.
- The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
- The monopole and its foundation have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
- The analysis provided in this report only addresses the capacity of the monopole and its foundation; capacities of individual standoffs, mounting frames, etc. are not included in this analysis and are assumed to have adequate capacity to resist loads applied by the appurtenances they support.
- Any and all documentation regarding any previous monopole and/or foundation modifications has been provided to MRA.

The results of this analysis are influenced by the assumptions listed above. MRA should be notified of any additional information that potentially contradicts the above assumptions to determine the effect on the analysis results.

The wind speed and radial ice thickness required by the IBC 2018 and TIA-222-H for this specific location and risk category is in accordance with the wind speed and radial ice thickness maps from ASCE 7-16. Section 2.6.4 of the TIA-222-H Standard states, "It shall be permissible to determine site-specific basic wind speeds and design ice thicknesses from the ASCE 7 online Hazard tool based on ASCE 7-16" to assist in automated interpolation of the wind speed and radial ice thickness maps provided in Annex B of TIA-222-H.

In addition to wind and ice, TIA-222-H requires consideration of earthquake loading effects based on site-specific seismic parameters, aside from Risk Category I structures (earthquake effects could be ignored if S_s was less than or equal to 1.00 in the TIA-222-G Standard).

Due to lack of detailed information provided in TIA-222-H, MRA used the provisions of ASCE 7-16 Chapter C26.7 for exposure category determination. In addition, since TIA-222-H does not recognize wind sectors, but rather defines a wind exposure category for the entire site for all wind directions, it is MRA's professional opinion that a sector of 45 degrees or more of a specific surface roughness, evaluated throughout the extended upwind fetch (greater of 20 times the height of the tower and 2,600 ft), be used for determining the overall site exposure category. Based on this evaluation, we determined that this site is Exposure Category C.

Since this structure does not represent a substantial hazard to human life and/or damage to property in the event of failure, we have determined this structure to be a Risk Category II.

Based on the surrounding topography using satellite imagery and guidelines provided in TIA-222-H, the Topographic Category was determined to be Category 1 due to no abrupt changes in the general topography.

Since the soil properties are not known in sufficient detail to determine the site-specific site class, the default Site Class D was used.

We understand that the structure has designated periodic inspection evaluations in accordance with a site-specific management plan, in addition to the condition assessments as recommended by TIA-222-H; therefore, the Existing Structure Load Modification Factors, K_{es}, were utilized.

In accordance with TIA-222-H, the following loading conditions were considered:

Basic Wind Speed without Ice:	113 mph Wind (3-second gust) + No Ice
Basic Wind Speed with Ice:	40 mph Wind (3-second gust) + 1" Radial Ice
Exposure Category:	C
Risk Category:	II
Topographic Category:	1
Load Modification Factors:	F_w=0.95, t_i=0.85, E_v=1.00, E_h=1.00
Spectral Response Accelerations:	S_s = 0.134 g & S_1 = 0.043 g
Seismic Response Coefficient:	C_s = 0.0715 g
Site Class:	D (by default)
Antenna Rad Center:	102'-0"
Ground Elevation (NAVD 88):	371 ft

The total weight of the existing structure and existing, proposed appurtenances (W) times the seismic response coefficient (C_s) is considerably smaller than the effective projected wind area (EPA) times the wind pressure ($q_z G_h$); therefore, by inspection, we have determined a complete detailed seismic analysis of the existing structure is not necessary as wind loading effects will vastly exceed earthquake loading effects.

As a result of our analysis, we have calculated the critical demand-capacity ratio in the pole shaft to be **97%**.

We have also calculated the maximum factored foundation reactions, and compared them to the original foundation design reactions calculated by Engineered Endeavors, Inc. (EEI) (multiplied by a 1.35 factor, per TIA-222-H 15.6.2), as follows:

REACTION TYPE	ORIGINAL DESIGN REACTION	REACTION FROM CURRENT ANALYSIS	PERCENTAGE
Axial	15.3 k	15.1 k	99%
Shear	13.1 k	11.5 k	88%
Moment	923.1 k-ft	966.3 k-ft	105%

The original design reactions are multiplied by a factor of 1.35 so that a consistent comparison could be made between the reactions from the original EEI design drawings (which were based on service loads) and those from the analysis (which are based on factored loads). Please note that the original design reactions listed above are not the capacities of the foundation itself, but the reactions used to design the foundation. Based on the comparison in the table above, we have determined that the existing foundation, base plate and anchor bolts have sufficient capacity to support the reactions from the current analysis.

As stated in TIA-222-H, the standard allows a comprehensive structural analysis to be limited to a maximum demand-capacity ratio of 105%. This is primarily due to the statistical probability of attaining the maximum wind loading condition, the variability associated with non-linear analysis, and the conservatism in the wind load calculations from the standard.

Our structural analysis indicates that, under the conditions noted above, the existing 96'-0" monopole has sufficient structural capacity to support the proposed T-Mobile installation, in addition to the existing appurtenances, as described herein. No problems for the pole or its foundation, base plate, or anchor bolts are anticipated, and no modifications are necessary.

Any further changes to the appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

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,
MORRIS & RITCHIE ASSOCIATES, INC.

Finny Joy, P.E.
Structural Engineer

Richard J. Dyer, P.E., S.E., S.E.C.B.
Principal

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 32384, Expiration Date: November 10, 2021

V:\Bg_PROJECTS\19800-19899\19851 - Site Link Wireless\19851038 7WAN235A (BOE - Richard D. Riddle School)\Analysis & Design\Revision 1\Monopole Analysis\7WAN235A (BOE - RDRS) - Monopole Analysis Report.Docm

Contents

STANDARD CONDITIONS FOR FURNISHING PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY MORRIS & RITCHIE ASSOCIATES, INC.

In rendering the engineering services described in our proposal or agreement we may rely on the following:

- Information supplied by the client regarding the structure, its foundations, soil conditions, antenna and feedline loading on the structure and its components.

- Information from reports and drawings in the possession of Morris & Ritchie Associates, Inc. (MRA) or generated by field inspection or measurements of the structure.

- Other documents and matters as we deemed necessary and appropriate to render the engineering services described in this proposal or agreement.

All engineering services are performed subject to the following:

That all information supplied by or through the client and owner is current and correct. It is the responsibility of the client to ensure that the information provided to MRA and used in the performance of our engineering services is correct and complete.

In the absence of specific written information to the contrary, we assume the following: (1) the structure was constructed in accordance with the drawings and specifications, (2) the structure has not been modified, (3) the structure is not corroded and has not otherwise deteriorated, and (4) the capacity of the structure has not significantly changed from the "as new" condition.

All services will be rendered with reference to the codes specified by the client. We make no representations with respect to compliance with any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of TIA/EIA-222.

All documents submitted to us for our review as originals are authentic, all documents submitted to us as certified or photostat copies conform to the original documents and all signatures on all documents submitted to us for review are genuine and that all public records are accurate and complete.

We assume no obligation to supplement reports or plans if any applicable codes or laws change after the date thereof.

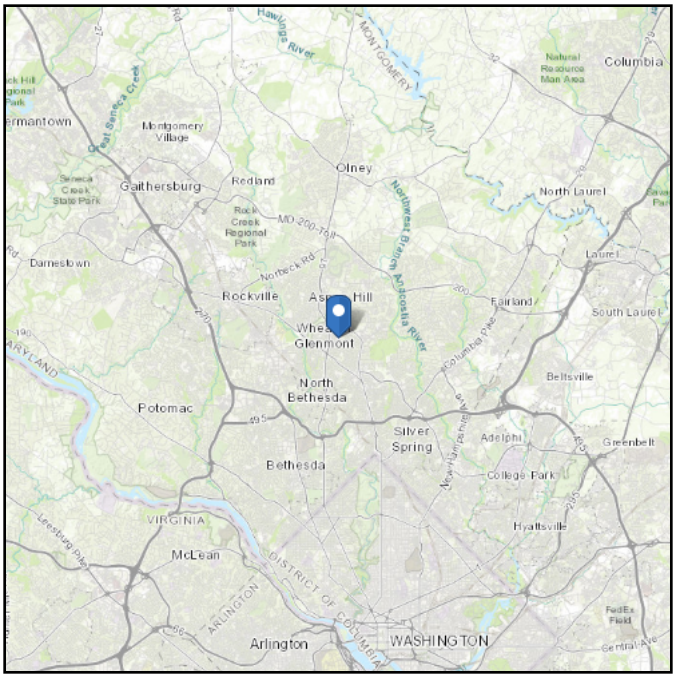
Services rendered are solely for the use of the Client. These reports, plans and specifications may not be relied upon by any person or persons without our prior written consent. Our services constitute professional services rendered in our capacity as professional engineers. Services rendered pursuant to this proposal or agreement do not give rise to or constitute warranties, certifications or guarantees giving rise to an obligation to indemnify anyone against any loss resulting from any inaccuracy contained therein. Our sole undertaking is to render such services in accordance with generally accepted engineering principles and practices. MRA is not responsible for the conclusions, opinions and recommendations made by others based upon the information we supply.

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 370.83 ft (NAVD 88)
Latitude: 39.05987
Longitude: -77.067



Wind

Results:

Wind Speed:	113 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Sun May 17 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

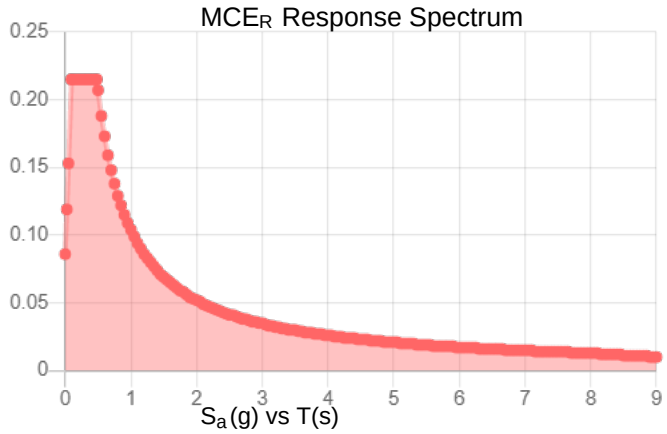
Seismic

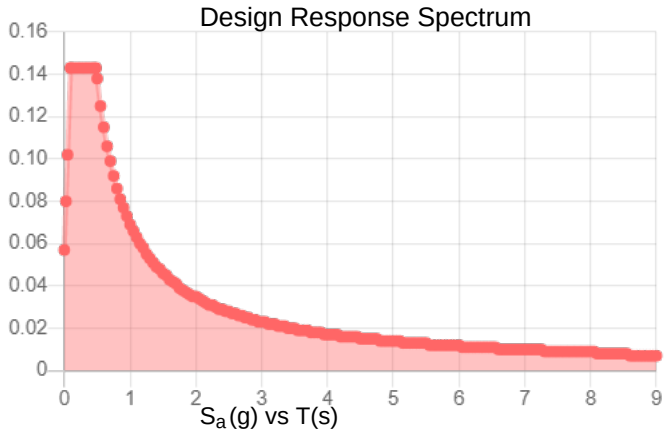
Site Soil Class: D - Stiff Soil

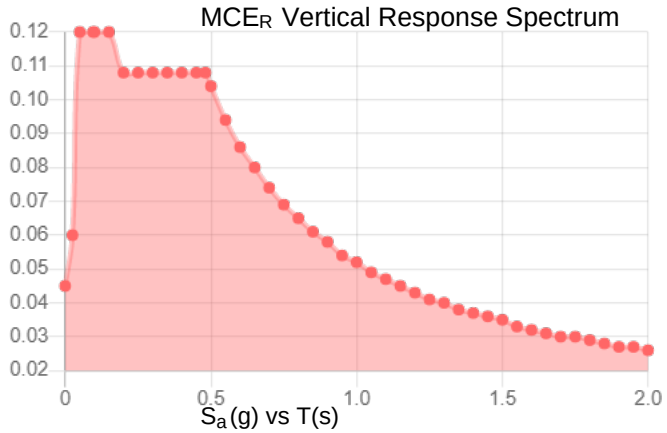
Results:

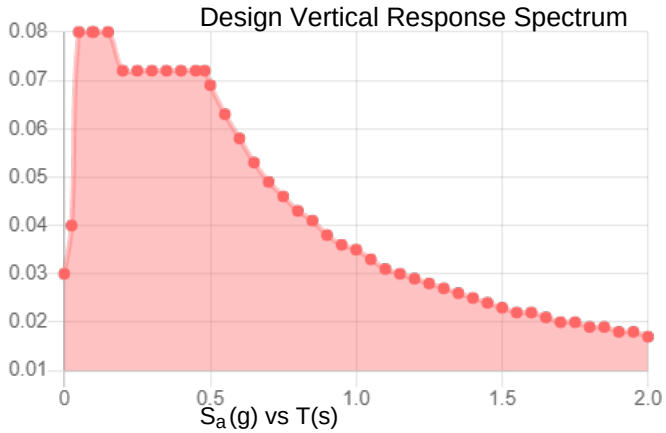
S_S :	0.134	S_{D1} :	0.069
S_1 :	0.043	T_L :	8
F_a :	1.6	PGA :	0.07
F_v :	2.4	PGA_M :	0.111
S_{MS} :	0.215	F_{PGA} :	1.6
S_{M1} :	0.104	I_e :	1
S_{DS} :	0.143	C_v :	0.7

Seismic Design Category B









Data Accessed: Sun May 17 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

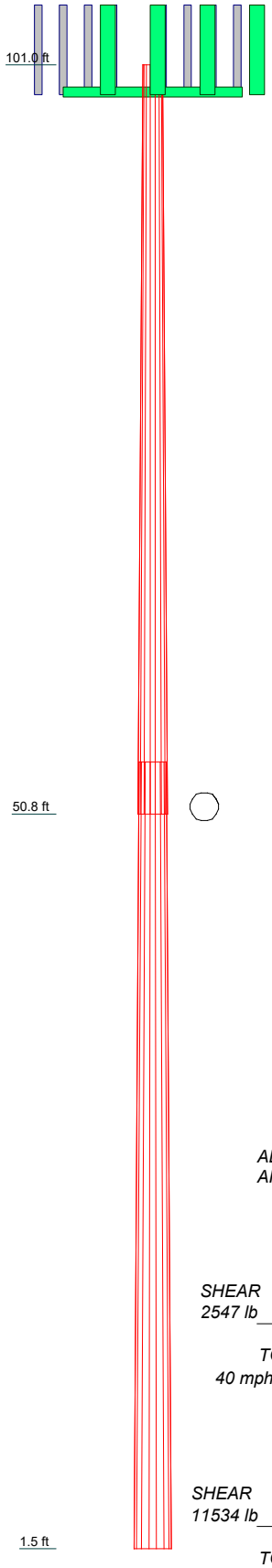
Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sun May 17 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	50.21	18	0.1875	3.42	16.0000	23.0500	A572-65	2064.5
2	52.71	18	0.2500		22.1948	30.0000		3862.6
								5927.2



ALL REACTIONS ARE FACTORED

AXIAL 22329 lb

SHEAR 2547 lb *MOMENT 225110 lb-ft*

TORQUE 225 lb-ft
40 mph WIND - 1.0000 in ICE

AXIAL 15080 lb

SHEAR 11534 lb *MOMENT 966299 lb-ft*

TORQUE 702 lb-ft
REACTIONS - 113 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Commscope 2HH-38A-R4 (T-Mobile)	102	Commscope 2HH-38A-R4 (T-Mobile)	102
8' Mount Pipe (T-Mobile)	102	8' Mount Pipe (T-Mobile)	102
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
		RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4424 B25 (T-Mobile)	99.5
Commscope 2HH-38A-R4 (T-Mobile)	102	RRU 11 B2 (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4449 B71+B85 (T-Mobile)	99.5
Ericsson AIR6449 B41 (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
8' Mount Pipe (T-Mobile)	102	RRU 4415 B66A (T-Mobile)	99.5
RFS APXVAARR24_43-U-NA20 (T-Mobile)	102	Andrew SO 101-1 (Other)	69
		Andrew SO 101-1 (Other)	69
8' Mount Pipe (T-Mobile)	102	Andrew SO 101-1 (Other)	69

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Montgomery County, Maryland.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 113 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 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 Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 97%

Morris & Ritchie Associates, Inc.
1220 E Joppa Rd #505
Towson, MD 21286
Phone: 410-821-1690
FAX:

Job: *7WAN235A (BOE - Richard D. Riddle School)*			
Project: *19851.038*			
Client: Site Link Wireless	Drawn by: FJoy	App'd:	
Code: TIA-222-H	Date: 10/13/20	Scale: NTS	
Path:		Dwg No. E-1	

Morris and Ritchie Associates
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
(410) 821-1690

Project Name: 7WAN235A (BOE - Richard D. Riddle School)
Project Location: Silver Spring, Montgomery County, MD

LEGEND
Existing
To Be Removed
Proposed
Reserved

APPURTENANCES

** Appurtenance types and elevations are approximations used for obtaining gravity & wind loads only. **

Appurtenance	***Carrier***	***Approximate Elevation (AGL)***	***Mount***	***Feedline Size***	***Notes***
(6) CommScope 2HH-38A-R4-V2	**T-Mobile**	102' (CL)	EEI 12' Low Profile Platform 'H' Part: K12443 w/ SitePro1 platform reinforcing kit (PRK- 1245L)	(4) Existing Hybriflex & (1) Proposed Hybriflex (Internal)	Existing
(3) RFS APXVAARR24_43-U-NA20					
(6) Ericsson 4415 B66A					
(3) RRUS01 B2					
(3) Ericsson Radio 4449 B71+B85					
(6) Radio 4415 B25					*To be removed*
(3) Ericsson AIR6449 B41					**Proposed**
(6) Ericsson RRU 4424 B25					
Double Pipe Supports	N/A	69' (CL)	(3) Andrew SO 101-1	-	Existing

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Montgomery County, Maryland.
Tower base elevation above sea level: 372.50 ft.
Basic wind speed of 113 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
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 40 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.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	101.00-50.79	50.21	3.42	18	16.0000	23.0500	0.1875	0.5625	A572-65 (65 ksi)
L2	50.79-1.50	52.71		18	22.1948	30.0000	0.2500	1.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.2237	9.4104	297.2674	5.6134	8.1280	36.5733	594.9259	4.7061	2.5520	13.611
	23.3824	13.6060	898.4973	8.1162	11.7094	76.7330	1798.1770	6.8043	3.7928	20.228
L2	23.0129	17.4132	1059.4466	7.7904	11.2750	93.9646	2120.2873	8.7083	3.4663	13.865
	30.4242	23.6066	2639.6436	10.5612	15.2400	173.2050	5282.7605	11.8056	4.8400	19.36

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 101.00-50.79				1.03	1.03	1.05			
L2 50.79-1.50				1.03	1.03	1.05			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8 (Unknown)	C	No	No	CaAa (Out Of Face)	101.00 - 1.50	1	No Ice	0.04	0.00
							1/2" Ice	0.14	0.00
							1" Ice	0.24	0.00
9x18 HCS (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 6AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	101.00 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
6x12 HCS 4AWG (T-Mobile)	A	No	No	Inside Pole	1.50 - 1.50	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00

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	101.00-50.79	A	0.000	0.000	0.000	0.000	151.63
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.883	11.05
L2	50.79-1.50	A	0.000	0.000	0.000	0.000	148.86
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.848	10.84

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	101.00-50.79	A	0.923	0.000	0.000	0.000	0.000	151.63
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.147	60.14

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
L2	50.79-1.50	A	0.831	0.000	0.000	0.000	0.000	148.86
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.943	59.04

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	101.00-50.79	-0.2480	0.1432	-0.7656	0.4420
L2	50.79-1.50	-0.2500	0.1443	-0.8054	0.4650

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
EEI Band-On 12' Low Profile Platform w/12 pipe (T-Mobile)	A	None		0.0000	99.50	No Ice	29.35	29.35	2000.00
						1/2" Ice	70.00	70.00	3000.00
						1" Ice	110.65	110.65	4000.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 -6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Ericsson AIR6449 B41 (T-Mobile)	A	From Face	4.17 -2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	5.68 5.98 6.29	2.49 2.72 2.95	119.00 158.12 201.46
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RFS APXVAARR24_43-U-NA20 (T-Mobile)	A	From Face	4.17 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	20.24 20.85 21.46	8.89 9.39 9.89	153.00 283.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 1.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
Commscope 2HH-38A-R4 (T-Mobile)	A	From Face	4.17 6.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	11.17 11.61 12.05	4.61 4.92 5.23	327.00 370.00 413.00
8' Mount Pipe (T-Mobile)	A	From Face	3.67 2.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice	1.90 2.85 3.80	1.90 2.85 3.80	29.00 46.00 63.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	A	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	A	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			1.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	A	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	B	From Face	4.17	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			1.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	B	From Face	4.17	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	B	From Face	4.17	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	B	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	B	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	B	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	B	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00

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
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			-6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Ericsson AIR6449 B41	C	From Face	4.67	0.0000	102.00	No Ice	5.68	2.49	119.00
(T-Mobile)			-2.00			1/2" Ice	5.98	2.72	158.12
			0.00			1" Ice	6.29	2.95	201.46
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RFS	C	From Face	4.67	0.0000	102.00	No Ice	20.24	8.89	153.00
APXVAARR24_43-U-NA20			2.00			1/2" Ice	20.85	9.39	283.00
(T-Mobile)			0.00			1" Ice	21.46	9.89	413.00
8' Mount Pipe	A	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
Commscope 2HH-38A-R4	C	From Face	4.67	0.0000	102.00	No Ice	11.17	4.61	327.00
(T-Mobile)			6.00			1/2" Ice	11.61	4.92	370.00
			0.00			1" Ice	12.05	5.23	413.00
8' Mount Pipe	C	From Face	3.67	0.0000	102.00	No Ice	1.90	1.90	29.00
(T-Mobile)			2.00			1/2" Ice	2.85	2.85	46.00
			0.00			1" Ice	3.80	3.80	63.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			3.50			1" Ice	2.20	1.06	79.00
RRU 4424 B25	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			-6.00			1/2" Ice	2.03	0.94	63.00
			1.50			1" Ice	2.20	1.06	79.00
RRU 11 B2	C	From Face	3.67	0.0000	99.50	No Ice	2.79	1.19	51.00
(T-Mobile)			1.50			1/2" Ice	3.00	1.34	75.00
			1.50			1" Ice	3.21	1.49	99.00
RRU 4449 B71+B85	C	From Face	3.67	0.0000	99.50	No Ice	1.67	1.15	74.00
(T-Mobile)			2.50			1/2" Ice	1.80	1.30	93.00
			1.50			1" Ice	1.93	1.45	112.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
RRU 4415 B66A	C	From Face	3.67	0.0000	99.50	No Ice	1.86	0.82	47.00
(T-Mobile)			6.00			1/2" Ice	2.03	0.94	63.00
			2.50			1" Ice	2.20	1.06	79.00
Andrew SO 101-1	A	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	B	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00
Andrew SO 101-1	C	None		0.0000	69.00	No Ice	3.75	1.28	84.00
(Other)						1/2" Ice	4.45	1.39	111.00
						1" Ice	5.15	1.50	138.00

222-H Verification Constants

Constant	Value
K_d	0.95
Ice Thickness Importance Factor	1
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	0.987

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
L1 101.00-50.79	1	TP23.05x16x0.1875	202.118	78.212		1	1	85.345	93.297	85.345	93.297
							Sum:	85.345	93.297	85.345	93.297
L2 50.79-1.50	2	TP30x22.1948x0.25	241.837	90.981		1	1	113.039	120.845	113.039	120.067
							Sum:	113.039	120.845	113.039	120.067

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82		1.191	1	1		34.5		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		27.2		1	113.039

222-H Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 101.00-50.79	74.82	75.90	1.191	1	1	0.9225	4.3		1	93.297
L2 50.79-1.50	26.21	26.15	0.955	1	1	0.8306	3.4		1	120.067

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 101.00-50.79	74.82		1.191	1	1		9.2		1	85.345
L2 50.79-1.50	26.21		0.955	1	1		7.2		1	113.039

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	34.5	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883
L2 50.79-1.50	26.21	0.955	27.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 101.00-50.79	74.82	1.191	4.3	0.9225	90.579	A	0.000	93.297	93.297	100.00	0.000	0.000
						B	0.000	93.297		100.00	0.000	0.000
						C	0.000	93.297		100.00	0.000	11.147
L2 50.79-1.50	26.21	0.955	3.4	0.8306	117.325	A	0.000	120.845	120.845	100.00	0.000	0.000
						B	0.000	120.845		100.00	0.000	0.000
						C	0.000	120.845		100.00	0.000	10.943

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	74.82	1.191	9.2	82.859	A	0.000	85.345	85.345	100.00	0.000	0.000
101.00-50.79					B	0.000	85.345		100.00	0.000	0.000
					C	0.000	85.345		100.00	0.000	1.883

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2 50.79-1.50	26.21	0.955	7.2	109.746	A	0.000	113.039	113.039	100.00	0.000	0.000
					B	0.000	113.039		100.00	0.000	0.000
					C	0.000	113.039		100.00	0.000	1.848

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	34.5	1	1	85.345	2438.21	0.05	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	27.2	1	1	113.039	2526.52	0.05	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
Sum Weight:	322.38	5927.16						OTM	241190.73 lb-ft	4964.73		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	211.78	3233.59	A	1	1.2	4.3	1	1	93.297	585.96	0.01	C
101.00-50.79			B	1	1.2		1	1	93.297			
			C	1	1.2		1	1	93.297			
L2 50.79-1.50	207.90	5236.24	A	1	1.2	3.4	1	1	120.067	581.72	0.01	C
			B	1	1.2		1	1	120.067			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			C	1	1.2		1	1	120.067			
Sum Weight:	419.68	8469.83						OTM	57334.88 lb-ft	1167.68		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	162.68	2064.54	A	1	0.73	9.2	1	1	85.345	647.42	0.01	C
101.00-50.79			B	1	0.73		1	1	85.345			
			C	1	0.73		1	1	85.345			
L2 50.79-1.50	159.70	3862.62	A	1	0.73	7.2	1	1	113.039	670.87	0.01	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
			B	1	0.73		1	1	113.039			
			C	1	0.73		1	1	113.039			
Sum Weight:	322.38	5927.16						OTM	64043.92 lb-ft	1318.30		

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	36.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	37.0	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	37.1	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	36.9	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	37.0	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	37.0	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	37.0	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	37.0	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	37.0	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	37.1	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	36.9	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	36.9	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	36.9	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	37.0	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	34.1	3.75	1.28
	Sum Weight:	6317.00							

Discrete Appurtenance Pressures - With Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	3898.37	0.00	0.00	99.50	1.264	4.6	106.52	106.52	0.9492
Commscope 2HH-38A-R4	300.0000	408.83	-7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-6.76	3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	300.0000	197.26	-5.19	-0.69	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	300.0000	400.40	-3.19	-4.15	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-3.26	-3.03	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	300.0000	408.83	-1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	300.0000	77.48	-6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	300.0000	77.42	-6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	300.0000	96.63	-3.01	-3.47	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	300.0000	110.12	-3.01	-3.47	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	300.0000	77.48	-0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	300.0000	77.42	-0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	60.0000	408.83	1.19	-7.61	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	60.0000	197.26	3.19	-4.15	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	60.0000	61.35	4.26	-1.30	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	60.0000	400.40	5.19	-0.69	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	60.0000	408.83	7.19	2.78	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	60.0000	61.35	4.76	-0.44	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	60.0000	77.48	0.76	-7.37	103.00	1.274	4.6	2.18	1.05	0.9525

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
RRU 4424 B25	60.0000	77.42	0.76	-7.37	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	60.0000	96.63	4.51	-0.87	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	60.0000	110.12	5.01	-0.01	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	60.0000	77.48	6.76	3.02	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4415 B66A	60.0000	77.42	6.76	3.02	101.00	1.268	4.6	2.18	1.05	0.9506
Commscope 2HH-38A-R4	180.0000	408.83	6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
Ericsson AIR6449 B41	180.0000	197.26	2.00	5.34	102.00	1.271	4.6	6.26	2.93	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RFS APXVAARR24_43-U-NA20	180.0000	400.40	-2.00	5.34	102.00	1.271	4.6	21.40	9.84	0.9515
8' Mount Pipe	300.0000	61.35	-2.76	-3.90	102.00	1.271	4.6	3.71	3.71	0.9515
Commscope 2HH-38A-R4	180.0000	408.83	-6.00	5.34	102.00	1.271	4.6	12.01	5.20	0.9515
8' Mount Pipe	180.0000	61.35	-2.00	4.34	102.00	1.271	4.6	3.71	3.71	0.9515
RRU 4424 B25	180.0000	77.48	6.00	4.35	103.00	1.274	4.6	2.18	1.05	0.9525
RRU 4424 B25	180.0000	77.42	6.00	4.35	101.00	1.268	4.6	2.18	1.05	0.9506
RRU 11 B2	180.0000	96.63	-1.50	4.35	101.00	1.268	4.6	3.19	1.48	0.9506
RRU 4449 B71+B85	180.0000	110.12	-2.50	4.35	101.00	1.268	4.6	1.92	1.44	0.9506
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
RRU 4415 B66A	180.0000	77.45	-6.00	4.35	102.00	1.271	4.6	2.18	1.05	0.9515
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
Andrew SO 101-1	0.0000	133.41	0.00	0.00	69.00	1.171	4.3	5.03	1.48	0.9151
	Sum Weight:	10830.46								

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
EEI Band-On 12' Low Profile Platform w/12 pipe	0.0000	2000.00	0.00	0.00	99.50	1.264	9.8	29.35	29.35
Commscope 2HH-38A-R4	300.0000	327.00	-7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-6.76	3.03	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	300.0000	119.00	-5.19	-0.69	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	300.0000	153.00	-3.19	-4.15	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-3.26	-3.03	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	300.0000	327.00	-1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	300.0000	47.00	-6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	300.0000	47.00	-6.76	3.02	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	300.0000	51.00	-3.01	-3.47	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	300.0000	74.00	-3.01	-3.47	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	300.0000	47.00	-0.76	-7.37	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	60.0000	327.00	1.19	-7.61	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Ericsson AIR6449 B41	60.0000	119.00	3.19	-4.15	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	60.0000	29.00	4.26	-1.30	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	60.0000	153.00	5.19	-0.69	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	60.0000	327.00	7.19	2.78	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	60.0000	29.00	4.76	-0.44	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	60.0000	47.00	0.76	-7.37	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	60.0000	47.00	0.76	-7.37	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	60.0000	51.00	4.51	-0.87	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	60.0000	74.00	5.01	-0.01	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	60.0000	47.00	6.76	3.02	103.00	1.274	9.8	1.86	0.82
RRU 4415 B66A	60.0000	47.00	6.76	3.02	101.00	1.268	9.8	1.86	0.82
Commscope 2HH-38A-R4	180.0000	327.00	6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
Ericsson AIR6449 B41	180.0000	119.00	2.00	5.34	102.00	1.271	9.8	5.68	2.49
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RFS APXVAARR24_43-U-NA20	180.0000	153.00	-2.00	5.34	102.00	1.271	9.8	20.24	8.89
8' Mount Pipe	300.0000	29.00	-2.76	-3.90	102.00	1.271	9.8	1.90	1.90
Commscope 2HH-38A-R4	180.0000	327.00	-6.00	5.34	102.00	1.271	9.8	11.17	4.61
8' Mount Pipe	180.0000	29.00	-2.00	4.34	102.00	1.271	9.8	1.90	1.90
RRU 4424 B25	180.0000	47.00	6.00	4.35	103.00	1.274	9.8	1.86	0.82
RRU 4424 B25	180.0000	47.00	6.00	4.35	101.00	1.268	9.8	1.86	0.82
RRU 11 B2	180.0000	51.00	-1.50	4.35	101.00	1.268	9.8	2.79	1.19
RRU 4449 B71+B85	180.0000	74.00	-2.50	4.35	101.00	1.268	9.8	1.67	1.15
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
RRU 4415 B66A	180.0000	47.00	-6.00	4.35	102.00	1.271	9.8	1.86	0.82
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
Andrew SO 101-1	0.0000	84.00	0.00	0.00	69.00	1.171	9.0	3.75	1.28
	Sum Weight:	6317.00							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	5927.16					
Bracing Weight	0.00					
Total Member Self-Weight	5927.16			524.69	236.51	
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - No Ice		0.00	-11534.21	-883683.98	236.51	-517.09
Wind 30 deg - No Ice		5767.10	-9988.92	-765222.48	-441867.87	-240.61
Wind 60 deg - No Ice		9988.92	-5767.10	-441579.64	-765510.74	100.33
Wind 90 deg - No Ice		11534.21	0.00	524.69	-883972.25	414.40
Wind 120 deg - No Ice		9988.92	5767.10	442629.02	-765510.74	617.42
Wind 150 deg - No Ice		5767.10	9988.92	766271.86	-441867.87	655.01
Wind 180 deg - No Ice		0.00	11534.21	884733.36	236.51	517.09
Wind 210 deg - No Ice		-5767.10	9988.92	766271.86	442340.88	240.61
Wind 240 deg - No Ice		-9988.92	5767.10	442629.02	765983.75	-100.33
Wind 270 deg - No Ice		-11534.21	0.00	524.69	884445.26	-414.40
Wind 300 deg - No Ice		-9988.92	-5767.10	-441579.64	765983.75	-617.42
Wind 330 deg - No Ice		-5767.10	-9988.92	-765222.48	442340.88	-655.01
Member Ice	2542.67					
Total Weight Ice	19719.97			832.74	537.38	
Wind 0 deg - Ice		0.00	-2546.41	-191325.50	537.38	-174.95
Wind 30 deg - Ice		1273.20	-2205.25	-165581.18	-95541.75	-105.79
Wind 60 deg - Ice		2205.25	-1273.20	-95246.38	-165876.55	-8.28
Wind 90 deg - Ice		2546.41	0.00	832.74	-191620.88	91.44
Wind 120 deg - Ice		2205.25	1273.20	96911.87	-165876.55	166.67
Wind 150 deg - Ice		1273.20	2205.25	167246.67	-95541.75	197.23
Wind 180 deg - Ice		0.00	2546.41	192990.99	537.38	174.95
Wind 210 deg - Ice		-1273.20	2205.25	167246.67	96616.51	105.79
Wind 240 deg - Ice		-2205.25	1273.20	96911.87	166951.31	8.28
Wind 270 deg - Ice		-2546.41	0.00	832.74	192695.64	-91.44
Wind 300 deg - Ice		-2205.25	-1273.20	-95246.38	166951.31	-166.67
Wind 330 deg - Ice		-1273.20	-2205.25	-165581.18	96616.51	-197.23
Total Weight	12566.54			524.69	236.51	
Wind 0 deg - Service		0.00	-3062.70	-234271.70	218.41	-137.30
Wind 30 deg - Service		1531.35	-2652.38	-202816.35	-117174.57	-63.89
Wind 60 deg - Service		2652.38	-1531.35	-116878.73	-203112.20	26.64
Wind 90 deg - Service		3062.70	0.00	514.24	-234567.55	110.04
Wind 120 deg - Service		2652.38	1531.35	117907.22	-203112.20	163.95
Wind 150 deg - Service		1531.35	2652.38	203844.84	-117174.57	173.93
Wind 180 deg - Service		0.00	3062.70	235300.19	218.41	137.30
Wind 210 deg - Service		-1531.35	2652.38	203844.84	117611.40	63.89
Wind 240 deg - Service		-2652.38	1531.35	117907.22	203549.03	-26.64
Wind 270 deg - Service		-3062.70	0.00	514.24	235004.38	-110.04
Wind 300 deg - Service		-2652.38	-1531.35	-116878.73	203549.03	-163.95
Wind 330 deg - Service		-1531.35	-2652.38	-202816.35	117611.40	-173.93

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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
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 lb-ft	Minor Axis Moment lb-ft
L1	101 - 50.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15690.99	656.70	-1130.87
			Max. Mx	20	-9110.37	399110.67	-689.49
			Max. My	14	-9109.75	285.53	-399505.00
			Max. Vy	20	-9781.34	399110.67	-689.49
			Max. Vx	14	9781.93	285.53	-399505.00
			Max. Torque	24			644.37
L2	50.79 - 1.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22328.58	749.91	-1219.52
			Max. Mx	20	-15052.38	965817.31	-730.89
			Max. My	14	-15052.37	315.25	-966221.74
			Max. Vy	20	-11570.03	965817.31	-730.89
			Max. Vx	14	11570.05	315.25	-966221.74
			Max. Torque	24			702.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	33	22328.58	0.00	-2546.54
	Max. H_x	20	15079.85	11534.21	-0.00
	Max. H_z	2	15079.85	0.00	11534.21
	Max. M_x	2	964754.58	0.00	11534.21
	Max. M_z	8	965159.26	-11534.21	-0.00
	Max. Torsion	24	702.40	5767.10	9988.92
	Min. Vert	19	11309.88	9988.92	-5767.10
	Min. H_x	8	15079.85	-11534.21	-0.00
	Min. H_z	14	15079.85	0.00	-11534.21
	Min. M_x	14	-966221.74	0.00	-11534.21
	Min. M_z	20	-965817.31	11534.21	-0.00
	Min. Torsion	12	-702.29	-5767.10	-9988.92

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	12566.54	-0.00	0.00	586.46	263.45	-0.01
1.2 Dead+1.0 Wind 0 deg - No Ice	15079.85	-0.00	-11534.21	-964754.58	314.95	-532.14
0.9 Dead+1.0 Wind 0 deg - No Ice	11309.88	-0.00	-11534.21	-941828.03	226.45	-524.32
1.2 Dead+1.0 Wind 30 deg - No Ice	15079.84	5767.10	-9988.92	-835407.42	-482429.67	-219.18
0.9 Dead+1.0 Wind 30 deg - No Ice	11309.88	5767.10	-9988.92	-815574.40	-470948.40	-223.40
1.2 Dead+1.0 Wind 60 deg - No Ice	15079.84	9988.92	-5767.10	-482011.94	-835819.65	152.40

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	11309.88	9988.92	-5767.10	-470649.16	-815869.80	137.27
1.2 Dead+1.0 Wind 90 deg - No Ice	15079.85	11534.21	0.00	730.57	-965159.26	483.24
0.9 Dead+1.0 Wind 90 deg - No Ice	11309.88	11534.21	0.00	524.20	-942118.14	461.26
1.2 Dead+1.0 Wind 120 deg - No Ice	15079.84	9988.92	5767.10	483474.50	-835822.36	684.47
0.9 Dead+1.0 Wind 120 deg - No Ice	11309.88	9988.92	5767.10	471698.63	-815871.71	661.61
1.2 Dead+1.0 Wind 150 deg - No Ice	15079.84	5767.10	9988.92	836873.05	-482432.40	702.29
0.9 Dead+1.0 Wind 150 deg - No Ice	11309.88	5767.10	9988.92	816626.05	-470950.33	684.59
1.2 Dead+1.0 Wind 180 deg - No Ice	15079.85	-0.00	11534.21	966221.74	314.87	532.04
0.9 Dead+1.0 Wind 180 deg - No Ice	11309.88	-0.00	11534.21	942880.76	226.41	524.26
1.2 Dead+1.0 Wind 210 deg - No Ice	15079.84	-5767.10	9988.92	836885.32	483069.11	219.16
0.9 Dead+1.0 Wind 210 deg - No Ice	11309.88	-5767.10	9988.92	816634.66	471408.10	223.43
1.2 Dead+1.0 Wind 240 deg - No Ice	15079.84	-9988.92	5767.10	483486.75	836473.29	-152.44
0.9 Dead+1.0 Wind 240 deg - No Ice	11309.88	-9988.92	5767.10	471707.24	816339.45	-137.34
1.2 Dead+1.0 Wind 270 deg - No Ice	15079.85	-11534.21	0.00	730.54	965817.31	-483.22
0.9 Dead+1.0 Wind 270 deg - No Ice	11309.88	-11534.21	0.00	524.19	942590.87	-461.24
1.2 Dead+1.0 Wind 300 deg - No Ice	15079.84	-9988.92	-5767.10	-482024.25	836470.65	-684.45
0.9 Dead+1.0 Wind 300 deg - No Ice	11309.88	-9988.92	-5767.10	-470657.79	816337.57	-661.55
1.2 Dead+1.0 Wind 330 deg - No Ice	15079.84	-5767.10	-9988.92	-835419.72	483066.51	-702.40
0.9 Dead+1.0 Wind 330 deg - No Ice	11309.88	-5767.10	-9988.92	-815583.02	471406.23	-684.71
1.2 Dead+1.0 Ice+1.0 Temp	22328.58	-0.01	0.01	1219.52	749.91	-0.01
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	-2546.54	-222375.13	762.31	-190.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	-2205.27	-192443.42	-111062.50	-104.76
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	-1273.21	-110581.61	-192923.48	8.81
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	22328.58	2546.54	0.00	1242.72	-222853.90	119.99
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	22328.58	2205.27	1273.22	113067.75	-192923.62	199.07
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	22328.58	1273.21	2205.27	194929.66	-111062.66	224.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	22328.58	-0.00	2546.54	224860.72	762.24	190.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	2205.27	194931.22	112588.39	104.73
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	1273.22	113069.29	194451.18	-8.85
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	22328.58	-2546.54	0.00	1242.69	224382.00	-120.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	22328.58	-2205.27	-1273.21	-110583.20	194451.11	-199.09

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	22328.58	-1273.22	-2205.27	-192445.00	112588.35	-224.80
Dead+Wind 0 deg - Service	12566.54	-0.00	-3062.71	-252802.89	271.65	-144.24
Dead+Wind 30 deg - Service	12566.54	1531.35	-2652.38	-218852.13	-126432.95	-60.75
Dead+Wind 60 deg - Service	12566.54	2652.38	-1531.35	-126097.85	-219186.92	38.99
Dead+Wind 90 deg - Service	12566.54	3062.71	0.00	606.62	-253137.25	128.30
Dead+Wind 120 deg - Service	12566.54	2652.38	1531.35	127311.18	-219187.09	183.23
Dead+Wind 150 deg - Service	12566.54	1531.35	2652.38	220065.64	-126433.12	189.05
Dead+Wind 180 deg - Service	12566.54	-0.00	3062.71	254016.49	271.64	144.22
Dead+Wind 210 deg - Service	12566.54	-1531.35	2652.38	220066.35	126976.81	60.75
Dead+Wind 240 deg - Service	12566.54	-2652.38	1531.35	127311.89	219731.61	-39.01
Dead+Wind 270 deg - Service	12566.54	-3062.71	0.00	606.61	253682.19	-128.31
Dead+Wind 300 deg - Service	12566.54	-2652.38	-1531.35	-126098.56	219731.46	-183.23
Dead+Wind 330 deg - Service	12566.54	-1531.35	-2652.38	-218852.85	126976.66	-189.07

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	-12566.54	0.00	0.00	12566.54	-0.00	0.000%
2	0.00	-15079.84	-11534.21	0.00	15079.85	11534.21	0.000%
3	0.00	-11309.88	-11534.21	0.00	11309.88	11534.21	0.000%
4	5767.10	-15079.84	-9988.92	-5767.10	15079.84	9988.92	0.000%
5	5767.10	-11309.88	-9988.92	-5767.10	11309.88	9988.92	0.000%
6	9988.92	-15079.84	-5767.10	-9988.92	15079.84	5767.10	0.000%
7	9988.92	-11309.88	-5767.10	-9988.92	11309.88	5767.10	0.000%
8	11534.21	-15079.84	0.00	-11534.21	15079.85	-0.00	0.000%
9	11534.21	-11309.88	0.00	-11534.21	11309.88	-0.00	0.000%
10	9988.92	-15079.84	5767.10	-9988.92	15079.84	-5767.10	0.000%
11	9988.92	-11309.88	5767.10	-9988.92	11309.88	-5767.10	0.000%
12	5767.10	-15079.84	9988.92	-5767.10	15079.84	-9988.92	0.000%
13	5767.10	-11309.88	9988.92	-5767.10	11309.88	-9988.92	0.000%
14	0.00	-15079.84	11534.21	0.00	15079.85	-11534.21	0.000%
15	0.00	-11309.88	11534.21	0.00	11309.88	-11534.21	0.000%
16	-5767.10	-15079.84	9988.92	5767.10	15079.84	-9988.92	0.000%
17	-5767.10	-11309.88	9988.92	5767.10	11309.88	-9988.92	0.000%
18	-9988.92	-15079.84	5767.10	9988.92	15079.84	-5767.10	0.000%
19	-9988.92	-11309.88	5767.10	9988.92	11309.88	-5767.10	0.000%
20	-11534.21	-15079.84	0.00	11534.21	15079.85	-0.00	0.000%
21	-11534.21	-11309.88	0.00	11534.21	11309.88	-0.00	0.000%
22	-9988.92	-15079.84	-5767.10	9988.92	15079.84	5767.10	0.000%
23	-9988.92	-11309.88	-5767.10	9988.92	11309.88	5767.10	0.000%
24	-5767.10	-15079.84	-9988.92	5767.10	15079.84	9988.92	0.000%
25	-5767.10	-11309.88	-9988.92	5767.10	11309.88	9988.92	0.000%
26	0.00	-22328.58	0.00	0.01	22328.58	-0.01	0.000%
27	0.00	-22328.58	-2546.41	0.00	22328.58	2546.54	0.001%
28	1273.20	-22328.58	-2205.25	-1273.21	22328.58	2205.27	0.000%
29	2205.25	-22328.58	-1273.20	-2205.27	22328.58	1273.21	0.000%
30	2546.41	-22328.58	0.00	-2546.54	22328.58	-0.00	0.001%
31	2205.25	-22328.58	1273.20	-2205.27	22328.58	-1273.22	0.000%
32	1273.20	-22328.58	2205.25	-1273.21	22328.58	-2205.27	0.000%
33	0.00	-22328.58	2546.41	0.00	22328.58	-2546.54	0.001%
34	-1273.20	-22328.58	2205.25	1273.22	22328.58	-2205.27	0.000%
35	-2205.25	-22328.58	1273.20	2205.27	22328.58	-1273.22	0.000%
36	-2546.41	-22328.58	0.00	2546.54	22328.58	-0.00	0.001%
37	-2205.25	-22328.58	-1273.20	2205.27	22328.58	1273.21	0.000%
38	-1273.20	-22328.58	-2205.25	1273.22	22328.58	2205.27	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
39	0.00	-12566.54	-3062.70	0.00	12566.54	3062.71	0.000%
40	1531.35	-12566.54	-2652.38	-1531.35	12566.54	2652.38	0.000%
41	2652.38	-12566.54	-1531.35	-2652.38	12566.54	1531.35	0.000%
42	3062.70	-12566.54	0.00	-3062.71	12566.54	-0.00	0.000%
43	2652.38	-12566.54	1531.35	-2652.38	12566.54	-1531.35	0.000%
44	1531.35	-12566.54	2652.38	-1531.35	12566.54	-2652.38	0.000%
45	0.00	-12566.54	3062.70	0.00	12566.54	-3062.71	0.000%
46	-1531.35	-12566.54	2652.38	1531.35	12566.54	-2652.38	0.000%
47	-2652.38	-12566.54	1531.35	2652.38	12566.54	-1531.35	0.000%
48	-3062.70	-12566.54	0.00	3062.71	12566.54	-0.00	0.000%
49	-2652.38	-12566.54	-1531.35	2652.38	12566.54	1531.35	0.000%
50	-1531.35	-12566.54	-2652.38	1531.35	12566.54	2652.38	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00001492
2	Yes	5	0.00000001	0.00042141
3	Yes	5	0.00000001	0.00016829
4	Yes	7	0.00000001	0.00013139
5	Yes	6	0.00000001	0.00038376
6	Yes	7	0.00000001	0.00013167
7	Yes	6	0.00000001	0.00038496
8	Yes	5	0.00000001	0.00042563
9	Yes	5	0.00000001	0.00016227
10	Yes	7	0.00000001	0.00013657
11	Yes	6	0.00000001	0.00039950
12	Yes	7	0.00000001	0.00012960
13	Yes	6	0.00000001	0.00037778
14	Yes	5	0.00000001	0.00042241
15	Yes	5	0.00000001	0.00016848
16	Yes	7	0.00000001	0.00013435
17	Yes	6	0.00000001	0.00039256
18	Yes	7	0.00000001	0.00013405
19	Yes	6	0.00000001	0.00039131
20	Yes	5	0.00000001	0.00042609
21	Yes	5	0.00000001	0.00016236
22	Yes	7	0.00000001	0.00012934
23	Yes	6	0.00000001	0.00037737
24	Yes	7	0.00000001	0.00013632
25	Yes	6	0.00000001	0.00039912
26	Yes	4	0.00000001	0.00003559
27	Yes	5	0.00019689	0.00058663
28	Yes	6	0.00000001	0.00020603
29	Yes	6	0.00000001	0.00020812
30	Yes	5	0.00019705	0.00058598
31	Yes	6	0.00000001	0.00022284
32	Yes	6	0.00000001	0.00020974
33	Yes	5	0.00019755	0.00060202
34	Yes	6	0.00000001	0.00022373
35	Yes	6	0.00000001	0.00022110
36	Yes	5	0.00019741	0.00059493
37	Yes	6	0.00000001	0.00020714
38	Yes	6	0.00000001	0.00022050
39	Yes	5	0.00000001	0.00003296

40	Yes	5	0.00000001	0.00028552
41	Yes	5	0.00000001	0.00028692
42	Yes	5	0.00000001	0.00003245
43	Yes	5	0.00000001	0.00031891
44	Yes	5	0.00000001	0.00027995
45	Yes	5	0.00000001	0.00003334
46	Yes	5	0.00000001	0.00030750
47	Yes	5	0.00000001	0.00030575
48	Yes	5	0.00000001	0.00003263
49	Yes	5	0.00000001	0.00027639
50	Yes	5	0.00000001	0.00031552

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	29.275	46	2.5825	0.0073
L2	54.21 - 1.5	8.244	46	1.4629	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	46	29.275	2.5825	0.0074	12745
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	46	28.497	2.5479	0.0072	12745
69.00	Andrew SO 101-1	46	13.718	1.8321	0.0034	1990

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 50.79	111.200	14	9.8198	0.0274
L2	54.21 - 1.5	31.377	14	5.5744	0.0074

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Commscope 2HH-38A-R4	14	111.200	9.8198	0.0274	3488
99.50	EEI Band-On 12' Low Profile Platform w/12 pipe	14	108.250	9.6890	0.0266	3488
69.00	Andrew SO 101-1	14	52.160	6.9765	0.0126	538

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	101 - 50.79 (1)	TP23.05x16x0.1875	50.21	0.00	0.0	13.3203	-9109.55	779235.00	0.012
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	52.71	0.00	0.0	23.6066	-15052.40	1380990.00	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	399570.00	427494.17	0.935	0.00	427494.17	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	966300.00	1007983.33	0.959	0.00	1007983.33	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 lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	101 - 50.79 (1)	TP23.05x16x0.1875	9782.16	233771.00	0.042	188.81	458220.83	0.000
L2	50.79 - 1.5 (2)	TP30x22.1948x0.25	11570.10	414296.00	0.028	219.16	1079391.67	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	101 - 50.79 (1)	0.012	0.935	0.000	0.042	0.000	0.948 ✔	1.000	4.8.2 ✔
L2	50.79 - 1.5 (2)	0.011	0.959	0.000	0.028	0.000	0.970 ✔	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	101 - 50.79	Pole	TP23.05x16x0.1875	1	-9109.55	779235.00	94.8	Pass
L2	50.79 - 1.5	Pole	TP30x22.1948x0.25	2	-15052.40	1380990.00	97.0	Pass
							Summary	
						Pole (L2)	97.0	Pass
						RATING =	**97.0**	**Pass**

T-MOBILE NORTHEAST LLC
SITE ID: 7WAN235A
SITE NAME: BOE - RICHARD D. RIDDLE SCHOOL
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
T-MOBILE ANCHOR PROJECT

TRUE NORTH

DESIGN BASED ON FINAL RFDS:
7WAN235A_ANCHOR_RFDS_FINAL_11_2020-08-28

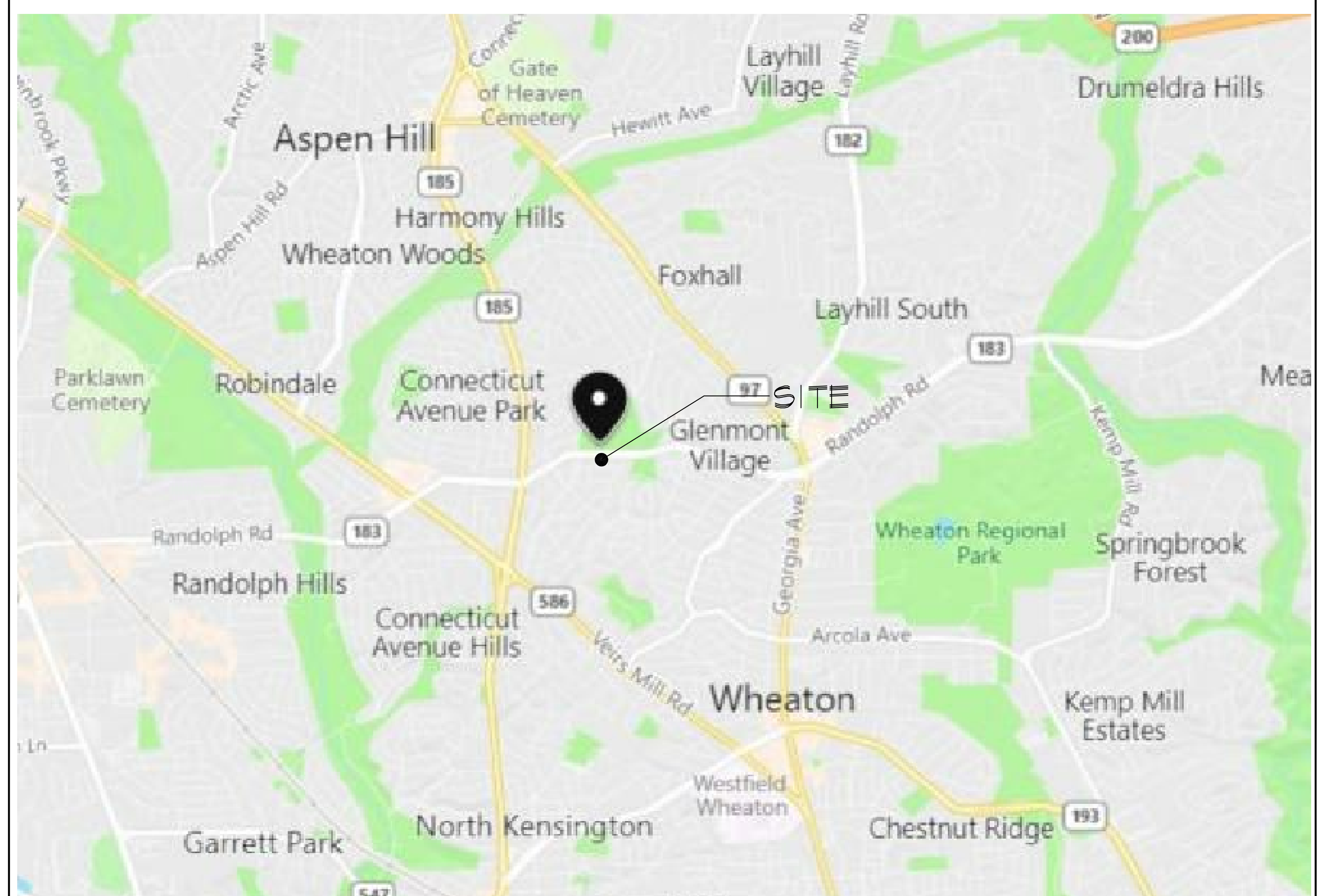
NOTE TO GENERAL CONTRACTOR

NO WORK IS TO BE PERFORMED ON THIS SITE WITHOUT REVIEW OF THE APPROVED STRUCTURAL ANALYSIS. IF ANY DISCREPANCIES ARE FOUND THE GENERAL CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING. AT NO TIME WILL ANY ADDITIONAL ANTENNAS BE INSTALLED WITHOUT WRITTEN CONSENT FROM TOWER ENGINEER.

SITE INFORMATION

SCOPE OF WORK:	(9) EXISTING ANTENNAS TO BE RELOCATED (3) PROPOSED AIR6449 B41 ANTENNAS TO BE INSTALLED (6) 4415 B25 RADIOS TO BE REMOVED (6) 4424 B25 RADIOS TO BE INSTALLED (12) EXISTING RADIOS TO BE RELOCATED (1) 6X12 HYBRID CABLE TO BE INSTALLED (1) RBS 2106 CABINET TO BE REMOVED (1) RBS 6131 CABINET TO REMAIN (1) 6160 CABINET TO BE ADDED (1) B160 CABİNET TO BE ADDED
PROJECT DESIGN:	T-MOBILE CONSTRUCTION
SITE ID NUMBER:	7WAN235A
911 SITE ADDRESS:	12501-A DALEWOOD DRIVE SILVER SPRING, MD 20906
CENTROID OF (6) SECTORS:	LAT. = 39° 03' 35.53" , LONG. = -77° 04' 1.20"
JURISDICTION:	MONTGOMERY, MD
ZONING:	R-60
ACCOUNT ID :	DISTRICT - 13 ACCOUNT NUMBER - 00953838
	MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE:	/01570/ 00082
GROUND ELEVATION:	371'± (NAVD 88)
STRUCTURE HEIGHT:	96' -0" ± AGL

VICINITY PLAN



INDEX OF DRAWINGS

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

PROJECT TEAM

APPLICANT:	T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610
PROJECT MANAGEMENT FIRM:	SITE LINK WIRELESS, LLC. 3620 COMMERCE DRIVE, SUITE 707 BALTIMORE, MD 21227 (410) 309-4949
ENGINEERING FIRMS:	TELEGENT ENGINEERING INC. 2216 COMMERCE ROAD, SUITE 1 FOREST HILL, MD 21050 (410) 692-5816
	MORRIS & RITCHIE ASSOCIATES, INC. 1220-C EAST JOPPA ROAD, SUITE 505 TOWSON, MD 21286 (410) 821-1690

CODE ANALYSIS

APPLICABLE BUILDING CODE:	IBC 2018
APPLICABLE ELECTRIC CODE:	NFPA 2017
USE GROUP:	UTILITY (U)

DIRECTIONS TO SITE

FROM BELTSVILLE:

1. HEAD SOUTHWEST TOWARD BALTIMORE AVE
2. TURN RIGHT TO MERGE ONTO I-495 W/I-95 N
3. MERGE ONTO I-495 W/I-95 N
4. CONTINUE TO FOLLOW I-495 W
5. TAKE EXIT 31 FOR MD-97/GEORGIA AVE TOWARD SILVER SPRING/WHEATON
6. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR MD-97 N AND MERGE ONTO MD-97 N/GEORGIA AVE
7. MERGE ONTO MD-97 N/GEORGIA AVE
8. USE THE LEFT 2 LANES TO TURN SLIGHTLY LEFT ONTO VEIRS MILL RD
9. TURN RIGHT ONTO CONNECTICUT AVE
10. KEEP RIGHT TO CONTINUE TOWARD RANDOLPH RD
11. SLIGHT RIGHT ONTO RANDOLPH RD
12. TURN LEFT ONTO DALEWOOD DR
13. TURN RIGHT AT EVERTON ST

DESTINATION WILL BE ON THE RIGHT

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	DISAPPROVED/ REVISE
PROPERTY OWNER	DATE	☐	☐	☐
SITE ACQUISITION	DATE	☐	☐	☐
CONSTRUCTION MANAGER	DATE	☐	☐	☐
ZONING	DATE	☐	☐	☐
RF ENGINEER	DATE	☐	☐	☐

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below. Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Cover Sheet

SHEET NUMBER

CS-1

STRUCTURAL NOTES:

CODES

ALL CONSTRUCTION SHALL CONFORM WITH THE:

A. INTERNATIONAL BUILDING CODE 2018 (IBC 2018)

B. ANSI/TIA-222-H-2017 "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS", AND ALL SUBSEQUENT SUPPLEMENTS

C. IN ADDITION, ALL CONSTRUCTION SHALL CONFORM WITH THE GOVERNING LOCAL BUILDING CODE.

DESIGN DATA

A. MOUNT MODIFICATIONS HAVE BEEN DESIGNED TO SUPPORT THE APPURTENANCES LISTED IN THE ANTENNA MOUNT ANALYSIS BY MORRIS & RITCHIE ASSOCIATES, JOB NO, 19851.038 - REVISION 1, DATED AUGUST 28, 2020,

B.

C. WIND LOAD DESIGN DATA

ULTIMATE WIND SPEED (NO ICE):	Vult = 113 MPH
BASIC WIND SPEED (WITH ICE):	VI = 40 MPH
DESIGN RADIAL ICE THICKNESS:	1" (ICE THICKNESS INCREASES WITH HEIGHT)
RISK CATEGORY:	II
EXPOSURE CATEGORY:	C
TOPOGRAPHIC CATEGORY:	1

D. EARTHQUAKE LOAD DESIGN DATA

SHORT PERIOD ACCELERATION, Ss:	0.134 g
ONE SECOND PERIOD ACCELERATION,S1:	0.043 g
SITE CLASS:	D (BY DEFAULT)
DAMPED SHORT PERIOD ACCELERATION, S_{DS}:	0.144 g
RESPONSE MODIFICATION FACTOR, R	2.0
SEISMIC RESPONSE COEFFICIENT, Cs:	0.0715 g
SEISMIC DESIGN CATEGORY:	B

E. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF TEMPORARY BRACING AND CONSTRUCTION SUPPORTS FOR THE EXISTING STRUCTURE, AS REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR THE METHOD OF CONSTRUCTION AND SHALL PROVIDE ALL TEMPORARY BRACING AND SHORING REQUIRED TO MAINTAIN THE STABILITY OF THE STRUCTURE AND TO SUPPORT CONSTRUCTION LOADS DURING CONSTRUCTION.

EXISTING STRUCTURE

A. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

B. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS OR OTHER APPURTENANCES, AS NEEDED, DURING CONSTRUCTION.

C. CONTRACTOR SHALL PROTECT ALL EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.

D. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE MOUNT UNTIL THE REINFORCING WORK IS COMPLETE.

E. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE AND CONDITION OF ALL EXISTING MOUNT ELEMENTS. SHOULD THE SIZE OR CONDITION OF THE EXISTING ELEMENTS DIFFER FROM THAT SHOWN ON THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

F. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS, TO THE COMPLETE SATISFACTION OF THE OWNER, OF ANY STRUCTURAL ELEMENTS WHICH ARE TO REMAIN AND THAT HAVE BEEN DAMAGED . THE REPAIRS SHALL BE AT NO EXPENSE TO THE OWNER. ALL REPAIR WORK SHALL BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE THAT THE PROJECT IS LOCATED AND SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO COMMENCING REPAIR WORK.

G. DO NOT PERMIT PORTIONS OF THE STRUCTURE TO FALL NOR DEBRIS TO DROP EXCEPT BY METHODS WHICH WILL INSURE INTEGRITY OF THE STRUCTURE.

MISCELLANEOUS

A. ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 20 MPH.

B. SHOP DRAWINGS FOR ALL STRUCTURAL ELEMENTS SHOWN ON THE CONTRACT DOCUMENTS MUST BE SUBMITTED FOR REVIEW BY THE ENGINEER. IF THE SHOP DRAWINGS ARE NOT SUBMITTED FOR REVIEW, THE ENGINEER WILL NOT BE RESPONSIBLE FOR STRUCTURAL CERTIFICATION AND DESIGN OF THE PROJECT. THE SHOP DRAWINGS SHALL INDICATE ANY DEVIATIONS OR OMISSIONS FROM THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION AND MAKE ALL CORRECTIONS DEEMED NECESSARY.

C. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES AND OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

D. SCALES SHOWN ON THE STRUCTURAL CONTRACT DRAWINGS ARE FOR GENERAL INFORMATION ONLY. DIMENSIONAL INFORMATION SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

E. THE CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURE DURING CONSTRUCTION. IMMEDIATELY NOTIFY THE ENGINEER OF AREAS EXHIBITING DISTRESS OR FAILURE.

STRUCTURAL AND MISCELLANEOUS STEEL

A. ALL STEEL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (ANSI/AISC 360) AND THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

B. ALL PIPE SHALL CONFORM TO ASTM A53, GRADE B (Fy = 35 KSI),

C. ALL HSS RECTANGULAR TUBE SHALL CONFORM TO ASTM A500 GRADE B, (Fy = 46 KSI).

D. ALL ANGLES, PLATES & CHANNELS SHALL CONFORM TO ASTM A36 (Fy = 36 KSI),

E. ALL BOLT SHALL CONFORM TO ASTM F3125 GRADE A325 (Fu = 120 KSI), UNLESS OTHERWISE NOTED.

F. ALL U-BOLT SHALL CONFORM TO SAE J429 GRADE 2 WITH SAE J995 NUTS AND WASHERS.

G. ALL WASHER SHALL CONFORM TO ASTM F436.

H. ALL SHOP WELDED CONNECTION SHALL USE E70XX ELECTRODES. FIELD WELDING IS NOT PERMITTED.

I. ALL SHOP WELDS SHALL BE PERFORMED BY CERTIFIED WELDERS AND CONFORM TO THE AMERICAN WELDING SOCIETY CODE FOR BUILDINGS AWS D1.1. WELDS SHALL DEVELOP THE FULL STRENGTH OF MATERIALS BEING WELDED UNLESS OTHERWISE INDICATED.

J. THE CONTRACTOR SHALL NOT SPLICE OR CUT OPENINGS IN STEEL MEMBERS NOT SHOWN ON CONTRACT DRAWINGS WITHOUT THE PERMISSION OF THE STRUCTURAL ENGINEER.

K. ALL STEEL MEMBERS, FABRICATIONS AND ASSEMBLIES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION. ALL BOLTS, WASHERS & NUTS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM F2329.

L. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

M. AN INDEPENDENT INSPECTION AGENCY SHALL INSPECT ALL STRUCTURAL STEEL AND VERIFY THAT IT CONFORMS TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. FIELD INSPECTION REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 5 DAYS OF THE INSPECTION. THE CONTRACTOR SHALL NOTIFY THE INSPECTION AGENCY OF ALL PHASES OF STEEL CONSTRUCTION AND WELDING.

POST-MODIFICATION INSPECTION

A. A POST-MODIFICATION INSPECTION REPORT IS REQUIRED AND SHALL BE INCLUDED IN THE CONTRACTOR'S BID. A POST-MODIFICATION INSPECTION IS A VISUAL INSPECTION OF THE MOUNT MODIFICATIONS AND APPURTENANCE CONFIGURATION AND A REVIEW OF MATERIAL SUBMITTALS OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MOUNT MODIFICATION DRAWINGS.

B. THE POST-MODIFICATION INSPECTION REPORT SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER LICENSED IN THE JURISDICTION IN WHICH THE PROJECT IS LOCATED.

C. THE INTENT OF THE POST-MODIFICATION INSPECTION REPORT IS TO CONFIRM INSTALLATION AND CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF.

D. TO ENSURE THAT THE REQUIREMENTS OF THE POST-MODIFICATION INSPECTION REPORT ARE MET, IT IS VITAL THAT THE CONTRACTOR AND POST-MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A P.O. IS RECEIVED.

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

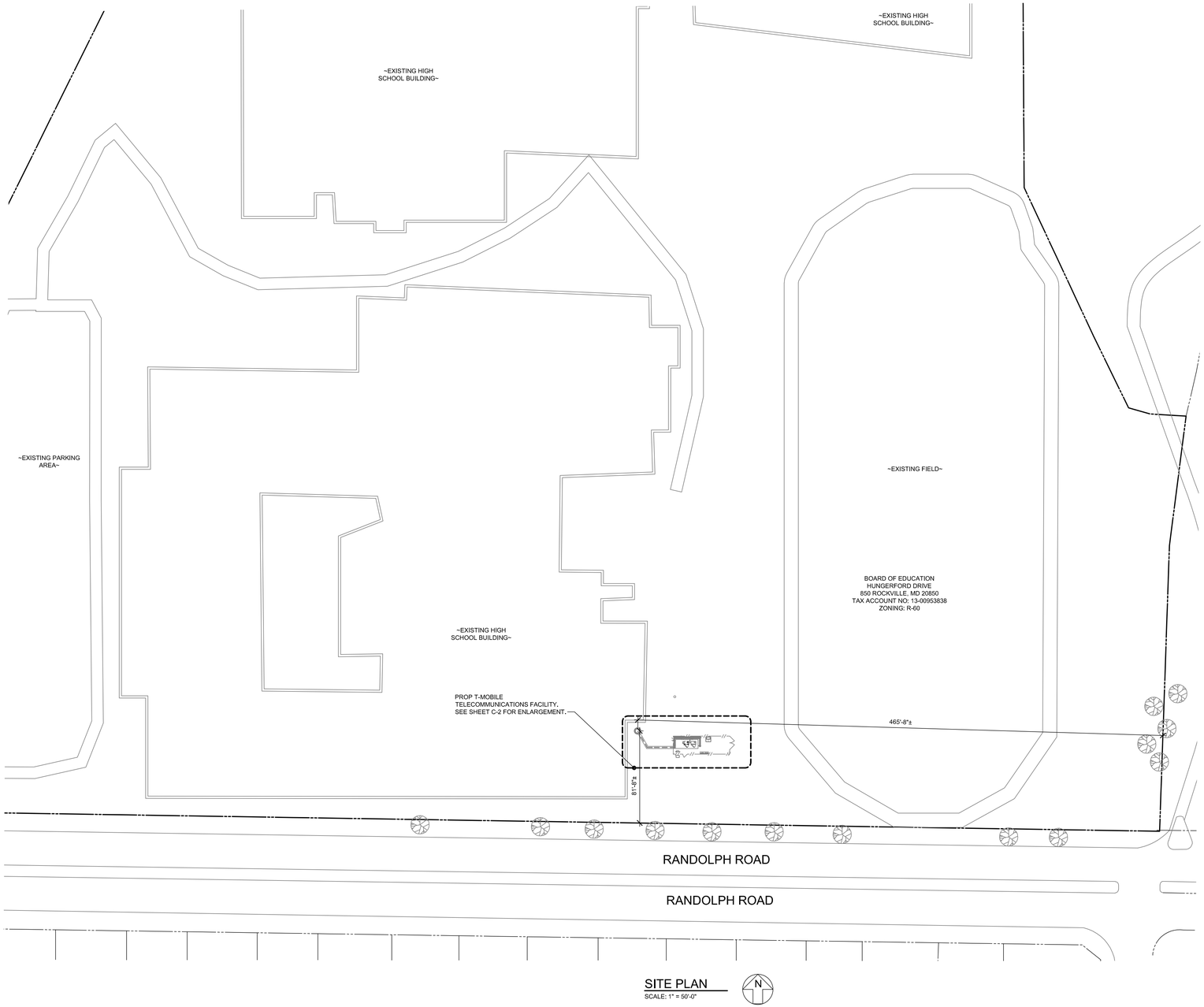
Know what's **below.**
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
General Structural Notes

SHEET NUMBER
GN-1



SITE PLAN
SCALE: 1" = 50'-0"

VICINITY MAP
SCALE: 1" = 2500'-0"

SITE NOTES:

1. APPLICANT: T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705
TEL (240) 264-8600
FAX (240) 264-8610
2. PROPERTY OWNER: BOARD OF EDUCATION
850 HUNGERFORD DRIVE
ROCKVILLE, MD 20850
3. SITE DATA: MAP: HQ53, PARCEL: P472, SUBDIVISION: 0001
DEED REFERENCE: 01570/ 00062
ACCOUNT NUMBER: 00953838
TRACT AREA: 25.7700 AC
DISTRICT: 13
ADDRESS: 12601 DALEWOOD DR
SILVER SPRING 20906-0000
EXISTING USE: TELECOMMUNICATIONS
4. ZONING: R-60
5. HORIZONTAL AND VERTICAL CONTROL SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY T-MOBILE RF DATA SHEET:
LATITUDE: N39° 03' 35.53" GROUND ELEVATION: 371.00' (±) AGL (NAVD 88)
LONGITUDE: W77° 04' 1.20" EXISTING STRUCTURE HEIGHT: 96.00' (±) AGL
TOTAL ELEVATION: 467.00' (±) AGL (NAVD 88)
6. TOTAL DISTURBED AREA = 0 SF (ANTENNA WORK ONLY)
7. THIS PROJECT INVOLVES ADDING THREE (3) ANTENNAS, ONE (1) AT EACH SECTOR AND REMOVING SIX (6) REMOTE RADIO HEADS (RRH), TWO (2) FROM EACH SECTOR AND ADDING SIX (6) REMOTE RADIO HEADS, TWO (2) AT EACH SECTOR AND ADDING (1) 6x12 HYBRID. THIS PROJECT ALSO INVOLVES REMOVING ONE (1) EXISTING EQUIPMENT CABINET AND INSTALLING (2) PROPOSED EQUIPMENT CABINETS.
8. THE STRUCTURE WILL NOT SUPPORT LIGHTS OR SIGNS UNLESS REQUIRED FOR AIRCRAFT WARNING OR OTHER SAFETY RECORDS.
9. THE APPLICANT WILL PROVIDE A CERTIFICATION FROM A REGISTERED ENGINEER THAT THE STRUCTURE WILL MEET THE APPLICABLE DESIGN STANDARDS FOR WIND LOADS PER THE REQUIREMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION.
10. IF THE ANTENNAS ARE NO LONGER USED FOR TELECOMMUNICATIONS PURPOSES FOR A CONTINUOUS PERIOD OF ONE (1) YEAR, THEY SHALL BE REMOVED BY THE ANTENNA OWNER AT OWNER'S EXPENSE.
11. NO WATER OR SANITARY UTILITIES ARE REQUIRED FOR THE OPERATION OF THIS FACILITY.
12. STORMWATER MANAGEMENT NOTE: NO STORMWATER MANAGEMENT IS REQUIRED FOR THIS SITE.
13. BOUNDARY SHOWN PER COUNTY RECORDS.
14. THIS PLAN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT. PLAN IS SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD.
15. ALL DETAILS SHOWN ARE "STANDARD" OR "TYPICAL" FOR REFERENCE ONLY. FOR ACTUAL DETAILS, SEE ARCHITECTURAL, STRUCTURAL, OR CONSTRUCTION PLANS BY OTHERS.
16. STRUCTURAL ANALYSIS/DESIGN TO BE PERFORMED BY OTHERS AT CLIENT AND/OR OWNER'S DISCRETION PRIOR TO COMMENCEMENT OF ANY WORK.
17. THE COMMUNICATION SHELTER SHALL BE UNMANNED, WITH INFREQUENT VISITS (FOUR OR FEWER PER YEAR) BY MAINTENANCE PERSONNEL, AND WITH ACCESS AND PARKING FOR NO MORE THAN ONE VEHICLE. THE PROPOSED FACILITY IS NOT FOR HUMAN HABITATION AND THEREFORE HANDICAP ACCESS IS NOT REQUIRED.
18. THE PROPOSED TOWER RELATED EQUIPMENT COMPOUND, EQUIPMENT CABINETS AND PROPOSED PANEL ANTENNAS SHALL COMPLY WITH ALL DESIGN STANDARDS IN SECTION 3.5.2.C.(2) OF THE REVISED MONTGOMERY COUNTY ZONING REGULATIONS THAT WENT INTO EFFECT ON OCTOBER 30, 2014.

GENERAL NOTES:

1. CONTRACTOR SHALL NOTIFY "MISS UTILITY" (811) 48 HOURS PRIOR TO DOING ANY EXCAVATION IN THIS AREA. CONTRACTOR SHALL CONTACT A SUBSURFACE UTILITY LOCATOR FOR LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY EXISTING UTILITY LOCATIONS BY TEST PIT AS NECESSARY. LOCATION OF UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR PLANNING PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. DAMAGE TO UTILITIES OR PROPERTY OF OTHER BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.
2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND ORDINANCES, THE LATEST EDITION THEREOF.
3. ANY PERMITS WHICH MUST BE OBTAINED SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM ALL APPLICABLE GOVERNMENTAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
4. CONTRACTOR SHALL COORDINATE ALL UTILITY CONNECTIONS WITH APPROPRIATE UTILITY OWNERS.
5. THESE PLANS ARE NOT FOR RECORDATION OR CONVEYANCE.
6. EXISTING PAVEMENT AND OTHER SURFACES DISTURBED BY CONTRACTOR (WHICH ARE NOT TO BE REMOVED) SHALL BE REPAIRED TO PRECONSTRUCTION CONDITIONS BY THE CONTRACTOR.

MONTGOMERY COUNTY NOTES:

PER SECTION 59-A-6.12

A) A PRIVATE TELECOMMUNICATIONS ANTENNA MAY BE ATTACHED AS A MATTER OF RIGHT TO AN EXISTING STRUCTURE OWNED OR OPERATED BY A COUNTY, BI-COUNTY, STATE OR FEDERAL AGENCY.

B) ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD APPROVED UNDER CHAPTER 21 IS NOT OWNED OR CONTROLLED BY A COUNTY AGENCY FOR PURPOSES OF THIS SECTION AND REQUIRES A SPECIAL EXCEPTION. ANY TELECOMMUNICATION FACILITY CONSTRUCTED AS OF NOVEMBER 21, 1995 ON ANY LAND OR STRUCTURE OWNED BY AN INDEPENDENT FIRE DEPARTMENT OR RESCUE SQUAD IS NOT A NONCONFORMING USE.

C) AN UNMANNED EQUIPMENT BUILDING OR CABINET ASSOCIATED WITH A TELECOMMUNICATION FACILITY LOCATED ON PUBLICLY OWNED LAND OR ATTACHED TO A PUBLICLY OWNED STRUCTURE MUST NOT EXCEED 560 SQUARE FEET AND 12 FEET IN HEIGHT, EXCEPT A SINGLE EQUIPMENT BUILDING IN EXCESS OF 560 SQUARE FEET MAY BE USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER, IF:

i) THE OVERALL SQUARE FOOTAGE DOES NOT EXCEED 1500 SQUARE FEET AND 12 FEET IN HEIGHT,
ii) THE BUILDING IS USED FOR MORE THAN ONE TELECOMMUNICATION PROVIDER OPERATING FROM THE SAME MONOPOLE OR TOWER; AND
iii) THE BUILDING IS REVIEWED BY THE TELECOMMUNICATIONS TRANSMISSION FACILITY COORDINATING GROUP IN ACCORDANCE WITH SEC 2-58E OF THE COUNTY CODE.

IF THE NEAREST ADJOINING PROPERTY IS CLASSIFIED IN A RESIDENTIAL ZONE, THE EQUIPMENT BUILDING OR CABINET MUST BE FACED WITH BRICK OR OTHER SUITABLE MATERIAL ON ALL SIDES AND LANDSCAPED TO A HEIGHT OF AT LEAST 3 FEET.

D) ANY PRIVATE TELECOMMUNICATION FACILITY ON PUBLICLY OWNED LAND THAT IS NOT PERMITTED UNDER SUBSECTIONS A), OR C) MUST OBTAIN A SPECIAL EXCEPTION FROM THE BOARD OF APPEALS.

T-Mobile
T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

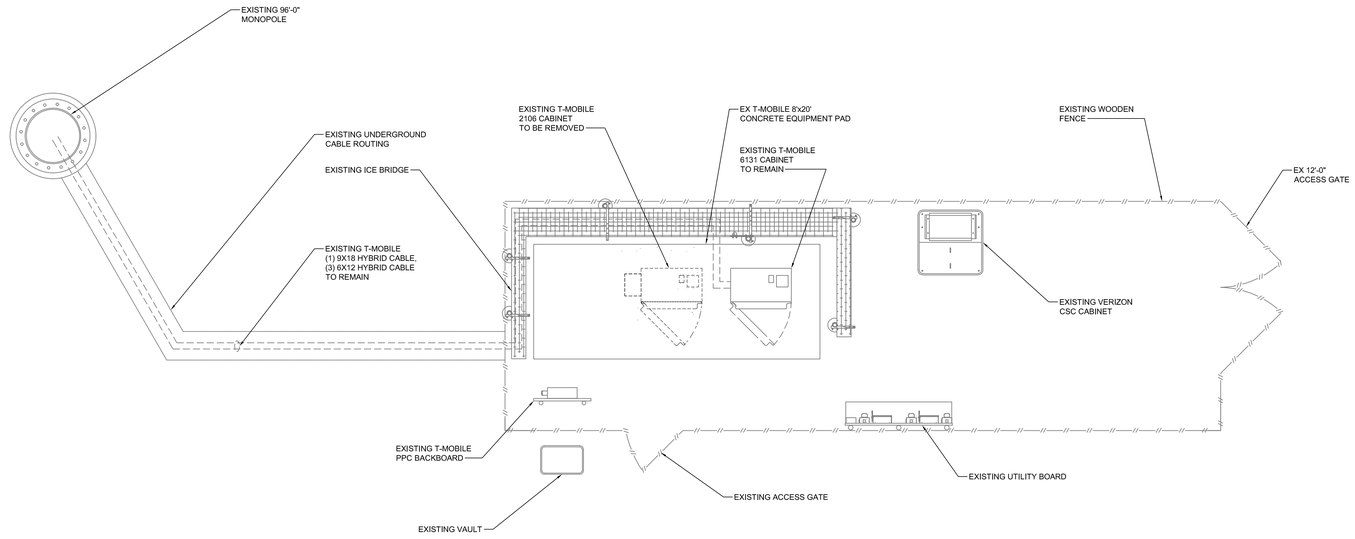
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

811
Know what's below.
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

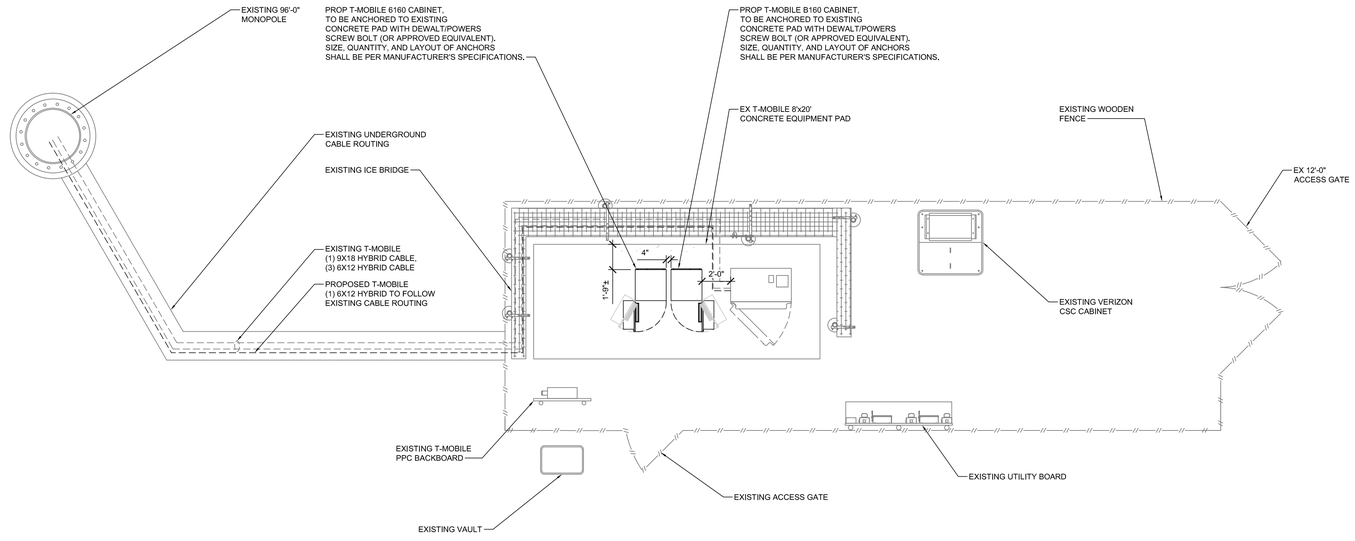
SHEET TITLE
Site Plan

SHEET NUMBER
C-1



EXISTING ENLARGED COMPOUND PLAN

SCALE: 1" = 15'-0"



PROPOSED ENLARGED COMPOUND PLAN

SCALE: 1" = 5'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below. Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

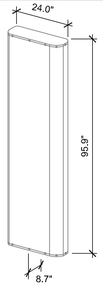
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

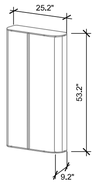
SHEET TITLE

Enlarged Compound Plan

SHEET NUMBER

C-2

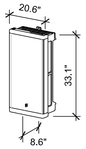




RFS APXVAARR24_43-U-NA20 COMMSCOPE 2HH-38A-R4

EXISTING T-MOBILE ANTENNA DETAILS

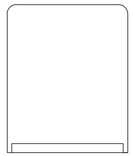
SCALE: NOT TO SCALE



ERICSSON
AIR6449 B41

PROPOSED T-MOBILE ANTENNA DETAILS

SCALE: NOT TO SCALE



RADIO 4424 B25: REMOTE RADIO UNIT:	
MANUFACTURER:	ERICSSON
POWER SUPPLY:	-48VDC
DIMENSIONS:	16.5"H x 13.4"W x 5.9"D
WEIGHT:	56 LBS

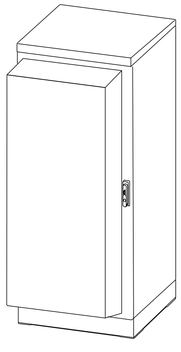
NOTES:

1. INSTALL RRU PER MANUFACTURERS RECOMMENDATIONS.
2. FIBER, DC POWER & GROUND CONNECTIONS NOT SHOWN.

ERICSSON RADIO 4424 B25 (PROPOSED)

T-MOBILE EQUIPMENT DETAILS

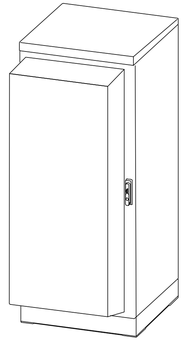
NOT TO SCALE



ERICSSON B160 BATTERY CABINET

NOT TO SCALE

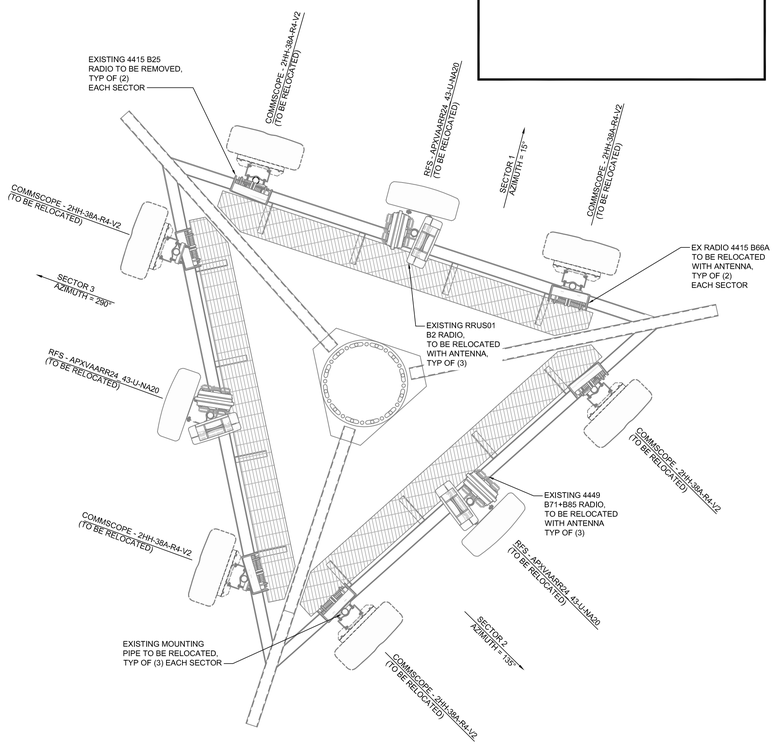
B160 BATTERY CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	295 LBS
WEIGHT (FULL):	2,000 LBS



ERICSSON 6160 EQUIPMENT CABINET

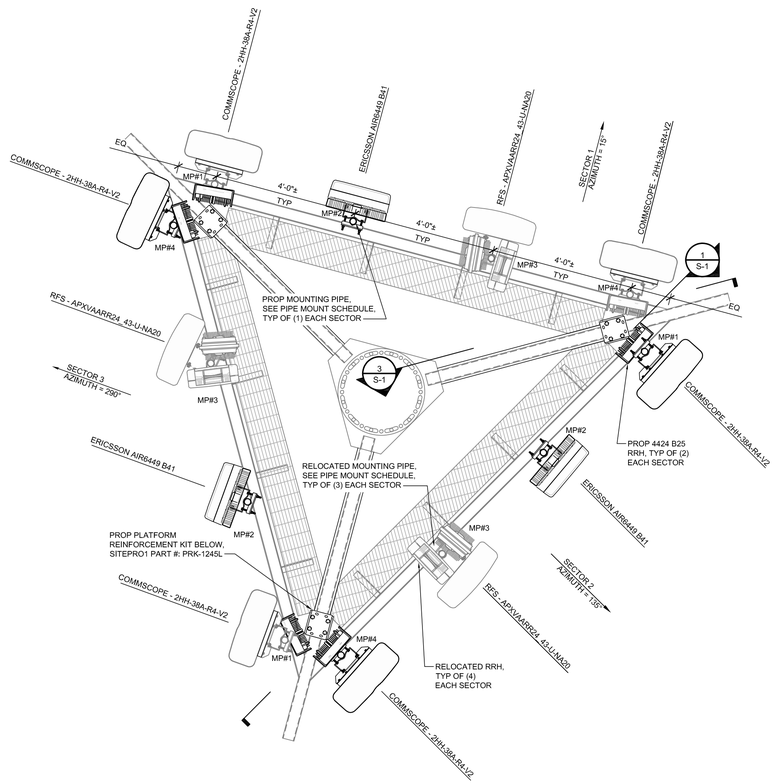
NOT TO SCALE

6160 EQUIPMENT CABINET:	
MANUFACTURER:	ERICSSON
DIMENSIONS:	26"W x 26"D x 63"H (INCL. BASE)
WEIGHT (EMPTY):	320 LBS
WEIGHT (FULL):	1,500 LBS



EXISTING ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"



PROPOSED ANTENNA SECTOR PLAN

SCALE: 1/2" = 1'-0"

ANTENNA SCHEDULE

SECTOR	STATUS	POS	MANUFACTURER	MODEL #	ANTENNA DIMENSIONS	AZIMUTH	RAD CENTER (FT)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	TMA / RRH QUANTITY & MODEL NO	CABLE QUANTITY & TYPE	CABLE LENGTH
SECTOR 1	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	(1) EXISTING ERICSSON 9X18 HCS (2) EXISTING ERICSSON 6X12 HCS 6AWG (1) EXISTING ERICSSON 6X12 HCS 4AWG (1) PROPOSED ERICSSON 6X12 HCS 4AWG	(±) 200'-0"
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	15°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	15°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 2	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	135°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	135°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 3	EXISTING	1	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED		
	PROPOSED	2	ERICSSON	AIR6449 B41	33.1"H x 20.6"W x 8.6"D	290°	102'-0"±	0°	4°/4°/4°	-		
	EXISTING	3	RFS	APXVAARR24_43-U-NA20	95.9"H x 24.0"W x 8.7"D	290°	102'-0"±	0°	4°/4°/4°/4°	(1) EXISTING RADIO 4449 B71+B85 & (1) EXISTING RRUS01 B2		
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (-27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 4	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 1	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	15°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 5	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 2	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	135°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		
SECTOR 6	EXISTING	1	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B25 TO BE REMOVED & (2) PROPOSED RADIO 4424 B25 TO BE INSTALLED	SHARED WITH SECTOR 3	N/A
	EXISTING	4	COMMSCOPE	2HH-38A-R4 (+27°)	53.2"H x 25.2"W x 9.3"D	290°	102'-0"±	0°	3°/3°	(2) EXISTING RADIO 4415 B66A		

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

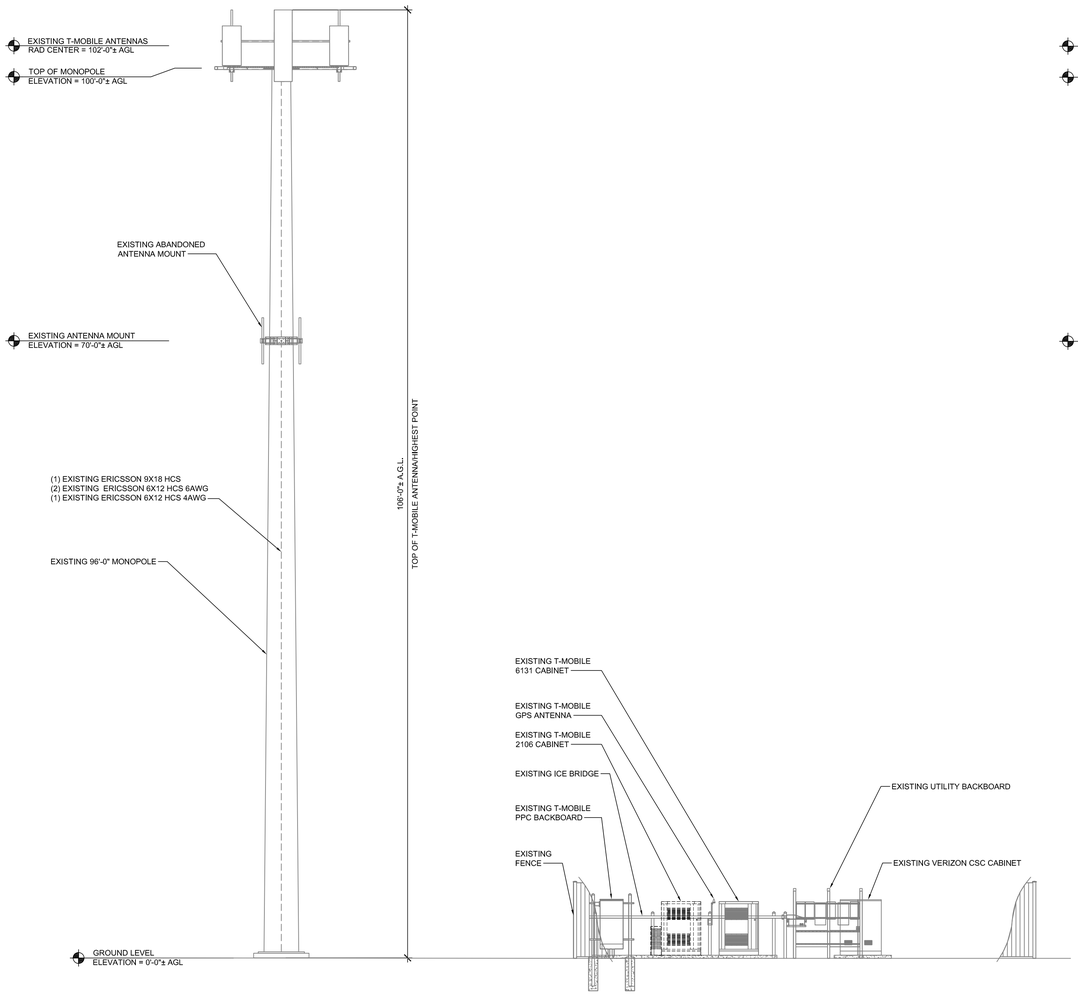
811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Antenna Sector Plans, Schedule & Details

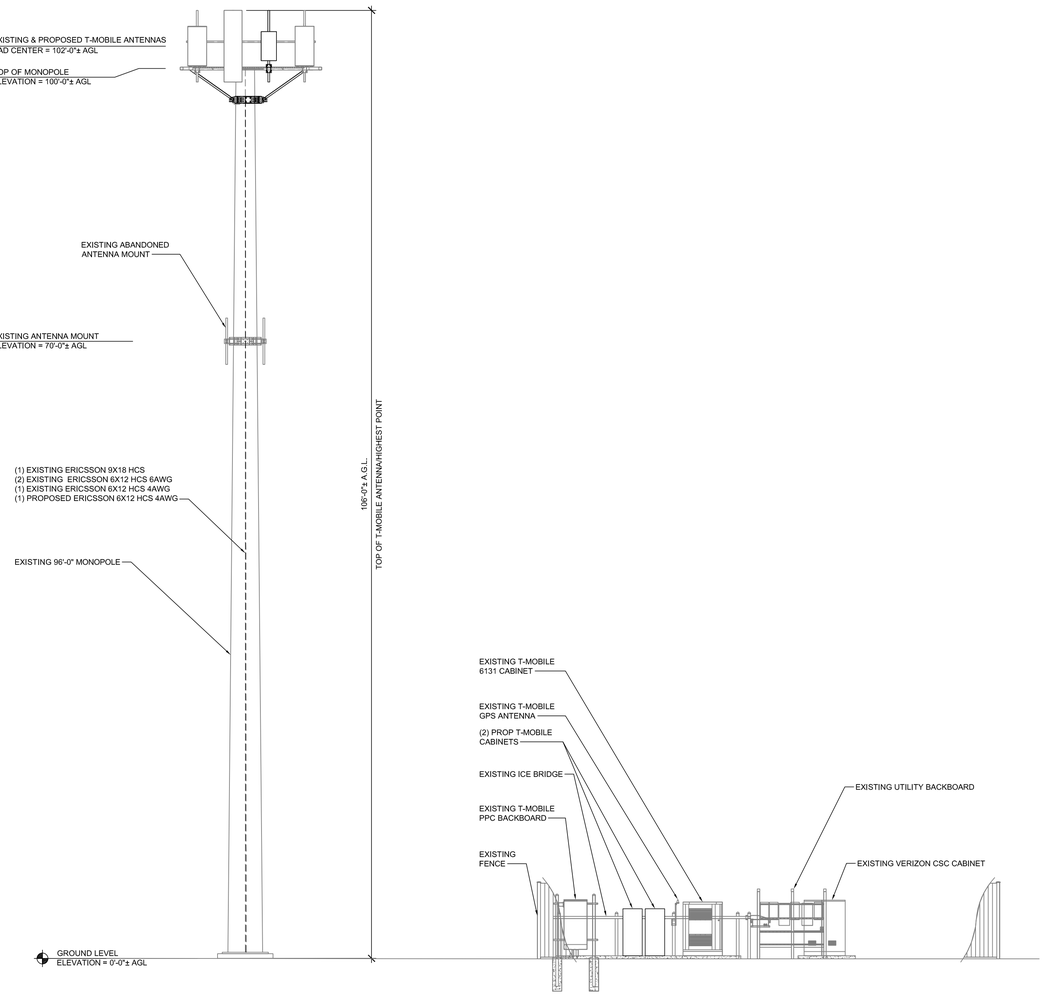
SHEET NUMBER

C-3



EXISTING MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"



PROPOSED MONOPOLE ELEVATION

SCALE: 1/8" = 1'-0"

T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

Know what's below.
Call before you dig.

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

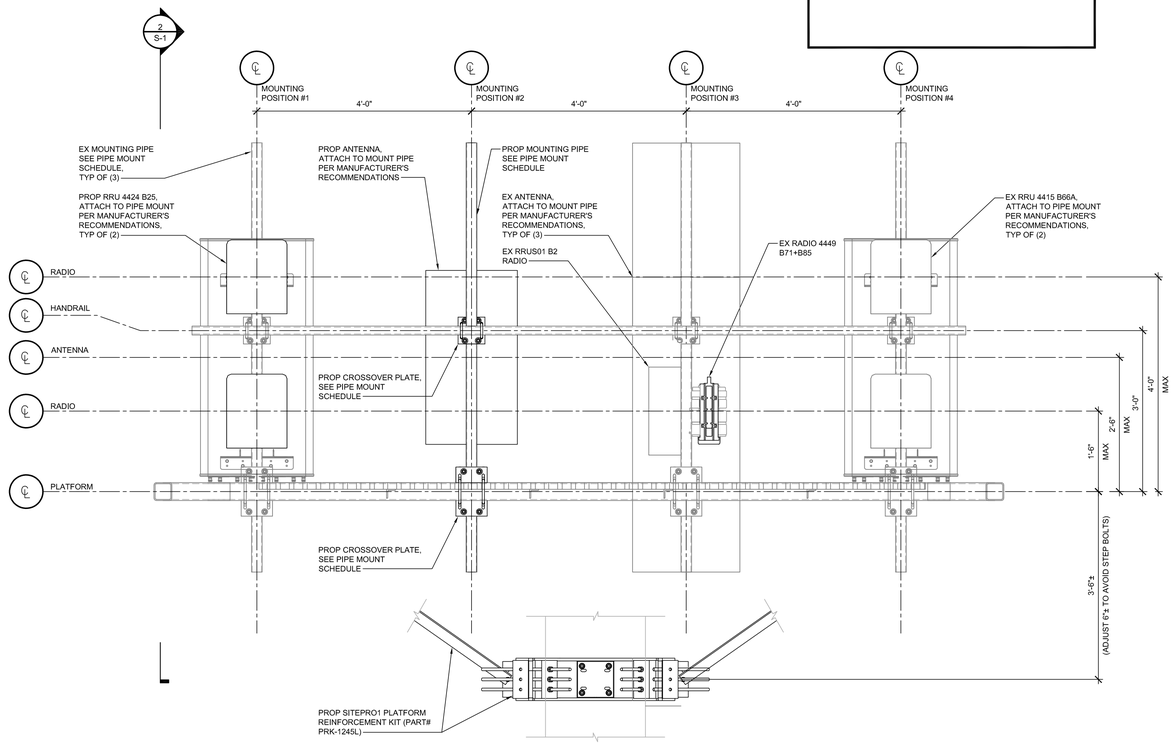
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Tower Elevations

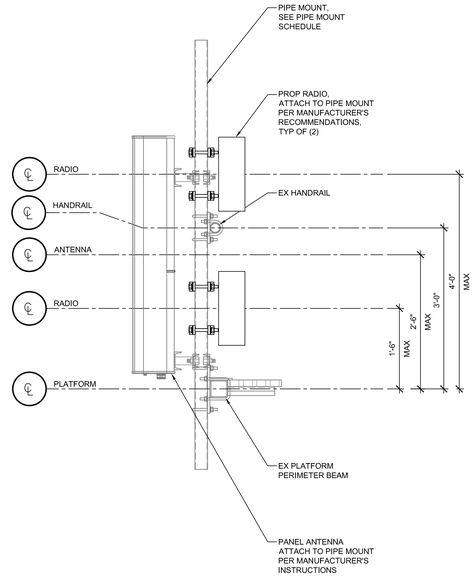
SHEET NUMBER

C-4



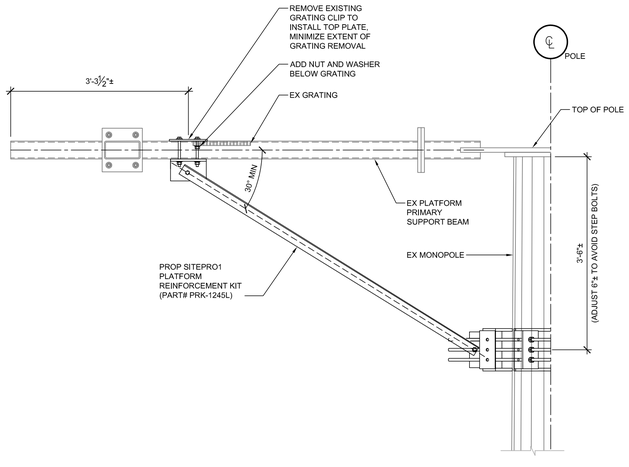
1 C-3 ANTENNA SECTOR REAR ELEVATION

SCALE: 3/4" = 1'-0"



2 S-1 TYPICAL ANTENNA & EQUIPMENT MOUNT

SCALE: 3/4" = 1'-0"



3 C-3 TYPICAL PLATFORM REINFORCEMENT

SCALE: 3/4" = 1'-0"

PIPE MOUNT SCHEDULE						
MOUNTING POSITION	PIPE O.D.	PIPE LENGTH	THICKNESS	HANDRAIL CONNECTION	BOTTOM CONNECTION	EXISTING/ PROPOSED
MP#1	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#2	2½"	96"	SCH. 40	SITEPRO1 SCX1-K	SITEPRO1 SQCX4-K	PROPOSED
MP#3	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING
MP#4	2½"	96"	SCH. 40	EXISTING	EXISTING	EXISTING

NOTES:

1. COORDINATE PIPE MOUNT SCHEDULE w/ PLANS, SECTIONS, DETAILS, & NOTES.

A PIPE MOUNT SCHEDULE

TYPICAL BOLT ASSEMBLIES						
TYPE	GRADE	DIA.	FINISH	WASHER[4]	NUT	TIGHTENING TORQUE (FT-LB)[2,3]
U-BOLT	SAE J429 GRADE 2	½"	GALV.	ASTM F436/F844	EXISTING	61
STRUCTURAL	ASTM F3125 GR A325	¾"	GALV.	ASTM F436	ASTM A563	175

NOTES:

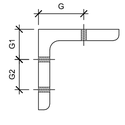
1. TIGHTENING TORQUES CORRESPOND TO AISC SNUG-TIGHTENED JOINTS.
2. CONTRACTOR SHALL VERIFY THAT ALL EXISTING BOLTS ARE TIGHTENED ACCORDING TO THIS TABLE. THREADED PARTS AND BOLTS MUST BE CORRECTLY IDENTIFIED PRIOR TO RE-TIGHTENING AND THE THREADED COMPONENTS SHALL NOT BE OVERTIGHTENED, OTHERWISE THEY NEED TO BE SAFELY REMOVED AND REPLACED. EXCEPTION: TIGHTENING TORQUES DO NOT APPLY TO THREADED COMPONENTS OF COLLAR MOUNTS AND/OR TOWER LEG ATTACHMENT POINTS (IF APPLICABLE).
3. TIGHTENING SHALL STOP WHEN THE SPECIFIED INSTALLATION TORQUE IS REACHED OR AT THE FIRST SIGN OF DEFORMATION.
4. WASHER SHALL BE PROVIDED UNDER ELEMENT THAT IS TURNED (NUT OR HEAD).

B TYPICAL BOLT ASSEMBLIES

MOUNT MODIFICATION BILL OF MATERIALS						
ITEM #	DESCRIPTION	PART MANUFACTURER	PART MODEL #	QUANTITY	MATERIAL	COMMENTS
1	PLATFORM REINFORCEMENT KIT	SITEPRO1	PRK-1245L	1	VARIES (GALV.)	SECTION 1/C-3 ON S-1 & 3/C-3 ON S-1
2a	2½" O.D. SCH 40 PIPE MOUNT x 8'-0" LONG	-	-	3	GALV. ASTM A53 GR B	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2b	CROSSOVER PLATE KIT W/ SQUARE U-BOLTS AND STD. U-BOLTS	SITEPRO1	SQCX4-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE
2c	CROSSOVER PLATE KIT	SITEPRO1	SCX1-K	3	GALV.	SECTION 1/C-3 ON S-1. PIPE MOUNT SCHEDULE

C MOUNT MODIFICATION BILL OF MATERIALS

WORKABLE GAUGE IN ANGLE LEGS														
LEG	8	7	6	5	4	3½	3	2½	2	1¾	1½	1⅜	1¼	1
G	4½	4	3½	3	2½	2	1¾	1⅜	1⅛	1	⅞	⅝	¾	⅝
G1	3	2½	2¼	2										
G2	3	3	2½	1¾										



NOMINAL HOLE DIMENSIONS, MINIMUM EDGE DISTANCE, & MINIMUM BOLT HOLE SPACING			
BOLT DIAMETER	STANDARD HOLE	MINIMUM EDGE DISTANCE	MINIMUM BOLT HOLE SPACING
½"	9/16"	¾", U.N.O.	2½", U.N.O.
⅝"	11/16"	⅞", U.N.O.	2⅝", U.N.O.

NOTE: ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EX CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.

D TYP CONNECTION REQUIREMENTS

T-Mobile
T-MOBILE NORTHEAST LLC

12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

MORRIS & RITCHIE ASSOCIATES, INC.
Civil / Structural Engineers
1220-C East Joppa Road, Suite 505
Towson, Maryland 21286
Office: (410) 821-1690
Fax: (410) 821-1748

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE - RICHARD D. RIDDLE SCHOOL
SITE ADDRESS:
12501-A DALEWOOD DRIVE
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/28/20

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32384, EXPIRATION DATE: 11/10/2021.

DRAWN BY:	FJ
DESIGNED BY:	RJD
ORIGINAL DATE:	08/18/2020
MRA PROJECT #:	19851.038
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

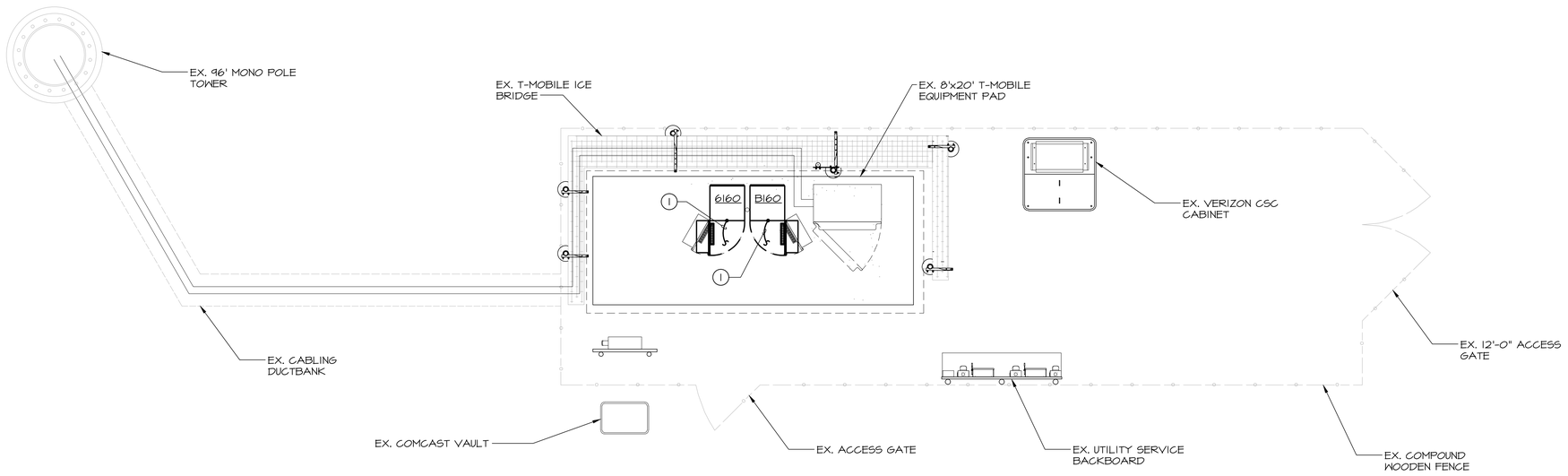
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE

Structural Details

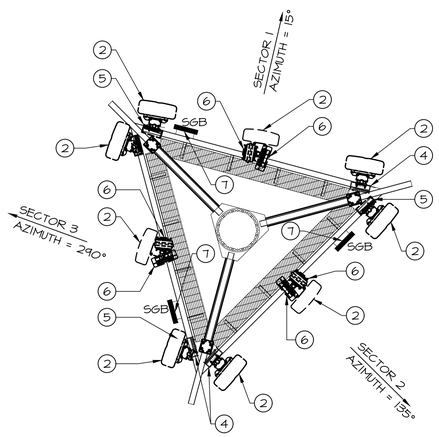
SHEET NUMBER

S-1



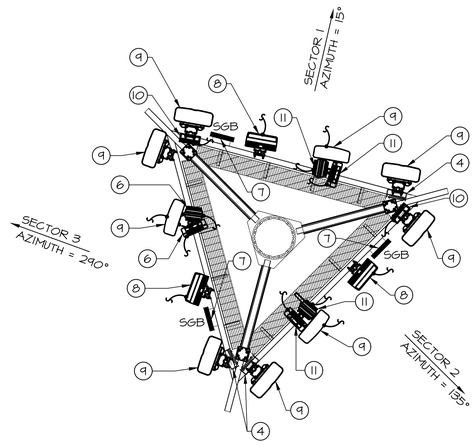
COMPOUND GROUNDING PLAN

SCALE: 1/4"=1'-0"



⑫ DEMOLITION ANTENNA PLAN

NO SCALE



⑫ ANTENNA PLAN

NO SCALE

GROUNDING NOTES

1. BOND NEW T-MOBILE B160 BATTERY CABINET AND NEW T-MOBILE 6160 POWER CABINET TO EXISTING GROUND RING USING 1#2AWG BARE TINNED COPPER CONDUCTOR.
2. REMOVE AND RELOCATE EXISTING MAST MOUNTED ANTENNA. DISCONNECT EXISTING ANTENNA JUMPERS AND ASSOCIATED GROUNDING AND SAVE FOR RECONNECTION TO NEW LOCATION IN NEW WORK PHASE.
3. NOT USED.
4. EXISTING RADIO HEAD (RRH) TO REMAIN.
5. REMOVE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING JUMPER CABLES AND ASSOCIATED GROUNDING.
6. REMOVE AND RELOCATE EXISTING RADIO HEAD (RRH). DISCONNECT EXISTING RADIO HEAD (RRH) JUMPERS AND ASSOCIATED GROUNDING.
7. EXISTING COPPER SECTOR GROUND BAR TO REMAIN.
8. PROVIDE NEW ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
9. RELOCATED ANTENNA. BOND ANTENNA TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
10. PROVIDE NEW RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR. REFER TO ANTENNA SCHEDULE ON MRA CIVIL ENGINEERING DRAWINGS FOR DETAILS.
11. RELOCATED RADIO HEAD (RRH). BOND RADIO HEAD (RRH) TO EXISTING SECTOR GROUND BAR, USING 1#2AWG BARE, TINNED COPPER CONDUCTOR.
12. REMOVE ALL EXISTING **UNUSED** COAX CABLING. PROVIDE (1) NEW 6x12 HYBRID FIBER CABLING.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND
TIMOTHY SMIDT
21585
REGISTERED
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

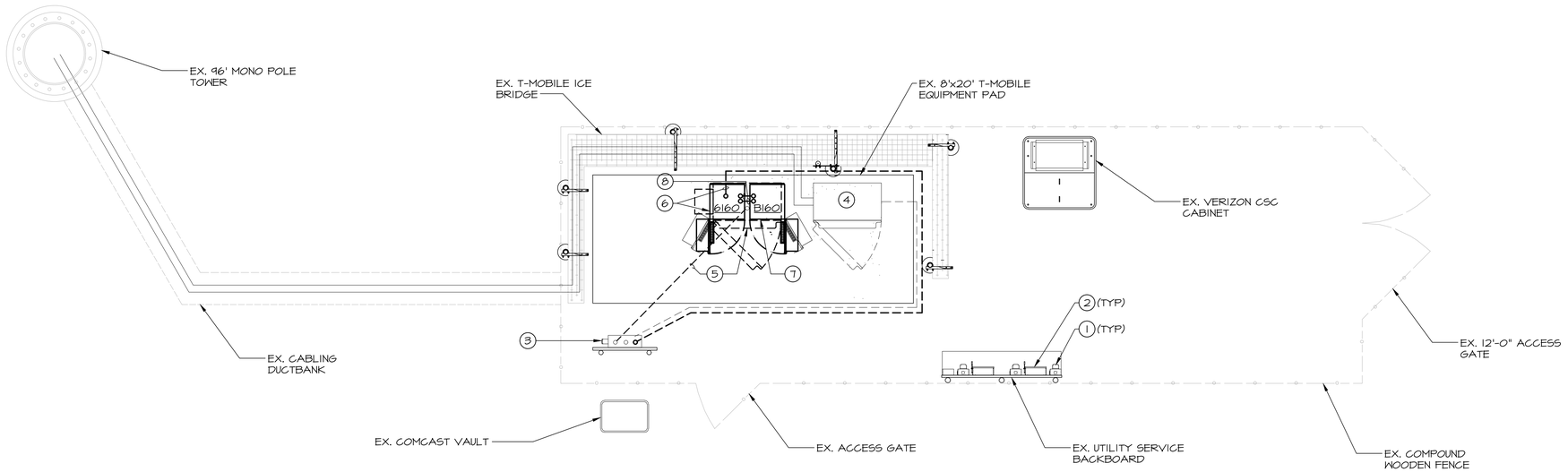
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811
Know what's **below.**
Call before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Grounding Compound Plan, Antenna Plans and Notes

SHEET NUMBER
G-1



COMPOUND POWER PLAN

SCALE: 1/4"=1'-0"

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET, DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET, EXTEND 3#1+#8GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.

0 1 2 3 4 8 12

SCALE: 1/4"=1'-0"

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND · TIMOTHY SMIDT · 21585 · REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

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

PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Compound Power Plan and Notes

SHEET NUMBER
E-1

(EXISTING) ③ PANEL T ⟨1⟩

120/240 VOLTS 1Φ 3 WIRE 200 AMP MCB

DESCRIPTION	BRKR	CKT	CKT	BRKR	DESCRIPTION
SURGE	60	1	2	150	6131 CABINET
		3	4		
SPARE (5)	50	5	6		
		7	8		
LIGHT/RECEPTACLE	20	9	10	20	SPARE (5)
SPACE	-	11	12	100	6160 CABINET (4)
SPACE	-	13	14		
SPACE	-	15	16	-	SPACE
SPACE	-	17	18	-	SPACE
SPACE	-	19	20	-	SPACE
SPACE	-	21	22	-	SPACE
SPACE	-	23	24	-	SPACE

LOAD CALCULATION:

PROPOSED EQUIPMENT LOAD: 40Ax240V =	9.6 KVA
LIGHT/RECEPTACLES LOAD:	0.20 KVA
EXISTING EQUIPMENT LOAD:	31.5 KVA
TOTAL:	41.3 KVA
TOTAL LOAD:	41.3 KVA = 172.1 AMPS @ 120/240V, 1Φ

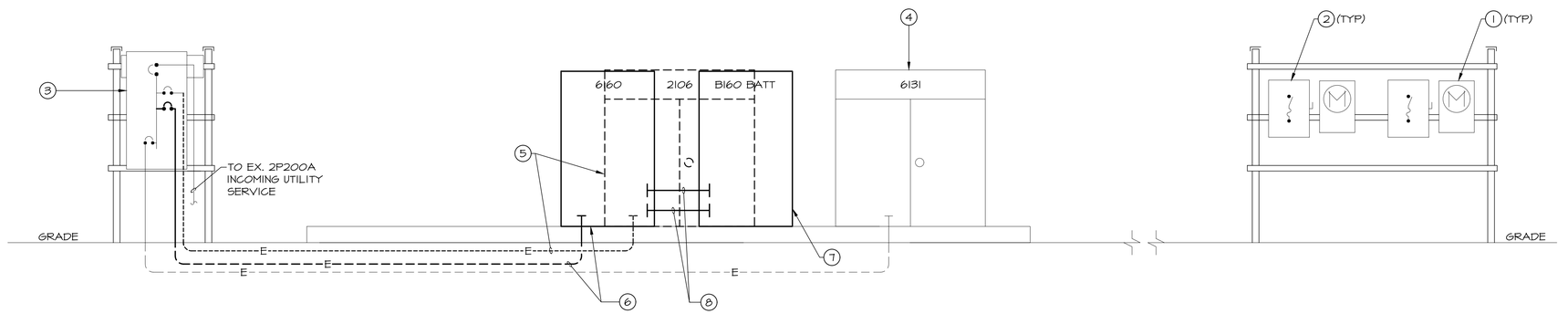
* PANELBOARD FEEDERS ARE SIZED FOR MAIN OVERCURRENT DEVICE PER N.E.C. ARTICLE 215-2
** ALL LOADS ARE BASED UPON N.E.C. ARTICLE 220

NOTES:

⟨1⟩ CONTRACTOR SHALL PROVIDE UPDATED, TYPED PANEL DIRECTORY WITH RESPECTIVE CIRCUIT NAMES AFTER PROJECT COMPLETION, **PER N.E.C. ARTICLE 408.4.**

DRAWING NOTES

1. EXISTING UTILITY COMPANY METER TO REMAIN.
2. EXISTING 240 VOLT, 2P200A MAIN SERVICE DISCONNECT TO REMAIN.
3. EXISTING T-MOBILE 120/240V 1Φ, 3W 200A MAIN CIRCUIT BREAKER PANEL TO REMAIN. REFER TO PANEL SCHEDULE, THIS SHEET FOR ADDITIONAL INFORMATION.
4. EXISTING T-MOBILE 6131 EQUIPMENT CABINET TO REMAIN.
5. REMOVE EXISTING T-MOBILE 2106 EQUIPMENT CABINET. DISCONNECT AND REMOVE EXISTING BRANCH CIRCUIT FEEDER AND LABEL EXISTING BREAKER AS "SPARE".
6. PROPOSED T-MOBILE 6160 CABINET. EXTEND 3#1+#8 GRD - 1 ½" BURIED PVC (IN GROUND) AND TRANSITION TO SEAL TIGHT SEAL TIGHT (ABOVE GROUND) CONDUIT FROM NEW 2P100A CIRCUIT BREAKER IN PANEL AND CONNECT TO 6160 CABINET.
7. PROPOSED T-MOBILE B160 BATTERY CABINET.
8. PROVIDE TWO (2) -2" CONDUIT SLEEVES BETWEEN CABINETS.



POWER RISER
NO SCALE

ELECTRICAL SPECIFICATIONS

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE IN STRICT ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODES. ALL WORK IS SUBJECT TO THE APPROVAL OF THE T-MOBILE REPRESENTATIVE.
2. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND SHALL PAY ALL ASSOCIATED CHARGES. CONTRACTOR SHALL ARRANGE FOR ALL INSPECTIONS.
3. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL SPECIFIED MATERIALS AND EQUIPMENT. ALL MATERIALS SHALL BE U.L. LISTED.
4. CONDUIT SHALL BE RIGID STEEL (HEAVY WALL) OR SEALTIGHT FOR WORK EXPOSED TO WEATHER. NO ALUMINUM CONDUIT OR CONDUCTORS PERMITTED.
5. WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THWN/THHN INSULATION FOR EXTERIOR USE. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED. CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 98% CONDUCTIVITY.
6. THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDED USING DOUBLE LOCKNUTS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTORS.
7. ALL ELECTRICAL EQUIPMENT INCULDING THE PANEL, SWITCH GEAR AND DISCONNECT SHALL BE IDENTIFIED WITH ENGRAVED BAKELITE NAMEPLATES.
8. ALL ELECTRICAL EQUIPMENT EXPOSED TO WEATHER SHALL BE PROTECTED IN NEMA 3R ENCLOSURES.
9. ALL DISCONNECTS SHALL BE SQUARE D NEMA 3R FUSIBLE.
10. **CONTRACTOR SHALL COORDINATE FINAL SERVICE TERMINATION LOCATIONS WITH TELEPHONE AND ELECTRIC UTILITY COMPANIES IN THE FIELD.**
11. CONTRACTOR SHALL UPDATE PANEL SCHEDULES AND IDENTIFY ALL MISCELLANEOUS CIRCUITS NOT INDICATED ON SCHEDULES.

ELECTRICAL SYMBOLS LIST

NOTE: ALL MOUNTING HEIGHTS ARE TO CENTER LINE OF THE OUTLET BOX UNLESS OTHERWISE INDICATED.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
◀	EQUIPMENT FRONT	●R	GROUND ROD
M	METER	◉R	GROUND TEST ROD
(5)	DRAWING NOTE	--- T ---	TELEPHONE CONDUIT
—⏚—	GROUND CONNECTION	--- E ---	ELECTRIC CONDUIT
⟶ ⟶	CONDUIT-DOWN, UP	--- G ---	GROUND CONDUCTOR
▨	120/240V, 1Φ ELECTRIC PANEL		

ABBREVIATIONS

AFF	- ABOVE FINISHED FLOOR	MTD	- MOUNTED
C, CDT	- CONDUIT	UG	- UNDERGROUND
DN	- DOWN	V	- VOLTS
GRD	- GROUND	W	- WITH
MH	- MOUNTING HEIGHT	WP	- WEATHERPROOF

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MARYLAND 20705
OFFICE: (240) 264-8600
FAX: (240) 264-8610

TELEGENT ENGINEERING INC.
2216 Commerce Road, Suite 1
Forest Hill, MD 21050
410-692-5816
www.tel-eng.com

SITE LINK
3620 COMMERCE DRIVE,
SUITE 707
BALTIMORE, MD 21227
(410) 309-4949

SITE ID:
7WAN235A
SITE NAME:
BOE-RICHARD D. RIDDLE SCHOOL

SITE ADDRESS:
12501A DALEWOOD DR.
SILVER SPRING, MD 20906
MONTGOMERY COUNTY

REVISION BLOCK

NO.	DESCRIPTION	DATE
2	PERMIT SET	10/13/20
1	RF REVISION	08/27/20

STATE OF MARYLAND — TIMOTHY SMIDT — 21585 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, TIMOTHY SMIDT, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21585, EXPIRATION DATE: MAY 8, 2021.

DRAWN BY:	BLN
DESIGNED BY:	BLN
ORIGINAL DATE:	08/07/2020
TEI PROJECT #	20032L
DESIGN SCALE:	AS NOTED

811 Know what's **below.** **Call** before you dig.
PROTECT YOURSELF, GIVE THREE WORKING DAYS NOTICE
THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL RULES AND REGULATIONS THERE TO APPURTENANT.

SHEET TITLE
Power Riser, Panel Schedule, Symbols List and Notes

SHEET NUMBER
E-2