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

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

Re: Notice of Exempt Modification Application
290 Preston Ave., Middletown, CT 06371

September 13, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 3 existing panel antennae and 3 remote radio units at the 130' level of the Monopole and proposes to add 3 new panel antennae and 3 new remote radio heads, also at the 130' level of the Monopole.

There are no documents from the initial approvals by CT Siting Council and Town of Middletown, but a recent approval for EM was issued on 12/16/2013 from CSC and a BP was issued pursuant to that CSC approval on 2/10/2014. The documents enclosed have been modified where necessary to reflect the current reality of the installations on the Monopole.

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

Thank you,

By: *Paul F. Sagristano*

Paul F. Sagristano
Cherundolo Consulting
917.841.0247
psagristano@lrivassoc.com

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

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

September 13, 2018

Re: Notice of Exempt Modification –
Existing Sprint Telecommunication Facility
290 Preston Ave. Middletown, CT 06457

Latitude : N41.5572
Longitude: W72.7433

Dear Ms. Bachman:

Sprint currently maintains 3 existing panel antenna and 3 remote radio units at the 130' centerline level of the AT&T owned Monopole. Sprint proposes to add 3 panel antenna and 3 remote radio units also at 130' centerline level of the aforementioned Monopole. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

There is no documentation for the original EM approval or the original Building Permit, there is however information on a recent EM approval from December 6, 2013 from CSC and an approved building permit by the City of Middletown on February 10, 2014. A copy of these approval are attached.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).
In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to Deborah Krenc of AT&T, the property owner, Hon. Daniel Drew, Mayor of the City of Middletown , Joe Samolis, the director of P&Z for the City of Middletown and Ernest and Brenda Trumpold, the property owners.
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The Middletown facility is located at 290 Preston Road, Middletown, CT, the Site coordinates are: N41. 5572, W – 72.7433. The facility is owned by AT&T. The existing facility consists of a 140' monopole and Sprint currently operates wireless communications equipment on a steel platform at the facility and has three antenna and three RRU's mounted on the monopole at a centerline of 130' feet

Statutory Considerations

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

1. The height of the overall structure will be unaffected.

2. The proposed changes will not require an extension of the property boundaries.

3. The proposed additions will not increase the noise level at the existing facility by

six decibels or more, or to levels that exceed state and/or local criteria

4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Respectfully submitted,

Paul F. Sagristano

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

PFS/mtf

Additional Recipients:
City of Middletown – Mayor Daniel Drew – Via Fed Ex
AT&T – Deborah Krenc – Tower Owner - Via Fed Ex
City of Middletown – Planning Director Joe Samolis – Via Fed Ex
Ernest and Brenda Trumphold – Property Owner - Via Fed Ex

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Deborah Krenc	Paul Sagristano
AT&T	CCC
5600 Glenridge Drive	4 Davis Road West
Cube 6E92F	Suite 5
ATLANTA, GA	OLD LYME, CT
30342	06371
US	US
678-917-1026	9178410247

Shipment Information:
Tracking no.: 773213235684
Ship date: 09/13/2018
Estimated shipping charges: 20.54 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.20 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CGT43XC816 CSC sub
P.O. no.:
Invoice no.:
Department no.:

Thank you for shipping online with FedEx ShipManager at fedex.com.

Please Note

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Ernest & Brenda Trumpold	Paul Sagristano CCC
290 Preston Ave.	4 Davis Road West Suite 5
MIDDLETOWN, CT 06457 US 860-347-6369	OLD LYME, CT 06371 US 9178410247

Shipment Information:
Tracking no.: 773213312127
Ship date: 09/13/2018
Estimated shipping charges: 18.83 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: Your Packaging
Number of packages: 1
Total weight: 1 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC816 - CSC sub
P.O. no.:
Invoice no.:
Department no.:

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Hon Daniel Drew, Mayor	Paul Sagristano
City of Middletown	CCC
25 deKoven Ave.	4 Davis Road West
	Suite 5
MIDDLETOWN, CT	OLD LYME, CT
06457	06371
US	US
(860) 638-4801	9178410247

Shipment Information:
Tracking no.: 773213011821
Ship date: 09/13/2018
Estimated shipping charges: 18.83 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.20 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC816 CSC Sub
P.O. no.:
Invoice no.:
Department no.:

Thank you for shipping online with FedEx ShipManager at fedex.com.

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Joe Samolis, zoning	Paul Sagristano
City of Middletown	CCC
25 deKoven Ave.	4 Davis Road West
	Suite 5
MIDDLETOWN, CT	OLD LYME, CT
06457	06371
US	US
(860) 344-3425	9178410247

Shipment Information:
Tracking no.: 773213094703
Ship date: 09/13/2018
Estimated shipping charges: 18.83 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.20 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC816 CSC Sub
P.O. no.:
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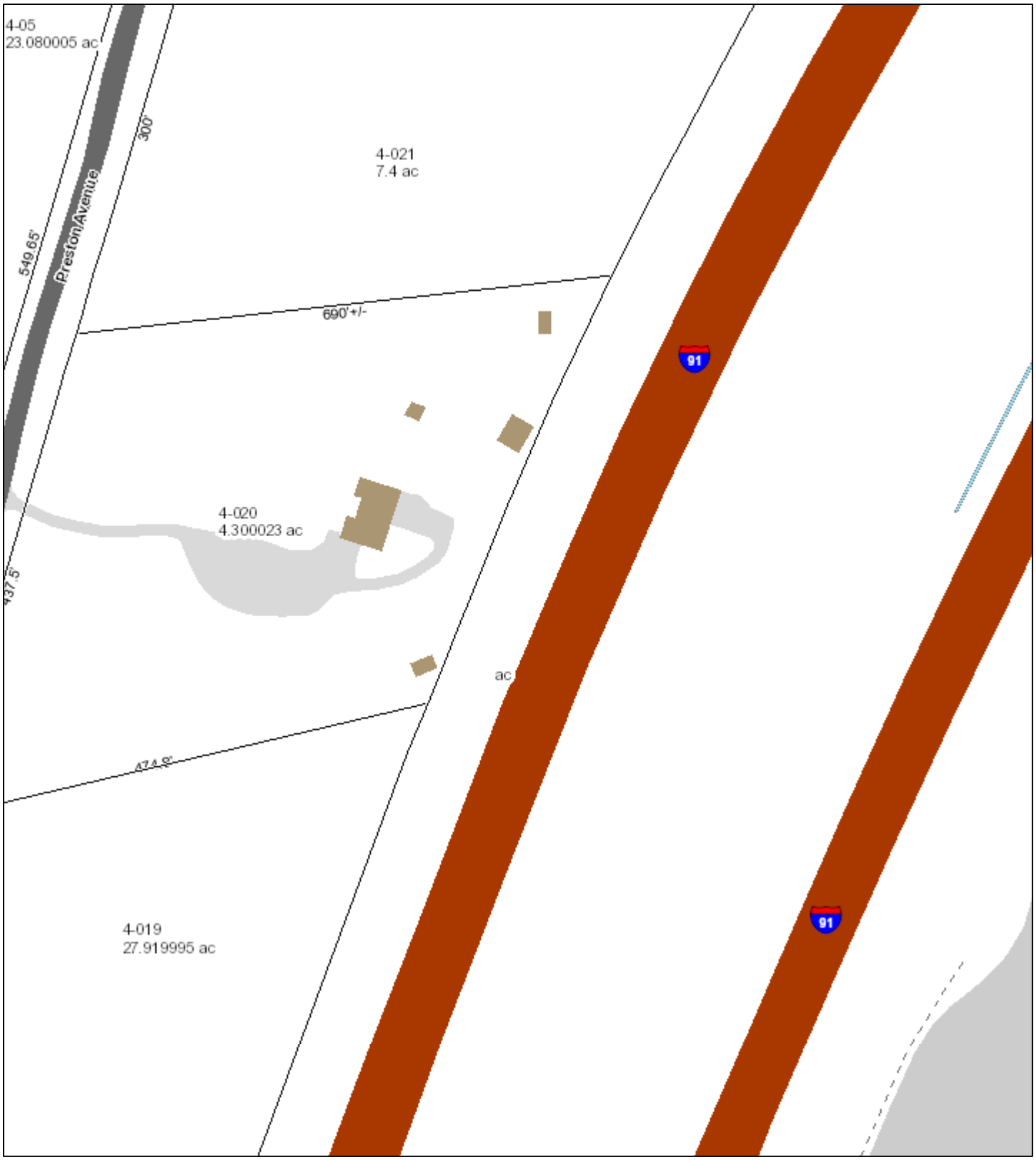
Google Maps 290 Preston Ave

Map data ©2018 Google 200 ft



City of Middletown, Connecticut

Map generated 9/13/2018

Map Legend: http://gis.cityofmiddletown.com/middletownct/legend.pdf

Property Card: http://gis.vgsi.com/MiddletownCT/Parcel.aspx?pid=9217

N

0 37.5 75 150 225 300 Feet

1 in = 118 ft

MAP FOR REFERENCE ONLY - NOT A LEGAL DOCUMENT

Because of different update schedules, current property assessments may not reflect recent changes to property boundaries. Check with the Board of Assessors to confirm boundaries uses at the time of assessment.

290 PRESTON AVE

Location	290 PRESTON AVE	**Map-Lot**	04/ / 0020/ /
Acct#	R08547	**Owner**	TRUMPOLD ERNEST & BRENDA
Municipality		**Assessment**	$315,660
Appraisal	$450,940	**PID**	9217
Building Count	2	**Assessing Distr...**	

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$164,190	$286,750	$450,940
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$114,930	$200,730	$315,660

Parcel Addreses

Additional Addresses		
Address	**City, State Zip**	**Type**
290 PRESTON AVE	MIDDLETOWN, CT 06457	Primary

Owner of Record

Owner	TRUMPOLD ERNEST & BRENDA	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	PO BOX 1761 WALLINGFORD, CT 06492	**Book & Page**	1142/ 98
		Sale Date	11/04/1997

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
TRUMPOLD ERNEST & BRENDA	$0		1142/ 98	11/04/1997

Building Information

Building 1 : Section 1

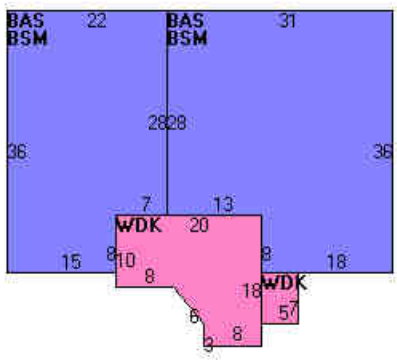
Year Built: 1950
Living Area: 1,748
Replacement Cost: $213,851
Building Percent Good: 56
Replacement Cost Less Depreciation: $119,760

Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential
Grade	C
Stories	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Brick Veneer
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	Laminate Flr
Heat Fuel	Oil
Heat Type	Hot Water
Bedrooms	2
Full Baths	1
Half Baths	1
Extra Fixtures	1
Total Rooms	5
Bath Remodel	Not Updated
Kitchen Remodel	Not Updated
Extra Kitchens	0
Fireplaces	1
Extra Openings	0
Gas Fireplace	0
Int vs Ext	Same
A/C Type	None
A/C %	0
Fin Bsmt Area	624
Bsmt Garage	2

Building Photo

(http://images.vgsi.com/photos/MiddletownCTPhotos//\00\03\08

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,748	1,748
BSM	Basement	1,748	0
WDK	Wood Deck	309	0
		3,805	1,748

Building 2 : Section 1

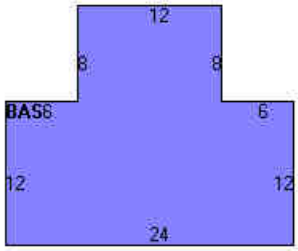
Year Built:	2013
Living Area:	384
Replacement Cost:	$32,059
Building Percent Good:	81
Replacement Cost Less Depreciation:	$25,970

Building Attributes : Bldg 2 of 2	
Field	**Description**
Style	Workshop
Model	Residential
Grade	D
Stories	1
Occupancy	1
Exterior Wall 1	Wood
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	
Heat Fuel	Propane
Heat Type	Hot Air-No Duc
Bedrooms	0
Full Baths	0
Half Baths	0
Extra Fixtures	0
Total Rooms	1
Bath Remodel	Not Updated
Kitchen Remodel	Not Updated
Extra Kitchens	0
Fireplaces	0
Extra Openings	0
Gas Fireplace	0
Int vs Ext	Same
A/C Type	None
A/C %	0
Fin Bsmt Area	0
Bsmt Garage	0

Building Photo

(http://images.vgsi.com/photos/MiddletownCTPhotos//default.jpg

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	384	384
		384	384

Extra Features

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	101
Description	Single Family
Zone	R-60
Neighborhood	02
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	4.3
Assessed Value	$200,730
Appraised Value	$286,750

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
BRN5	2s Barn			700 UNITS	$5,180	1
SHD1	Shed	FR	Frame	192 UNITS	$1,870	1
SHD1	Shed	FR	Frame	120 UNITS	$1,170	1
SPL4	Above Ground Pool			1 UNITS	$0	1
FOP	Porch			64 UNITS	$0	1
CUB	Commercial Util Bldg			320 UNITS	$5,120	1
CUB	Commercial Util Bldg			320 UNITS	$5,120	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$164,190	$286,750	$450,940
2016	$153,280	$302,050	$455,330
2015	$153,280	$302,050	$455,330

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$114,930	$200,730	$315,660
2016	$107,290	$211,440	$318,730
2015	$107,290	$211,440	$318,730

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NV_CT43XC816

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 16, 20143

Melanie J. Howlett
HPC Wireless Services
22 Shelter Rock Lane, Building C
Danbury, CT 06810

RE: **EM-SPRINT-083-131127** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 290 Preston Avenue, Middletown, Connecticut.

Dear Ms. Howlett:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 26, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/laf

c: The Honorable Daniel T. Drew, Mayor, City of Middletown
William Warner, AICP Director, City of Middletown
Christopher B. Fisher, Esq., Cuddy & Feder LLP (c/o AT&T)

 NV_CT43XC816

Building Permit
Middletown Building Department
Phone: (860) 638-4870 Fax: (860) 638-1970

Permit Number
20133616
City Project?
☐

Building Permit	Electric Permit	Plumbing Permit	HVAC Permit	Demolition Permit	Application Date
☑	☐	☐	☐	☐	12/23/2013

Location of Proposed Work	Date of Approval	Building Official Approval
290 Preston Avenue	02/06/2014	Dean Lisitano

Permit Description

Replace (6) antenaas with (3) antennas, install (6) RRHs & (3) notchfilters, replace GPS unit, replace (2) cabinests, install (2) additional cabinets, install additional support equipment.

Permit Expiration	Contractor's License Number	Number of Dwelling Units	Sanitation Taxes OK?
	MCO. 0902836	0	☐

Water Taxes OK?	Motor Vehicle Taxes OK?	Personal Property Taxes OK?	Real Estate Taxes OK?
☑	☑	☐	☑

Other Taxes OK?	Sewer Taxes OK?	Estimated Costs	Check Number
☐	☑	$15,000.00	09692

Chargeable Amount	Permit Fee	Total Fee	State Fee	City Fee	Payment Date
$15.00	$214.90	$3.90	$3.75	$0.15	12/23/2013

Applicant Name	Applicant's Address	Applicant's City	State	Zip
Nanepashemet Project Management, Inc.	328 West Shore Drive-Suite 1-A	Marblehead	MA	01945-

Applicant's Phone	Applicant's Fax	Applicant's Email
860-463-1076	203-797-1137	dburnett-pollock@hpcwireless.com

Owner Name	Owner's Address	City	State	Zip
Ernest & Brenda Trumpold-C/O AT&T	P.O. Box 97076	Redmond	WA	98073-

Department Approval Signatures for Certificate of Occupancy: *Date of Approval:* _____

Health Department: _____ *Water & Sewer:* _____

Fire Marshal: _____ *Assistant Building Official:* _____

Planning & Zoning: _____ *Assistant Building Official:* _____

Chief Building Official: _____

NV_CT43XC816

Building Permit
Middletown Building Department
Phone: (860) 344-3416 Fax: (860) 344-3553

Permit Number
City Project?
☐

Building Permit	Electric Permit	Plumbing Permit	HVAC Permit	Demolition Permit	Application Date
☑	☐	☐	☐	☐	

Location of Proposed Work

290 Preston Avenue

Permit Description Replace (6) antennas with (3) antennas, install (6) RRHs & (3) notch filters, replace GPS unit, replace (2) cabinets, install (2) additional cabinets, install additional support equipment

Contractor's License Number	Number of Dwelling Units
MCO.0902836	
Estimated Costs	**Permit Fee**
$15,000.00	$214.90

Applicant Name	Applicant's Address	Applicant's City	State	Zip
Nanepashemet Project Management, Inc.	328 West Shore Drive	Marblehead	MA	01945

Applicant's Phone	Applicant's Fax	Applicant's Email
860.463.1076	203.797.1137	dburnett-pollock@hpcwireless.com

Owner Name	Owner's Address	City	State	Zip
Ernest & Brenda Trumpold c/o AT&T	P.O. Box 97076	Redmond	WA	98073

Date: _____

Permit Number: _____

Location: 290 Preston Avenue

To: John C. Parker Jr., Chief Building Official:
This letter is to authorize the following person(s) or company to act as agent(s) on behalf of Owner(s)

Nanepashemet Project Management Inc. to obtain permit under Connecticut Contractor license or registration number MCO.0902836.

Authorized Person(s):

Daniel Burnett-Pollock
Print Name

Signature

Company Name Address City, State, Zip

Owner's Information: _____
Printed Name

Signature

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT43XC816

Middletown-AT&T
290 Preston Avenue
Middletown, CT 06492

August 30, 2018

EBI Project Number: 6218005914

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.60 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

August 30, 2018

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

Emissions Analysis for Site: **CT43XC816 – Middletown-AT&T**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **290 Preston Avenue, Middletown, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **290 Preston Avenue, Middletown, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed panel antennas are **130 feet** above ground level (AGL) for **Sector A**, **130 feet** above ground level (AGL) for **Sector B** and **130 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**130 feet**	Height (AGL):	**130 feet**	Height (AGL):	**130 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	8,850.04	ERP (W):	8,850.04	ERP (W):	8,850.04
Antenna A1 MPE%	**2.54 %**	Antenna B1 MPE%	**2.54 %**	Antenna C1 MPE%	**2.54 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**130 feet**	Height (AGL):	**130 feet**	Height (AGL):	**130 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.45 %**	Antenna B2 MPE%	**1.45 %**	Antenna C2 MPE%	**1.45 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.99 %**
MetroPCS	1.72 %
Nextel	0.46 %
Verizon Wireless	3.84 %
T-Mobile	0.95 %
AT&T	2.64 %
Site Total MPE %:	**13.60 %**

SPRINT Sector A Total:	3.99 %
SPRINT Sector B Total:	3.99 %
SPRINT Sector C Total:	3.99 %
Site Total:	13.60 %

SPRINT _ Frequency Band / Technology (All Sectors)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
Sprint 850 MHz CDMA	1	437.55	130	1.02	850 MHz	567	0.18%
Sprint 850 MHz LTE	2	1,093.88	130	5.12	850 MHz	567	0.90%
Sprint 1900 MHz (PCS) CDMA	5	622.47	130	7.28	1900 MHz (PCS)	1000	0.73%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	130	7.28	1900 MHz (PCS)	1000	0.73%
Sprint 2500 MHz (BRS) LTE	8	778.09	130	14.53	2500 MHz (BRS)	1000	1.45%
						Total:	**3.99%**

Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	3.99 %
Sector B:	3.99 %
Sector C:	3.99 %
SPRINT Maximum MPE % (per sector):	3.99 %
Site Total:	13.60 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.60 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED

August 21, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Route 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

SUBJECT: **MOUNT ASSESSMENT**

CARRIER: **SPRINT**

SITE: **MIDDLETOWN-AT&T (CT43XC816)**
290 PRESTON AVENUE
MIDDLETOWN, MIDDLESEX COUNTY, CONNECTICUT 06492
RAMAKER & ASSOCIATES PROJECT NUMBER: 28802

RESULTS: **MOUNT:** **PASS WITH MODIFICATIONS**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this mount assessment for the above mentioned site. The purpose of this report is to determine the structural integrity of the mounting structure with the proposed loading configurations. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the mount(s) using RISA analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the mount loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Joshua M. Opseth
Structural Designer

James R. Skowronski, P.E.
Supervising Engineer

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

ANALYSIS CRITERIA

State Building Code	2016 CT State Building Code
Adopted Building Code	2012 IBC
Referenced Standard	TIA-222-G
Risk Category	II
Ultimate Design Wind Speed, V_{ult}	130 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	101 mph (3 sec. gust)
Design Wind Speed w/ Ice	50 mph (3 sec. gust)
Ice Thickness	3/4 inch
Exposure Category	B
Topographic Feature	None

SUPPORTING DOCUMENTATION

- Previous mount analysis by Armor Tower Engineering, dated March 3, 2014
- Construction drawings by RAMAKER, project number 28802
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

MOUNT LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antennas and equipment configurations as shown in the following chart(s):

Antenna Mount – All Sectors				
Elevation	**Position**	**Appurtenance**	**Mount Type**	**Status**
130	1	**(1) RFS APXVTM14-ALU-I20**	Low Profile Platform w/ **Site Pro 1 HRK12 Handrail Kit** & **PRK-1245L Reinforcement Kit**	**Proposed**
		(1) ALU TD-RRHx20		
	2	(1) RFS APXVSPP18-C-A20		Existing
	3	--		--

Universal Ring Mount		
Elevation	**Appurtenance**	**Status**
130	(3) ALU 800MHz 2x50W RRH	Existing
	(3) ALU 1900MHz 4x45 RRH	

MOUNT RESULTS

By engineering calculation and inspection, the ***modified*** antenna and equipment mounting structure(s) are capable of supporting the proposed loading configurations without causing an overstress condition in the antenna and equipment mounting structure(s), ***provided the proposed structural modifications are completed prior to antenna and equipment installation. See the associated construction drawings by RAMAKER for required modifications.***

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance
- Member grades less than assumed grades show below:

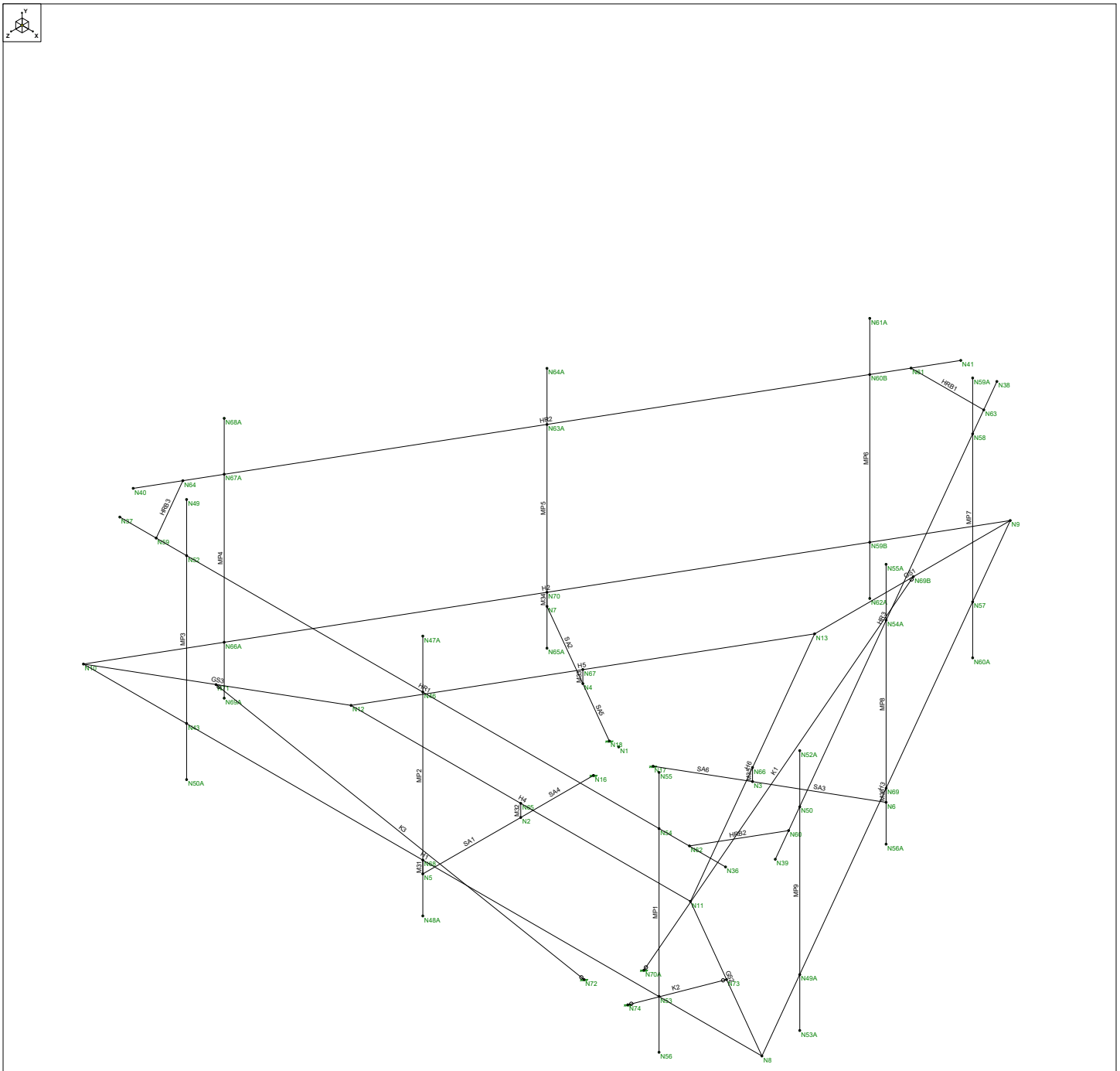
Assumed Steel Member Grades	
Angles/Plates/Channels/Solid Rods	ASTM A36, 36 ksi
Pipes	ASTM A53 Gr. B, 35 ksi
HSS (Square Tube)	ASTM A36, 36 ksi

RAMAKER is not responsible for verifying that the loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

This analysis pertains only to the mounting structure, and no analyses or conclusions were made regarding the supporting structure. Analysis and certification of the supporting structure is performed and submitted separately.

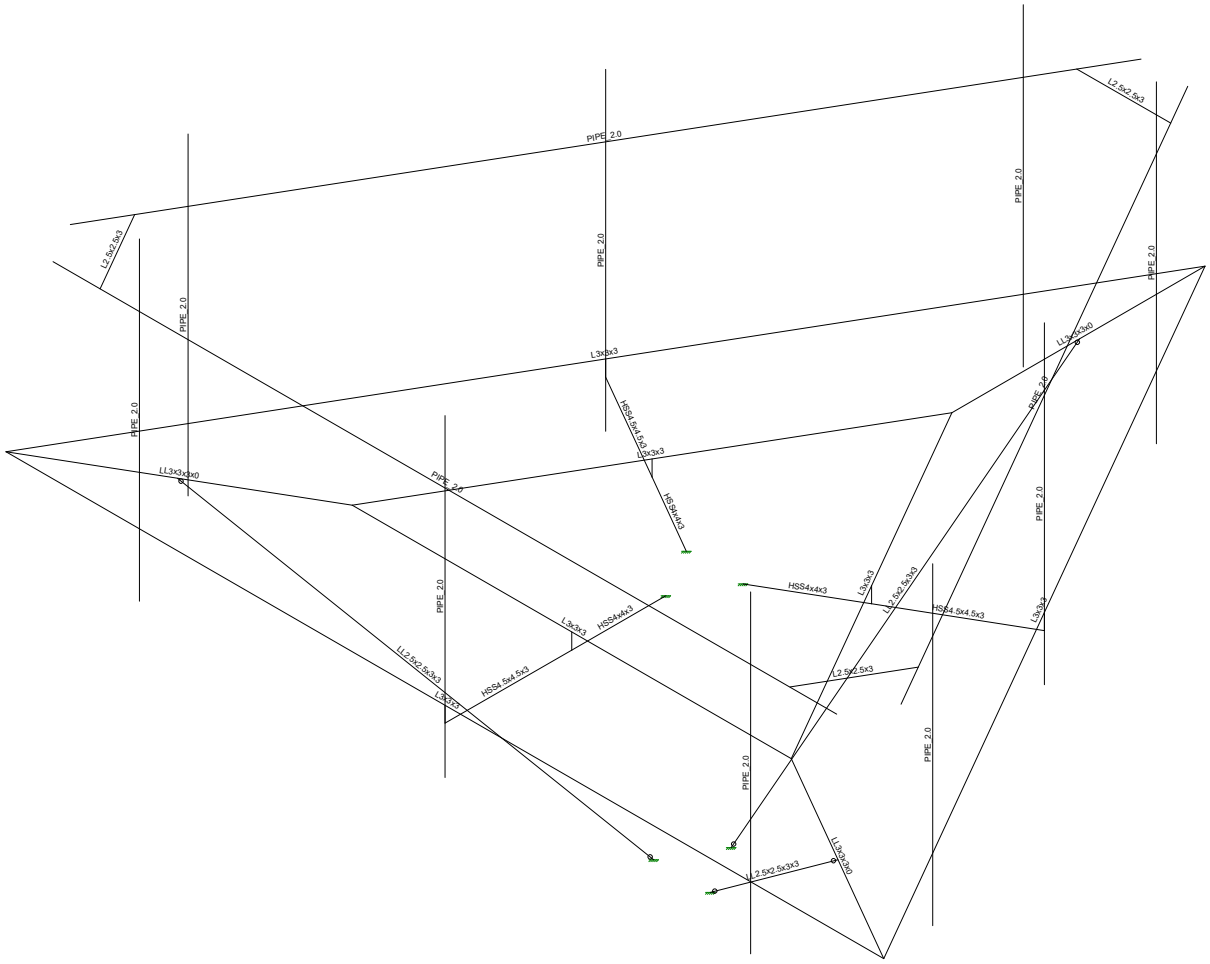
ATTACHMENTS

- Analysis Figures
- Analysis Calculations



Envelope Only Solution

Ramaker & Associates	CT43XC816	SK - 1
JMO		Aug 21, 2018 at 5:11 PM
28802		28802 Mount Rev1.r3d



Envelope Only Solution

Ramaker & Associates	CT43XC816	SK - 2
JMO		Aug 21, 2018 at 5:11 PM
28802		28802 Mount Rev1.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65 .49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65 .49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65 .49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65 .49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65 .49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65 .49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65 .49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	L3x3x3/16	L3x3x3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014
2	LL3x3x3/16	LL3x3x3x0	Beam	Double Angle (No Ga...	A36 Gr.36	Typical	2.18	3.35	1.9	.027
3	LL2.5x2.5x3/16x3/8	LL2.5x2.5x3x3	Beam	Double Angle (3/8 G...	A36 Gr.36	Typical	1.8	2.46	1.07	.023
4	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	HSS4x4x3/16	HSS4x4x3	Beam	SquareTube	A36 Gr.36	Typical	2.58	6.21	6.21	10
6	HSS4.5x4.5x3/16	HSS4.5x4.5x3	Beam	SquareTube	A36 Gr.36	Typical	2.93	9.02	9.02	14.4
7	L2.5x2.5x3/16	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	SA1	N2	N5		90	HSS4.5x4.5x3/...	Beam	SquareTube	A36 Gr.36	Typical
2	SA2	N4	N7		90	HSS4.5x4.5x3/...	Beam	SquareTube	A36 Gr.36	Typical
3	SA3	N3	N6		90	HSS4.5x4.5x3/...	Beam	SquareTube	A36 Gr.36	Typical
4	H1	N10	N8		270	L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
5	H3	N8	N9		270	L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
6	H2	N9	N10		270	L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
7	H4	N12	N11			L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
8	H6	N11	N13			L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
9	H5	N13	N12			L3x3x3/16	Beam	Single Angle	A36 Gr.36	Typical
10	GS3	N10	N12		180	LL3x3x3/16	Beam	Double Angle (...	A36 Gr.36	Typical
11	GS2	N8	N11		180	LL3x3x3/16	Beam	Double Angle (...	A36 Gr.36	Typical
12	GS1	N9	N13		180	LL3x3x3/16	Beam	Double Angle (...	A36 Gr.36	Typical
13	HR1	N37	N36		270	Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
14	HR3	N39	N38		270	Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
15	HR2	N41	N40		270	Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
16	SA4	N16	N2			HSS4x4x3/16	Beam	SquareTube	A36 Gr.36	Typical
17	SA6	N17	N3			HSS4x4x3/16	Beam	SquareTube	A36 Gr.36	Typical
18	SA5	N18	N4			HSS4x4x3/16	Beam	SquareTube	A36 Gr.36	Typical
19	HRB3	N59	N64		180	L2.5x2.5x3/16	Beam	Single Angle	A36 Gr.36	Typical
20	HRB1	N61	N63		180	L2.5x2.5x3/16	Beam	Single Angle	A36 Gr.36	Typical
21	HRB2	N60	N62		180	L2.5x2.5x3/16	Beam	Single Angle	A36 Gr.36	Typical
22	M31	N68	N5			RIGID	None	None	RIGID	Typical
23	M32	N65	N2			RIGID	None	None	RIGID	Typical
24	M33	N67	N4			RIGID	None	None	RIGID	Typical
25	M34	N70	N7			RIGID	None	None	RIGID	Typical
26	M35	N66	N3			RIGID	None	None	RIGID	Typical
27	M36	N69	N6			RIGID	None	None	RIGID	Typical
28	MP3	N50A	N49			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
29	MP2	N48A	N47A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
30	MP1	N56	N55			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
31	MP9	N53A	N52A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
32	MP8	N56A	N55A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
33	MP7	N60A	N59A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
34	MP6	N62A	N61A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
35	MP5	N65A	N64A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
36	MP4	N69A	N68A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
37	K1	N70A	N69B			LL2.5x2.5x3/1...	Beam	Double Angle (...	A36 Gr.36	Typical
38	K3	N72	N71			LL2.5x2.5x3/1...	Beam	Double Angle (...	A36 Gr.36	Typical
39	K2	N74	N73			LL2.5x2.5x3/1...	Beam	Double Angle (...	A36 Gr.36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Dead Load	None		-1			15		3	
2	Antenna Wind 0	None					30			
3	Antenna Wind 30	None					30			
4	Antenna Wind 45	None					30			
5	Antenna Wind 60	None					30			
6	Antenna Wind 90	None					30			
7	Antenna Wind 120	None					30			
8	Antenna Wind 135	None					30			
9	Antenna Wind 150	None					30			
10	Antenna Wind 180	None					30			
11	Antenna Wind 210	None					30			
12	Antenna Wind 225	None					30			
13	Antenna Wind 240	None					30			
14	Antenna Wind 270	None					30			
15	Antenna Wind 300	None					30			
16	Antenna Wind 315	None					30			
17	Antenna Wind 330	None					30			
18	Antenna Ice Dead Load	None					15			
19	Antenna Wind w/Ice 0	None					30			
20	Antenna Wind w/Ice 30	None					30			
21	Antenna Wind w/Ice 45	None					30			
22	Antenna Wind w/Ice 60	None					30			
23	Antenna Wind w/Ice 90	None					30			
24	Antenna Wind w/Ice 120	None					30			
25	Antenna Wind w/Ice 135	None					30			
26	Antenna Wind w/Ice 150	None					30			
27	Antenna Wind w/Ice 180	None					30			
28	Antenna Wind w/Ice 210	None					30			
29	Antenna Wind w/Ice 225	None					30			
30	'Antenna Wind w/Ice 240	None					30			
31	Antenna Wind w/Ice 270	None					30			
32	Antenna Wind w/Ice 300	None					30			
33	Antenna Wind w/Ice 315	None					30			
34	Antenna Wind w/Ice 330	None					30			
35	Member Wind 0	None						66		
36	Member Wind 30	None						66		
37	Member Wind 45	None						66		
38	Member Wind 60	None						66		
39	Member Wind 90	None						66		
40	Member Wind 120	None						66		
41	Member Wind 135	None						66		
42	Member Wind 150	None						66		
43	Member Wind 180	None						66		
44	Member Wind 210	None						66		
45	Member Wind 225	None						66		
46	Member Wind 240	None						66		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
47	Member Wind 270	None						66		
48	Member Wind 300	None						66		
49	Member Wind 315	None						66		
50	Member Wind 330	None						66		
51	Member Ice Dead Load	None						33	3	
52	Member Wind w/Ice 0	None						66		
53	Member Wind w/Ice 30	None						66		
54	Member Wind w/Ice 45	None						66		
55	Member Wind w/Ice 60	None						66		
56	Member Wind w/Ice 90	None						66		
57	Member Wind w/Ice 120	None						66		
58	Member Wind w/Ice 135	None						66		
59	Member Wind w/Ice 150	None						66		
60	Member Wind w/Ice 180	None						66		
61	Member Wind w/Ice 210	None						66		
62	Member Wind w/Ice 225	None						66		
63	Member Wind w/Ice 240	None						66		
64	Member Wind w/Ice 270	None						66		
65	Member Wind w/Ice 300	None						66		
66	Member Wind w/Ice 315	None						66		
67	Member Wind w/Ice 330	None						66		
68	LV-1	None					1			
69	LV-2	None					1			
70	LV-3	None					1			
71	LV-4	None					1			
72	LV-5	None					1			
73	LV-6	None					1			
74	LV-7	None					1			
75	LV-8	None					1			
76	LV-9	None					1			
77	LV-10	None								
78	LV-11	None								
79	LV-12	None								
80	LV-13	None								
81	LV-14	None								
82	LV-15	None								
83	LM-1	None					1			
84	LM-2	None					1			
85	LM-3	None					1			
86	LM-4	None					1			
87	LM-5	None					1			
88	LM-6	None					1			
89	LM-7	None					1			
90	LM-8	None					1			
91	LM-9	None					1			
92	LM-10	None								
93	LM-11	None								
94	LM-12	None								
95	LM-13	None								
96	LM-14	None								
97	LM-15	None								
98	BLC 1 Transient Area Loads	None						25		
99	BLC 51 Transient Area Loads	None						25		

Load Combinations

	Description	...	PD..	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
1	1.4D	...	Y		1	1.4																		
2	0.9D + 1.6 (0-Wind)	...	Y		1	.9	2	1.6	35	1.6														
3	0.9D + 1.6 (30-Wind)	...	Y		1	.9	3	1.6	36	1.6														
4	0.9D + 1.6 (45-Wind)	...	Y		1	.9	4	1.6	37	1.6														
5	0.9D + 1.6 (60-Wind)	...	Y		1	.9	5	1.6	38	1.6														
6	0.9D + 1.6 (90-Wind)	...	Y		1	.9	6	1.6	39	1.6														
7	0.9D + 1.6 (120-Wind)	...	Y		1	.9	7	1.6	40	1.6														
8	0.9D + 1.6 (135-Wind)	...	Y		1	.9	8	1.6	41	1.6														
9	0.9D + 1.6 (150-Wind)	...	Y		1	.9	9	1.6	42	1.6														
10	0.9D + 1.6 (180-Wind)	...	Y		1	.9	10	1.6	43	1.6														
11	0.9D + 1.6 (210-Wind)	...	Y		1	.9	11	1.6	44	1.6														
12	0.9D + 1.6 (225-Wind)	...	Y		1	.9	12	1.6	45	1.6														
13	0.9D + 1.6 (240-Wind)	...	Y		1	.9	13	1.6	46	1.6														
14	0.9D + 1.6 (270-Wind)	...	Y		1	.9	14	1.6	47	1.6														
15	0.9D + 1.6 (300-Wind)	...	Y		1	.9	15	1.6	48	1.6														
16	0.9D + 1.6 (315-Wind)	...	Y		1	.9	16	1.6	49	1.6														
17	0.9D + 1.6 (330-Wind)	...	Y		1	.9	17	1.6	50	1.6														
18	1.2D + 1.6 (0-Wind)	...	Y		1	1.2	2	1.6	35	1.6														
19	1.2D + 1.6 (30-Wind)	...	Y		1	1.2	3	1.6	36	1.6														
20	1.2D + 1.6 (45-Wind)	...	Y		1	1.2	4	1.6	37	1.6														
21	1.2D + 1.6 (60-Wind)	...	Y		1	1.2	5	1.6	38	1.6														
22	1.2D + 1.6 (90-Wind)	...	Y		1	1.2	6	1.6	39	1.6														
23	1.2D + 1.6 (120-Wind)	...	Y		1	1.2	7	1.6	40	1.6														
24	1.2D + 1.6 (135-Wind)	...	Y		1	1.2	8	1.6	41	1.6														
25	1.2D + 1.6 (150-Wind)	...	Y		1	1.2	9	1.6	42	1.6														
26	1.2D + 1.6 (180-Wind)	...	Y		1	1.2	10	1.6	43	1.6														
27	1.2D + 1.6 (210-Wind)	...	Y		1	1.2	11	1.6	44	1.6														
28	1.2D + 1.6 (225-Wind)	...	Y		1	1.2	12	1.6	45	1.6														
29	1.2D + 1.6 (240-Wind)	...	Y		1	1.2	13	1.6	46	1.6														
30	1.2D + 1.6 (270-Wind)	...	Y		1	1.2	14	1.6	47	1.6														
31	1.2D + 1.6 (300-Wind)	...	Y		1	1.2	15	1.6	48	1.6														
32	1.2D + 1.6 (315-Wind)	...	Y		1	1.2	16	1.6	49	1.6														
33	1.2D + 1.6 (330-Wind)	...	Y		1	1.2	17	1.6	50	1.6														
34	1.2D + 1.0Di + 1.0 (0-Wind Ice)	...	Y		1	1.2	18	1	51	1	19	1	52	1										
35	1.2D + 1.0Di + 1.0 (30-Wind Ice)	...	Y		1	1.2	18	1	51	1	20	1	53	1										
36	1.2D + 1.0Di + 1.0 (45-Wind Ice)	...	Y		1	1.2	18	1	51	1	21	1	54	1										
37	1.2D + 1.0Di + 1.0 (60-Wind Ice)	...	Y		1	1.2	18	1	51	1	22	1	55	1										
38	1.2D + 1.0Di + 1.0 (90-Wind Ice)	...	Y		1	1.2	18	1	51	1	23	1	56	1										
39	1.2D + 1.0Di + 1.0 (120-Wind Ice)	...	Y		1	1.2	18	1	51	1	24	1	57	1										
40	1.2D + 1.0Di + 1.0 (135-Wind Ice)	...	Y		1	1.2	18	1	51	1	25	1	58	1										
41	1.2D + 1.0Di + 1.0 (150-Wind Ice)	...	Y		1	1.2	18	1	51	1	26	1	59	1										
42	1.2D + 1.0Di + 1.0 (180-Wind Ice)	...	Y		1	1.2	18	1	51	1	27	1	60	1										
43	1.2D + 1.0Di + 1.0 (210-Wind Ice)	...	Y		1	1.2	18	1	51	1	28	1	61	1										
44	1.2D + 1.0Di + 1.0 (225-Wind Ice)	...	Y		1	1.2	18	1	51	1	29	1	62	1										
45	1.2D + 1.0Di + 1.0 (240-Wind Ice)	...	Y		1	1.2	18	1	51	1	30	1	63	1										
46	1.2D + 1.0Di + 1.0 (270-Wind Ice)	...	Y		1	1.2	18	1	51	1	31	1	64	1										
47	1.2D + 1.0Di + 1.0 (300-Wind Ice)	...	Y		1	1.2	18	1	51	1	32	1	65	1										
48	1.2D + 1.0Di + 1.0 (315-Wind Ice)	...	Y		1	1.2	18	1	51	1	33	1	66	1										
49	1.2D + 1.0Di + 1.0 (330-Wind Ice)	...	Y		1	1.2	18	1	51	1	34	1	67	1										
50	1.2D + 1.5LV-1	...	Y		1	1.2	68	1.5																
51	1.2D + 1.5LV-2	...	Y		1	1.2	69	1.5																
52	1.2D + 1.5LV-3	...	Y		1	1.2	70	1.5																
53	1.2D + 1.5LV-4	...	Y		1	1.2	71	1.5																
54	1.2D + 1.5LV-5	...	Y		1	1.2	72	1.5																
55	1.2D + 1.5LV-6	...	Y		1	1.2	73	1.5																
56	1.2D + 1.5LV-7	...	Y		1	1.2	74	1.5																

Load Combinations (Continued)

	Description	...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
57	1.2D + 1.5LV-8	...	Y		1	1.2	75	1.5																		
58	1.2D + 1.5LV-9	...	Y		1	1.2	76	1.5																		
59	1.2D + 1.5LV-10	...	Y		1	1.2	77	1.5																		
60	1.2D + 1.5LV-11	...	Y		1	1.2	78	1.5																		
61	1.2D + 1.5LV-12	...	Y		1	1.2	79	1.5																		
62	1.2D + 1.5LV-13	...	Y		1	1.2	80	1.5																		
63	1.2D + 1.5LV-14	...	Y		1	1.2	81	1.5																		
64	1.2D + 1.5LV-15	...	Y		1	1.2	82	1.5																		
65	1.2D + 1.5LM-1 + Maintenance (0-Wind)	...	Y		1	1.2	83	1.5	2	.088	35	.0...														
66	1.2D + 1.5LM-1 + Maintenance (30-Wind)	...	Y		1	1.2	83	1.5	3	.088	36	.0...														
67	1.2D + 1.5LM-1 + Maintenance (45-Wind)	...	Y		1	1.2	83	1.5	4	.088	37	.0...														
68	1.2D + 1.5LM-1 + Maintenance (60-Wind)	...	Y		1	1.2	83	1.5	5	.088	38	.0...														
69	1.2D + 1.5LM-1 + Maintenance (90-Wind)	...	Y		1	1.2	83	1.5	6	.088	39	.0...														
70	1.2D + 1.5LM-1 + Maintenance (120-Wind)	...	Y		1	1.2	83	1.5	7	.088	40	.0...														
71	1.2D + 1.5LM-1 + Maintenance (135-Wind)	...	Y		1	1.2	83	1.5	8	.088	41	.0...														
72	1.2D + 1.5LM-1 + Maintenance (150-Wind)	...	Y		1	1.2	83	1.5	9	.088	42	.0...														
73	1.2D + 1.5LM-1 + Maintenance (180-Wind)	...	Y		1	1.2	83	1.5	10	.088	43	.0...														
74	1.2D + 1.5LM-1 + Maintenance (210-Wind)	...	Y		1	1.2	83	1.5	11	.088	44	.0...														
75	1.2D + 1.5LM-1 + Maintenance (225-Wind)	...	Y		1	1.2	83	1.5	12	.088	45	.0...														
76	1.2D + 1.5LM-1 + Maintenance (240-Wind)	...	Y		1	1.2	83	1.5	13	.088	46	.0...														
77	1.2D + 1.5LM-1 + Maintenance (270-Wind)	...	Y		1	1.2	83	1.5	14	.088	47	.0...														
78	1.2D + 1.5LM-1 + Maintenance (300-Wind)	...	Y		1	1.2	83	1.5	15	.088	48	.0...														
79	1.2D + 1.5LM-1 + Maintenance (315-Wind)	...	Y		1	1.2	83	1.5	16	.088	49	.0...														
80	1.2D + 1.5LM-1 + Maintenance (330-Wind)	...	Y		1	1.2	83	1.5	17	.088	50	.0...														
81	1.2D + 1.5LM-2 + Maintenance (0-Wind)	...	Y		1	1.2	84	1.5	2	.088	35	.0...														
82	1.2D + 1.5LM-2 + Maintenance (30-Wind)	...	Y		1	1.2	84	1.5	3	.088	36	.0...														
83	1.2D + 1.5LM-2 + Maintenance (45-Wind)	...	Y		1	1.2	84	1.5	4	.088	37	.0...														
84	1.2D + 1.5LM-2 + Maintenance (60-Wind)	...	Y		1	1.2	84	1.5	5	.088	38	.0...														
85	1.2D + 1.5LM-2 + Maintenance (90-Wind)	...	Y		1	1.2	84	1.5	6	.088	39	.0...														
86	1.2D + 1.5LM-2 + Maintenance (120-Wind)	...	Y		1	1.2	84	1.5	7	.088	40	.0...														
87	1.2D + 1.5LM-2 + Maintenance (135-Wind)	...	Y		1	1.2	84	1.5	8	.088	41	.0...														
88	1.2D + 1.5LM-2 + Maintenance (150-Wind)	...	Y		1	1.2	84	1.5	9	.088	42	.0...														
89	1.2D + 1.5LM-2 + Maintenance (180-Wind)	...	Y		1	1.2	84	1.5	10	.088	43	.0...														
90	1.2D + 1.5LM-2 + Maintenance (210-Wind)	...	Y		1	1.2	84	1.5	11	.088	44	.0...														
91	1.2D + 1.5LM-2 + Maintenance (225-Wind)	...	Y		1	1.2	84	1.5	12	.088	45	.0...														
92	1.2D + 1.5LM-2 + Maintenance (240-Wind)	...	Y		1	1.2	84	1.5	13	.088	46	.0...														
93	1.2D + 1.5LM-2 + Maintenance (270-Wind)	...	Y		1	1.2	84	1.5	14	.088	47	.0...														
94	1.2D + 1.5LM-2 + Maintenance (300-Wind)	...	Y		1	1.2	84	1.5	15	.088	48	.0...														
95	1.2D + 1.5LM-2 + Maintenance (315-Wind)	...	Y		1	1.2	84	1.5	16	.088	49	.0...														
96	1.2D + 1.5LM-2 + Maintenance (330-Wind)	...	Y		1	1.2	84	1.5	17	.088	50	.0...														
97	1.2D + 1.5LM-3 + Maintenance (0-Wind)	...	Y		1	1.2	85	1.5	2	.088	35	.0...														
98	1.2D + 1.5LM-3 + Maintenance (30-Wind)	...	Y		1	1.2	85	1.5	3	.088	36	.0...														
99	1.2D + 1.5LM-3 + Maintenance (45-Wind)	...	Y		1	1.2	85	1.5	4	.088	37	.0...														
100	1.2D + 1.5LM-3 + Maintenance (60-Wind)	...	Y		1	1.2	85	1.5	5	.088	38	.0...														
101	1.2D + 1.5LM-3 + Maintenance (90-Wind)	...	Y		1	1.2	85	1.5	6	.088	39	.0...														
102	1.2D + 1.5LM-3 + Maintenance (120-Wind)	...	Y		1	1.2	85	1.5	7	.088	40	.0...														
103	1.2D + 1.5LM-3 + Maintenance (135-Wind)	...	Y		1	1.2	85	1.5	8	.088	41	.0...														
104	1.2D + 1.5LM-3 + Maintenance (150-Wind)	...	Y		1	1.2	85	1.5	9	.088	42	.0...														
105	1.2D + 1.5LM-3 + Maintenance (180-Wind)	...	Y		1	1.2	85	1.5	10	.088	43	.0...														
106	1.2D + 1.5LM-3 + Maintenance (210-Wind)	...	Y		1	1.2	85	1.5	11	.088	44	.0...														
107	1.2D + 1.5LM-3 + Maintenance (225-Wind)	...	Y		1	1.2	85	1.5	12	.088	45	.0...														
108	1.2D + 1.5LM-3 + Maintenance (240-Wind)	...	Y		1	1.2	85	1.5	13	.088	46	.0...														
109	1.2D + 1.5LM-3 + Maintenance (270-Wind)	...	Y		1	1.2	85	1.5	14	.088	47	.0...														
110	1.2D + 1.5LM-3 + Maintenance (300-Wind)	...	Y		1	1.2	85	1.5	15	.088	48	.0...														
111	1.2D + 1.5LM-3 + Maintenance (315-Wind)	...	Y		1	1.2	85	1.5	16	.088	49	.0...														
112	1.2D + 1.5LM-3 + Maintenance (330-Wind)	...	Y		1	1.2	85	1.5	17	.088	50	.0...														
113	1.2D + 1.5LM-4 + Maintenance (0-Wind)	...	Y		1	1.2	86	1.5	2	.088	35	.0...														

Load Combinations (Continued)

	Description	...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
114	1.2D + 1.5LM-4 + Maintenance (30-Wind)	...	Y		1	1.2	86	1.5	3	.088	36	.0...												
115	1.2D + 1.5LM-4 + Maintenance (45-Wind)	...	Y		1	1.2	86	1.5	4	.088	37	.0...												
116	1.2D + 1.5LM-4 + Maintenance (60-Wind)	...	Y		1	1.2	86	1.5	5	.088	38	.0...												
117	1.2D + 1.5LM-4 + Maintenance (90-Wind)	...	Y		1	1.2	86	1.5	6	.088	39	.0...												
118	1.2D + 1.5LM-4 + Maintenance (120-Wind)	...	Y		1	1.2	86	1.5	7	.088	40	.0...												
119	1.2D + 1.5LM-4 + Maintenance (135-Wind)	...	Y		1	1.2	86	1.5	8	.088	41	.0...												
120	1.2D + 1.5LM-4 + Maintenance (150-Wind)	...	Y		1	1.2	86	1.5	9	.088	42	.0...												
121	1.2D + 1.5LM-4 + Maintenance (180-Wind)	...	Y		1	1.2	86	1.5	10	.088	43	.0...												
122	1.2D + 1.5LM-4 + Maintenance (210-Wind)	...	Y		1	1.2	86	1.5	11	.088	44	.0...												
123	1.2D + 1.5LM-4 + Maintenance (225-Wind)	...	Y		1	1.2	86	1.5	12	.088	45	.0...												
124	1.2D + 1.5LM-4 + Maintenance (240-Wind)	...	Y		1	1.2	86	1.5	13	.088	46	.0...												
125	1.2D + 1.5LM-4 + Maintenance (270-Wind)	...	Y		1	1.2	86	1.5	14	.088	47	.0...												
126	1.2D + 1.5LM-4 + Maintenance (300-Wind)	...	Y		1	1.2	86	1.5	15	.088	48	.0...												
127	1.2D + 1.5LM-4 + Maintenance (315-Wind)	...	Y		1	1.2	86	1.5	16	.088	49	.0...												
128	1.2D + 1.5LM-4 + Maintenance (330-Wind)	...	Y		1	1.2	86	1.5	17	.088	50	.0...												
129	1.2D + 1.5LM-5 + Maintenance (0-Wind)	...	Y		1	1.2	87	1.5	2	.088	35	.0...												
130	1.2D + 1.5LM-5 + Maintenance (30-Wind)	...	Y		1	1.2	87	1.5	3	.088	36	.0...												
131	1.2D + 1.5LM-5 + Maintenance (45-Wind)	...	Y		1	1.2	87	1.5	4	.088	37	.0...												
132	1.2D + 1.5LM-5 + Maintenance (60-Wind)	...	Y		1	1.2	87	1.5	5	.088	38	.0...												
133	1.2D + 1.5LM-5 + Maintenance (90-Wind)	...	Y		1	1.2	87	1.5	6	.088	39	.0...												
134	1.2D + 1.5LM-5 + Maintenance (120-Wind)	...	Y		1	1.2	87	1.5	7	.088	40	.0...												
135	1.2D + 1.5LM-5 + Maintenance (135-Wind)	...	Y		1	1.2	87	1.5	8	.088	41	.0...												
136	1.2D + 1.5LM-5 + Maintenance (150-Wind)	...	Y		1	1.2	87	1.5	9	.088	42	.0...												
137	1.2D + 1.5LM-5 + Maintenance (180-Wind)	...	Y		1	1.2	87	1.5	10	.088	43	.0...												
138	1.2D + 1.5LM-5 + Maintenance (210-Wind)	...	Y		1	1.2	87	1.5	11	.088	44	.0...												
139	1.2D + 1.5LM-5 + Maintenance (225-Wind)	...	Y		1	1.2	87	1.5	12	.088	45	.0...												
140	1.2D + 1.5LM-5 + Maintenance (240-Wind)	...	Y		1	1.2	87	1.5	13	.088	46	.0...												
141	1.2D + 1.5LM-5 + Maintenance (270-Wind)	...	Y		1	1.2	87	1.5	14	.088	47	.0...												
142	1.2D + 1.5LM-5 + Maintenance (300-Wind)	...	Y		1	1.2	87	1.5	15	.088	48	.0...												
143	1.2D + 1.5LM-5 + Maintenance (315-Wind)	...	Y		1	1.2	87	1.5	16	.088	49	.0...												
144	1.2D + 1.5LM-5 + Maintenance (330-Wind)	...	Y		1	1.2	87	1.5	17	.088	50	.0...												
145	1.2D + 1.5LM-6 + Maintenance (0-Wind)	...	Y		1	1.2	88	1.5	2	.088	35	.0...												
146	1.2D + 1.5LM-6 + Maintenance (30-Wind)	...	Y		1	1.2	88	1.5	3	.088	36	.0...												
147	1.2D + 1.5LM-6 + Maintenance (45-Wind)	...	Y		1	1.2	88	1.5	4	.088	37	.0...												
148	1.2D + 1.5LM-6 + Maintenance (60-Wind)	...	Y		1	1.2	88	1.5	5	.088	38	.0...												
149	1.2D + 1.5LM-6 + Maintenance (90-Wind)	...	Y		1	1.2	88	1.5	6	.088	39	.0...												
150	1.2D + 1.5LM-6 + Maintenance (120-Wind)	...	Y		1	1.2	88	1.5	7	.088	40	.0...												
151	1.2D + 1.5LM-6 + Maintenance (135-Wind)	...	Y		1	1.2	88	1.5	8	.088	41	.0...												
152	1.2D + 1.5LM-6 + Maintenance (150-Wind)	...	Y		1	1.2	88	1.5	9	.088	42	.0...												
153	1.2D + 1.5LM-6 + Maintenance (180-Wind)	...	Y		1	1.2	88	1.5	10	.088	43	.0...												
154	1.2D + 1.5LM-6 + Maintenance (210-Wind)	...	Y		1	1.2	88	1.5	11	.088	44	.0...												
155	1.2D + 1.5LM-6 + Maintenance (225-Wind)	...	Y		1	1.2	88	1.5	12	.088	45	.0...												
156	1.2D + 1.5LM-6 + Maintenance (240-Wind)	...	Y		1	1.2	88	1.5	13	.088	46	.0...												
157	1.2D + 1.5LM-6 + Maintenance (270-Wind)	...	Y		1	1.2	88	1.5	14	.088	47	.0...												
158	1.2D + 1.5LM-6 + Maintenance (300-Wind)	...	Y		1	1.2	88	1.5	15	.088	48	.0...												
159	1.2D + 1.5LM-6 + Maintenance (315-Wind)	...	Y		1	1.2	88	1.5	16	.088	49	.0...												
160	1.2D + 1.5LM-6 + Maintenance (330-Wind)	...	Y		1	1.2	88	1.5	17	.088	50	.0...												
161	1.2D + 1.5LM-7 + Maintenance (0-Wind)	...	Y		1	1.2	89	1.5	2	.088	35	.0...												
162	1.2D + 1.5LM-7 + Maintenance (30-Wind)	...	Y		1	1.2	89	1.5	3	.088	36	.0...												
163	1.2D + 1.5LM-7 + Maintenance (45-Wind)	...	Y		1	1.2	89	1.5	4	.088	37	.0...												
164	1.2D + 1.5LM-7 + Maintenance (60-Wind)	...	Y		1	1.2	89	1.5	5	.088	38	.0...												
165	1.2D + 1.5LM-7 + Maintenance (90-Wind)	...	Y		1	1.2	89	1.5	6	.088	39	.0...												
166	1.2D + 1.5LM-7 + Maintenance (120-Wind)	...	Y		1	1.2	89	1.5	7	.088	40	.0...												
167	1.2D + 1.5LM-7 + Maintenance (135-Wind)	...	Y		1	1.2	89	1.5	8	.088	41	.0...												
168	1.2D + 1.5LM-7 + Maintenance (150-Wind)	...	Y		1	1.2	89	1.5	9	.088	42	.0...												
169	1.2D + 1.5LM-7 + Maintenance (180-Wind)	...	Y		1	1.2	89	1.5	10	.088	43	.0...												
170	1.2D + 1.5LM-7 + Maintenance (210-Wind)	...	Y		1	1.2	89	1.5	11	.088	44	.0...												

Load Combinations (Continued)

	Description	...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
171	1.2D + 1.5LM-7 + Maintenance (225-Wind)	...	Y		1	1.2	89	1.5	12	.088	45	.0...												
172	1.2D + 1.5LM-7 + Maintenance (240-Wind)	...	Y		1	1.2	89	1.5	13	.088	46	.0...												
173	1.2D + 1.5LM-7 + Maintenance (270-Wind)	...	Y		1	1.2	89	1.5	14	.088	47	.0...												
174	1.2D + 1.5LM-7 + Maintenance (300-Wind)	...	Y		1	1.2	89	1.5	15	.088	48	.0...												
175	1.2D + 1.5LM-7 + Maintenance (315-Wind)	...	Y		1	1.2	89	1.5	16	.088	49	.0...												
176	1.2D + 1.5LM-7 + Maintenance (330-Wind)	...	Y		1	1.2	89	1.5	17	.088	50	.0...												
177	1.2D + 1.5LM-8 + Maintenance (0-Wind)	...	Y		1	1.2	90	1.5	2	.088	35	.0...												
178	1.2D + 1.5LM-8 + Maintenance (30-Wind)	...	Y		1	1.2	90	1.5	3	.088	36	.0...												
179	1.2D + 1.5LM-8 + Maintenance (45-Wind)	...	Y		1	1.2	90	1.5	4	.088	37	.0...												
180	1.2D + 1.5LM-8 + Maintenance (60-Wind)	...	Y		1	1.2	90	1.5	5	.088	38	.0...												
181	1.2D + 1.5LM-8 + Maintenance (90-Wind)	...	Y		1	1.2	90	1.5	6	.088	39	.0...												
182	1.2D + 1.5LM-8 + Maintenance (120-Wind)	...	Y		1	1.2	90	1.5	7	.088	40	.0...												
183	1.2D + 1.5LM-8 + Maintenance (135-Wind)	...	Y		1	1.2	90	1.5	8	.088	41	.0...												
184	1.2D + 1.5LM-8 + Maintenance (150-Wind)	...	Y		1	1.2	90	1.5	9	.088	42	.0...												
185	1.2D + 1.5LM-8 + Maintenance (180-Wind)	...	Y		1	1.2	90	1.5	10	.088	43	.0...												
186	1.2D + 1.5LM-8 + Maintenance (210-Wind)	...	Y		1	1.2	90	1.5	11	.088	44	.0...												
187	1.2D + 1.5LM-8 + Maintenance (225-Wind)	...	Y		1	1.2	90	1.5	12	.088	45	.0...												
188	1.2D + 1.5LM-8 + Maintenance (240-Wind)	...	Y		1	1.2	90	1.5	13	.088	46	.0...												
189	1.2D + 1.5LM-8 + Maintenance (270-Wind)	...	Y		1	1.2	90	1.5	14	.088	47	.0...												
190	1.2D + 1.5LM-8 + Maintenance (300-Wind)	...	Y		1	1.2	90	1.5	15	.088	48	.0...												
191	1.2D + 1.5LM-8 + Maintenance (315-Wind)	...	Y		1	1.2	90	1.5	16	.088	49	.0...												
192	1.2D + 1.5LM-8 + Maintenance (330-Wind)	...	Y		1	1.2	90	1.5	17	.088	50	.0...												
193	1.2D + 1.5LM-9 + Maintenance (0-Wind)	...	Y		1	1.2	91	1.5	2	.088	35	.0...												
194	1.2D + 1.5LM-9 + Maintenance (30-Wind)	...	Y		1	1.2	91	1.5	3	.088	36	.0...												
195	1.2D + 1.5LM-9 + Maintenance (45-Wind)	...	Y		1	1.2	91	1.5	4	.088	37	.0...												
196	1.2D + 1.5LM-9 + Maintenance (60-Wind)	...	Y		1	1.2	91	1.5	5	.088	38	.0...												
197	1.2D + 1.5LM-9 + Maintenance (90-Wind)	...	Y		1	1.2	91	1.5	6	.088	39	.0...												
198	1.2D + 1.5LM-9 + Maintenance (120-Wind)	...	Y		1	1.2	91	1.5	7	.088	40	.0...												
199	1.2D + 1.5LM-9 + Maintenance (135-Wind)	...	Y		1	1.2	91	1.5	8	.088	41	.0...												
200	1.2D + 1.5LM-9 + Maintenance (150-Wind)	...	Y		1	1.2	91	1.5	9	.088	42	.0...												
201	1.2D + 1.5LM-9 + Maintenance (180-Wind)	...	Y		1	1.2	91	1.5	10	.088	43	.0...												
202	1.2D + 1.5LM-9 + Maintenance (210-Wind)	...	Y		1	1.2	91	1.5	11	.088	44	.0...												
203	1.2D + 1.5LM-9 + Maintenance (225-Wind)	...	Y		1	1.2	91	1.5	12	.088	45	.0...												
204	1.2D + 1.5LM-9 + Maintenance (240-Wind)	...	Y		1	1.2	91	1.5	13	.088	46	.0...												
205	1.2D + 1.5LM-9 + Maintenance (270-Wind)	...	Y		1	1.2	91	1.5	14	.088	47	.0...												
206	1.2D + 1.5LM-9 + Maintenance (300-Wind)	...	Y		1	1.2	91	1.5	15	.088	48	.0...												
207	1.2D + 1.5LM-9 + Maintenance (315-Wind)	...	Y		1	1.2	91	1.5	16	.088	49	.0...												
208	1.2D + 1.5LM-9 + Maintenance (330-Wind)	...	Y		1	1.2	91	1.5	17	.088	50	.0...												
209	1.2D + 1.5LM-10 + Maintenance (0-Wind)	...	Y		1	1.2	92	1.5	2	.088	35	.0...												
210	1.2D + 1.5LM-10 + Maintenance (30-Wind)	...	Y		1	1.2	92	1.5	3	.088	36	.0...												
211	1.2D + 1.5LM-10 + Maintenance (45-Wind)	...	Y		1	1.2	92	1.5	4	.088	37	.0...												
212	1.2D + 1.5LM-10 + Maintenance (60-Wind)	...	Y		1	1.2	92	1.5	5	.088	38	.0...												
213	1.2D + 1.5LM-10 + Maintenance (90-Wind)	...	Y		1	1.2	92	1.5	6	.088	39	.0...												
214	1.2D + 1.5LM-10 + Maintenance (120-Wind)	...	Y		1	1.2	92	1.5	7	.088	40	.0...												
215	1.2D + 1.5LM-10 + Maintenance (135-Wind)	...	Y		1	1.2	92	1.5	8	.088	41	.0...												
216	1.2D + 1.5LM-10 + Maintenance (150-Wind)	...	Y		1	1.2	92	1.5	9	.088	42	.0...												
217	1.2D + 1.5LM-10 + Maintenance (180-Wind)	...	Y		1	1.2	92	1.5	10	.088	43	.0...												
218	1.2D + 1.5LM-10 + Maintenance (210-Wind)	...	Y		1	1.2	92	1.5	11	.088	44	.0...												
219	1.2D + 1.5LM-10 + Maintenance (225-Wind)	...	Y		1	1.2	92	1.5	12	.088	45	.0...												
220	1.2D + 1.5LM-10 + Maintenance (240-Wind)	...	Y		1	1.2	92	1.5	13	.088	46	.0...												
221	1.2D + 1.5LM-10 + Maintenance (270-Wind)	...	Y		1	1.2	92	1.5	14	.088	47	.0...												
222	1.2D + 1.5LM-10 + Maintenance (300-Wind)	...	Y		1	1.2	92	1.5	15	.088	48	.0...												
223	1.2D + 1.5LM-10 + Maintenance (315-Wind)	...	Y		1	1.2	92	1.5	16	.088	49	.0...												
224	1.2D + 1.5LM-10 + Maintenance (330-Wind)	...	Y		1	1.2	92	1.5	17	.088	50	.0...												
225	1.2D + 1.5LM-11 + Maintenance (0-Wind)	...	Y		1	1.2	93	1.5	2	.088	35	.0...												
226	1.2D + 1.5LM-11 + Maintenance (30-Wind)	...	Y		1	1.2	93	1.5	3	.088	36	.0...												
227	1.2D + 1.5LM-11 + Maintenance (45-Wind)	...	Y		1	1.2	93	1.5	4	.088	37	.0...												

Load Combinations (Continued)

	Description	...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
228	1.2D + 1.5LM-11 + Maintenance (60-Wind)	...	Y		1	1.2	93	1.5	5	.088	38	.0...												
229	1.2D + 1.5LM-11 + Maintenance (90-Wind)	...	Y		1	1.2	93	1.5	6	.088	39	.0...												
230	1.2D + 1.5LM-11 + Maintenance (120-Wind)	...	Y		1	1.2	93	1.5	7	.088	40	.0...												
231	1.2D + 1.5LM-11 + Maintenance (135-Wind)	...	Y		1	1.2	93	1.5	8	.088	41	.0...												
232	1.2D + 1.5LM-11 + Maintenance (150-Wind)	...	Y		1	1.2	93	1.5	9	.088	42	.0...												
233	1.2D + 1.5LM-11 + Maintenance (180-Wind)	...	Y		1	1.2	93	1.5	10	.088	43	.0...												
234	1.2D + 1.5LM-11 + Maintenance (210-Wind)	...	Y		1	1.2	93	1.5	11	.088	44	.0...												
235	1.2D + 1.5LM-11 + Maintenance (225-Wind)	...	Y		1	1.2	93	1.5	12	.088	45	.0...												
236	1.2D + 1.5LM-11 + Maintenance (240-Wind)	...	Y		1	1.2	93	1.5	13	.088	46	.0...												
237	1.2D + 1.5LM-11 + Maintenance (270-Wind)	...	Y		1	1.2	93	1.5	14	.088	47	.0...												
238	1.2D + 1.5LM-11 + Maintenance (300-Wind)	...	Y		1	1.2	93	1.5	15	.088	48	.0...												
239	1.2D + 1.5LM-11 + Maintenance (315-Wind)	...	Y		1	1.2	93	1.5	16	.088	49	.0...												
240	1.2D + 1.5LM-11 + Maintenance (330-Wind)	...	Y		1	1.2	93	1.5	17	.088	50	.0...												
241	1.2D + 1.5LM-12 + Maintenance (0-Wind)	...	Y		1	1.2	94	1.5	2	.088	35	.0...												
242	1.2D + 1.5LM-12 + Maintenance (30-Wind)	...	Y		1	1.2	94	1.5	3	.088	36	.0...												
243	1.2D + 1.5LM-12 + Maintenance (45-Wind)	...	Y		1	1.2	94	1.5	4	.088	37	.0...												
244	1.2D + 1.5LM-12 + Maintenance (60-Wind)	...	Y		1	1.2	94	1.5	5	.088	38	.0...												
245	1.2D + 1.5LM-12 + Maintenance (90-Wind)	...	Y		1	1.2	94	1.5	6	.088	39	.0...												
246	1.2D + 1.5LM-12 + Maintenance (120-Wind)	...	Y		1	1.2	94	1.5	7	.088	40	.0...												
247	1.2D + 1.5LM-12 + Maintenance (135-Wind)	...	Y		1	1.2	94	1.5	8	.088	41	.0...												
248	1.2D + 1.5LM-12 + Maintenance (150-Wind)	...	Y		1	1.2	94	1.5	9	.088	42	.0...												
249	1.2D + 1.5LM-12 + Maintenance (180-Wind)	...	Y		1	1.2	94	1.5	10	.088	43	.0...												
250	1.2D + 1.5LM-12 + Maintenance (210-Wind)	...	Y		1	1.2	94	1.5	11	.088	44	.0...												
251	1.2D + 1.5LM-12 + Maintenance (225-Wind)	...	Y		1	1.2	94	1.5	12	.088	45	.0...												
252	1.2D + 1.5LM-12 + Maintenance (240-Wind)	...	Y		1	1.2	94	1.5	13	.088	46	.0...												
253	1.2D + 1.5LM-12 + Maintenance (270-Wind)	...	Y		1	1.2	94	1.5	14	.088	47	.0...												
254	1.2D + 1.5LM-12 + Maintenance (300-Wind)	...	Y		1	1.2	94	1.5	15	.088	48	.0...												
255	1.2D + 1.5LM-12 + Maintenance (315-Wind)	...	Y		1	1.2	94	1.5	16	.088	49	.0...												
256	1.2D + 1.5LM-12 + Maintenance (330-Wind)	...	Y		1	1.2	94	1.5	17	.088	50	.0...												
257	1.2D + 1.5LM-13 + Maintenance (0-Wind)	...	Y		1	1.2	95	1.5	2	.088	35	.0...												
258	1.2D + 1.5LM-13 + Maintenance (30-Wind)	...	Y		1	1.2	95	1.5	3	.088	36	.0...												
259	1.2D + 1.5LM-13 + Maintenance (45-Wind)	...	Y		1	1.2	95	1.5	4	.088	37	.0...												
260	1.2D + 1.5LM-13 + Maintenance (60-Wind)	...	Y		1	1.2	95	1.5	5	.088	38	.0...												
261	1.2D + 1.5LM-13 + Maintenance (90-Wind)	...	Y		1	1.2	95	1.5	6	.088	39	.0...												
262	1.2D + 1.5LM-13 + Maintenance (120-Wind)	...	Y		1	1.2	95	1.5	7	.088	40	.0...												
263	1.2D + 1.5LM-13 + Maintenance (135-Wind)	...	Y		1	1.2	95	1.5	8	.088	41	.0...												
264	1.2D + 1.5LM-13 + Maintenance (150-Wind)	...	Y		1	1.2	95	1.5	9	.088	42	.0...												
265	1.2D + 1.5LM-13 + Maintenance (180-Wind)	...	Y		1	1.2	95	1.5	10	.088	43	.0...												
266	1.2D + 1.5LM-13 + Maintenance (210-Wind)	...	Y		1	1.2	95	1.5	11	.088	44	.0...												
267	1.2D + 1.5LM-13 + Maintenance (225-Wind)	...	Y		1	1.2	95	1.5	12	.088	45	.0...												
268	1.2D + 1.5LM-13 + Maintenance (240-Wind)	...	Y		1	1.2	95	1.5	13	.088	46	.0...												
269	1.2D + 1.5LM-13 + Maintenance (270-Wind)	...	Y		1	1.2	95	1.5	14	.088	47	.0...												
270	1.2D + 1.5LM-13 + Maintenance (300-Wind)	...	Y		1	1.2	95	1.5	15	.088	48	.0...												
271	1.2D + 1.5LM-13 + Maintenance (315-Wind)	...	Y		1	1.2	95	1.5	16	.088	49	.0...												
272	1.2D + 1.5LM-13 + Maintenance (330-Wind)	...	Y		1	1.2	95	1.5	17	.088	50	.0...												
273	1.2D + 1.5LM-14 + Maintenance (0-Wind)	...	Y		1	1.2	96	1.5	2	.088	35	.0...												
274	1.2D + 1.5LM-14 + Maintenance (30-Wind)	...	Y		1	1.2	96	1.5	3	.088	36	.0...												
275	1.2D + 1.5LM-14 + Maintenance (45-Wind)	...	Y		1	1.2	96	1.5	4	.088	37	.0...												
276	1.2D + 1.5LM-14 + Maintenance (60-Wind)	...	Y		1	1.2	96	1.5	5	.088	38	.0...												
277	1.2D + 1.5LM-14 + Maintenance (90-Wind)	...	Y		1	1.2	96	1.5	6	.088	39	.0...												
278	1.2D + 1.5LM-14 + Maintenance (120-Wind)	...	Y		1	1.2	96	1.5	7	.088	40	.0...												
279	1.2D + 1.5LM-14 + Maintenance (135-Wind)	...	Y		1	1.2	96	1.5	8	.088	41	.0...												
280	1.2D + 1.5LM-14 + Maintenance (150-Wind)	...	Y		1	1.2	96	1.5	9	.088	42	.0...												
281	1.2D + 1.5LM-14 + Maintenance (180-Wind)	...	Y		1	1.2	96	1.5	10	.088	43	.0...												
282	1.2D + 1.5LM-14 + Maintenance (210-Wind)	...	Y		1	1.2	96	1.5	11	.088	44	.0...												
283	1.2D + 1.5LM-14 + Maintenance (225-Wind)	...	Y		1	1.2	96	1.5	12	.088	45	.0...												
284	1.2D + 1.5LM-14 + Maintenance (240-Wind)	...	Y		1	1.2	96	1.5	13	.088	46	.0...												

Load Combinations (Continued)

	Description	...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	F...	B...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
285	1.2D + 1.5LM-14 + Maintenance (270-Wind)	...	Y		1	1.2	96	1.5	14	.088	47	.0...												
286	1.2D + 1.5LM-14 + Maintenance (300-Wind)	...	Y		1	1.2	96	1.5	15	.088	48	.0...												
287	1.2D + 1.5LM-14 + Maintenance (315-Wind)	...	Y		1	1.2	96	1.5	16	.088	49	.0...												
288	1.2D + 1.5LM-14 + Maintenance (330-Wind)	...	Y		1	1.2	96	1.5	17	.088	50	.0...												
289	1.2D + 1.5LM-15 + Maintenance (0-Wind)	...	Y		1	1.2	97	1.5	2	.088	35	.0...												
290	1.2D + 1.5LM-15 + Maintenance (30-Wind)	...	Y		1	1.2	97	1.5	3	.088	36	.0...												
291	1.2D + 1.5LM-15 + Maintenance (45-Wind)	...	Y		1	1.2	97	1.5	4	.088	37	.0...												
292	1.2D + 1.5LM-15 + Maintenance (60-Wind)	...	Y		1	1.2	97	1.5	5	.088	38	.0...												
293	1.2D + 1.5LM-15 + Maintenance (90-Wind)	...	Y		1	1.2	97	1.5	6	.088	39	.0...												
294	1.2D + 1.5LM-15 + Maintenance (120-Wind)	...	Y		1	1.2	97	1.5	7	.088	40	.0...												
295	1.2D + 1.5LM-15 + Maintenance (135-Wind)	...	Y		1	1.2	97	1.5	8	.088	41	.0...												
296	1.2D + 1.5LM-15 + Maintenance (150-Wind)	...	Y		1	1.2	97	1.5	9	.088	42	.0...												
297	1.2D + 1.5LM-15 + Maintenance (180-Wind)	...	Y		1	1.2	97	1.5	10	.088	43	.0...												
298	1.2D + 1.5LM-15 + Maintenance (210-Wind)	...	Y		1	1.2	97	1.5	11	.088	44	.0...												
299	1.2D + 1.5LM-15 + Maintenance (225-Wind)	...	Y		1	1.2	97	1.5	12	.088	45	.0...												
300	1.2D + 1.5LM-15 + Maintenance (240-Wind)	...	Y		1	1.2	97	1.5	13	.088	46	.0...												
301	1.2D + 1.5LM-15 + Maintenance (270-Wind)	...	Y		1	1.2	97	1.5	14	.088	47	.0...												
302	1.2D + 1.5LM-15 + Maintenance (300-Wind)	...	Y		1	1.2	97	1.5	15	.088	48	.0...												
303	1.2D + 1.5LM-15 + Maintenance (315-Wind)	...	Y		1	1.2	97	1.5	16	.088	49	.0...												
304	1.2D + 1.5LM-15 + Maintenance (330-Wind)	...	Y		1	1.2	97	1.5	17	.088	50	.0...												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N16	max	1958.039	31	733.17	81	874.296	18	334.968	2	2139.758	16	460.824	23
2		min	-1939.539	7	107.927	10	-804.819	10	-2515.046	89	-2136.662	24	-445.132	15
3	N17	max	1287.418	30	732.282	140	1834.73	2	1276.687	130	2040.73	10	2173.952	133
4		min	-1228.539	6	107.261	5	-1875.838	26	-373.388	11	-2050.261	18	-320.051	14
5	N18	max	1271.903	14	732.467	182	1604.166	2	1259.001	192	2043.169	5	343.981	6
6		min	-1339.554	22	107.402	15	-1629.427	26	-367.931	9	-2046.794	29	-2185.998	189
7	N70A	max	61.207	14	1551.218	34	-57.461	10	0	1	.223	175	.418	147
8		min	-61.196	6	20.465	10	-1911.264	34	0	1	-.32	147	-.291	175
9	N72	max	-50.283	5	1552.642	45	956.81	46	.362	205	.222	73	.146	73
10		min	-1656.779	45	20.925	5	26.34	6	-.252	73	-.319	205	-.209	205
11	N74	max	1644.613	39	1541.851	39	949.422	39	.252	116	.223	116	.146	116
12		min	46.345	15	17.447	15	26.757	15	-.362	108	-.319	108	-.209	108
13	Totals:	max	3762.306	30	6219.111	38	3762.306	2						
14		min	-3762.306	6	1558.676	14	-3762.306	26						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [l...	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	SA1	HSS4.5x4.5x3	.122	0	29	.031	0	z	85	93982.368	94932	12717	12717	1....	H1-1b
2	SA2	HSS4.5x4.5x3	.123	0	28	.031	0	z	187	93982.368	94932	12717	12717	1....	H1-1b
3	SA3	HSS4.5x4.5x3	.126	0	24	.031	0	z	144	93982.41	94932	12717	12717	1....	H1-1b
4	H1	L3x3x3	.598	14	102	.068	14	z	102	12869.479	35316	1320.097	1421.916	1	H2-1
5	H3	L3x3x3	.598	14	145	.068	14	z	145	12869.479	35316	1320.097	1421.926	1	H2-1
6	H2	L3x3x3	.598	14	204	.068	14	z	204	12869.479	35316	1320.097	1421.914	1	H2-1
7	H4	L3x3x3	.179	3.5	32	.015	0	y	43	25406.116	35316	1320.097	2094.152	1	H2-1
8	H6	L3x3x3	.174	3.5	27	.015	7	y	35	25406.116	35316	1320.097	2094.128	1	H2-1
9	H5	L3x3x3	.178	3.5	25	.015	0	y	49	25406.116	35316	1320.097	2094.128	1	H2-1
10	GS3	LL3x3x3x0	.445	0	205	.051	1.979	y	205	50486.945	70632	4823.218	2344.607	1....	H1-1b
11	GS2	LL3x3x3x0	.445	0	104	.051	1.979	y	104	50486.994	70632	4823.218	2344.607	1....	H1-1b
12	GS1	LL3x3x3x0	.445	0	147	.051	1.979	y	146	50487.072	70632	4823.218	2344.607	1....	H1-1b
13	HR1	PIPE_2.0	.164	1.432	31	.137	11.719		98	18606.359	32130	1871.625	1871.625	2....	H1-1b
14	HR3	PIPE_2.0	.164	1.432	26	.137	11.719		157	18606.359	32130	1871.625	1871.625	2....	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [l...	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
15	HR2	PIPE_2.0	.169	1.432	20	.137	11.719		200	18606.359	32130	1871.625	1871.625	2....	H1-1b
16	SA4	HSS4x4x3	.332	0	24	.138	0	z	23	83001.728	83592	9909	9909	1....	H1-1b
17	SA6	HSS4x4x3	.309	0	19	.139	0	z	18	83001.693	83592	9909	9909	1....	H1-1b
18	SA5	HSS4x4x3	.309	0	30	.139	0	z	29	83001.728	83592	9909	9909	1....	H1-1b
19	HRB3	L2.5x2.5x3	.291	0	31	.052	0	z	32	26697.818	29192.4	872.574	1971.83	2....	H2-1
20	HRB1	L2.5x2.5x3	.291	0	21	.051	0	z	21	26697.818	29192.4	872.574	1971.83	2....	H2-1
21	HRB2	L2.5x2.5x3	.291	0	26	.051	0	z	26	26697.818	29192.4	872.574	1971.83	2....	H2-1
22	MP3	PIPE_2.0	.160	1.042	30	.052	1.042		27	23808.54	32130	1871.625	1871.625	1....	H1-1b
23	MP2	PIPE_2.0	.434	1.042	18	.062	1.042		30	23808.54	32130	1871.625	1871.625	1....	H1-1b
24	MP1	PIPE_2.0	.209	1.042	23	.069	1.042		25	23808.54	32130	1871.625	1871.625	1....	H1-1b
25	MP9	PIPE_2.0	.160	1.042	25	.052	1.042		22	23808.54	32130	1871.625	1871.625	1....	H1-1b
26	MP8	PIPE_2.0	.434	1.042	29	.062	1.042		25	23808.54	32130	1871.625	1871.625	1....	H1-1b
27	MP7	PIPE_2.0	.209	1.042	18	.069	1.042		19	23808.54	32130	1871.625	1871.625	1....	H1-1b
28	MP6	PIPE_2.0	.160	1.042	19	.054	3.958		32	23808.54	32130	1871.625	1871.625	1....	H1-1b
29	MP5	PIPE_2.0	.434	1.042	23	.062	1.042		20	23808.54	32130	1871.625	1871.625	1....	H1-1b
30	MP4	PIPE_2.0	.209	1.042	29	.069	1.042		30	23808.54	32130	1871.625	1871.625	2....	H1-1b
31	K1	LL2.5x2.5x3x3	.093	3.5	37	.005	7	y	35	31016.938	58320	3954.307	2549.586	1....	H1-1b
32	K3	LL2.5x2.5x3x3	.093	3.5	47	.005	0	y	46	31016.938	58320	3954.307	2549.586	1....	H1-1b
33	K2	LL2.5x2.5x3x3	.093	3.5	42	.005	0	y	41	31016.938	58320	3954.307	2549.586	1....	H1-1b

RAMAKER & ASSOCIATES, INC.
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Job	CT43XC816
Project	28802
By	QAR
Date	8/21/18

Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V :	101	mph	Basic Wind Speed (Annex B)
z :	130	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	26.4	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
TD-RRH8x20	26.1	18.6	1.4	Flat	1.200	3.37	106.9	
APXVTM14-ALU-I20	56.3	12.6	4.5	Flat	1.287	4.93	167.6	
APXVSPP18-C-A20	72.0	11.8	6.1	Flat	1.360	5.90	212.0	
Pipe2STD x 12.5 ft	150.0	2.4	63.2	Round	1.200	2.47	78.5	6.3
Pipe2STD x 5 ft	60.0	2.4	25.3	Round	1.200	0.99	31.4	6.3
HSS4-1/2X4-1/2X3/16 x 2 ft	24.0	4.5	5.3	Flat	1.326	0.75	26.3	13.1
HSS4X4X3/16 x 1.5 ft	18.0	4.0	4.5	Flat	1.289	0.50	17.0	11.4
2L3X3X3/16 x 4 ft	48.0	6.0	8.0	Flat	1.433	2.00	75.8	18.9
L3X3X3/16 x 14 ft	168.0	3.0	56.0	Flat	2.000	3.50	185.0	13.2
L3X3X3/16 x 7 ft	84.0	3.0	28.0	Flat	2.000	1.75	92.5	13.2
L2-1/2X2-1/2X3/16 x 1.5 ft	18.0	2.5	7.2	Flat	1.407	0.31	11.6	7.7
2L2-1/2X2-1/2X3/16X3/8 x 7 ft	84.0	5.4	15.6	Flat	1.688	3.14	139.8	20.0

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Job	CT43XC816
Project	28802
By	QAR
Date	8/21/18

Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V :	101	mph	Basic Wind Speed (Annex B)
z :	130	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	26.4	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
TD-RRH8x20	26.1	6.7	3.9	Flat	1.262	1.21	40.5	
APXVTM14-ALU-I20	56.3	6.3	8.9	Flat	1.465	2.46	95.3	
APXVSPP18-C-A20	72.0	7.9	9.1	Flat	1.470	3.95	153.5	
Pipe2STD x 12.5 ft	150.0	2.4	63.2	Round	1.200	2.47	78.5	6.3
Pipe2STD x 5 ft	60.0	2.4	25.3	Round	1.200	0.99	31.4	6.3
HSS4-1/2X4-1/2X3/16 x 2 ft	24.0	4.5	5.3	Flat	1.326	0.75	26.3	13.1
HSS4X4X3/16 x 1.5 ft	18.0	4.0	4.5	Flat	1.289	0.50	17.0	11.4
2L3X3X3/16 x 4 ft	48.0	3.0	16.0	Flat	1.700	1.00	44.9	11.2
L3X3X3/16 x 14 ft	168.0	3.0	56.0	Flat	2.000	3.50	185.0	13.2
L3X3X3/16 x 7 ft	84.0	3.0	28.0	Flat	2.000	1.75	92.5	13.2
L2-1/2X2-1/2X3/16 x 1.5 ft	18.0	2.5	7.2	Flat	1.407	0.31	11.6	7.7
2L2-1/2X2-1/2X3/16X3/8 x 7 ft	84.0	2.5	33.6	Flat	2.000	1.46	77.1	11.0

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED

Job	CT43XC816
Project	28802
By	QAR
Date	8/21/18

Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	6.48	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections
t_{iz} :	1.72	in	Design Thickness of Radial Ice at Height z (2.6.8)

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
TD-RRH8x20	29.5	22.0	1.3	Flat	1.200	4.52	35.1	
APXVTM14-ALU-I20	59.7	16.0	3.7	Flat	1.254	6.65	54.1	
APXVSPP18-C-A20	75.4	15.2	4.9	Flat	1.309	7.98	67.7	
Pipe2STD x 12.5 ft	153.4	5.8	26.4	Round	1.200	6.20	48.2	3.8
Pipe2STD x 5 ft	63.4	5.8	10.9	Round	0.887	2.56	14.7	2.8
HSS4-1/2X4-1/2X3/16 x 2 ft	27.4	7.9	3.5	Flat	1.242	1.51	12.2	5.3
HSS4X4X3/16 x 1.5 ft	21.4	7.4	2.9	Flat	1.217	1.11	8.7	4.9
2L3X3X3/16 x 4 ft	51.4	9.4	5.4	Flat	1.331	3.37	29.1	6.8
L3X3X3/16 x 14 ft	171.4	6.4	26.6	Flat	2.000	7.67	99.3	7.0
L3X3X3/16 x 7 ft	87.4	6.4	13.6	Flat	1.619	3.91	41.0	5.6
L2-1/2X2-1/2X3/16 x 1.5 ft	21.4	5.9	3.6	Flat	1.249	0.88	7.2	4.0
2L2-1/2X2-1/2X3/16X3/8 x 7 ft	87.4	8.8	9.9	Flat	1.497	5.35	51.9	7.1

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED

Job	CT43XC816
Project	28802
By	QAR
Date	8/21/18

Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	6.48	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections
t_{iz} :	1.72	in	Design Thickness of Radial Ice at Height z (2.6.8)

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
TD-RRH8x20	29.5	10.1	2.9	Flat	1.218	2.08	16.4	
APXVTM14-ALU-I20	59.7	9.7	6.1	Flat	1.361	4.04	35.6	
APXVSPP18-C-A20	75.4	11.3	6.7	Flat	1.385	5.94	53.3	
Pipe2STD x 12.5 ft	153.4	5.8	26.4	Round	1.200	6.20	48.2	3.8
Pipe2STD x 5 ft	63.4	5.8	10.9	Round	0.887	2.56	14.7	2.8
HSS4-1/2X4-1/2X3/16 x 2 ft	27.4	7.9	3.5	Flat	1.242	1.51	12.2	5.3
HSS4X4X3/16 x 1.5 ft	21.4	7.4	2.9	Flat	1.217	1.11	8.7	4.9
2L3X3X3/16 x 4 ft	51.4	6.4	8.0	Flat	1.433	2.30	21.4	5.0
L3X3X3/16 x 14 ft	171.4	6.4	26.6	Flat	2.000	7.67	99.3	7.0
L3X3X3/16 x 7 ft	87.4	6.4	13.6	Flat	1.619	3.91	41.0	5.6
L2-1/2X2-1/2X3/16 x 1.5 ft	21.4	5.9	3.6	Flat	1.249	0.88	7.2	4.0
2L2-1/2X2-1/2X3/16X3/8 x 7 ft	87.4	5.9	14.7	Flat	1.657	3.61	38.7	5.3

RAMAKER & ASSOCIATES, INC.
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Job	CT43XC816
Project	28802
By	QAR
Date	8/21/18

Ice Load on Antennas TIA-222-G

Ice Weight :	56	pcf	Ice Density
t_i :	0.75		Design Ice Thickness
Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_{iz} :	1.15		Height Escalation Factor for Ice Thickness
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
t_{iz} :	1.72	in	Design Thickness of Radial Ice at Height z (2.6.8)

Platform Grating :	Expanded	
Ice Load :	8.0	psf

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	Depth	Diam.	Area	Perim.	Ice Weight	
	in	*in*	*in*	*in*	*sq in*	*in*	*lb*	*plf*
TD-RRH8x20	29.5	22.0	10.1	19.77	116.15	57.48	98.2	
APXVTM14-ALU-I20	59.7	16.0	9.7	14.09	85.44	44.68	155.9	
APXVSPP18-C-A20	75.4	15.2	11.3	14.20	86.05	46.28	200.8	
Pipe2STD x 12.5 ft	153.4	5.8	5.8	2.38	22.14	12.87	107.6	8.6
Pipe2STD x 5 ft	63.4	5.8	5.8	2.38	22.14	12.87	43.0	8.6
HSS4-1/2X4-1/2X3/16 x 2 ft	27.4	7.9	7.9	6.01	41.81	29.44	32.5	16.3
HSS4X4X3/16 x 1.5 ft	21.4	7.4	7.4	5.31	37.98	27.44	22.2	14.8
2L3X3X3/16 x 4 ft	51.4	9.4	6.4	6.71	45.56	24.88	70.9	17.7
L3X3X3/16 x 14 ft	171.4	6.4	6.4	4.24	32.23	18.88	175.5	12.5
L3X3X3/16 x 7 ft	87.4	6.4	6.4	4.24	32.23	18.88	87.7	12.5
L2-1/2X2-1/2X3/16 x 1.5 ft	21.4	5.9	5.9	3.54	28.41	16.88	16.6	11.0
2L2-1/2X2-1/2X3/16X3/8 x 7 ft	87.4	8.8	5.9	5.93	41.34	22.63	112.5	16.1

AT&T Towers
5600 Glenridge Drive
Atlanta, GA. 30342
(678) 917-1026

GPD Engineering and Architecture
Professional Corporation
Brian Daugherty
520 South Main St, Suite 2531
Akron OH, 44311
(216) 927-8687
bdaugherty@gpdgroup.com

GPD# 2018723.01.14635.03
May 31, 2018

RIGOROUS STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**14635**
	Site FA:	**10035088**
	Site Name:	**MIDDLETOWN SW**
	Sprint Site #:	**CT43XC816**
	Sprint Site Name:	**Middletown-ATT**
	AT&T Project:	**Sprint Modification 2nd amend 1-11-2018**
ANALYSIS CRITERIA:	**Codes:**	**TIA-222-G, 2012 IBC & 2016 CSBC** **130-mph Ultimate 3 second gust with 0" ice** **101-mph Nominal 3 second gust with 0" ice** **50-mph Nominal 3 second gust with 3/4" ice**
SITE DATA:		**290 Preston Avenue, Middletown, CT 06457, Middlesex County** **Latitude 41° 33' 26.471"N, Longitude 72° 44' 35.797"W** **Market: NEW ENGLAND** **148' Modified PennSummit Monopole**

Ms. Deborah Krenc,

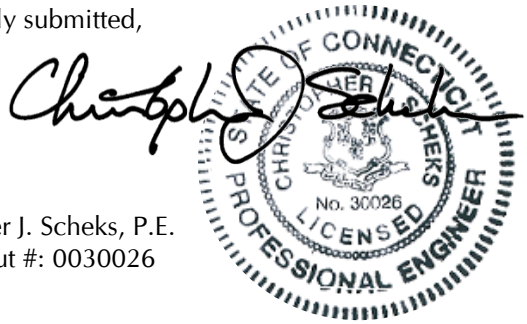
GPD is pleased to submit this Rigorous Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	78.6%	Pass
Foundation Ratio with Proposed Equipment:	65.4%	Pass

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

Respectfully submitted,



Christopher J. Scheks, P.E.
Connecticut #: 0030026

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing modified structure is capable of carrying the proposed loading configuration as specified by Sprint to AT&T Towers. This report was commissioned by Ms. Deborah Krenc of AT&T Towers.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II were used in this analysis.

Modifications designed by B+T Group (Project #: 84934.003, dated 2/8/2013) have been considered in this analysis.

The proposed coax shall be installed internal to the monopole for the analysis to be valid.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	78.6%	Pass
Anchor Rods	67.2%	Pass
Base Plate	56.4%	Pass
Foundation	65.4%	Pass

ANALYSIS METHOD

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

DOCUMENTS PROVIDED

Document	Remarks	Source
Site Lease Application	Sprint Colocation Application, revised 4/12/2018	AT&T
Tower Design	PJF Job #: 29201-0230, dated 2/26/2001	AT&T
Foundation Design	PJF Job #: 29201-0230, dated 2/26/2001	AT&T
Geotechnical Report	Not Provided	N/A
Previous Structural Analysis	GPD Job #: 2018723.01.14635.02, dated 5/29/2018	AT&T
Modification Drawings	B+T Project #: 84934.003, dated 2/8/2013	AT&T
Post Modification Report	Centek Project #: 12033.034, dated 8/2/2013	AT&T

ASSUMPTIONS

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

1. The tower shaft sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
11. All existing loading was obtained from the previous structural analysis by GPD (Job #: 2018723.01.14635.02, dated 5/29/2018), site photos, and the provided Site Lease Application and is assumed to be accurate.
12. The proposed coax shall be installed internal to the monopole for the analysis to be valid.
13. The future equipment was modeled based on the future generic configuration.

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

DISCLAIMER OF WARRANTIES

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

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

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

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

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

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

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

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

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

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	MIDDLETOWN SW
Site Number	14635
FA Number	10035088
Date of Analysis	5/31/2018
Company Performing Analysis	GPD

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

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	148'	
Tower Manufacturer	PennSummit	
Tower Model	n/a	
Tower Design	PJF Job #: 29201-0230	2/26/2001
Foundation Design	PJF Job #: 29201-0230	2/26/2001
Geotech Report	Dr. Clarence Welti, P.E.	7/25/2000
Tower Mapping	n/a	
Previous Structural Analysis	GPD Job #: 2018723.01.14635.02	5/29/2018
Modification Drawings	B+T Project #: 84934.003	2/8/2013
Post Modification Report	Centek Project #: 12033.034	8/2/2013

Design Parameters

Design Code Used	TIA-222-G, 2012 IBC & 2016 CSBC
Location of Tower (County, State)	Middlesex, CT
Nominal Wind Speed (mph)	101 (3 second gust)
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	II
Exposure Category (B, C, D)	B
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	78.6%
Tower Base (%)	67.2%
Foundation (%)	65.4%
Foundation Adequate?	Yes

Steel Yield Strength (ksi)

Pole	65
Base Plate	55
Anchor Rods	75

Modifications designed by B+T Group (Project #: 84934.003, dated 2/8/2013) have been considered in this analysis.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Int. / Ext.
AT&T Mobility	148	150	6	Panel	Powerwave	7770.00	40/200/320	1	Unknown	12' LP Platform	12	Unknown	1-5/8"	External
AT&T Mobility	148	150	1	Panel	CCI	HPA-65R-BUU-H6	40			on the same mount	2	DC Power	7/8"	Internal
AT&T Mobility	148	150	1	Panel	Andrew	SBNHH-1D65C	200			on the same mount	1	Fiber	3/8"	Internal
AT&T Mobility	148	150	1	Panel	Andrew	SBNHH-1D65A	320			on the same mount				
AT&T Mobility	148	150	3	RRU	Ericsson	RRUS-32 B2				on the same mount				
AT&T Mobility	148	150	3	RRU	Ericsson	RRUS-11				on the same mount				
AT&T Mobility	148	149	12	TMA	Powerwave	LGP21401				on the same mount				
AT&T Mobility	148	148	1	Squid	Raycap	DC6-48-60-18-8F				on the same mount				
T-Mobile	140	140	6	Panel	Ericsson	AIR21	0/120/240	1	Unknown	12' LP Platform	18	Unknown	1-5/8"	Internal
T-Mobile	140	140	2	Panel	RFS	APX16DWV-16DWV-S-E-ACU	0/120/240			on the same mount	1	Hybrid Cable	1-5/8"	Internal
T-Mobile	140	140	3	TMA	Andrew	Onebase Twin Dual Duplex TMA				on the same mount				
Sprint	126	130	3	Panel	Powerwave	APXVSPP18-C-A20	45/210/310	1	Unknown	12' LP Platform w/ Rails	3	Hybrid Cable	1-1/4"	Internal
Sprint	126	130	6	RRH	Alcatel Lucent	1900 MHz RRH				on the same mount				
Sprint	126	130	3	RRH	Alcatel Lucent	800 MHz RRH				on the same mount				
Verizon	110	111	1	Panel	Andrew	LNX-6514DS-T4M	0	1	Unknown	13' LP Platform	12	Unknown	1-5/8"	Internal
Verizon	110	111	2	Panel	Antel	BXA-70063-6CF	120/240	1	Unknown	Collar Mount	1	Hybrid Cable	1-5/8"	Internal
Verizon	110	111	6	Diplexer	RFS	FD9R6004/2C-3				on the same mounts				
Verizon	110	110	3	Panel	Andrew	HBX-6517DS-VTM	0/120/240			on the same mounts				
Verizon	110	110	3	Panel	Andrew	LNX-6513DS-VTM	0/120/240			on the same mounts				
Verizon	110	110	3	Panel	Andrew	HBX-6516DS-VTM	0/120/240			on the same mounts				
Verizon	110	110	3	RRH	Alcatel Lucent	RRH 2x40AWS				on the same mounts				
Verizon	110	110	1	Surge	RFS	DB-T1-6Z-8AB00Z				on the same mounts				
City of Middletown	105	105	1	Dish	Cambium	HP3-11	36	1	Unknown	Dish Mount	1	Elliptical	EW90	Internal
City of Middletown	100	105	2	Omni	RFI	CC807-08	0/120	3	Unknown	6' Standoff	3	Unknown	7/8"	Internal
City of Middletown	100	104	1	Omni	dBSpectra	DS1F00F36U-D	240			on the same mounts	1	Unknown	1/2"	Internal
City of Middletown	100	100	1	TTA	Bird Tech	DS428E83I01T				on the same mounts				
Metro PCS	90	90	3	Panel	Kathrein	742-213	Assumed	3	Unknown	Pipe Mounts	6	Unknown	1-5/8"	External
Metro PCS	55	55	1	GPS	Unknown	GPS Unit		1	Unknown	1' Standoff	1	Unknown	3/8"	External
Unknown	50	50	1	GPS	Unknown	GPS Unit		1	Unknown	1' Standoff	1	Unknown	1/2"	External

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Int. / Ext.
Sprint	126	130	3	Panel	RFS	APXVTM14-ALU-I20	45/210/310			on the existing mount	1	Hybrid Cable	1-5/8"	Internal
Sprint	126	130	3	RRH	Alcatel Lucent	RRH8x20-25/TD RRH				on the existing mount				

Note: The proposed coax shall be installed internal to the monopole for the analysis to be valid.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Int. / Ext.
AT&T Mobility	148	150	3	Panel	Andrew	SBNHH-1D65C	40/200/320			on the existing mount	6	Unknown	1-5/8"	External

Note: The future equipment shall be in addition to the existing oading at the same elevation.

APPENDIX B

tnxTower Output File

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 101 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Sector*	*Component Type*	*Placement*	*Total Number*	*Number Per Row*	*Start/End Position*	*Width or Diameter*	*Perimeter*	*Weight*
			ft				*in*	*in*	*plf*
Climbing Pegs	A	Surface Ar (CaAa)	148.00 - 8.00	1	1	0.000 0.000	0.1500		0.31
LDF7-50A (1-5/8 FOAM)	B	Surface Ar (CaAa)	148.00 - 8.00	18	9	0.400 0.500	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Surface Ar (CaAa)	90.00 - 8.00	6	6	0.000 0.100	1.9800		0.82
LDF2-50A (3/8 FOAM)	C	Surface Ar (CaAa)	55.00 - 8.00	1	1	0.100 0.100	0.4400		0.08
LDF4-50A (1/2 FOAM)	C	Surface Ar (CaAa)	50.00 - 8.00	1	1	0.000 0.000	0.6300		0.15
MP3-05 Mod Channel (Rev G)	C	Surface Af (CaAa)	18.00 - 0.00	1	1	0.000 0.000	5.3300	14.7500	0.00
MP3-08 Mod Channel (Rev G)	B	Surface Af (CaAa)	30.50 - 0.00	1	1	0.000 0.000	7.9300	24.9100	0.00
MP3-06 Mod Channel (Rev G)	C	Surface Af (CaAa)	60.50 - 30.50	1	1	0.000 0.000	6.8900	19.0000	0.00
MP3-05 Mod Channel (Rev G)	C	Surface Af (CaAa)	90.50 - 60.50	1	1	0.000 0.000	5.3300	14.7500	0.00
MP3-03 Mod Channel (Rev G)	C	Surface Af (CaAa)	99.00 - 90.50	1	1	0.000 0.000	4.0600	12.8600	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line (3/8")	A	No	CaAa (Out Of Face)	148.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
7/8" DC Power Cable	A	No	Inside Pole	148.00 - 8.00	2	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
3/8" Fiber Cable	A	No	Inside Pole	148.00 - 8.00	1	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	140.00 - 8.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
1-5/8" Hybrid Cable	B	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
1-1/4" Hybrid Cable	B	No	Inside Pole	126.00 - 8.00	3	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1-5/8" Hybrid Cable	B	No	Inside Pole	126.00 - 8.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	110.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
1-5/8" Hybrid Cable	C	No	Inside Pole	110.00 - 8.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	100.00 - 8.00	3	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	100.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
EW90	A	No	Inside Pole	105.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32

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
Lightning Rod 8'x3/4"	C	From Leg	0.00 0.00 4.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	0.60 1.41 2.25	0.60 1.41 2.25	12.00 18.19 29.49
Platform Mount [LP 1201-1]	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2100.00 2500.00 2900.00
(2) 7770.00 w/Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	61.54 108.55 162.39

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
(2) 7770.00 w/Mount Pipe	B	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	61.54 108.55 162.39
(2) 7770.00 w/Mount Pipe	C	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	61.54 108.55 162.39
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	76.55 158.03 247.79
SBNHH-1D65A w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	6.10 6.54 6.97	5.19 5.96 6.66	61.30 115.03 175.35
SBNHH-1D65C w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	8.28 9.07 9.87	61.16 135.10 217.80
(2) SBNHH-1D65C w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	8.28 9.07 9.87	61.16 135.10 217.80
SBNHH-1D65C w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	11.35 11.97 12.59	8.28 9.07 9.87	61.16 135.10 217.80
(4) LGP21401	A	From Leg	3.00 0.00 1.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
(4) LGP21401	B	From Leg	3.00 0.00 1.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
(4) LGP21401	C	From Leg	3.00 0.00 1.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
RRUS 32 B2	A	From Leg	3.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	52.90 73.96 98.21
RRUS 32 B2	B	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	52.90 73.96 98.21
RRUS 32 B2	C	From Leg	3.00 0.00 2.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	52.90 73.96 98.21
RRUS 11	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
RRUS 11	B	From Leg	3.00 0.00 0.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
RRUS 11	C	From Leg	3.00 0.00 0.00	40.0000	148.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	50.70 71.50 95.33
DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	18.90 36.62 56.82
Platform Mount [LP 1201-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2100.00 2500.00 2900.00
(2) AIR 21 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.37 6.85 7.30	5.78 6.63 7.35	112.90 170.69 235.28

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
(2) AIR 21 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.37 6.85 7.30	5.78 6.63 7.35	112.90 170.69 235.28
(2) AIR 21 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.37 6.85 7.30	5.78 6.63 7.35	112.90 170.69 235.28
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.22 6.61 7.01	3.19 3.82 4.46	57.85 102.47 153.24
APX16DWV-16DWV-S-E-A CU w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.22 6.61 7.01	3.19 3.82 4.46	57.85 102.47 153.24
Onebase Twin Dual Duplex TMA	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
Onebase Twin Dual Duplex TMA	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
Onebase Twin Dual Duplex TMA	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
Platform Mount [LP 1201-1]	C	None		0.0000	126.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2100.00 2500.00 2900.00
Miscellaneous [NA 510-1]	C	None		0.0000	126.00	No Ice 1/2" Ice 1" Ice	6.00 8.50 11.00	6.00 8.50 11.00	225.70 339.50 453.30
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	78.90 144.31 217.47
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	78.90 144.31 217.47
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	6.71 7.66 8.49	78.90 144.31 217.47
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	76.99 131.60 192.90
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	76.99 131.60 192.90
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	76.99 131.60 192.90
(2) 1900MHz RRH	A	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
(2) 1900MHz RRH	B	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
(2) 1900MHz RRH	C	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
800MHZ RRH	A	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	53.00 74.19 98.39

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
800MHZ RRH	B	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	53.00 74.19 98.39
800MHZ RRH	C	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	53.00 74.19 98.39
RRH8x20-25/TD RRH	A	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	66.14 90.08 117.36
RRH8x20-25/TD RRH	B	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	66.14 90.08 117.36
RRH8x20-25/TD RRH	C	From Leg	3.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	66.14 90.08 117.36
Platform Mount [LP 1201-1]	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2100.00 2500.00 2900.00
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	58.15 126.70 203.21
BXA-70063-6CF w/ Mount Pipe	B	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	7.57 8.02 8.47	5.49 6.23 6.99	45.95 104.10 170.26
BXA-70063-6CF w/ Mount Pipe	C	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	7.57 8.02 8.47	5.49 6.23 6.99	45.95 104.10 170.26
(2) FD9R6004/2C-3L	A	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	3.10 5.40 8.79
(2) FD9R6004/2C-3L	B	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	3.10 5.40 8.79
(2) FD9R6004/2C-3L	C	From Leg	3.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	3.10 5.40 8.79
HBX-6517DS-VTM w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.30 5.77 6.25	4.73 5.68 6.50	40.60 84.00 134.78
HBX-6517DS-VTM w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.30 5.77 6.25	4.73 5.68 6.50	40.60 84.00 134.78
HBX-6517DS-VTM w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.30 5.77 6.25	4.73 5.68 6.50	40.60 84.00 134.78
LNX-6513DS-VTM w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.95 6.34 6.74	5.03 5.69 6.35	48.65 100.77 159.34
LNX-6513DS-VTM w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.95 6.34 6.74	5.03 5.69 6.35	48.65 100.77 159.34
LNX-6513DS-VTM w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	5.95 6.34 6.74	5.03 5.69 6.35	48.65 100.77 159.34
HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	3.53 3.91 4.28	3.17 3.80 4.43	28.15 60.65 98.79

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
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	3.53 3.91 4.28	3.17 3.80 4.43	28.15 60.65 98.79
HBX-6516DS-VTM w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	3.53 3.91 4.28	3.17 3.80 4.43	28.15 60.65 98.79
RRH2x40-AWS	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	43.00 60.40 80.69
RRH2x40-AWS	B	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	43.00 60.40 80.69
RRH2x40-AWS	C	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	2.16 2.36 2.57	1.42 1.59 1.77	43.00 60.40 80.69
DB-T1-6Z-8AB-0Z	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	50.00 86.13 126.22
Pipe Mount 4'x2.375"	A	From Leg	0.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	0.87 1.11 1.36	0.87 1.11 1.36	18.50 25.81 35.97
6' Standoff - Flat (GPD)	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.96 3.08 4.20	8.31 11.83 15.35	97.06 138.19 179.32
6' Standoff - Flat (GPD)	B	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.96 3.08 4.20	8.31 11.83 15.35	97.06 138.19 179.32
6' Standoff - Flat (GPD)	C	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.96 3.08 4.20	8.31 11.83 15.35	97.06 138.19 179.32
CC807-08	A	From Leg	6.00 0.00 5.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.86 3.84 4.68	2.86 3.84 4.68	24.30 45.05 72.08
CC807-08	B	From Leg	6.00 0.00 5.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.86 3.84 4.68	2.86 3.84 4.68	24.30 45.05 72.08
DS1F00F36U-D	C	From Leg	6.00 0.00 4.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	4.35 5.83 7.33	4.35 5.83 7.33	38.00 69.41 110.13
DS428E-83I-01-T	A	From Leg	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.40 0.48 0.57	0.46 0.55 0.65	8.90 13.93 20.47
742-213 w/Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	5.42 5.95 6.47	4.63 6.02 6.93	47.55 91.91 144.02
742-213 w/Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	5.42 5.95 6.47	4.63 6.02 6.93	47.55 91.91 144.02
742-213 w/Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	5.42 5.95 6.47	4.63 6.02 6.93	47.55 91.91 144.02
MTS 12" Antenna Standoff	A	From Leg	0.50 0.00 0.00	0.0000	55.00	No Ice 1/2" Ice 1" Ice	2.82 4.07 5.32	2.20 3.16 4.12	40.00 61.95 83.90
GPS	A	From Leg	1.00 0.00 0.00	0.0000	55.00	No Ice 1/2" Ice 1" Ice	0.12 0.21 0.28	0.12 0.21 0.28	0.87 3.85 7.85

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
MTS 12" Antenna Standoff	A	From Leg	0.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	2.82 4.07 5.32	2.20 3.16 4.12	40.00 61.95 83.90
GPS	A	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.12 0.21 0.28	0.12 0.21 0.28	0.87 3.85 7.85

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
HP3-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	36.0000		105.00	3.00	No Ice 1/2" Ice 1" Ice	12.57 13.10 13.62	150.00 250.00 320.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	Lightning Rod 8'x3/4"	40	18.040	1.1062	0.0038	37552
140.00	Platform Mount [LP 1201-1]	40	16.193	1.0962	0.0033	25360
126.00	Platform Mount [LP 1201-1]	40	13.050	1.0398	0.0025	9958
110.00	Platform Mount [LP 1201-1]	40	9.749	0.9307	0.0020	6673
105.00	HP3-11	40	8.802	0.8771	0.0018	5072
100.00	6' Standoff - Flat (GPD)	40	7.914	0.8178	0.0015	4644
90.00	742-213 w/Mount Pipe	40	6.337	0.6881	0.0011	5397
55.00	MTS 12" Antenna Standoff	40	2.326	0.4022	0.0005	7054
50.00	MTS 12" Antenna Standoff	40	1.926	0.3611	0.0004	6948

CCIpole

per TIA-222- G

Site BU: _____

Work Order: _____

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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	148	37	4	18	24	30.661	0.25	1	A607-65
2	115	40	4.75	18	29.44	36.643	0.25	1	A607-65
3	79.75	40	5.25	18	35.29	42.489	0.3125	1.25	A607-65
4	45	45	0	18	40.92	49.02	0.375	1.5	A607-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	18.083	channel	MP3-05 (1.1875")	2					x		x											
2	18.083	30.5	channel	MP3-08 (1.1875")	1						x												
3	0	30.5	channel	MP3-08 (1.1875")	2												x						x
4	30.5	60.5	channel	MP3-06 (1.1875")	3						x						x						x
5	60.5	90.5	channel	MP3-05 (1.1875")	3						x						x						x
6	90.5	99.33	channel	MP3-03 (1.1875")	3						x						x						x
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
2	7.93	2.8	10.32	0.95	47.000	47.000	24.000	9.370	1.1875	A572-65
3	7.93	2.8	10.32	0.95	47.000	47.000	24.000	9.370	1.1875	A572-65
4	6.89	2.61	8.47	0.93	41.000	41.000	24.000	7.670	1.1875	A572-65
5	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
6	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
148 - 143	Pole	TP24.9x24x0.25	Pole	5.9%	Pass
143 - 138	Pole	TP25.8x24.9x0.25	Pole	10.9%	Pass
138 - 133	Pole	TP26.7x25.8x0.25	Pole	16.7%	Pass
133 - 128	Pole	TP27.601x26.7x0.25	Pole	22.0%	Pass
128 - 123	Pole	TP28.501x27.601x0.25	Pole	30.0%	Pass
123 - 118	Pole	TP29.401x28.501x0.25	Pole	36.9%	Pass
118 - 115	Pole	TP30.661x29.401x0.25	Pole	40.9%	Pass
115 - 110	Pole	TP30.341x29.441x0.25	Pole	48.4%	Pass
110 - 105	Pole	TP31.241x30.341x0.25	Pole	56.4%	Pass
105 - 100	Pole	TP32.142x31.241x0.25	Pole	64.0%	Pass
100 - 99.33	Pole	TP32.262x32.142x0.25	Pole	65.0%	Pass
99.33 - 99.08	Pole	TP32.307x32.262x0.25	Pole	65.3%	Pass
99.08 - 94.08	Pole	TP33.208x32.307x0.25	Pole	72.6%	Pass
94.08 - 90.5	Pole	TP33.852x33.208x0.25	Pole	77.4%	Pass
90.5 - 90.25	Pole + Reinf.	TP33.897x33.852x0.4313	Reinf. 5 Tension Rupture	61.5%	Pass
90.25 - 85.25	Pole + Reinf.	TP34.797x33.897x0.425	Reinf. 5 Tension Rupture	66.8%	Pass
85.25 - 80.25	Pole + Reinf.	TP35.698x34.797x0.425	Reinf. 5 Tension Rupture	71.8%	Pass
80.25 - 79.75	Pole + Reinf.	TP36.643x35.698x0.425	Reinf. 5 Tension Rupture	72.3%	Pass
79.75 - 74.75	Pole + Reinf.	TP36.188x35.288x0.4875	Reinf. 5 Tension Rupture	68.6%	Pass
74.75 - 69.75	Pole + Reinf.	TP37.088x36.188x0.475	Reinf. 5 Tension Rupture	72.3%	Pass
69.75 - 64.75	Pole + Reinf.	TP37.988x37.088x0.475	Reinf. 5 Tension Rupture	75.8%	Pass
64.75 - 60.5	Pole + Reinf.	TP38.753x37.988x0.4688	Reinf. 5 Tension Rupture	78.6%	Pass
60.5 - 60.25	Pole + Reinf.	TP38.798x38.753x0.55	Reinf. 4 Tension Rupture	66.2%	Pass
60.25 - 55.25	Pole + Reinf.	TP39.699x38.798x0.55	Reinf. 4 Tension Rupture	68.9%	Pass
55.25 - 50.25	Pole + Reinf.	TP40.599x39.699x0.5375	Reinf. 4 Tension Rupture	71.5%	Pass
50.25 - 45.25	Pole + Reinf.	TP41.499x40.599x0.5375	Reinf. 4 Tension Rupture	74.0%	Pass
45.25 - 45	Pole + Reinf.	TP42.489x41.499x0.5375	Reinf. 4 Tension Rupture	74.1%	Pass
45 - 38.75	Pole + Reinf.	TP42.044x40.919x0.6	Reinf. 4 Tension Rupture	70.6%	Pass
38.75 - 33.75	Pole + Reinf.	TP42.944x42.044x0.5875	Reinf. 4 Tension Rupture	72.4%	Pass
33.75 - 30.5	Pole + Reinf.	TP43.529x42.944x0.5875	Reinf. 4 Tension Rupture	73.6%	Pass
30.5 - 30.25	Pole + Reinf.	TP43.574x43.529x0.6375	Reinf. 3 Tension Rupture	68.0%	Pass
30.25 - 25.25	Pole + Reinf.	TP44.474x43.574x0.625	Reinf. 3 Tension Rupture	69.6%	Pass
25.25 - 20.25	Pole + Reinf.	TP45.374x44.474x0.625	Reinf. 3 Tension Rupture	71.1%	Pass
20.25 - 18.08	Pole + Reinf.	TP45.765x45.374x0.625	Reinf. 3 Tension Rupture	71.7%	Pass
18.08 - 17.83	Pole + Reinf.	TP45.81x45.765x0.6125	Reinf. 1 Tension Rupture	73.7%	Pass
17.83 - 12.83	Pole + Reinf.	TP46.71x45.81x0.6125	Reinf. 1 Tension Rupture	75.0%	Pass
12.83 - 7.83	Pole + Reinf.	TP47.61x46.71x0.6	Reinf. 1 Tension Rupture	76.3%	Pass
7.83 - 2.83	Pole + Reinf.	TP48.51x47.61x0.6	Reinf. 1 Tension Rupture	77.5%	Pass
2.83 - 0	Pole + Reinf.	TP49.02x48.51x0.6	Reinf. 1 Tension Rupture	78.2%	Pass
				Summary	
			Pole	77.4%	Pass
			Reinforcement	78.6%	Pass
			Overall	78.6%	Pass

Additional Calculations

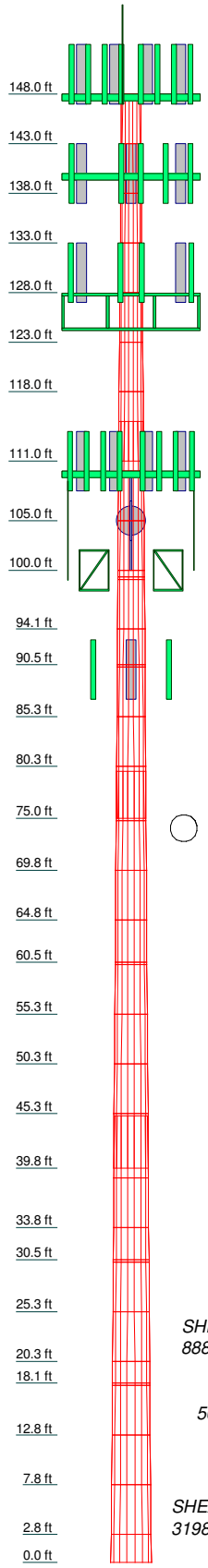
Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity						
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6
148 - 143	1501	n/a	1501	19.56	n/a	19.56	5.9%						
143 - 138	1672	n/a	1672	20.27	n/a	20.27	10.9%						
138 - 133	1855	n/a	1855	20.99	n/a	20.99	16.7%						
133 - 128	2050	n/a	2050	21.70	n/a	21.70	22.0%						
128 - 123	2260	n/a	2260	22.42	n/a	22.42	30.0%						
123 - 118	2482	n/a	2482	23.13	n/a	23.13	36.9%						
118 - 115	2623	n/a	2623	23.56	n/a	23.56	40.9%						
115 - 110	2731	n/a	2731	23.88	n/a	23.88	48.4%						
110 - 105	2983	n/a	2983	24.59	n/a	24.59	56.4%						
105 - 100	3251	n/a	3251	25.31	n/a	25.31	64.0%						
100 - 99.33	3288	n/a	3288	25.40	n/a	25.40	65.0%						
99.33 - 99.08	3301	n/a	3301	25.44	n/a	25.44	65.3%						
99.08 - 94.08	3588	n/a	3588	26.15	n/a	26.15	72.6%						
94.08 - 90.5	3802	n/a	3802	26.66	n/a	26.66	77.4%						
90.5 - 90.25	3817	2678	6495	26.70	16.95	43.65	45.1%					61.5%	
90.25 - 85.25	4132	2815	6947	27.41	16.95	44.36	49.6%					66.8%	
85.25 - 80.25	4464	2955	7419	28.13	16.95	45.08	53.9%					71.8%	
80.25 - 79.75	4498	2969	7467	28.20	16.95	45.15	54.3%					72.3%	
79.75 - 74.75	5784	3033	8817	35.58	16.95	52.53	47.8%					68.6%	
74.75 - 69.75	6230	3179	9409	36.48	16.95	53.43	50.9%					72.3%	
69.75 - 64.75	6699	3328	10027	37.37	16.95	54.32	53.8%					75.8%	
64.75 - 60.5	7116	3458	10573	38.13	16.95	55.08	56.2%					78.6%	
60.5 - 60.25	7141	5276	12417	38.17	25.41	63.58	48.1%				66.2%		
60.25 - 55.25	7654	5511	13165	39.06	25.41	64.47	50.5%				68.9%		
55.25 - 50.25	8190	5752	13942	39.96	25.41	65.37	52.9%				71.5%		
50.25 - 45.25	8752	5997	14749	40.85	25.41	66.26	55.2%				74.0%		
45.25 - 45	8781	6009	14790	40.89	25.41	66.30	55.3%				74.1%		
45 - 38.75	10876	6148	17024	49.59	25.41	75.00	49.9%				70.6%		
38.75 - 33.75	11596	6402	17998	50.67	25.41	76.08	51.6%				72.4%		
33.75 - 30.5	12081	6569	18650	51.36	25.41	76.77	52.6%				73.6%		
30.5 - 30.25	12118	8046	20164	51.42	30.96	82.38	48.9%		68.0%	68.0%			
30.25 - 25.25	12892	8365	21257	52.49	30.96	83.45	50.4%		69.6%	69.6%			
25.25 - 20.25	13698	8692	22389	53.56	30.96	84.52	51.8%		71.1%	71.1%			
20.25 - 18.08	14057	8835	22892	54.02	30.96	84.98	52.4%		71.7%	71.7%			
18.08 - 17.83	14099	8698	22797	54.08	31.94	86.02	53.0%	73.7%		70.4%			
17.83 - 12.83	14954	9029	23982	55.15	31.94	87.09	54.3%	75.0%		71.7%			
12.83 - 7.83	15842	9366	25208	56.22	31.94	88.16	55.7%	76.3%		73.0%			
7.83 - 2.83	16765	9710	26475	57.29	31.94	89.23	56.9%	77.5%		74.2%			
2.83 - 0	17304	9907	27211	57.90	31.94	89.84	57.6%	78.2%		74.8%			

Note: Section capacity checked in 5 degree increments.

APPENDIX C

Tower Elevation Drawing

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	6.250	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.000	5.00	5.00	2.83
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.4250	0.4250	0.4250	0.4750	0.4750	0.4750	0.4750	0.4750	0.5500	0.5375	0.5375	0.5375	0.5625	0.5750	0.5750	0.6250	0.6250	0.6250	0.6250	0.6250	0.6250	0.6000	0.6000	0.6000
Socket Length (ft)	4.00	4.75	5.25	A607-65																																			
Top Dia (in)	24.0000	24.9001	25.8003	26.7004	27.6005	28.5007	29.4008	30.3010	31.2011	32.1012	33.0014	33.9015	34.8017	35.7018	36.6019	37.5021	38.4022	39.3023	40.2025	41.1026	42.0027	42.9029	43.8030	44.7031	45.6033	46.5034	47.4035	48.3037	49.2038	50.1039	51.0041	51.9042	52.8043	53.7045	54.6046	55.5047	56.4049	57.3050	58.1951
Bot Dia (in)	24.9001	25.8003	26.7004	27.6005	28.5007	29.4008	30.3010	31.2011	32.1012	33.0014	33.9015	34.8017	35.6977	36.5977	37.4977	38.3978	39.2978	40.1978	41.0979	41.9979	42.8980	43.7980	44.6981	45.5981	46.4982	47.3982	48.1983	49.0983	49.9984	50.8984	51.7985	52.6985	53.5986	54.4986	55.3987	56.2987	57.1988	58.0988	58.8989
Grade	A607-65																																						
Weight (lb)	326.7	338.9	351.0	363.2	375.3	387.5	562.9	400.2	412.3	424.5	438.9	451.0	463.2	475.3	487.5	744.9	757.2	769.4	781.5	897.8	913.1	928.4	943.7	959.0	974.3	989.6	1004.9	1020.2	1035.5	1050.8	1066.1	1081.4	1096.7	1112.0	1127.3	1142.6	1157.9	1173.2	1188.5



ALL REACTIONS ARE FACTORED

AXIAL 97821 lb

SHEAR 8885 lb

MOMENT 987663 lb-ft

TORQUE 993 lb-ft

50 mph WIND - 0.7500 in ICE

AXIAL 57106 lb

SHEAR 31980 lb

MOMENT 3591998 lb-ft

TORQUE 2771 lb-ft

REACTIONS - 101 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 8'x3/4"	148	800MHZ RRH	126
Platform Mount [LP 1201-1]	148	800MHZ RRH	126
(2) 7770.00 w/Mount Pipe	148	800MHZ RRH	126
(2) 7770.00 w/Mount Pipe	148	RRH8x20-25/TD RRH	126
(2) 7770.00 w/Mount Pipe	148	RRH8x20-25/TD RRH	126
HPA-65R-BUU-H6 w/ Mount Pipe	148	RRH8x20-25/TD RRH	126
SBNHH-1D65A w/ Mount Pipe	148	Platform Mount [LP 1201-1]	110
SBNHH-1D65C w/ Mount Pipe	148	LNX-6514DS-T4M w/ Mount Pipe	110
(2) SBNHH-1D65C w/ Mount Pipe	148	BXA-70063-6CF w/ Mount Pipe	110
SBNHH-1D65C w/ Mount Pipe	148	BXA-70063-6CF w/ Mount Pipe	110
(4) LGP21401	148	(2) FD9R6004/2C-3L	110
(4) LGP21401	148	(2) FD9R6004/2C-3L	110
(4) LGP21401	148	(2) FD9R6004/2C-3L	110
RRUS 32 B2	148	HBX-6517DS-VTM w/ Mount Pipe	110
RRUS 32 B2	148	HBX-6517DS-VTM w/ Mount Pipe	110
RRUS 32 B2	148	HBX-6517DS-VTM w/ Mount Pipe	110
RRUS 11	148	LNX-6513DS-VTM w/ Mount Pipe	110
RRUS 11	148	LNX-6513DS-VTM w/ Mount Pipe	110
RRUS 11	148	LNX-6513DS-VTM w/ Mount Pipe	110
DC6-48-60-18-8F Surge Suppression Unit	148	HBX-6516DS-VTM w/ Mount Pipe	110
		HBX-6516DS-VTM w/ Mount Pipe	110
Platform Mount [LP 1201-1]	140	HBX-6516DS-VTM w/ Mount Pipe	110
(2) AIR 21 w/ Mount Pipe	140	RRH2x40-AWS	110
(2) AIR 21 w/ Mount Pipe	140	RRH2x40-AWS	110
(2) AIR 21 w/ Mount Pipe	140	RRH2x40-AWS	110
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	140	DB-T1-6Z-8AB-0Z	110
		Pipe Mount 4'x2.375"	105
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	140	HP3-11	105
		6' Standoff - Flat (GPD)	100
Onebase Twin Dual Duplex TMA	140	6' Standoff - Flat (GPD)	100
Onebase Twin Dual Duplex TMA	140	CC807-08	100
Onebase Twin Dual Duplex TMA	140	CC807-08	100
Platform Mount [LP 1201-1]	126	DS1F00F36U-D	100
Miscellaneous [NA 510-1]	126	DS428E-83I-01-T	100
APXVSPP18-C-A20 w/ Mount Pipe	126	6' Standoff - Flat (GPD)	100
APXVSPP18-C-A20 w/ Mount Pipe	126	742-213 w/Mount Pipe	90
APXVSPP18-C-A20 w/ Mount Pipe	126	742-213 w/Mount Pipe	90
APXVTM14-ALU-I20 w/ Mount Pipe	126	742-213 w/Mount Pipe	90
APXVTM14-ALU-I20 w/ Mount Pipe	126	GPS	55
APXVTM14-ALU-I20 w/ Mount Pipe	126	MTS 12" Antenna Standoff	55
(2) 1900MHz RRH	126	GPS	50
(2) 1900MHz RRH	126	MTS 12" Antenna Standoff	50
(2) 1900MHz RRH	126		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

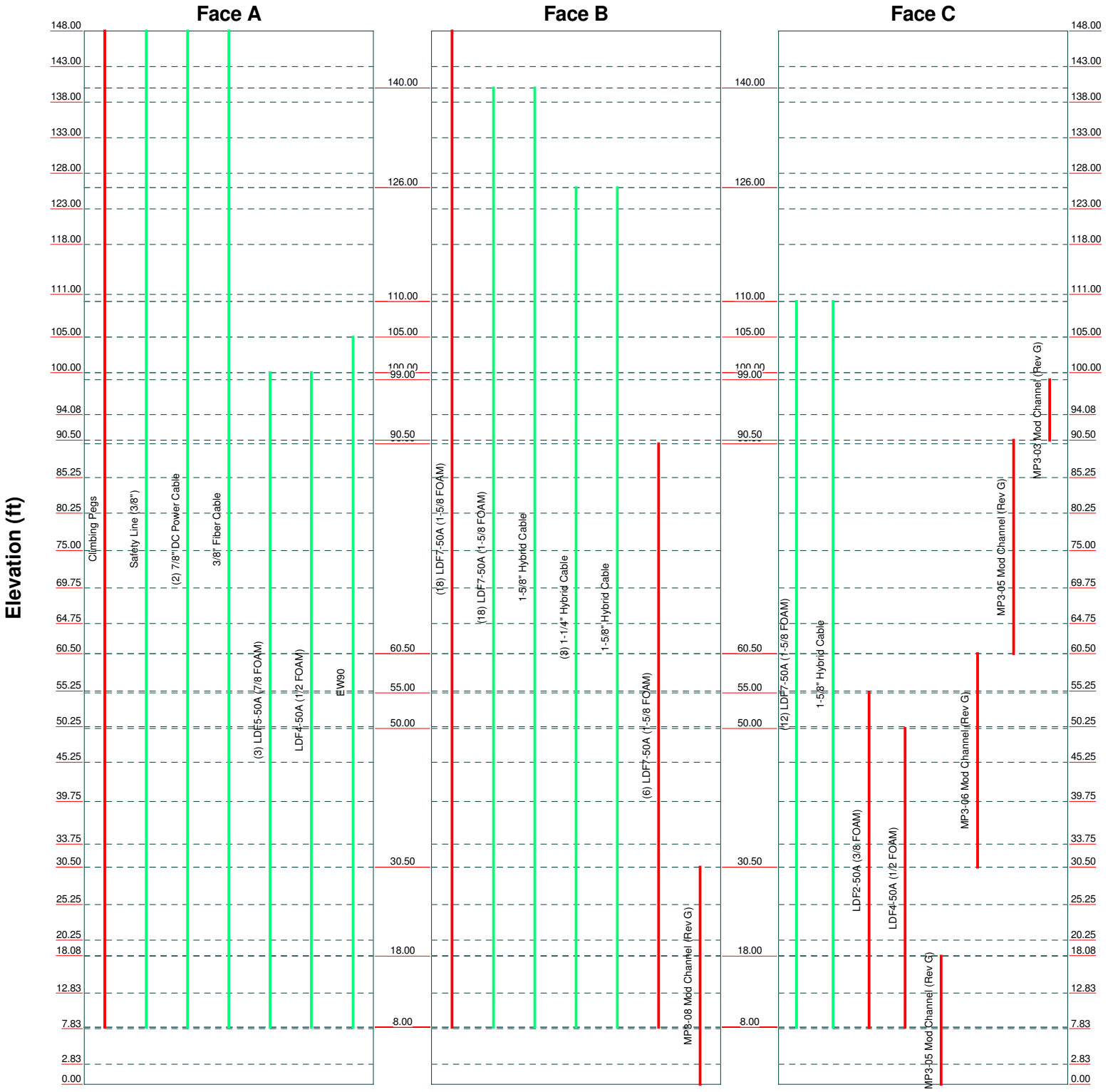
1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 78.6%

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: 14635 MIDDLETOWN SW			
Project: 2018723.01.14635.03			
Client: AT&T Towers	Drawn by: mrisley	App'd:	
Code: TIA-222-G	Date: 05/29/18	Scale: NTS	
Path: T:\ATandT\14635\06 2018723.01.14635.03 AT&T SA\tnx\14635 Modified.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 148'

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



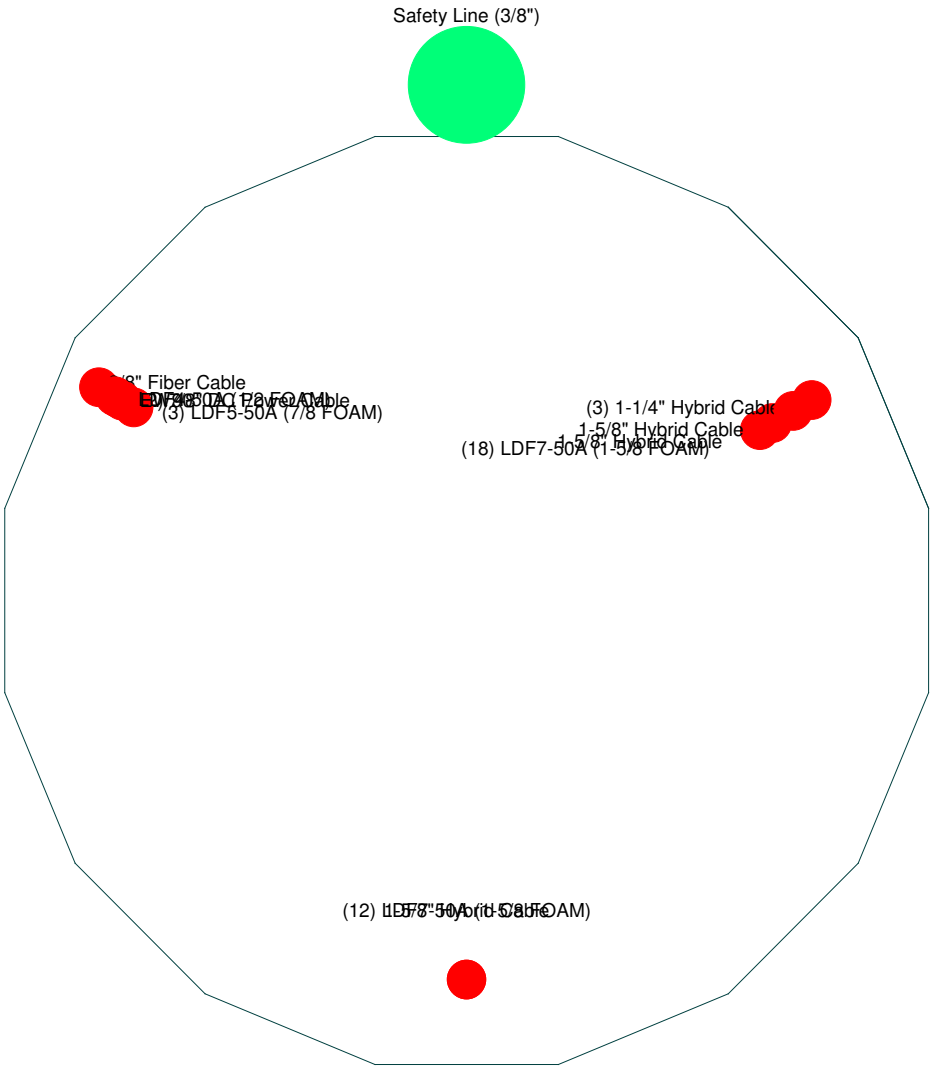
GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: ***14635 MIDDLETOWN SW***			
Project: ***2018723.01.14635.03***			
Client: AT&T Towers	Drawn by: mrisley	App'd:	
Code: TIA-222-G	Date: 05/29/18	Scale: NTS	
Path: T:\ATandT\14635\06 2018723.01.14635.03 AT&T SA\tnx\14635 Modified.eri		Dwg No. E-7	

Feed Line Plan
12'9-31/32"

Round Flat App In Face App Out Face

Section @ 12'9-31/32"



GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (555) 555-1234
FAX: (555) 555-1235

Job: 14635 MIDDLETOWN SW			
Project: 2018723.01.14635.03			
Client: AT&T Towers	Drawn by: mrisley	App'd:	
Code: TIA-222-G	Date: 05/29/18	Scale: NTS	
Path: T:\ATandT\14635\06 2018723.01.14635.03 AT&T SA\tnx\14635 Modified.er		Dwg No. E-7	

APPENDIX D

Base Plate and Anchor Rod Analysis

Anchor Rod Interaction, TIA-222-G
14635 MIDDLETOWN SW
2018723.01.14635.03

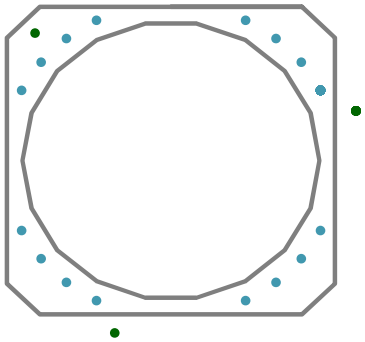
tnx Reactions		
Overturning Moment=	3592.00	k*ft
Axial Force =	57.11	k
Shear Force =	31.98	k

Existing Anchor Rods		
Number of Rods =	16	
Rod Circle =	56	in
Rod Diameter =	2.25	in
Est. Dist. b/w ea. Rod =	6	in
Plate Type =	Square	
Plate Width =	55	in

Pole		
Pole Diameter =	49.02	in
Number of Sides =	18	
Thickness =	0.375	in

First Added Anchor Rods		
Number of Rods =	3	
Rod Circle =	64.50	in
Rod Diameter =	1.75	in
Anchor Rod Grade =	A772	

Rod Number	Initial Angle
1	74
2	197
3	315



Second Added Anchor Rods		
Number of Rods =		
Rod Circle =		in
Rod Diameter =		in
Anchor Rod Grade =		

First Added Anchor Rods		
Max Rod Compression =	116.73	k
ϕRnt =	228.00	k
Anchor Rod Capacity =	51.20%	**OK**

Reactions in Existing Rods		
Overturning Moment=	**3134.84**	k*ft
Axial Force =	**57.11**	k
Shear Force =	**31.98**	k
Centroid Offset =	**0.05**	in

Anchor Rod and Base Plate Stresses, TIA-222-G-1

14635 MIDDLETOWN SW

2018723.01.14635.03

Overturning Moment* =	3134.84	k*ft
Axial Force =	57.11	k
Shear Force =	31.98	k
Centroid Offset =	0.05	in

Acceptable Stress Ratio =	105.0%

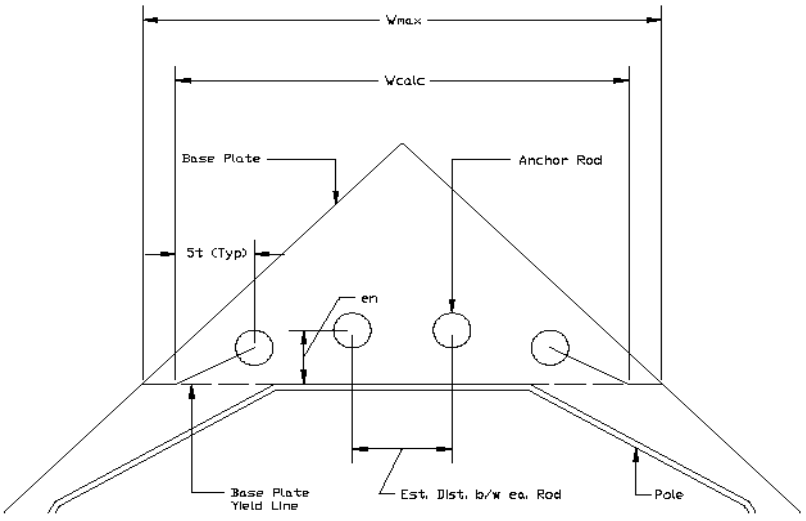
*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of anchor rod forces in the analysis.

Anchor Rods		
Pole Diameter =	49.02	in
Number of Rods =	16	
ϕ =	0.8	
Rod Ultimate Strength (F_u) =	100	ksi
Base Plate Detail Type* =	d	
Rod Circle =	56	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in^2
Max Tension on Rod =	163.57	kips
Max Compression on Rod =	170.71	kips
P_u =	170.71	kips
V_u =	2.00	kips
η =	0.50	
$P_u + V_u / η$ =	174.71	kips
$φR_{nt}$ =	260.00	kips
Anchor Rod Capacity =	**67.2%**	**OK**

(Section 4.9.9, TIA-222-G-1)

Base Plate		
Plate Strength (Fy) =	55	ksi
ϕ =	0.9	
Plate Thickness =	3	in
Plate Width =	55	in
Est. Dist. b/w ea. Rod =	6	in
w_{calc} =	47.72	in
w_{max} =	28.76	in
w =	28.76	in
Z =	64.71	in^3
M_u =	1805.19	k-in
$φM_n$ =	3203.34	k-in
Base Plate Capacity =	**56.4%**	**OK**

***This analysis assumes the clear distance from the top of the concrete to the bottom of the leveling nut is less than the diameter of the anchor rod. Notify GPD Group immediately if existing field conditions do not meet this assumption.**



APPENDIX E

Foundation Analysis

Mat Foundation Analysis
14635 MIDDLETOWN SW
2018723.01.14635.03

General Info	
Foundation Criteria	GPD
TIA Code	TIA-222-G
Soil Code	AASHTO 2012
Concrete Code	ACI 318-11
Seismic Design Category	B
Tower Height	148 ft
Bearing On	Rock
Foundation Type	Monopole Pad
Pier Type	Round
Reinforcing Known	Yes
Max Bearing Capacity	105%
Max Overturning Capacity	105%

Tower Reactions	
Moment, M	3592 k-ft
Axial, P	57.11 k
Shear, V	31.98 k

Pad & Pier Geometry	
Pier Diameter, ø	7 ft
Pad Length, L [y]	22 ft
Pad Width, W [x]	22 ft
Pad Thickness, t	3 ft
Depth, D	8 ft
Height Above Grade, HG	0.5 ft
Tower Centroid, X	11 ft
Tower Centroid, Y	11 ft
Tower Eccentricity	0.0000 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete F'c	3 ksi
Pier Reinforcing Clear Cover	3 in
Shear Rebar Type	Tie
Shear Rebar Size	# 5
Pad Reinforcing Clear Cover	3 in
Reinforced Top & Bottom?	Yes
Pad Reinforcing Size	# 11
Pad Quantity Per Layer	22
Pier Rebar Size	# 11
Pier Quantity of Rebar	28

Soil Properties	
Soil Type	Granular
Soil Unit Weight	100 pcf
Angle of Friction, ø	30
Base Friction Coeff. Provided in Geo?	No
Bearing Type	Gross
Ultimate Bearing	12 ksf
Water Table Depth	7 ft
Frost Depth	3.5 ft

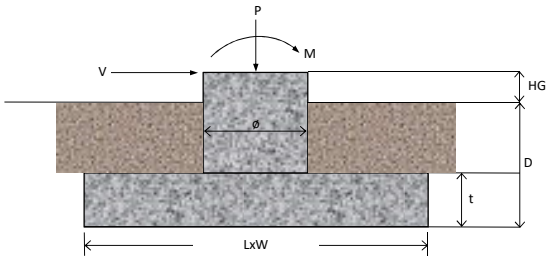
GPD Mat Foundation Analysis - V3.2

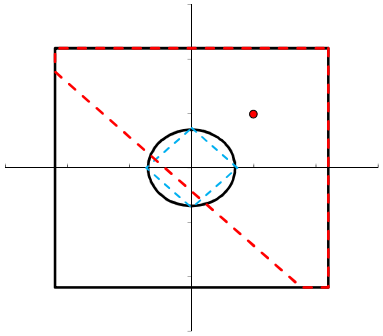
Bearing Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*	*Eccentricity*	*Load Case*
Qxmax	3.51 ksf	9.00 ksf	OK, <= 105%	L/3.1	0.9D+1.6W
Qymax	3.51 ksf	9.00 ksf	OK, <= 105%	W/3.1	0.9D+1.6W
Qmax @ 45°	4.54 ksf	9.00 ksf	OK, <= 105%	W/4.4	0.9D+1.6W
Controlling Capacity		**50.4%**	**Pass**		

Overturning Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Ovtx	3168.9 k-ft	4848.0 k-ft	65.4%	OK	0.9D+1.6W
Ovty	3168.9 k-ft	4848.0 k-ft	65.4%	OK	0.9D+1.6W
Ovtxy	2190.1 k-ft	4848.0 k-ft	45.2%	OK	0.9D+1.6W
Controlling Capacity		**65.4%**	**Pass**		

Sliding Summary					
Case	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Slidingx	32.0 k	225.3 k	14.2%	OK	0.9D+1.6W
Slidingy	32.0 k	225.3 k	14.2%	OK	0.9D+1.6W
Controlling Capacity		**14.2%**	**Pass**		

Reinforcement Summary					
Component	*Demand/Limits*	*Capacity/Availability*	*Check*		*Load Case*
Pad Flexural Bending	54.6 k-ft	206.1 k-ft	26.5%	OK	0.9D+1.6W
One-Way Shear in Pad	211.5 k	669.9 k	31.6%	OK	0.9D+1.6W
Two-Way Shear in Pad	604.1 k	2138.1 k	28.3%	OK	0.9D+1.6W
Compression on Pier	95.2 k	18371.0 k	0.5%	OK	1.2D+1.6W
Moment on Pier	3760.8 k-ft	6760.3 k-ft	55.6%	OK	1.2D+1.6W
As Min Pad Met?	3.12 sq. in.	0.23 sq. in.	Yes		
As Min Pier Met?	43.68 sq. in.	27.71 sq. in.	Yes		
Controlling Capacity		**55.6%**	**Pass**		





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Sprint®

PROJECT: DO MACRO UPGRADE

SITE NAME: MIDDLETOWN-AT&T

SITE CASCADE: CT43XC816

SITE ADDRESS: 290 PRESTON AVENUE
MIDDLETOWN, CT 06492

SITE TYPE: 148'-0" MONOPOLE

SITE INFORMATION

PROPERTY OWNER:
AT&T WIRELESS SVCS, INC.
COLLOCATION A/R
PO BOX 97076
REDMOND, WA 98073

SITE ADDRESS:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41° 33' 26.49
LONGITUDE: 72° 44' 35.76"

ZONING JURISDICTION:
R-60

ZONING DISTRICT:
XXXXXXXX

POWER COMPANY:
CONNECTICUT LIGHT AND POWER
PH.: (800) 286-2000

AAV PROVIDER:
XXX
PH.: (XXX) XXX-XXXX

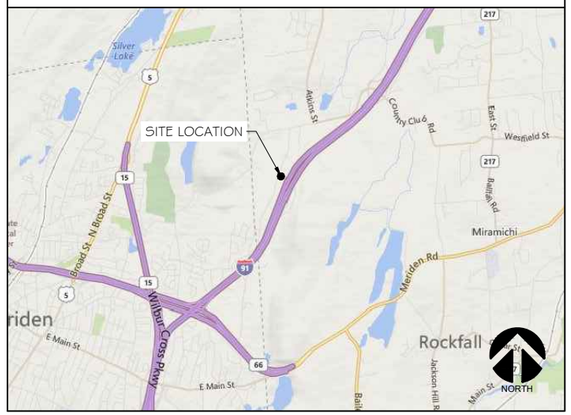
SPRINT CONSTRUCTION MANAGER:
NAME: MIKE DELIA
PHONE: (781) 316-6348
E-MAIL: Michael.Delia@Sprint.com

EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600-700 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974
PH.: (908) 508-8080

SITE ACQUISITION:
CHARLES CHERUNDOLO CONSULTING, INC.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
CONTACT: TOM JUPIN, PMP, PROJECT MANAGER
CELL: (973) 819-9033
EMAIL: tom.jupin@cherundoloconsulting.com

PLANS PREPARED BY:
RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK, PROJECT MANAGER
PH.: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

AREA MAP



LOCATION MAP

PROJECT DESCRIPTION

- INSTALL NEW 2.5 EQUIPMENT IN EXISTING BTS CABINET
  *(1) RECTIFIER SHELF AND (3) RECTIFIERS
  *(1) BASE BAND UNIT
- INSTALL NEW BATTERY STRING(S) IN EXISTING BATTERY CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRH'S ON TOWER
- INSTALL (1) HYBRIFLEX CABLE AND (1) SECTOR JUMPERS
- INSTALL (27) ANTENNA / RRH JUMPERS

APPLICABLE CODES

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

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

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SHEET INDEX

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SP-3	SPRINT SPECIFICATIONS	-	JRS
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E-3	DC POWER DETAILS & PANEL SCHEDULES	-	JRS
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RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
Phone: 973-794-3633 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/22/2018 Date:

MARK	DATE	DESCRIPTION
2	08/22/18	ADDED STRUCTURAL DETAILS & REVISED RF TABLE
1	10/09/17	REVISED CDs PER RFDS

ISSUE PHASE: FINAL DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: T-1

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SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
   1. EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
   2. TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
   3. EL-0568: (FIBER TESTING POLICY)
   4. NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
   5. NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:
THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONCRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

USE OF JOB SITE:
THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSOR'S OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

DIMENSIONS:
VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

EXISTING CONDITIONS:
NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
   1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
   2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
   3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
   1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
   2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
   2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
   3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
   4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
   5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
   6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
   7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
   8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
   9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
   10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
   11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
   12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
   13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
   14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
   15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
   16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
   17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
   18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
   19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
   20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
   1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
   2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
   3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
   4. ALL REQUIRED TEST REPORTS.
   5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
      a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
      b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
      c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
      d. LIEN WAIVERS
      e. FINAL PAYMENT APPLICATION
      f. REQUIRED FINAL CONSTRUCTION PHOTOS
      g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
      h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
   1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
   2. PROJECT PROGRESS REPORTS.
   3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
   2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
   3. CONCRETE BREAK TESTS
   4. SITE RESISTANCE TO EARTH TEST
   5. STRUCTURAL BACKFILL COMPACTION TESTS
   6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
   7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
   2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
   3. CHEMICAL GROUNDING SYSTEM .
   4. REINFORCEMENT CERTIFICATIONS
   5. STRUCTURAL BACKFILL TEST RESULTS
   6. SWEEP AND FIBER TESTS
   7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
   8. POST CONSTRUCTION HEIGHT VERIFICATION
   9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.

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RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
Phone: 973-794-3633 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 8/22/2018

MARK	DATE	DESCRIPTION
2	08/22/18	ADDED STRUCTURAL DETAILS & REVISED RF TABLE
1	10/09/17	REVISED CDs PER RFDS

ISSUE PHASE: FINAL DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: SP-1

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5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION

D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING

E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.

1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.

B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:

1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAXCABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:

A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REPRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.

1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:

CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.

B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURERS REQUIREMENTS.

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10'-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:

1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:

1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
Phone: 973-794-3633 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/22/2018 Date:

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290 PRESTON AVENUE
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MIDDLESEX COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: SP-2

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SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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Phone: 973-794-3633 Fax: 570-842-5592

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/22/2018 Date:

MARK	DATE	DESCRIPTION
2	08/22/18	ADDED STRUCTURAL DETAILS & REVISED RF TABLE
1	10/09/17	REVISED CDs PER RFDS

ISSUE PHASE: FINAL — DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28802

SHEET NUMBER: SP-3

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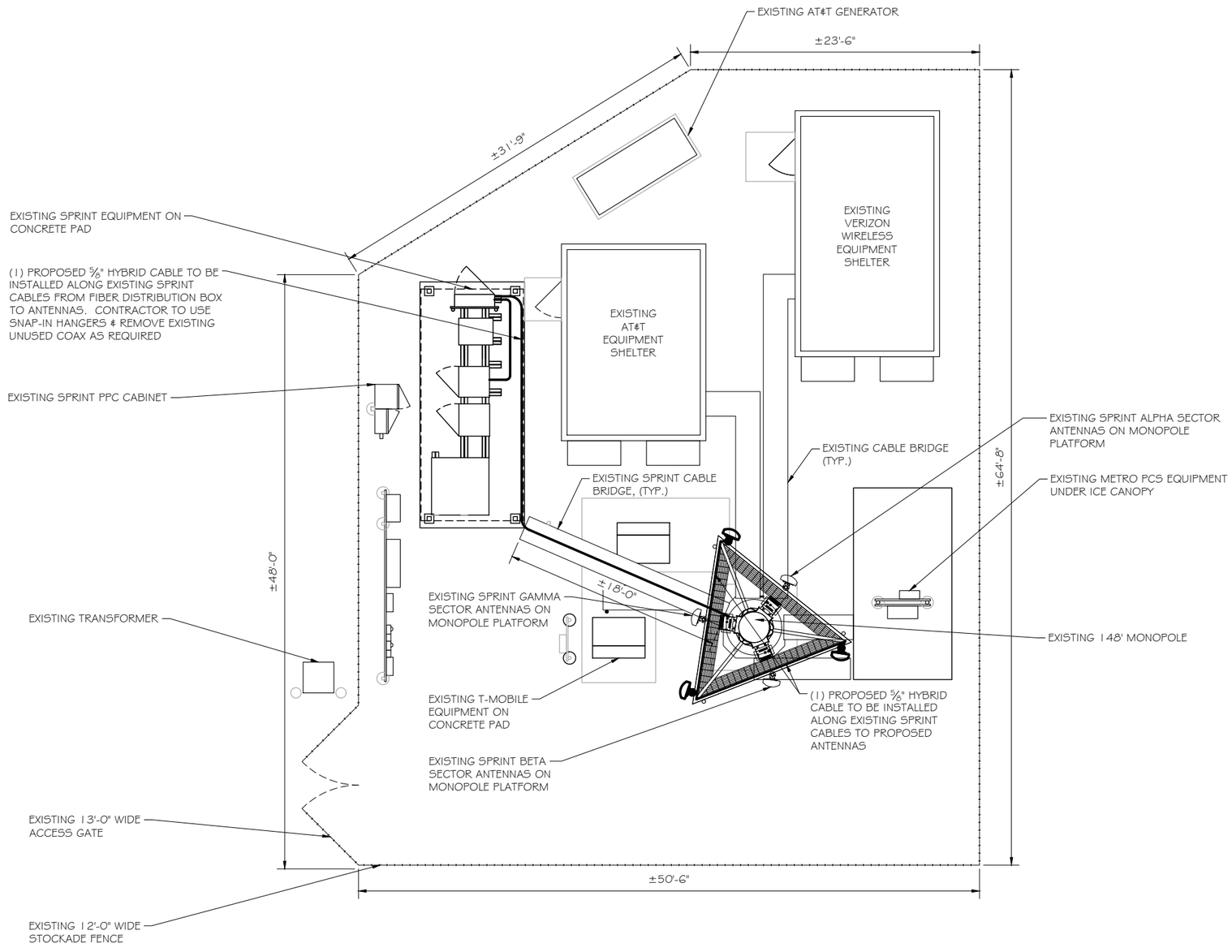

SITE PLAN
SCALE: 1" = 10'
1

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26266
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ISSUE PHASE: FINAL
DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
SITE PLAN

0 5' 10' 20'
11" x 17" - 1" = 10'
22" x 34" - 1" = 5'

PROJECT NUMBER: 28802
SHEET NUMBER: A-1

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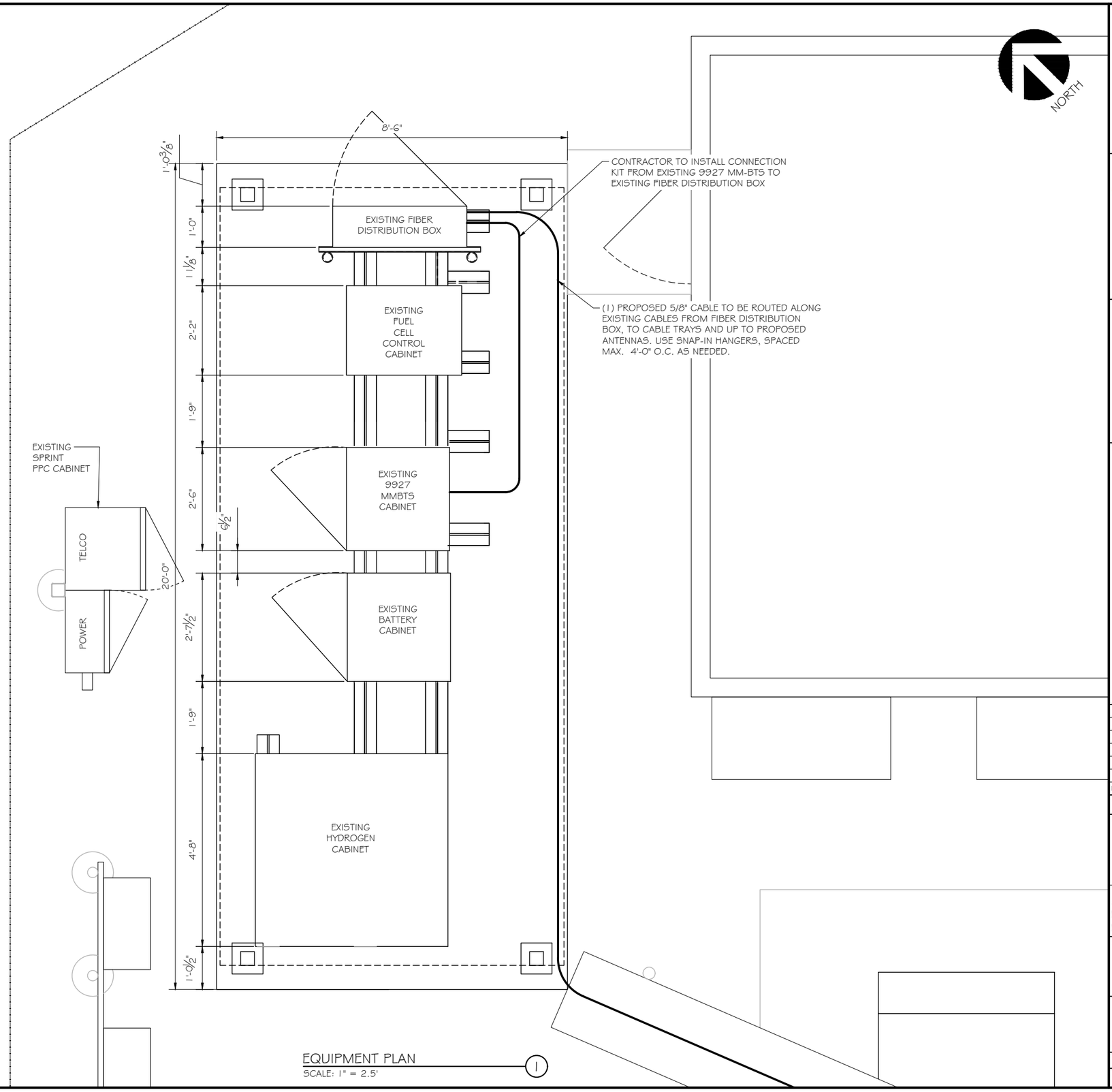

EQUIPMENT PLAN (1)
SCALE: 1" = 2.5'

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DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
EQUIPMENT PLAN

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

PROJECT NUMBER: 28802
SHEET NUMBER: A-2

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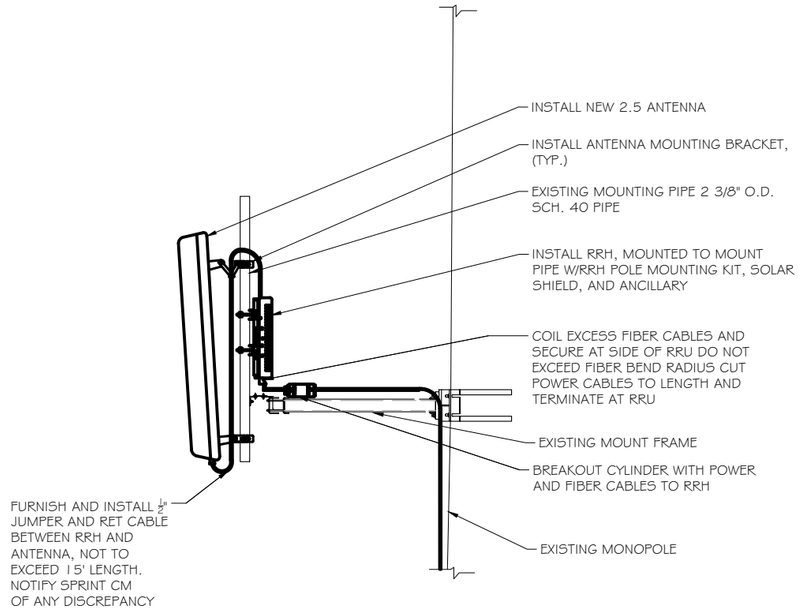
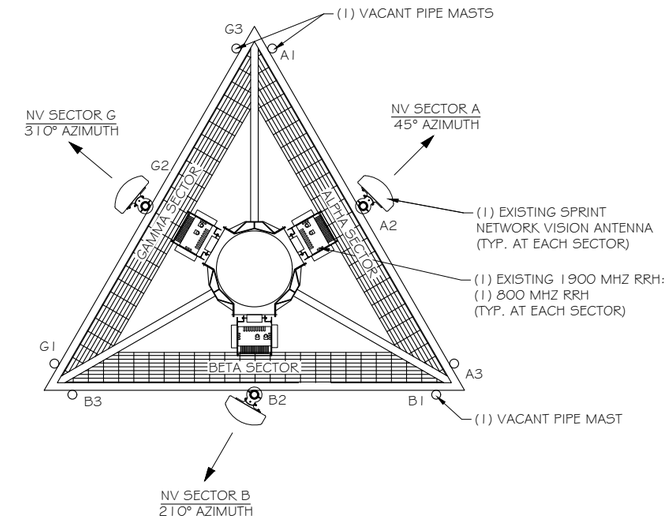
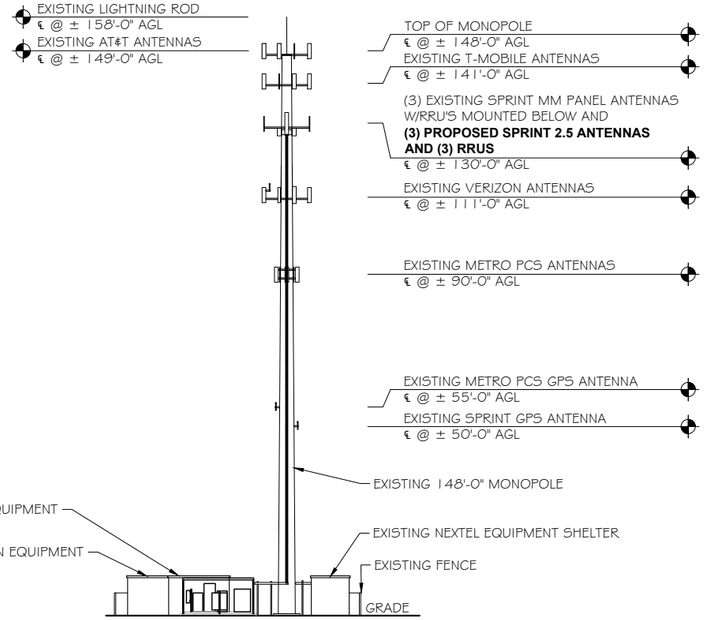


ANTENNA & RRH MOUNTING DETAILS — 1
SCALE: NTS

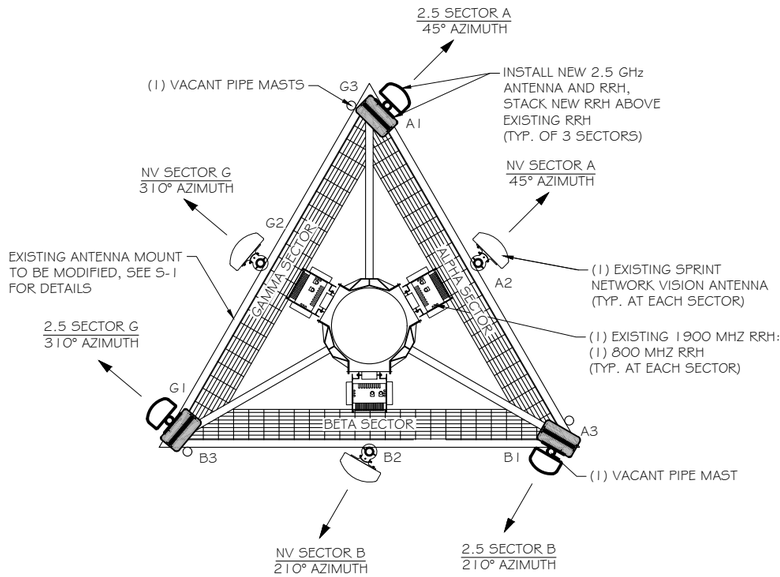


NORTH

EXISTING ANTENNA ARRAY — 3
SCALE: NTS



BUILDING ELEVATION — 2
SCALE: 1" = 40'



NORTH

PROPOSED ANTENNA ARRAY — 4
SCALE: NTS

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PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
BUILDING ELEVATIONS & ANTENNA DETAILS

0 20' 40' 80'
11" x 17" - 1" = 40'
22" x 34" - 1" = 20'

PROJECT NUMBER: 28802
SHEET NUMBER: A-3

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800/1900/2.5 EQUIPMENT SCHEDULE

SECTOR	POSITION	ANTENNA MAKE/MODEL	AZIMUTH	CENTERLINE	RRH	CABLE TYPE	CABLE LENGTH	JUMPER TYPE
ALPHA	1	(1) PROPOSED 2.5 PANEL ANTENNA (RFS APXVTM14-ALU-I20)	45°	130'-0"	(1) PROPOSED 2.5 RRH (ALU TD-RRHx20)	(1) PROPOSED HYBRIFLEX	175'	8' HYBRID
	2	(1) EXISTING PANEL ANTENNA (RFS APXVSPP18-C-A20)	45°	130'-0"	(1) EXISTING 800 RRH (ALU RRH-2x50-800) (1) EXISTING 1900 RRH (ALU RRH-4x45-1900)	EXISTING HYBRIFLEX	175'	EXISTING
	3	VACANT MOUNT	-	-	-	-	-	-
BETA	1	(1) PROPOSED 2.5 PANEL ANTENNA (RFS APXVTM14-ALU-I20)	210°	130'-0"	(1) PROPOSED 2.5 RRH (ALU TD-RRHx20)	SHARED W/ ALPHA	175'	8' HYBRID
	2	(1) EXISTING PANEL ANTENNA (RFS APXVSPP18-C-A20)	210°	130'-0"	(1) EXISTING 800 RRH (ALU RRH-2x50-800) (1) EXISTING 1900 RRH (ALU RRH-4x45-1900)	EXISTING HYBRIFLEX	175'	EXISTING
	3	VACANT MOUNT	-	-	-	-	-	-
GAMMA	1	(1) PROPOSED 2.5 PANEL ANTENNA (RFS APXVTM14-ALU-I20)	310°	130'-0"	(1) PROPOSED 2.5 RRH (ALU TD-RRHx20)	SHARED W/ ALPHA	175'	8' HYBRID
	2	(1) EXISTING PANEL ANTENNA (RFS APXVSPP18-C-A20)	310°	130'-0"	(1) EXISTING 800 RRH (ALU RRH-2x50-800) (1) EXISTING 1900 RRH (ALU RRH-4x45-1900)	EXISTING HYBRIFLEX	175'	EXISTING
	3	VACANT MOUNT	-	-	-	-	-	-

EQUIPMENT & CABLE SCHEDULE (1)
SCALE: NTS

NOTES:

1. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND C/L HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHZ ANTENNA AT SAME C/L HEIGHT AS 1.9GHZ ANTENNA AND EMAIL CORRECT C/L HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT C/L HEIGHT. ALSO EMAIL CORRECT 1.9GHZ AND 800MHZ ANTENNA C/L HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
2. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5GHZ. TEST TO INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
3. GENERAL CONTRACTOR MUST ENSURE THAT NO OBJECT IS LOCATED WITHIN 45 DEGREES OF LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHZ ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
4. 2.5GHZ ANTENNA MUST BE AT LEAST 6' FROM 1.9GHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30" FROM DUAL BAND 1.9GHZ AND 800MHZ ANTENNA.
5. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 32 RF ALIGNMENT TOOL OR EQUIVALENT TOOL.

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1	10/09/17	REVISED CDs PER RFDS

ISSUE PHASE: FINAL
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PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
RF DATA SHEET

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: A-4

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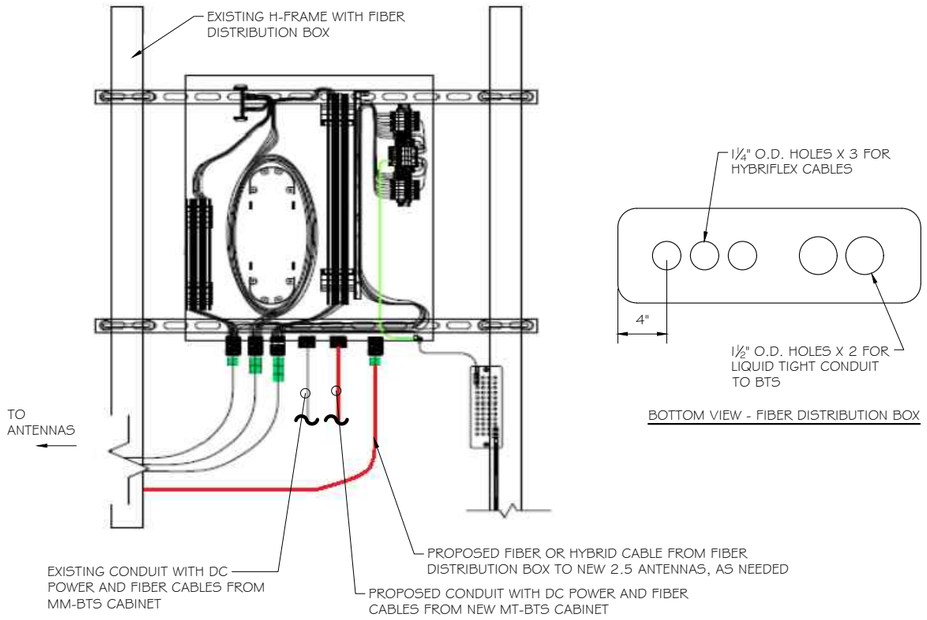
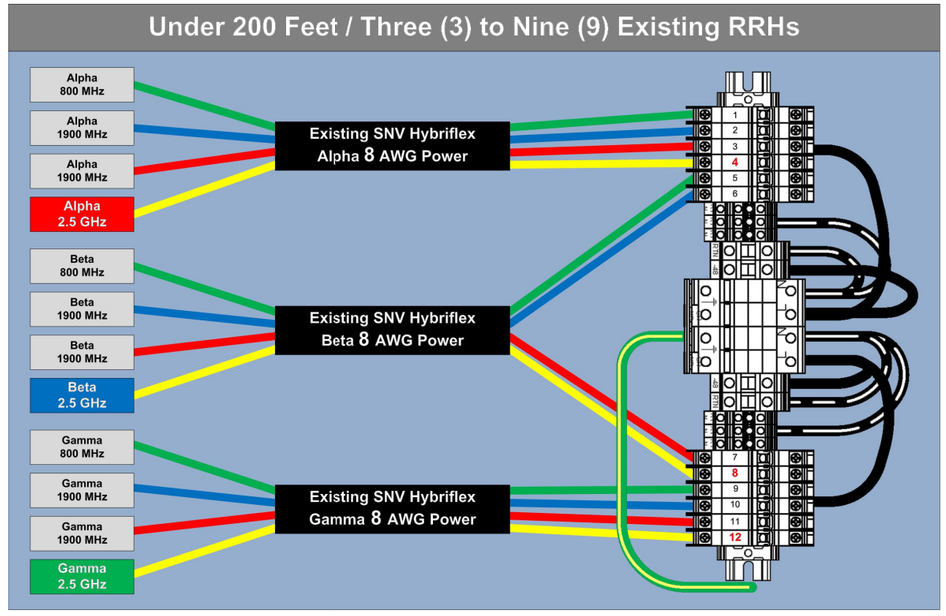
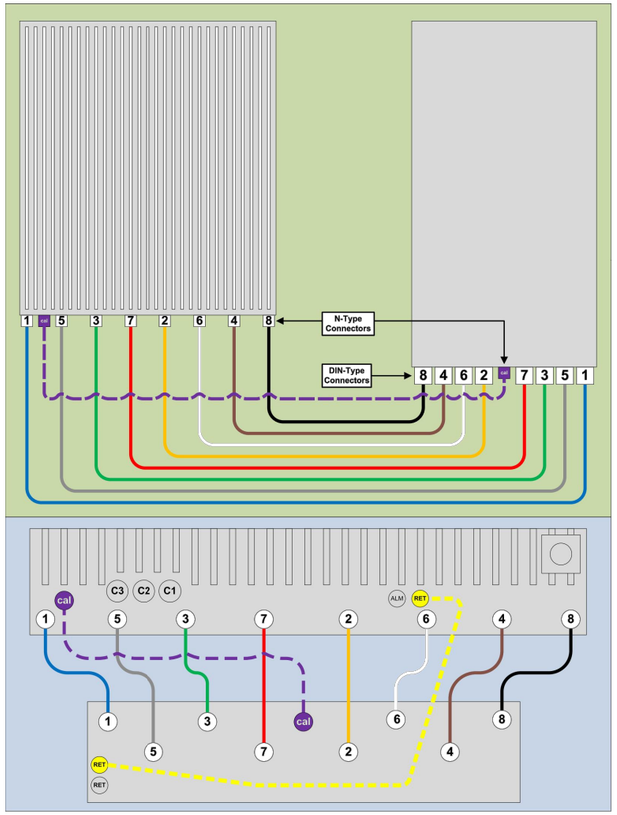


TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)
SCALE: NTS

BOTTOM VIEW - FIBER DISTRIBUTION BOX

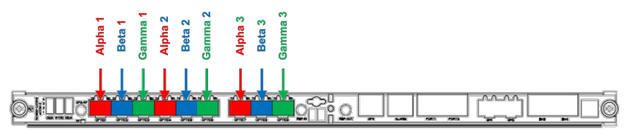


RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)
SCALE: NTS

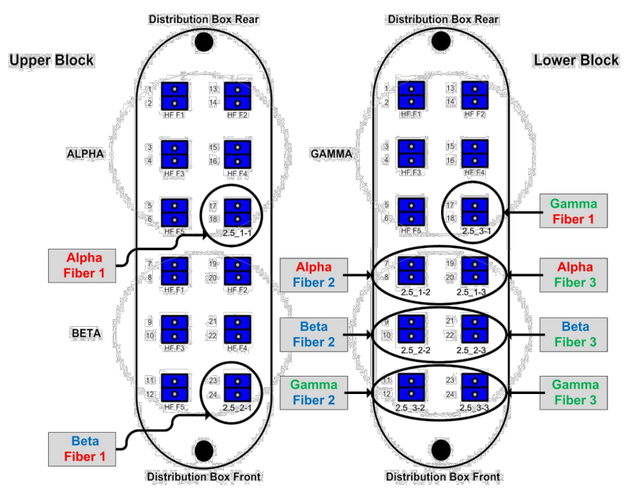


8T8R DETAIL (3)
SCALE: NTS

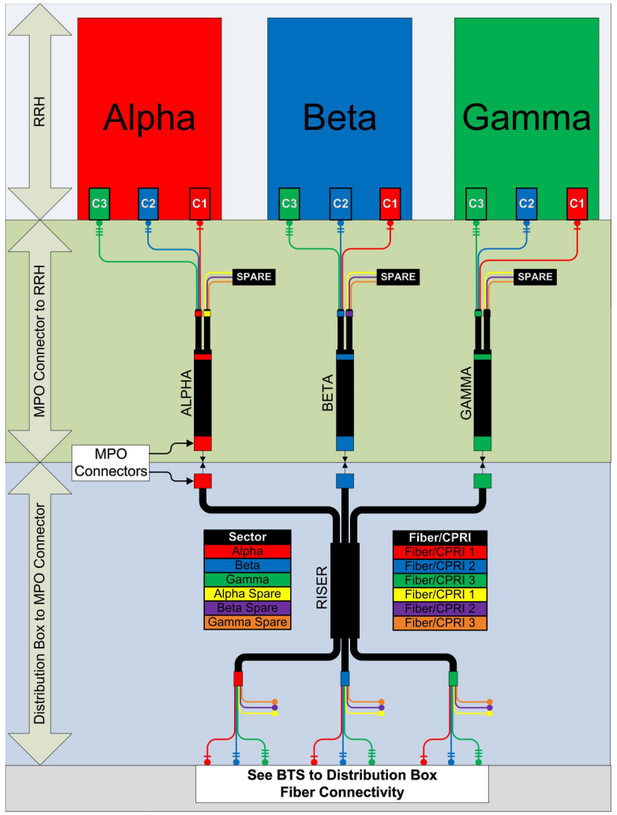
eCCM2-HR



Distribution Box Fiber Panel



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)
SCALE: NTS



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)
SCALE: NTS

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CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: A-5

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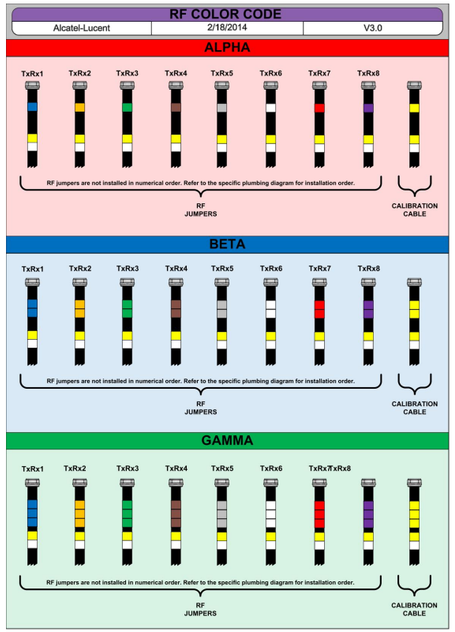

SECTOR COLOR CODING AND BANDING (1)
SCALE: NTS

2.5 Coaxial Cable Color Code (Radio#1)

Sector	Cable	Start at Connector Side	Wrap2	Wrap3	Wrap4	Wrap5
1 Alpha	1	Blue			Yellow	White
1	2	Orange			Yellow	White
1	3	Green			Yellow	White
1	4	Brown			Yellow	White
1	5	Slate			Yellow	White
1	6	White			Yellow	White
1	7	Red			Yellow	White
1	8	Violet			Yellow	White
1	Calibration Cable	Yellow			Yellow	White
2 Beta	1	Blue	Blue		Yellow	White
2	2	Orange	Orange		Yellow	White
2	3	Green	Green		Yellow	White
2	4	Brown	Brown		Yellow	White
2	5	Slate	Slate		Yellow	White
2	6	White	White		Yellow	White
2	7	Red	Red		Yellow	White
2	8	Violet	Violet		Yellow	White
2	Calibration Cable	Yellow	Yellow		Yellow	White
3 Gamma	1	Blue	Blue	Blue	Yellow	White
3	2	Orange	Orange	Orange	Yellow	White
3	3	Green	Green	Green	Yellow	White
3	4	Brown	Brown	Brown	Yellow	White
3	5	Slate	Slate	Slate	Yellow	White
3	6	White	White	White	Yellow	White
3	7	Red	Red	Red	Yellow	White
3	8	Violet	Violet	Violet	Yellow	White
3	Calibration Cable	Yellow	Yellow	Yellow	Yellow	White

2.5 Coaxial Cable Color Code (Radio#2)

Sector	Cable	Start at Connector Side	Wrap2	Wrap3	Wrap4	Wrap5
1 Alpha	1	Blue			Yellow	Violet
1	2	Orange			Yellow	Violet
1	3	Green			Yellow	Violet
1	4	Brown			Yellow	Violet
1	5	Slate			Yellow	Violet
1	6	White			Yellow	Violet
1	7	Red			Yellow	Violet
1	8	Violet			Yellow	Violet
1	Calibration Cable	Yellow			Yellow	Violet
2 Beta	1	Blue	Blue		Yellow	Violet
2	2	Orange	Orange		Yellow	Violet
2	3	Green	Green		Yellow	Violet
2	4	Brown	Brown		Yellow	Violet
2	5	Slate	Slate		Yellow	Violet
2	6	White	White		Yellow	Violet
2	7	Red	Red		Yellow	Violet
2	8	Violet	Violet		Yellow	Violet
2	Calibration Cable	Yellow	Yellow		Yellow	Violet
3 Gamma	1	Blue	Blue	Blue	Yellow	Violet
3	2	Orange	Orange	Orange	Yellow	Violet
3	3	Green	Green	Green	Yellow	Violet
3	4	Brown	Brown	Brown	Yellow	Violet
3	5	Slate	Slate	Slate	Yellow	Violet
3	6	White	White	White	Yellow	Violet
3	7	Red	Red	Red	Yellow	Violet
3	8	Violet	Violet	Violet	Yellow	Violet
3	Calibration Cable	Yellow	Yellow	Yellow	Yellow	Violet

2.5 COAXIAL CABLE COLOR CODE (2)
SCALE: NTS

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

Signature: 8/22/2018 Date:

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DATE ISSUED: 08/28/2017

PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: A-6

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HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF:RFS

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
Fiber Only	Varies	Use NV Hybriflex	5/8"
Hybriflex	<200'	8 AWG	1-1/4"
Hybriflex	225-300'	6 AWG	1-1/4"
Hybriflex	325-375'	4 AWG	1-1/4"

RFS HYBRIFLEX RISER CABLE SCHEDULE

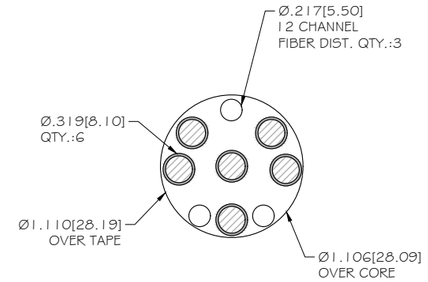
FIBER ONLY (EXISTING DC POWER)	Hybrid cable MN:HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN:HB058-M12-075F	75 ft
	MN:HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN:HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 50 ft	50 ft
	MN:HB114-08U3M12-075F	75 ft
	MN:HB114-08U3M12-100F	100 ft
	MN:HB114-08U3M12-125F	125 ft
	MN:HB114-08U3M12-150F	150 ft
	MN:HB114-08U3M12-175F	175 ft
	MN:HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN:HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 225 ft	225 ft
	MN:HB114-13U3M12-250F	250 ft
	MN:HB114-13U3M12-275F	275 ft
	MN:HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN:HB114-21U3M12-325F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 325 ft	325 ft
	MN:HB114-21U3M12-350F	350 ft
	MN:HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

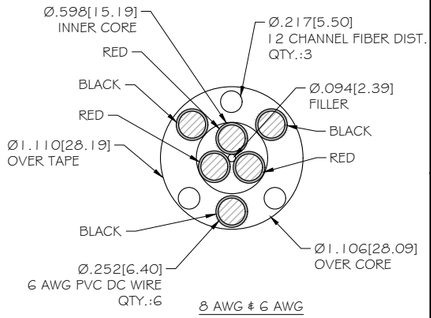
FIBER ONLY	Hybrid Jumper cable MN:HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN:HBF012-M3-10F1	10 ft
	MN:HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
8 AWG POWER	Hybrid Jumper cable MN:HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-08U1M3-10F1	10 ft
	MN:HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG POWER	Hybrid Jumper cable MN:HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-13U1M3-10F1	10 ft
	MN:HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG POWER	Hybrid Jumper cable MN:HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 7/8 cable	5 ft
	MN:HBF078-21U1M3-10F1	10 ft
	MN:HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	

*NOTE: SPRINT CM TO CONFIRM HYBRID/FIBER RISER CABLE & HYBRID/FIBER JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.

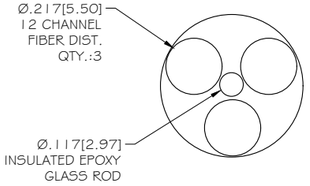
HYBRID CABLE CROSS SECTION & DATA (1)
SCALE: NTS



4 AWG



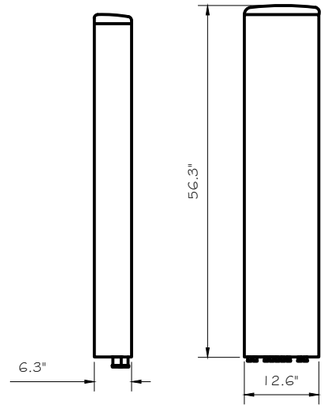
8 AWG & 6 AWG



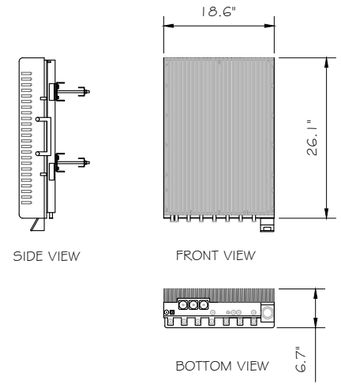
FIBER ONLY

RFS: APXVTM14-ALU-120

DIMENSIONS, HxWxD:	56.3" x 12.6" x 6.3"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	55.12 lbs.
CONNECTOR:	(9) XX" MINI-DIN FEMALE/BOTTOM



2.5 ANTENNA DETAIL (2)
SCALE: NTS



ALCATEL-LUCENT: TD-RRH8x20

HxWxD = (26.1" x 18.6" x 6.7")

WEIGHT = 70 lbs.

2.5 RRH DETAIL (3)
SCALE: NTS

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CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: A-7

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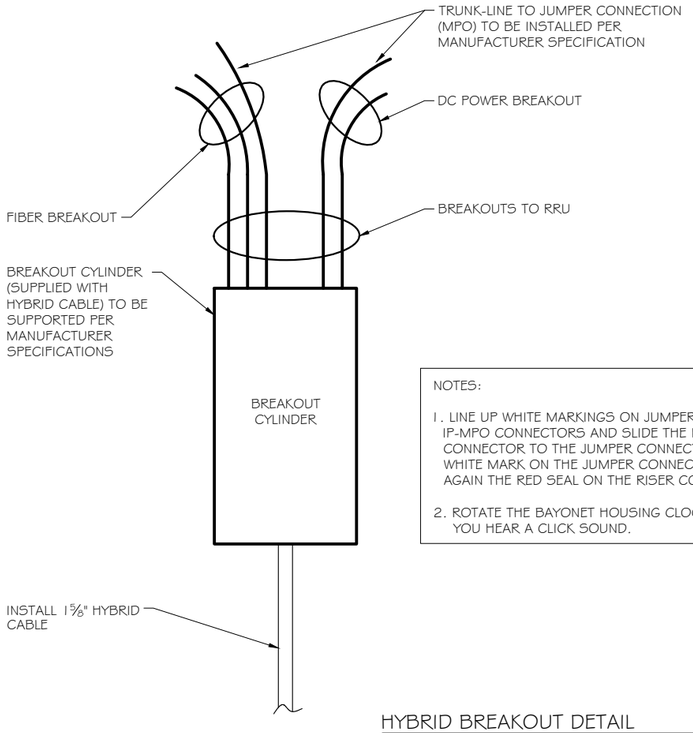
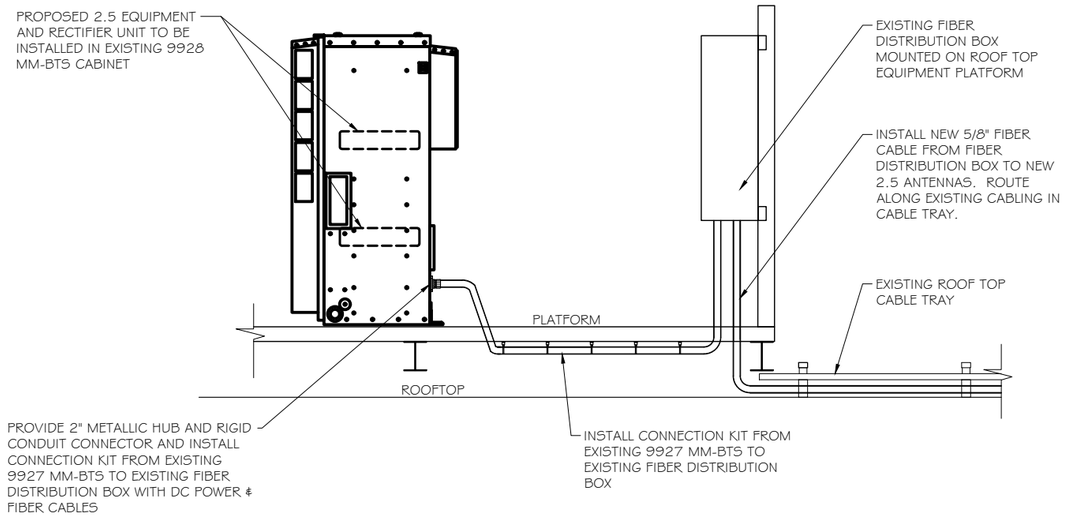


NOTES:

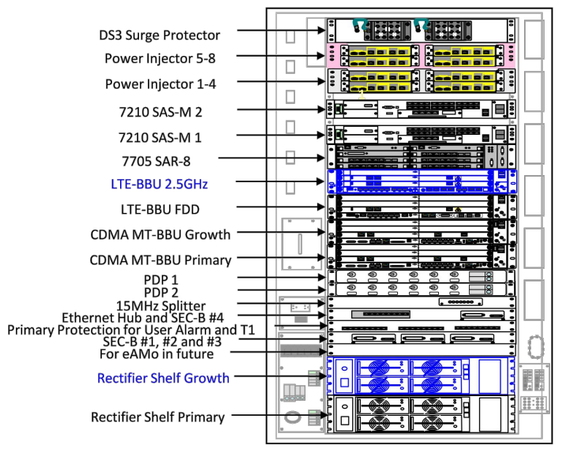
1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

HYBRID BREAKOUT DETAIL (1)
SCALE: NTS



CABLE ROUTE FROM CABINET (2)
SCALE: NTS

EXISTING BBU CABINET (3)
SCALE: NTS



EXISTING MMBS CABINET (4)
SCALE: NTS

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PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
EQUIPMENT DETAILS

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: A-8

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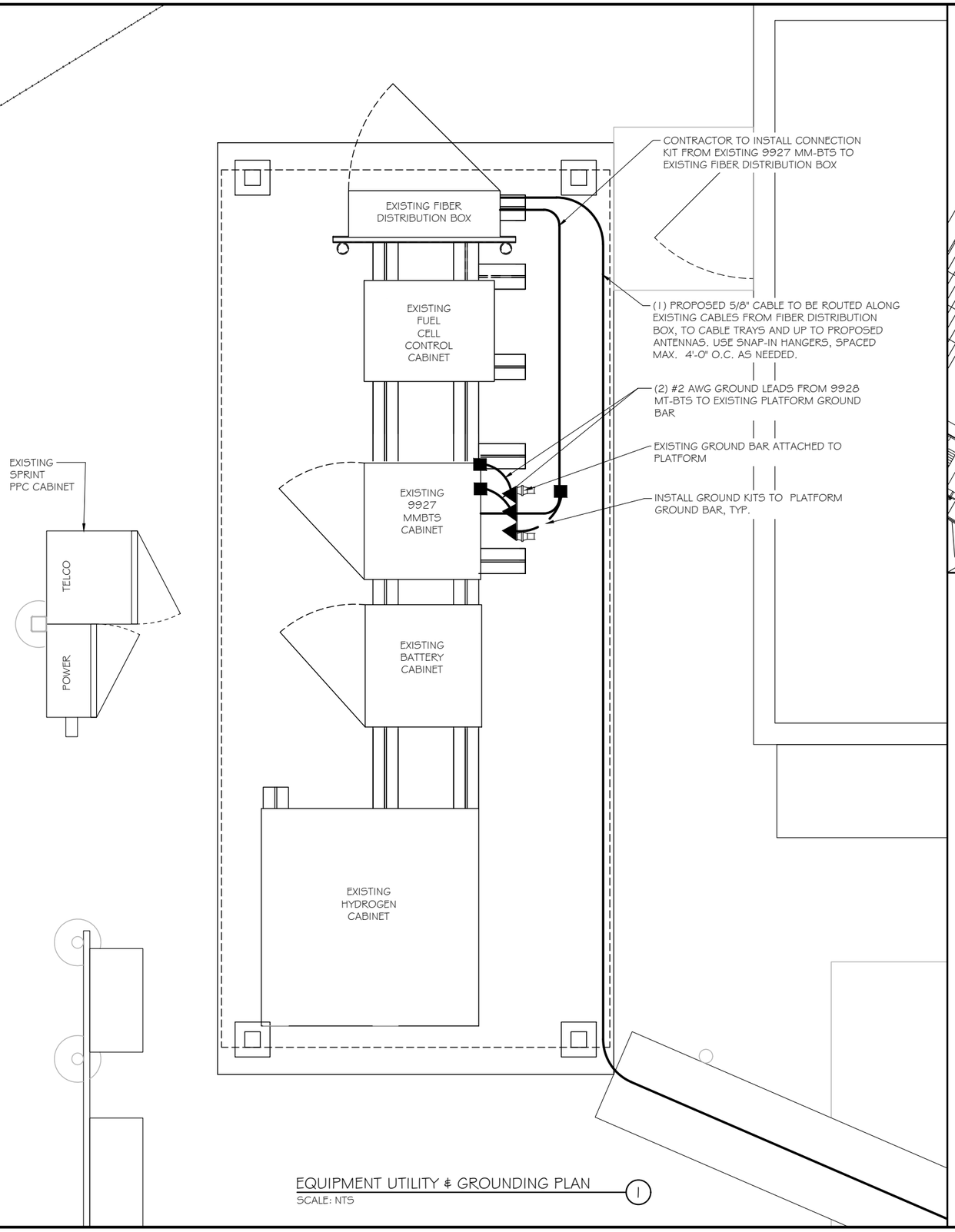
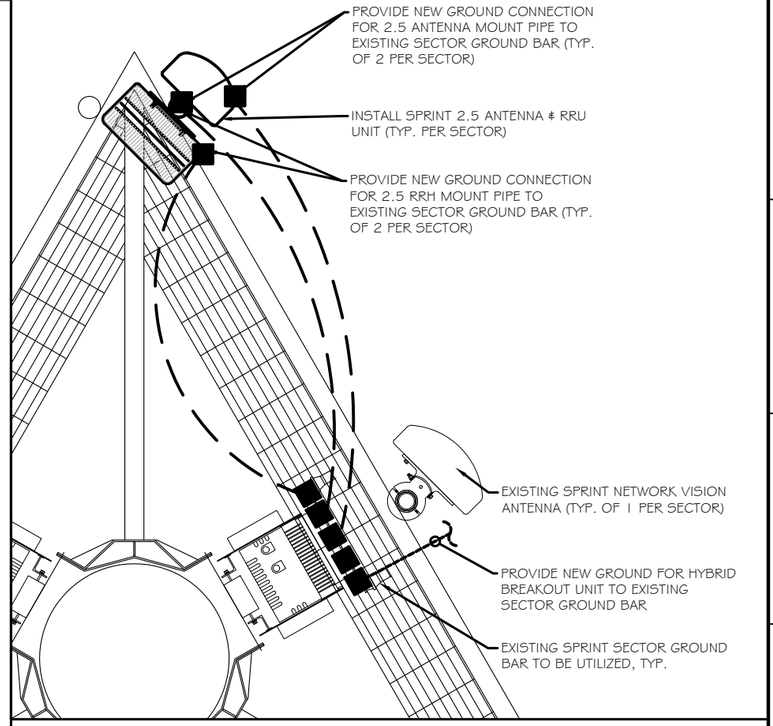


EQUIPMENT UTILITY & GROUNDING PLAN (1)
SCALE: NTS



ANTENNA GROUNDING DETAIL (2)
SCALE: NTS

GROUNDING NOTES:

1. CONTRACTOR TO ENSURE PROPER SEQUENCING OF GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM AND/OR DAMAGE TO THE CONDUIT.
2. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS NOTED OTHERWISE.
3. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
4. ALL GROUND CONNECTIONS ABOVE GRADE AND/OR INTERIOR SHALL BE COMPRESSION TYPE, TWO-HOLE LUGS OR DOUBLE-CRIMP "C" TAPS.
5. CONTACT AREAS WHERE CONNECTIONS ARE MADE SHALL BE PREPARED TO A BARE BRIGHT FINISH AND COATED WITH AN ANTI-OXIDATION MATERIAL BEFORE CONNECTIONS ARE MADE.
6. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL SURFACES, PAINT SHALL BE REMOVED TO BEAR METAL TO ENSURE PROPER CONTACT AND RESTORED/PAINTED TO ORIGINAL FINISH.
8. GROUND DEPTH SHALL BE 30" MINIMUM BELOW FINISHED GRADE, OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

LEGEND:	
– – – – – – – – – – – –	EXISTING GROUND CABLE
▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
—E—E—E—E—	PROPOSED ELECTRIC

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MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
EQUIPMENT UTILITY & GROUNDING PLAN

SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: E-1

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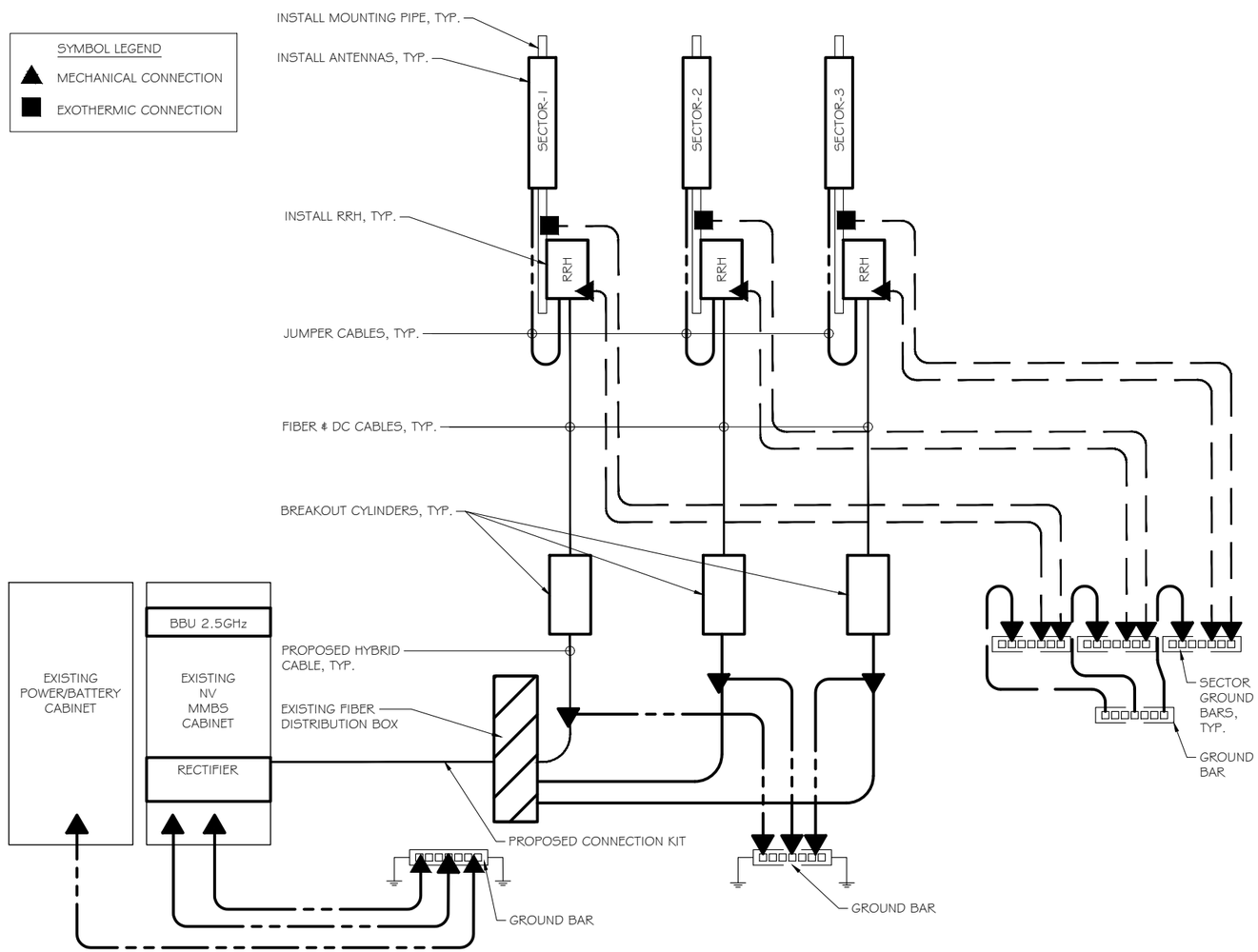
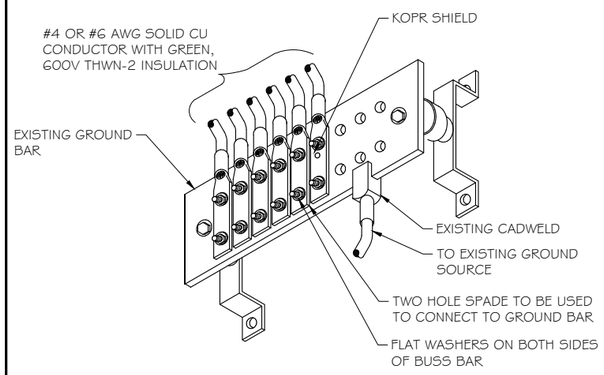
SYMBOL LEGEND
- MECHANICAL CONNECTION
- EXOTHERMIC CONNECTION



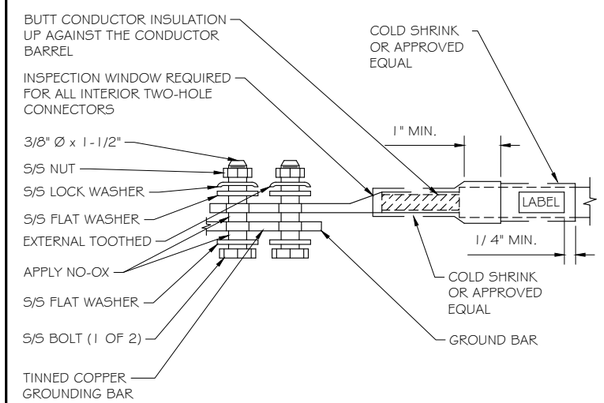
GROUNDING RISER DIAGRAM (1)
SCALE: NTS



NOTES:
1. APPLY NO-OX TO LUG AND GROUND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

GROUNDING CONDUCTOR INSTALLATION (2)
SCALE: NTS



TWO-HOLE LUG (3)
SCALE: NTS

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James R. Skowronski 8/22/2018
Signature: Date:

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SHEET TITLE:
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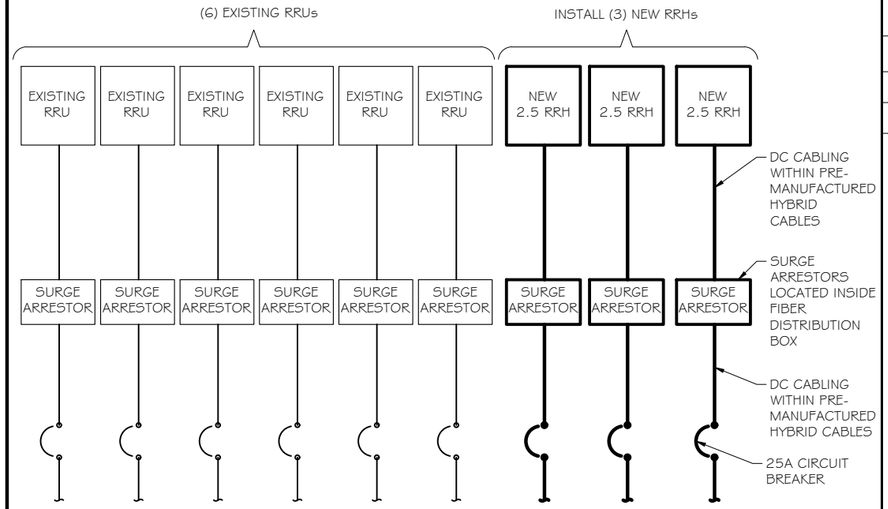

DC ONE-LINE DIAGRAM (1)
SCALE: NTS

A/C PANEL SCHEDULE

VOLTAGE:	240V/120	PANEL STATUS:	EXISTING	N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP	MODEL NUMBER:	TBD	INTERNAL TVSS:	YES
MOUNT:	ROOFTOP	PHASE:	1	WIRE:	3
ENCLOSURE TYPE:	NEMA 3R	BUSS RATING:	200 AMP	GROUND BAR:	YES
		NEUTRAL BAR:	YES		

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	MMBTS	100	2	ON			ON	2	60	AC SURGE PROTECTOR	7
2											8
3	GEN HTR	15	1	ON			-	-	-	BLANK (UNUSED)	9
4	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	10
5	BLANK (UNUSED)	-	-	-			ON	1	15	TELCO GFI	11
6	FAN	10	1	ON			-	-	-	BLANK (UNUSED)	12

AC PANEL SCHEDULE (2)
SCALE: NTS

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/22/2018 Date:

MARK	DATE	DESCRIPTION
2	08/22/18	ADDED STRUCTURAL DETAILS & REVISED RF TABLE
1	10/09/17	REVISED CDs PER RFDS

ISSUE PHASE: FINAL DATE ISSUED: 08/28/2017

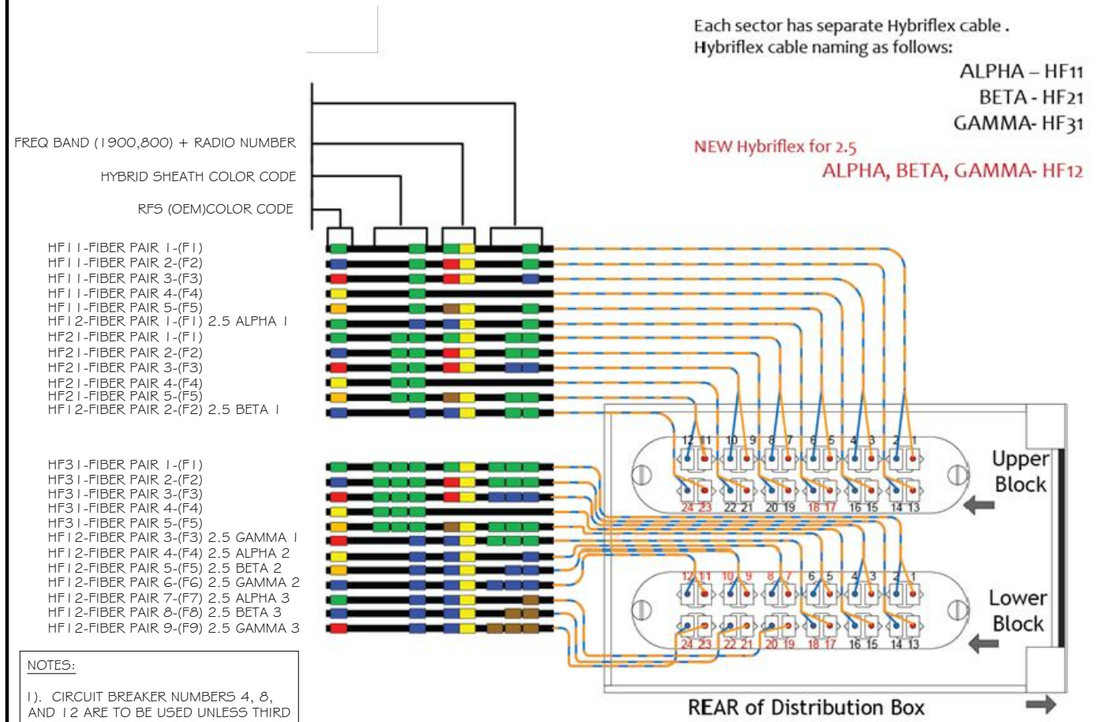
PROJECT TITLE:
MIDDLETOWN-AT&T
CT43XC816

PROJECT INFORMATION:
290 PRESTON AVENUE
MIDDLETOWN, CT 06492
MIDDLESEX COUNTY

SHEET TITLE:
DC POWER DETAILS & PANEL SCHEDULES

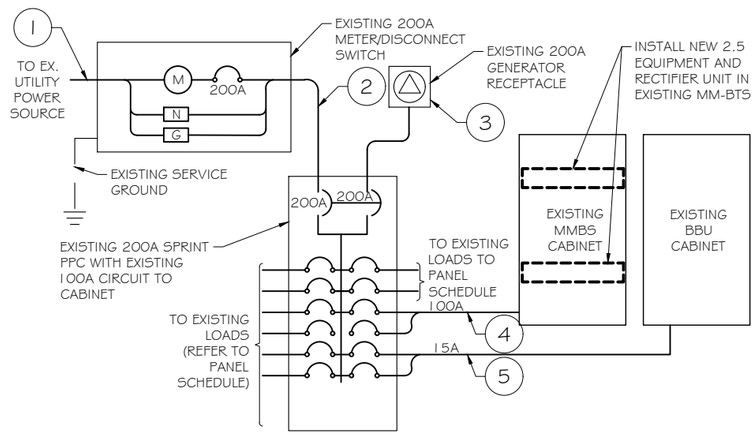
SCALE: NONE

PROJECT NUMBER: 28802
SHEET NUMBER: E-3



NOTES:
1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

TYPICAL FIBER DISTRIBUTION (3)
SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN ¾" CONDUIT

ELECTRICAL ONE-LINE DIAGRAM (4)
SCALE: NTS

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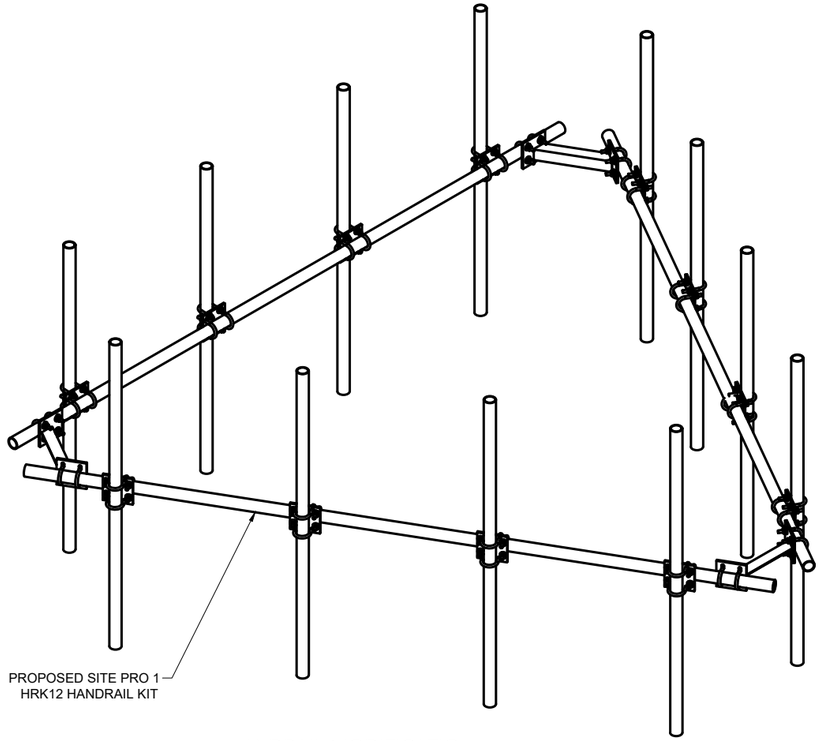
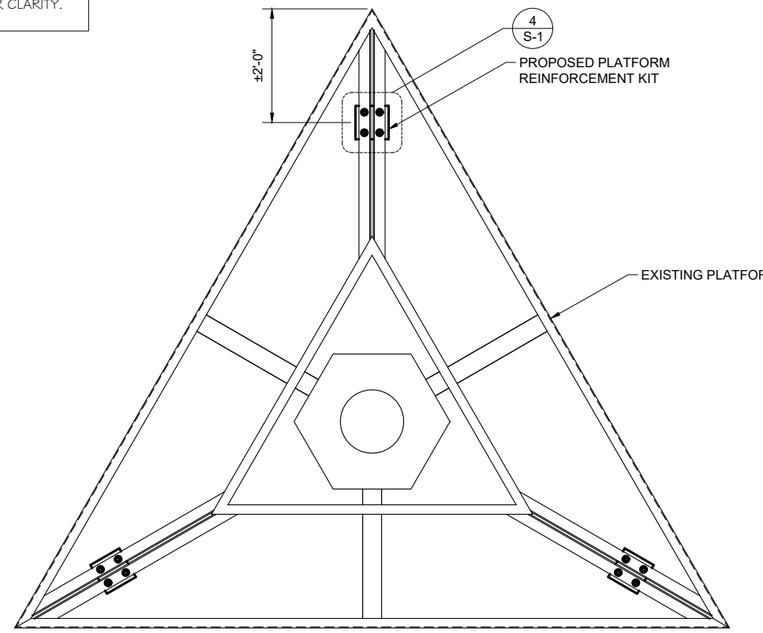
DRAWN BY: KJG CHECKED BY: KAB



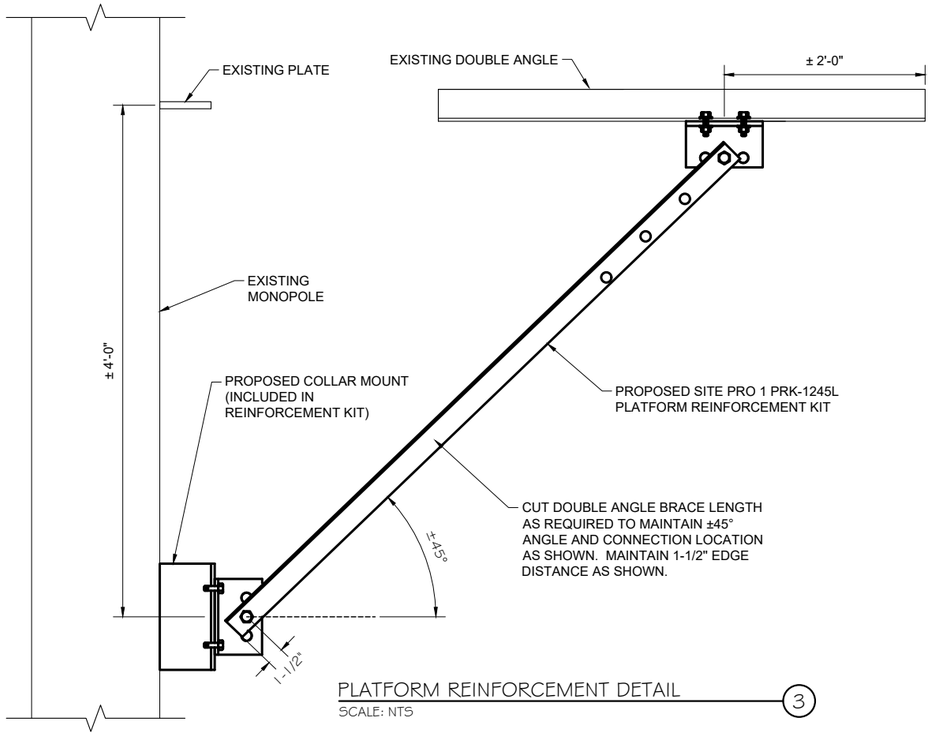
HANDRAIL MODIFICATION (1)
SCALE: NTS

NOTE:

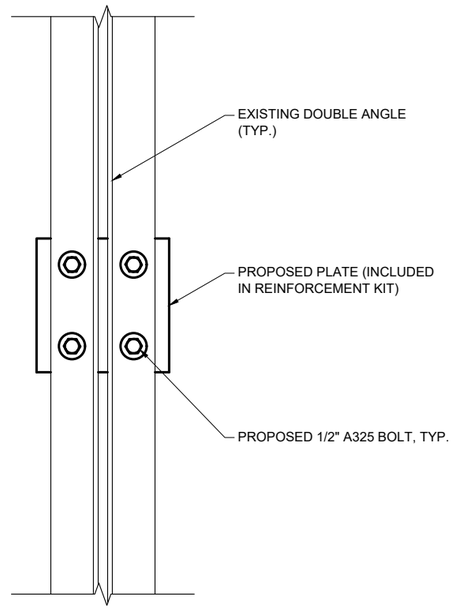
GRATING, HANDRAIL & PIPES NOT SHOWN FOR CLARITY.



PLATFORM MODIFICATION PLAN VIEW (2)
SCALE: NTS



PLATFORM REINFORCEMENT DETAIL (3)
SCALE: NTS



CONNECTION DETAIL (4)
SCALE: NTS

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
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