Cherundolo Consulting

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

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

EM-SPRINT-093-180803

RECEIVED
AUG 3 2018
Connecticut Siting Council

Re: Notice of Exempt Modification Application
69 Wheeler St, New Haven, CT 06512

Latitude: N41.0754
Longitude:
W73.51938

ORIGINAL

Dear Ms. Bachman:

Sprint currently maintains 14 existing panel antennas, 2 microwave and 3 remote radio units at the 80' centerline level of the existing monopole. Sprint proposes to remove all 14 existing panel antennas and 3 remote radio heads and replace them with 6 panel antennas and 9 remote radio unit at the 80' centerline on the tower. Sprint further proposes to add 4 hybrid cables. 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.

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 Mayor Toni Harp of the City of New Haven as well as Stacey Davis, Planner for the City of New Haven and Landmark Dividend, owner of the Monopole.

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 as well as the latest CSC decision, tax sheet and tax map.

Existing Facility

CSC Summary Statement – CT52XC073 – 69 Wheeler St, New Haven, CT 06512

The Communications Tower facility is located at 69 Wheeler St, New Haven CT and is owned by Landmark Dividend, the Site coordinates are: N41.07542 W73.5193.

The existing facility consists of a 100' Monopole. Sprint currently operates wireless communications equipment inside a shelter at the facility and has 14 antennas, 2 microwave and 3 RRU's mounted on at centerline of 80' 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,

Ryan G Bailey
Charles Cherundolo Consulting
856-625-1596
ryan@mackenzierealtyconsulting.com

Additional Recipients:
Mayor Toni Harp for the City of New Haven– Via FedEx
Stacey Davis, Planner for the City of New Haven - Via FedEx
Landmark Dividend, owner of the tower – Via FedEx

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
Internet: ct.gov/csc

Daniel F. Caruso
Chairman

May 27, 2010

Thomas F. Flynn III
Site Development Project Manager
Maxton Technology Inc.
1296 Blue Hills Avenue
Bloomfield, CT 06002

RE: **EM-CLEARWIRE-093-100407** – Clearwire Corporation notice of intent to modify an existing telecommunications facility located at 69 Wheeler Street, New Haven, Connecticut.

Dear Mr. Flynn:

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.

The proposed modifications are to be implemented as specified here and in your notice dated April 7, 2010, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/CDM/laf

c: The Honorable John DeStefano, Jr, Mayor, City of New Haven
Frank Gargiulo, Zoning Administrator, City of New Haven
Crown Castle USA, Inc.

G:\EM\Clearwire\New Haven\dc052710WheelerStNewHaven.DOC

N92

69 WHEELER ST

Location	69 WHEELER ST	**Mblu**	077/ 0975/ 00200/ /
Acct#	077 0975 00200	**Owner**	WHITNEY REALTY ENTERPRISES LLC
Assessment	$295,960	**Appraisal**	$422,800
PID	3459	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$292,700	$130,100	$422,800
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$204,890	$91,070	$295,960

Owner of Record

Owner	WHITNEY REALTY ENTERPRISES LLC	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	51 LONGHINI LANE NEW HAVEN, CT 06519	**Book & Page**	8954/ 126
		Sale Date	03/01/2013
		Instrument	3

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WHITNEY REALTY ENTERPRISES LLC	$0		8954/ 126	3	03/01/2013
ELMER LAYDON SPRAY TRUST	$0		8826/ 20	25	05/04/2012
LAYDON ELMER F & WILLIAM M	$0		2868/ 345		09/11/1980

Building Information

Building 1 : Section 1

Year Built:	1920
Living Area:	8,816
Replacement Cost:	$444,431
Building Percent Good:	60
Replacement Cost Less Depreciation:	$266,700

Building Photo

Building Attributes

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: CT52XC073

Sprint Laydon CT2507
69 Wheeler Street
New Haven,CT 06512

May 22, 2018

EBI Project Number: 6218003994

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	26.71%

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

EBI Consulting
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May 22, 2018

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

Emissions Analysis for Site: **CT52XC073 – Sprint Laydon CT2507**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **69 Wheeler Street, New Haven, 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), 2500 MHz (BRS) and 11 GHz microwave 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.

7) 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.

8) 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 and 20 dB for highly focused parabolic microwave dishes, 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.

9) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the Nokia AAHC** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands and one **2-foot parabolic microwave dish (Sector C)** and one **18-inch parabolic microwave dish (Sector B)** was modeled for the 11 GHz backhaul channels. 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 and 20 dB for highly focused parabolic microwave dishes, 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.

10) The antenna mounting height centerlines of the proposed antennas and microwave dishes are **80 feet** above ground level (AGL) for **Sector A**, **80 feet** above ground level (AGL) for **Sector B** and **80 feet** above ground level (AGL) for Sector C.

11) 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.

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SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**80 feet**	Height (AGL):	**80 feet**	Height (AGL):	**80 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	6,248.42	ERP (W):	6,248.42	ERP (W):	6,248.42
Antenna A1 MPE%	**4.67 %**	Antenna B1 MPE%	**4.67 %**	Antenna C1 MPE%	**4.67 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	**80 feet**	Height (AGL):	**80 feet**	Height (AGL):	**80 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):	5,118.23	ERP (W):	5,118.23	ERP (W):	5,118.23
Antenna A2 MPE%	**3.36 %**	Antenna B2 MPE%	**3.36 %**	Antenna C2 MPE%	**3.36 %**

Microwave Backhaul Data

Antenna Type:	Gain (dBd)	Height (feet AGL):	Frequency Bands	Channel Count	Total TX Power(W)	ERP (W)	MPE %	Sector
1.5 foot parabolic dish	27 dBd	80	11 GHz	1	1	501.19	**0.03**	B
2 foot parabolic dish	34 dBd	80	11 GHz	1	1	2511.89	**0.16**	C

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Sector C	**8.19 %**
Nextel	2.78 %
Clearwire	0.48 %
AT&T	8.19 %
T-Mobile	7.07 %
Site Total MPE %:	**26.71 %**

SPRINT Sector A Total:	8.03 %
SPRINT Sector B Total:	8.06 %
SPRINT Sector C Total:	8.19 %
Site Total:	26.71%

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	376.73	80	2.47	850 MHz	567	0.44%
Sprint 850 MHz LTE	2	376.73	80	4.95	850 MHz	567	0.87%
Sprint 1900 MHz (PCS) CDMA	5	511.82	80	16.80	1900 MHz (PCS)	1000	1.68%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	80	16.80	1900 MHz (PCS)	1000	1.68%
Sprint 2500 MHz (BRS) LTE	8	639.78	80	33.60	2500 MHz (BRS)	1000	3.36%
Sprint 11 GHz Microwave	1	2,511.89	80	1.65	11 GHz	1000	0.16%
						Total:	**8.19%**

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

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:	8.03 %
Sector B:	8.06 %
Sector C:	8.19 %
SPRINT Maximum Total (Sector C):	8.19 %
Site Total:	26.71 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.71 %** 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.

WESTCHESTER
SERVICES LLC

ARCHITECTURE & ENGINEERING DIVISION
604 FOX GLEN . BARRINGTON, IL 60010
847/277-0070 . FAX: 847/277-0080
AE@westchesterservices.com / www.westchesterservices.com

Date: **April 23, 2018**

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NY 07054

Subject: Structural Analysis Report

Sprint Co-Locate
Site Number: CT52XC073-B
Site Name: Sprint Laydon CT2507

Engineering Firm Designation: **Westchester Services, LLC**

Site Data: **69 Wheeler St., New Haven, CT 06512**
New Haven County – 98' Monopole

Tom Jupin,

Westchester Services, LLC is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned monopole.

The purpose of the analysis is to determine acceptability of the tower stress levels. Based on our analysis we have determined the stress levels to be:

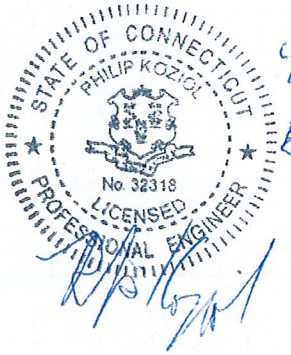
Existing and Proposed Equipment **Sufficient Capacity**
Note: See Table 2-1 for the existing and proposed loading.

The analysis has been performed in accordance with the TIA-222-G standard and local code requirements based upon a wind speed of 118 mph ultimate gust, exposure category D with topographic category 1 and crest height of 0 feet.

We at Westchester Services, LLC appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects please give us a call.

I certify that this report was prepared by me or under my direct supervision and that I am a licensed Professional Engineer under the laws of the State of Connecticut.

Philip Koziol, PE
Professional Engineer



4/23/18

Exp. 1/31/19

TABLE OF CONTENTS

1) INTRODUCTION

This structure is a 98ft monopole is located in New Haven County, CT. The proposed antennas will be mounted on the existing sector frames.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas using a ultimate gust wind speed of 118 mph (converted to 92 mph 3-second gust) with no ice, 30 mph with 0.5 inch ice thickness and 60 mph under service loads, exposure category D with topographic category 1 and crest height of 0 feet.

Table 2-1 – Proposed Final Antenna Configuration

(New antennas in **bold**)

Center Line Elevation (ft)	Sector	Pos.	Antenna	Radio(s)	Note
80	Alpha	1	**(1) Nokia AAHC**		
		2			
		3		**(2) ALU RRH-2x50-800**	
		4	**(1) NNH4-65B-R4**	**(1) ALU RRH-4x45-1900**	
80	Beta	1	**(1) Nokia AAHC**		
		2			
		3	(1) 18" MW Dish	**(2) ALU RRH-2x50-800**	
		4	**(1) NNH4-65B-R4**	**(1) ALU RRH-4x45-1900**	
80	Gamma	1	**(1) Nokia AAHC**		
		2			
		3	(1) 24" MW Dish	**(2) ALU RRH-2x50-800**	
		4	**(1) NNH4-65B-R4**	**(1) ALU RRH-4x45-1900**	

Other Carrier info located in Appendix A.

3) ANALYSIS PROCEDURE

Table 3-1 – Documents Provided

Document	Remarks	Reference	Date	Source
Previous Structural Analysis	Bay State Design	N/A	3/10/10	Sprint
Previous Structural Analysis	Westchester Services	N/A	11/19/17	WSLLC

3.1) Analysis Method

tnxTower (version 8.0.1.0) is a finite element analysis software program was used for modeling and analyzing this tower. The output from the analysis can be found in Appendix A.

4) ANALYSIS RESULTS

Table 4-1 – Critical Section Capacity (Summary)

Member Type	Elevation (ft)	% Capacity	Pass/Fail
Tower Pole	0-45.6	67.9	Pass
Overall		67.9	Pass

Table 4-2 – Base and Foundation Loads vs. Previous Analysis

Reactions	Calculated	Previous Analysis	Pass/Fail
Base Moment (kip-ft)	844.0	970.1	Pass
Base Shear (kip)	12.0	13.3	Pass
Base Axial (kip)	15.6	11.1	OK*

*Axial load does not control design of monopole foundations. Therefore, the foundation is adequate by engineering judgment.

4.1) Recommendations

The existing tower and its foundation have sufficient capacity to carry the existing and proposed loads.

5) ASSUMPTIONS

- The analysis performed is to the theoretical capacity of the members and connections. No accommodations are taken for any damaged, rusted, deteriorated, or otherwise compromised member conditions. To this, the tower or structure is assumed to be properly maintained and monitored and this analysis cannot be considered to be a condition assessment of the structure.

- The analysis is performed to the minimum design wind, ice, and other environmental loading prescribed by the governing building codes and standards. Any higher loading conditions required by the local jurisdiction or structure owner should be made known to Westchester immediately for analysis. No lesser conditions will be accommodated.

- Member sizes are assumed to be of standard AISC or manufacturer designations unless explicitly specified otherwise. The geometry of the tower or structure is assumed as schematic. Steel grade and concrete strength are assumed to be conservative standard and fully developed unless otherwise specified.

- The information provided to Westchester for analysis is assumed accurate and up to date as supplied. No independent efforts were taken by Westchester to verify the validity of the information supplied. If any additional information is presented at any time that contradicts what is referenced in the analysis, the analysis is invalid and must be performed again with the new information.

- Any reinforcement or modifications are assumed to be fully installed and functional.

- All welds are assumed to have been performed to current welding standards and are assumed to develop their full capacity and to be in good condition. In addition, all bolts and bolt-like anchors are assumed to be fully tightened, fastened, or bonded to the manufacturers' specifications and are assumed to have full capacity.

- Numerous connection details of large-scale structures are unobtainable and are omitted from the structural analysis. This includes, but is not limited to: bolts, welds, flanges, and plates. These connections are considered adequate and are therefore neglected from the analysis. In addition, in the absence of building plans, many wall, floor, and ceiling constructions can only be determined from observable field data and are supplemented by best judgment and experience.

- Antennas, dishes, feedlines, and any other such appurtenances are assumed adequate through manufacturer testing. No analysis is provided for the structural strength or stability of these items unless otherwise specified.

- Equipment mounting systems are assumed structurally sound unless specifically called for in the analysis.

- Soil conditions and foundations are not considered unless specified in the analysis and have no deterioration or defects. For sites located on a building, only local effects of the equipment is considered unless otherwise specified. The overall structure of the building and its foundation are assumed to be unaffected by the telecom equipment.

- Any changes or differences to the site or site plans at any time prior to installation must be brought to the attention of Westchester immediately.

APPENDIX A

CALCULATIONS

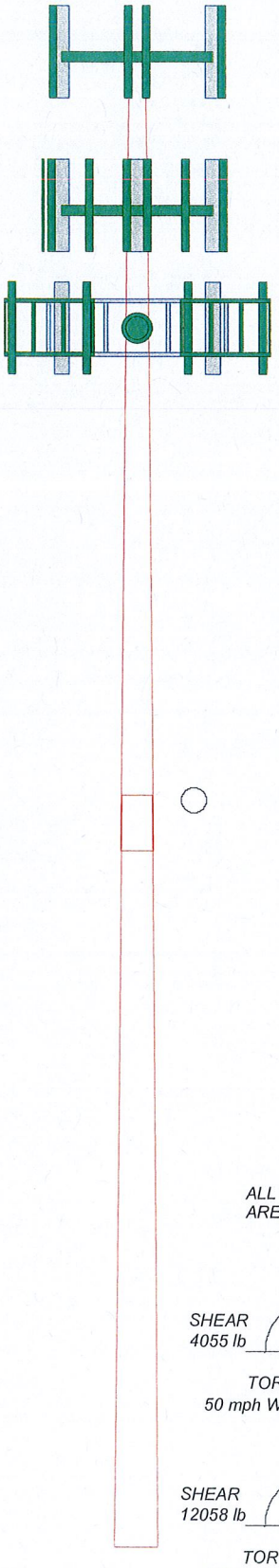
Section	1	2	3		
Length (ft)	10.00	42.33	49.34		
Number of Sides	1	18	18		
Thickness (in)	0.3750	0.1875	0.2500		
Socket Length (ft)		3.67			
Top Dia (in)	12.7500	16.5000	24.0342		
Bot Dia (in)	16.5000	25.1600	34.0000		
Grade	A572-50		A572-65		
Weight (lb)	571.3	1769.5	3832.5		6173.2

98.0 ft

88.0 ft

45.7 ft

0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APX16PV-16PVL	98	2' Standoff T-Arm (10' face width)	80
APX16PV-16PVL	98	RRH 1900	80
APX16PV-16PVL	98	RRH 1900	80
APX16DWV-16DWVS-E-A	98	RRH 1900	80
APX16DWV-16DWVS-E-A	98	(2) RRH 800	80
APX16DWV-16DWVS-E-A	98	(2) RRH 800	80
PiROD 13' Platform w/handrails (Monopole)	98	(2) RRH 800	80
		Nokia AAHC MIMO	80
PiROD 13' Low Profile Platform	88	Nokia AAHC MIMO	80
(3) DUO1417-8670	88	Nokia AAHC MIMO	80
(3) DUO1417-8670	88	CommScope NNVV-65B-R4	80
(3) DUO1417-8670	88	CommScope NNVV-65B-R4	80
2" Dia 8' Omni	88	CommScope NNVV-65B-R4	80
2' Standoff T-Arm (10' face width)	80	Andrew 2' w/Radome	80
2' Standoff T-Arm (10' face width)	80	1.5" w/Radome	80

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure D to the TIA-222-G Standard.
3. Tower designed for a 92 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. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 67.9%

ALL REACTIONS ARE FACTORED

AXIAL
29924 lb

SHEAR
4055 lb

MOMENT
298480 lb-ft

TORQUE 399 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL
15649 lb

SHEAR
12058 lb

MOMENT
844428 lb-ft

TORQUE 1355 lb-ft
REACTIONS - 92 mph WIND

Westchester Services
604 Fox Glen Ct.
Barrington, IL 60010
WSLLCb
Phone: 847-277-0070
FAX:

Job:	*98ft Monopole*		
Project:	*CT52XC073*		
Client: Cherundolo - Sprint		Drawn by: T.A.Holt	App'd:
Code: TIA-222-G		Date: 04/23/18	Scale: NTS
Path: P:\Cherundolo-Sprint\Connecticut\CT52XC073-B\Structural\tnx\CT52XC073-B - Rev 1.eri			Dwg No. E-1

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 92 mph.
Structure Class II.
Exposure Category D.
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.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	98.00-88.00	10.00	0.00	Round	12.7500	16.5000	0.3750		A572-50 (50 ksi)
L2	88.00-45.67	42.33	3.67	18	16.5000	25.1600	0.1875	0.7500	A572-65 (65 ksi)
L3	45.67-0.00	49.34		18	24.0342	34.0000	0.2500	1.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	12.7500	14.5790	279.3350	4.3772	6.3750	43.8173	558.6701	7.2851	0.0000	0
	16.5000	18.9968	617.7676	5.7026	8.2500	74.8809	1235.5352	9.4927	0.0000	0
L2	16.7256	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	25.5192	14.8618	1170.9321	8.8652	12.7813	91.6131	2343.4049	7.4323	4.0982	21.857
L3	25.1191	18.8727	1348.8043	8.4434	12.2094	110.4729	2699.3833	9.4382	3.7900	15.16
	34.4859	26.7806	3853.9468	11.9812	17.2720	223.1326	7712.9647	13.3929	5.5440	22.176

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 98.00-88.00				1	1	1			
L2 88.00-45.67				1	1	1			
L3 45.67-0.00				1	1	1			

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
Existing								
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	98.00 - 6.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	90.00 - 6.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	90.00 - 6.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
1 1/4	C	No	Inside Pole	80.00 - 6.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
1 1/2	C	No	Inside Pole	80.00 - 6.00	1	No Ice	0.00	0.75
						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
CATEGORY 5e (1	C	No	Inside Pole	80.00 - 6.00	1	No Ice	0.00	0.21

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
WIRE)						1/2" Ice	0.00	0.21
						1" Ice	0.00	0.21

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	98.00-88.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	113.82
L2	88.00-45.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	843.82
L3	45.67-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	812.84

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	98.00-88.00	A	1.663	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	113.82
L2	88.00-45.67	A	1.607	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	843.82
L3	45.67-0.00	A	1.443	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	812.84

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	98.00-88.00	0.0000	0.0000	0.0000	0.0000
L2	88.00-45.67	0.0000	0.0000	0.0000	0.0000
L3	45.67-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Existing									
PiROD 13' Low Profile Platform	C	None		0.0000	88.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
APX16PV-16PVL	A	From Leg	3.00	0.0000	98.00	No Ice	6.65	1.98	40.00
			0.00			1/2" Ice	7.08	2.30	70.00
			0.00			1" Ice	7.51	2.62	100.00
APX16PV-16PVL	B	From Leg	3.00	0.0000	98.00	No Ice	6.65	1.98	40.00
			0.00			1/2" Ice	7.08	2.30	70.00
			0.00			1" Ice	7.51	2.62	100.00
APX16PV-16PVL	C	From Leg	3.00	0.0000	98.00	No Ice	6.65	1.98	40.00
			0.00			1/2" Ice	7.08	2.30	70.00
			0.00			1" Ice	7.51	2.62	100.00
APX16DWV-16DWVS-E-A	A	From Leg	3.00	0.0000	98.00	No Ice	7.22	2.15	40.00
			0.00			1/2" Ice	7.68	2.49	75.00
			0.00			1" Ice	8.14	2.83	110.00
APX16DWV-16DWVS-E-A	B	From Leg	3.00	0.0000	98.00	No Ice	7.22	2.15	40.00
			0.00			1/2" Ice	7.68	2.49	75.00
			0.00			1" Ice	8.14	2.83	110.00
APX16DWV-16DWVS-E-A	C	From Leg	3.00	0.0000	98.00	No Ice	7.22	2.15	40.00
			0.00			1/2" Ice	7.68	2.49	75.00
			0.00			1" Ice	8.14	2.83	110.00
PiROD 13' Platform w/handrails (Monopole)	C	None		0.0000	98.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
(3) DUO1417-8670	A	From Leg	3.00	0.0000	88.00	No Ice	6.53	4.20	20.00
			0.00			1/2" Ice	6.94	4.57	62.50
			0.00			1" Ice	7.35	4.94	105.00
(3) DUO1417-8670	B	From Leg	3.00	0.0000	88.00	No Ice	6.53	4.20	20.00
			0.00			1/2" Ice	6.94	4.57	62.50
			0.00			1" Ice	7.35	4.94	105.00
(3) DUO1417-8670	C	From Leg	3.00	0.0000	88.00	No Ice	6.53	4.20	20.00
			0.00			1/2" Ice	6.94	4.57	62.50
			0.00			1" Ice	7.35	4.94	105.00
2" Dia 8' Omni	C	From Face	3.00	0.0000	88.00	No Ice	2.00	2.00	5.00
			6.25			1/2" Ice	3.03	3.03	18.00
			0.00			1" Ice	4.06	4.06	31.00
Sprint									
2' Standoff T-Arm (10' face width)	A	From Leg	1.50	0.0000	80.00	No Ice	5.50	5.50	129.00
			0.00			1/2" Ice	6.90	6.90	170.00
			0.00			1" Ice	8.30	8.30	211.00
2' Standoff T-Arm (10' face width)	B	From Leg	1.50	0.0000	80.00	No Ice	5.50	5.50	129.00
			0.00			1/2" Ice	6.90	6.90	170.00
			0.00			1" Ice	8.30	8.30	211.00
2' Standoff T-Arm (10' face width)	C	From Leg	1.50	0.0000	80.00	No Ice	5.50	5.50	129.00
			0.00			1/2" Ice	6.90	6.90	170.00
			0.00			1" Ice	8.30	8.30	211.00
RRH 1900	B	From Leg	3.00	0.0000	80.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42

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
RRH 1900	C	From Leg	3.00	0.0000	80.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRH 1900	C	From Leg	3.00	0.0000	80.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
(2) RRH 800	B	From Leg	3.00	0.0000	80.00	No Ice	3.15	1.29	50.00
			0.00			1/2" Ice	3.36	1.44	73.22
			0.00			1" Ice	3.59	1.60	99.64
(2) RRH 800	C	From Leg	3.00	0.0000	80.00	No Ice	3.15	1.29	50.00
			0.00			1/2" Ice	3.36	1.44	73.22
			0.00			1" Ice	3.59	1.60	99.64
(2) RRH 800	C	From Leg	3.00	0.0000	80.00	No Ice	3.15	1.29	50.00
			0.00			1/2" Ice	3.36	1.44	73.22
			0.00			1" Ice	3.59	1.60	99.64
Nokia AAHC MIMO	A	From Leg	3.00	0.0000	80.00	No Ice	4.20	2.07	103.70
			0.00			1/2" Ice	4.46	2.26	136.01
			0.00			1" Ice	4.72	2.46	172.07
Nokia AAHC MIMO	B	From Leg	3.00	0.0000	80.00	No Ice	4.20	2.07	103.70
			0.00			1/2" Ice	4.46	2.26	136.01
			0.00			1" Ice	4.72	2.46	172.07
Nokia AAHC MIMO	C	From Leg	3.00	0.0000	80.00	No Ice	4.20	2.07	103.70
			0.00			1/2" Ice	4.46	2.26	136.01
			0.00			1" Ice	4.72	2.46	172.07
CommScope NNVV-65B-R4	A	From Leg	3.00	0.0000	80.00	No Ice	12.27	5.75	77.40
			0.00			1/2" Ice	12.77	6.21	149.54
			0.00			1" Ice	13.27	6.67	228.32
CommScope NNVV-65B-R4	B	From Leg	3.00	0.0000	80.00	No Ice	12.27	5.75	77.40
			0.00			1/2" Ice	12.77	6.21	149.54
			0.00			1" Ice	13.27	6.67	228.32
CommScope NNVV-65B-R4	C	From Leg	3.00	0.0000	80.00	No Ice	12.27	5.75	77.40
			0.00			1/2" Ice	12.77	6.21	149.54
			0.00			1" Ice	13.27	6.67	228.32

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
Existing											
Andrew 2' w/Radome		Paraboloid w/Radome	None		Worst		80.00	2.00	No Ice	3.14	70.00
									1/2" Ice	3.41	282.00
									1" Ice	3.68	494.00
1.5" w/Radome		Paraboloid w/Radome	None		Worst		80.00	1.50	No Ice	2.80	70.00
									1/2" Ice	3.50	282.00
									1" Ice	3.68	494.00

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-88.00	92.79	1.414	29	12.188	A	0.000	12.188	12.188	100.00	0.000	0.000
					B	0.000	12.188		100.00	0.000	0.000
					C	0.000	12.188		100.00	0.000	0.000
L2 88.00-45.67	65.66	1.332	27	74.509	A	0.000	74.509	74.509	100.00	0.000	0.000
					B	0.000	74.509		100.00	0.000	0.000
					C	0.000	74.509		100.00	0.000	0.000
L3 45.67-0.00	22.45	1.105	23	113.423	A	0.000	113.423	113.423	100.00	0.000	0.000
					B	0.000	113.423		100.00	0.000	0.000
					C	0.000	113.423		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-88.00	92.79	1.414	9	1.6634	14.960	A	0.000	14.960	14.960	100.00	0.000	0.000
						B	0.000	14.960		100.00	0.000	0.000
						C	0.000	14.960		100.00	0.000	0.000
L2 88.00-45.67	65.66	1.332	8	1.6068	85.845	A	0.000	85.845	85.845	100.00	0.000	0.000
						B	0.000	85.845		100.00	0.000	0.000
						C	0.000	85.845		100.00	0.000	0.000
L3 45.67-0.00	22.45	1.105	7	1.4433	125.654	A	0.000	125.654	125.654	100.00	0.000	0.000
						B	0.000	125.654		100.00	0.000	0.000
						C	0.000	125.654		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-88.00	92.79	1.414	11	12.188	A	0.000	12.188	12.188	100.00	0.000	0.000
					B	0.000	12.188		100.00	0.000	0.000
					C	0.000	12.188		100.00	0.000	0.000
L2 88.00-45.67	65.66	1.332	10	74.509	A	0.000	74.509	74.509	100.00	0.000	0.000
					B	0.000	74.509		100.00	0.000	0.000
					C	0.000	74.509		100.00	0.000	0.000
L3 45.67-0.00	22.45	1.105	9	113.423	A	0.000	113.423	113.423	100.00	0.000	0.000
					B	0.000	113.423		100.00	0.000	0.000
					C	0.000	113.423		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	29	1	1	12.188	234.19	23.42	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	27	1	1	74.509	1456.70	34.41	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	23	1	1	113.423	1840.45	40.30	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			
Sum Weight:	1770.48	6173.23						OTM	158685.06 lb-ft	3531.34		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	29	1	1	12.188	234.19	23.42	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	27	1	1	74.509	1456.70	34.41	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	23	1	1	113.423	1840.45	40.30	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			
Sum Weight:	1770.48	6173.23						OTM	158685.06 lb-ft	3531.34		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	29	1	1	12.188	234.19	23.42	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	27	1	1	74.509	1456.70	34.41	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	23	1	1	113.423	1840.45	40.30	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	1770.48	6173.23						OTM	158685.06 lb-ft	3531.34		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	113.82	902.27	A	1	1.2	9	1	1	14.960	169.81	16.98	C
98.00-88.00			B	1	1.2		1	1	14.960			
			C	1	1.2		1	1	14.960			
L2	843.82	3653.21	A	1	1.2	8	1	1	85.845	915.18	21.62	C
88.00-45.67			B	1	1.2		1	1	85.845			
			C	1	1.2		1	1	85.845			
L3 45.67-0.00	812.84	6340.92	A	1	1.2	7	1	1	125.654	1111.81	24.34	C
			B	1	1.2		1	1	125.654			
			C	1	1.2		1	1	125.654			
Sum Weight:	1770.48	10896.39						OTM	100801.68 lb-ft	2196.81		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	113.82	902.27	A	1	1.2	9	1	1	14.960	169.81	16.98	C
98.00-88.00			B	1	1.2		1	1	14.960			
			C	1	1.2		1	1	14.960			
L2	843.82	3653.21	A	1	1.2	8	1	1	85.845	915.18	21.62	C
88.00-45.67			B	1	1.2		1	1	85.845			
			C	1	1.2		1	1	85.845			
L3 45.67-0.00	812.84	6340.92	A	1	1.2	7	1	1	125.654	1111.81	24.34	C
			B	1	1.2		1	1	125.654			
			C	1	1.2		1	1	125.654			
Sum Weight:	1770.48	10896.39						OTM	100801.68 lb-ft	2196.81		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	902.27	A	1	1.2	9	1	1	14.960	169.81	16.98	C
			B	1	1.2		1	1	14.960			
			C	1	1.2		1	1	14.960			
L2 88.00-45.67	843.82	3653.21	A	1	1.2	8	1	1	85.845	915.18	21.62	C
			B	1	1.2		1	1	85.845			
			C	1	1.2		1	1	85.845			
L3 45.67-0.00	812.84	6340.92	A	1	1.2	7	1	1	125.654	1111.81	24.34	C
			B	1	1.2		1	1	125.654			
			C	1	1.2		1	1	125.654			
Sum Weight:	1770.48	10896.39						OTM	100801.68 lb-ft	2196.81		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	11	1	1	12.188	89.12	8.91	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	10	1	1	74.509	554.36	13.10	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	9	1	1	113.423	700.40	15.34	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			
Sum Weight:	1770.48	6173.23						OTM	60389.05 lb-ft	1343.88		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	11	1	1	12.188	89.12	8.91	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	10	1	1	74.509	554.36	13.10	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	9	1	1	113.423	700.40	15.34	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			
Sum Weight:	1770.48	6173.23						OTM	60389.05 lb-ft	1343.88		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 98.00-88.00	113.82	571.26	A	1	0.6	11	1	1	12.188	89.12	8.91	C
			B	1	0.6		1	1	12.188			
			C	1	0.6		1	1	12.188			
L2 88.00-45.67	843.82	1769.51	A	1	0.65	10	1	1	74.509	554.36	13.10	C
			B	1	0.65		1	1	74.509			
			C	1	0.65		1	1	74.509			
L3 45.67-0.00	812.84	3832.46	A	1	0.65	9	1	1	113.423	700.40	15.34	C
			B	1	0.65		1	1	113.423			
			C	1	0.65		1	1	113.423			
Sum Weight:	1770.48	6173.23						OTM	60389.05 lb-ft	1343.88		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	6173.23					
Bracing Weight	0.00					
Total Member Self-Weight	6173.23			919.80	551.65	
Total Weight	13041.01			919.80	551.65	
Wind 0 deg - No Ice		64.79	-7311.40	-482370.96	-4631.21	-430.30
Wind 30 deg - No Ice		3824.02	-6364.25	-420213.71	-254559.21	-29.04
Wind 60 deg - No Ice		6558.61	-3711.80	-245214.07	-436130.46	380.00
Wind 90 deg - No Ice		7535.82	-64.79	-4263.06	-500693.09	687.22
Wind 120 deg - No Ice		6493.82	3599.59	238076.69	-430947.60	810.30
Wind 150 deg - No Ice		3711.80	6299.46	416870.45	-245582.22	716.26
Wind 180 deg - No Ice		-64.79	7311.40	484210.57	5734.52	430.30
Wind 210 deg - No Ice		-3824.02	6364.25	422053.32	255662.52	29.04
Wind 240 deg - No Ice		-6558.61	3711.80	247053.68	437233.77	-380.00
Wind 270 deg - No Ice		-7535.82	64.79	6102.67	501796.40	-687.22
Wind 300 deg - No Ice		-6493.82	-3599.59	-236237.08	432050.91	-810.30
Wind 330 deg - No Ice		-3711.80	-6299.46	-415030.84	246685.53	-716.26
Member Ice	4723.16					
Total Weight Ice	27114.66			2561.13	1676.56	
Wind 0 deg - Ice		21.28	-3981.69	-253797.71	-25.99	-178.80
Wind 30 deg - Ice		2046.14	-3458.88	-220303.41	-130926.21	-15.73
Wind 60 deg - Ice		3522.73	-2009.27	-127092.74	-226295.63	151.55
Wind 90 deg - Ice		4055.41	-21.28	858.58	-260580.08	278.22
Wind 120 deg - Ice		3501.45	1972.41	129266.10	-224593.08	330.35
Wind 150 deg - Ice		2009.27	3437.60	223723.13	-127977.31	293.96
Wind 180 deg - Ice		-21.28	3981.69	258919.97	3379.10	178.80
Wind 210 deg - Ice		-2046.14	3458.88	225425.67	134279.33	15.73
Wind 240 deg - Ice		-3522.73	2009.27	132215.00	229648.74	-151.55
Wind 270 deg - Ice		-4055.41	21.28	4263.68	263933.20	-278.22
Wind 300 deg - Ice		-3501.45	-1972.41	-124143.84	227946.19	-330.35
Wind 330 deg - Ice		-2009.27	-3437.60	-218600.86	131330.43	-293.96

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Total Weight	13041.01			919.80	551.65	
Wind 0 deg - Service		24.65	-2782.42	-183000.92	-1420.73	-163.75
Wind 30 deg - Service		1455.26	-2421.97	-159346.41	-96533.12	-11.05
Wind 60 deg - Service		2495.94	-1412.56	-92748.70	-165631.72	144.61
Wind 90 deg - Service		2867.83	-24.65	-1052.58	-190201.62	261.53
Wind 120 deg - Service		2471.28	1369.86	91172.03	-163659.33	308.37
Wind 150 deg - Service		1412.56	2397.32	159213.63	-93116.85	272.58
Wind 180 deg - Service		-24.65	2782.42	184840.53	2524.04	163.75
Wind 210 deg - Service		-1455.26	2421.97	161186.02	97636.43	11.05
Wind 240 deg - Service		-2495.94	1412.56	94588.30	166735.03	-144.61
Wind 270 deg - Service		-2867.83	24.65	2892.19	191304.93	-261.53
Wind 300 deg - Service		-2471.28	-1369.86	-89332.42	164762.64	-308.37
Wind 330 deg - Service		-1412.56	-2397.32	-157374.02	94220.15	-272.58

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	98 - 88	Pole	Max Tension	26	0.01	-0.40	0.61
			Max. Compression	26	-6387.09	41.59	-62.04
			Max. Mx	20	-3094.42	20618.26	-46.65
			Max. My	14	-3101.50	39.94	-20534.24
			Max. Vy	20	-2294.89	20618.26	-46.65
			Max. Vx	14	2285.20	39.94	-20534.24
			Max. Torque	22			-0.01
L2	88 - 45.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21169.57	2127.96	-3265.46
			Max. Mx	20	-9250.47	312617.06	-4608.30
			Max. My	14	-9289.43	4143.51	-301214.36
			Max. Vy	20	-9417.02	312617.06	-4608.30
			Max. Vx	14	9039.15	4143.51	-301214.36
			Max. Torque	22			1364.53
L3	45.67 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29924.44	2215.74	-3400.33
			Max. Mx	20	-15633.27	843862.97	-9937.00
			Max. My	14	-15634.27	9454.74	-814169.65
			Max. Vy	20	-12077.71	843862.97	-9937.00
			Max. Vx	14	11717.64	9454.74	-814169.65
			Max. Torque	22			1358.58

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	29924.44	-0.30	0.45
	Max. H_x	20	15649.20	12057.07	-103.66
	Max. H_z	2	15649.18	-103.65	11697.73
	Max. M_x	2	811739.99	-103.65	11697.73
	Max. M_z	8	842380.89	-12056.79	103.65
	Max. Torsion	22	1355.01	10390.07	5759.32
	Min. Vert	3	11736.87	-103.65	11697.53
	Min. H_x	9	11736.89	-12056.98	103.65
	Min. H_z	15	11736.89	103.65	-11697.91
	Min. M_x	14	-814169.65	103.65	-11697.72

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. M_z	20	-843862.98	12057.07	-103.66
	Min. Torsion	10	-1352.53	-10390.07	-5759.32

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	13041.01	0.51	-0.84	913.67	547.95	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15649.18	103.65	-11697.73	-811739.99	-8006.68	-716.78
0.9 Dead+1.6 Wind 0 deg - No Ice	11736.87	103.65	-11697.53	-801346.05	-8083.31	-707.54
1.2 Dead+1.6 Wind 30 deg - No Ice	15649.21	6118.40	-10182.75	-707188.24	-428431.15	-45.17
0.9 Dead+1.6 Wind 30 deg - No Ice	11736.91	6118.41	-10182.77	-698189.05	-422970.04	-45.10
1.2 Dead+1.6 Wind 60 deg - No Ice	15649.21	10493.72	-5938.86	-412804.75	-733825.55	637.10
0.9 Dead+1.6 Wind 60 deg - No Ice	11736.91	10493.74	-5938.87	-407679.42	-724344.27	628.03
1.2 Dead+1.6 Wind 90 deg - No Ice	15649.18	12056.79	-103.65	-7522.93	-842380.89	1148.17
0.9 Dead+1.6 Wind 90 deg - No Ice	11736.89	12056.98	-103.65	-7729.99	-831486.17	1132.40
1.2 Dead+1.6 Wind 120 deg - No Ice	15649.21	10390.07	5759.32	400122.33	-725140.07	1352.53
0.9 Dead+1.6 Wind 120 deg - No Ice	11736.91	10390.09	5759.33	394549.08	-715772.66	1334.25
1.2 Dead+1.6 Wind 150 deg - No Ice	15649.21	5938.86	10079.10	700920.49	-413337.49	1195.41
0.9 Dead+1.6 Wind 150 deg - No Ice	11736.91	5938.87	10079.11	691383.71	-408077.72	1179.51
1.2 Dead+1.6 Wind 180 deg - No Ice	15649.18	-103.65	11697.72	814169.65	9454.46	717.96
0.9 Dead+1.6 Wind 180 deg - No Ice	11736.89	-103.65	11697.91	803154.41	9141.66	708.71
1.2 Dead+1.6 Wind 210 deg - No Ice	15649.21	-6118.40	10182.75	709618.04	429887.25	47.68
0.9 Dead+1.6 Wind 210 deg - No Ice	11736.91	-6118.41	10182.77	699964.49	424033.98	47.56
1.2 Dead+1.6 Wind 240 deg - No Ice	15649.21	-10493.72	5938.86	415226.19	735286.31	-635.77
0.9 Dead+1.6 Wind 240 deg - No Ice	11736.91	-10493.74	5938.87	409448.81	725411.59	-626.75
1.2 Dead+1.6 Wind 270 deg - No Ice	15649.20	-12057.07	103.66	9936.53	843862.98	-1149.33
0.9 Dead+1.6 Wind 270 deg - No Ice	11736.89	-12056.98	103.66	9493.63	832550.66	-1133.57
1.2 Dead+1.6 Wind 300 deg - No Ice	15649.21	-10390.07	-5759.32	-397709.03	726588.60	-1355.01
0.9 Dead+1.6 Wind 300 deg - No Ice	11736.91	-10390.09	-5759.33	-392785.60	716831.08	-1336.70
1.2 Dead+1.6 Wind 330 deg - No Ice	15649.21	-5938.86	-10079.10	-698498.83	414781.35	-1196.74
0.9 Dead+1.6 Wind 330 deg - No Ice	11736.91	-5938.87	-10079.11	-689614.18	409132.76	-1180.80

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Ice+1.0 Temp	29924.44	0.30	-0.45	3400.33	2215.74	0.08
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	29924.44	21.29	-3981.32	-284675.44	336.37	-217.40
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	29924.44	2045.95	-3458.56	-247031.43	-146802.94	-20.52
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	29924.44	3522.40	-2009.09	-142268.27	-254000.45	181.78
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	29924.44	4055.03	-21.29	1542.80	-292534.81	335.35
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	29924.44	3501.12	1972.22	145869.74	-252081.21	399.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	29924.44	2009.09	3437.27	252040.65	-143476.88	356.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	29924.43	-21.27	3981.30	291605.04	4178.50	217.65
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	29924.43	-2045.93	3458.54	253960.95	151318.66	20.90
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	29924.43	-3522.39	2009.07	149196.84	258516.61	-181.49
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	29924.43	-4055.01	21.27	5384.89	297050.55	-335.28
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	29924.44	-3501.11	-1972.24	-138941.98	256596.11	-399.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	29924.44	-2009.08	-3437.28	-245111.93	147991.34	-356.04
Dead+Wind 0 deg - Service	13041.00	24.65	-2781.99	-190863.45	-1459.61	-170.71
Dead+Wind 30 deg - Service	13041.00	1455.04	-2421.60	-166188.00	-100683.65	-11.06
Dead+Wind 60 deg - Service	13041.00	2495.55	-1412.34	-96714.76	-172768.20	151.49
Dead+Wind 90 deg - Service	13041.00	2867.38	-24.65	-1059.06	-198399.16	273.42
Dead+Wind 120 deg - Service	13041.00	2470.89	1369.64	95149.06	-170708.93	322.12
Dead+Wind 150 deg - Service	13041.00	1412.34	2396.94	166130.88	-97116.12	284.56
Dead+Wind 180 deg - Service	13041.00	-24.65	2781.98	192866.04	2660.45	170.78
Dead+Wind 210 deg - Service	13041.00	-1455.03	2421.59	168190.59	101884.83	11.21
Dead+Wind 240 deg - Service	13041.00	-2495.54	1412.33	98717.01	173969.57	-151.41
Dead+Wind 270 deg - Service	13041.00	-2867.37	24.65	3060.97	199600.37	-273.48
Dead+Wind 300 deg - Service	13041.00	-2470.89	-1369.65	-93147.15	171909.80	-322.26
Dead+Wind 330 deg - Service	13041.00	-1412.34	-2396.95	-164128.62	98316.80	-284.64

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-13041.01	0.00	-0.51	13041.01	0.84	0.008%
2	103.66	-15649.21	-11698.23	-103.65	15649.18	11697.73	0.003%
3	103.66	-11736.91	-11698.23	-103.65	11736.87	11697.53	0.004%
4	6118.43	-15649.21	-10182.80	-6118.40	15649.21	10182.75	0.000%
5	6118.43	-11736.91	-10182.80	-6118.41	11736.91	10182.77	0.000%
6	10493.77	-15649.21	-5938.89	-10493.72	15649.21	5938.86	0.000%
7	10493.77	-11736.91	-5938.89	-10493.74	11736.91	5938.87	0.000%
8	12057.31	-15649.21	-103.66	-12056.79	15649.18	103.65	0.003%
9	12057.31	-11736.91	-103.66	-12056.98	11736.89	103.65	0.002%
10	10390.11	-15649.21	5759.35	-10390.07	15649.21	-5759.32	0.000%
11	10390.11	-11736.91	5759.35	-10390.09	11736.91	-5759.33	0.000%
12	5938.89	-15649.21	10079.14	-5938.86	15649.21	-10079.10	0.000%
13	5938.89	-11736.91	10079.14	-5938.87	11736.91	-10079.11	0.000%
14	-103.66	-15649.21	11698.23	103.65	15649.18	-11697.72	0.003%
15	-103.66	-11736.91	11698.23	103.65	11736.89	-11697.91	0.002%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
16	-6118.43	-15649.21	10182.80	6118.40	15649.21	-10182.75	0.000%
17	-6118.43	-11736.91	10182.80	6118.41	11736.91	-10182.77	0.000%
18	-10493.77	-15649.21	5938.89	10493.72	15649.21	-5938.86	0.000%
19	-10493.77	-11736.91	5938.89	10493.74	11736.91	-5938.87	0.000%
20	-12057.31	-15649.21	103.66	12057.07	15649.20	-103.66	0.001%
21	-12057.31	-11736.91	103.66	12056.98	11736.89	-103.66	0.002%
22	-10390.11	-15649.21	-5759.35	10390.07	15649.21	5759.32	0.000%
23	-10390.11	-11736.91	-5759.35	10390.09	11736.91	5759.33	0.000%
24	-5938.89	-15649.21	-10079.14	5938.86	15649.21	10079.10	0.000%
25	-5938.89	-11736.91	-10079.14	5938.87	11736.91	10079.11	0.000%
26	0.00	-29924.44	0.00	-0.30	29924.44	0.45	0.002%
27	21.28	-29924.44	-3981.69	-21.29	29924.44	3981.32	0.001%
28	2046.14	-29924.44	-3458.88	-2045.95	29924.44	3458.56	0.001%
29	3522.73	-29924.44	-2009.27	-3522.40	29924.44	2009.09	0.001%
30	4055.41	-29924.44	-21.28	-4055.03	29924.44	21.29	0.001%
31	3501.45	-29924.44	1972.41	-3501.12	29924.44	-1972.22	0.001%
32	2009.27	-29924.44	3437.60	-2009.09	29924.44	-3437.27	0.001%
33	-21.28	-29924.44	3981.69	21.27	29924.43	-3981.30	0.001%
34	-2046.14	-29924.44	3458.88	2045.93	29924.43	-3458.54	0.001%
35	-3522.73	-29924.44	2009.27	3522.39	29924.43	-2009.07	0.001%
36	-4055.41	-29924.44	21.28	4055.01	29924.43	-21.27	0.001%
37	-3501.45	-29924.44	-1972.41	3501.11	29924.44	1972.24	0.001%
38	-2009.27	-29924.44	-3437.60	2009.08	29924.44	3437.28	0.001%
39	24.65	-13041.01	-2782.42	-24.65	13041.00	2781.99	0.003%
40	1455.26	-13041.01	-2421.97	-1455.04	13041.00	2421.60	0.003%
41	2495.94	-13041.01	-1412.56	-2495.55	13041.00	1412.34	0.003%
42	2867.83	-13041.01	-24.65	-2867.38	13041.00	24.65	0.003%
43	2471.28	-13041.01	1369.86	-2470.89	13041.00	-1369.64	0.003%
44	1412.56	-13041.01	2397.32	-1412.34	13041.00	-2396.94	0.003%
45	-24.65	-13041.01	2782.42	24.65	13041.00	-2781.98	0.003%
46	-1455.26	-13041.01	2421.97	1455.03	13041.00	-2421.59	0.003%
47	-2495.94	-13041.01	1412.56	2495.54	13041.00	-1412.33	0.003%
48	-2867.83	-13041.01	24.65	2867.37	13041.00	-24.65	0.003%
49	-2471.28	-13041.01	-1369.86	2470.89	13041.00	1369.65	0.003%
50	-1412.56	-13041.01	-2397.32	1412.34	13041.00	2396.95	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00002278
2	Yes	17	0.00000001	0.00007522
3	Yes	16	0.00004435	0.00011730
4	Yes	20	0.00000001	0.00011493
5	Yes	20	0.00000001	0.00007884
6	Yes	20	0.00000001	0.00011174
7	Yes	20	0.00000001	0.00007637
8	Yes	17	0.00000001	0.00012750
9	Yes	17	0.00000001	0.00009510
10	Yes	20	0.00000001	0.00012272
11	Yes	20	0.00000001	0.00008420
12	Yes	20	0.00000001	0.00010378
13	Yes	20	0.00000001	0.00007101
14	Yes	17	0.00000001	0.00012430
15	Yes	17	0.00000001	0.00009261
16	Yes	20	0.00000001	0.00011856

17	Yes	20	0.00000001	0.00008083
18	Yes	20	0.00000001	0.00012402
19	Yes	20	0.00000001	0.00008446
20	Yes	18	0.00000001	0.00008850
21	Yes	17	0.00000001	0.00013462
22	Yes	20	0.00000001	0.00010195
23	Yes	20	0.00000001	0.00006966
24	Yes	20	0.00000001	0.00011893
25	Yes	20	0.00000001	0.00008191
26	Yes	12	0.00000001	0.00002737
27	Yes	18	0.00000001	0.00003909
28	Yes	18	0.00000001	0.00009192
29	Yes	18	0.00000001	0.00008960
30	Yes	18	0.00000001	0.00004340
31	Yes	18	0.00000001	0.00010811
32	Yes	18	0.00000001	0.00009238
33	Yes	18	0.00000001	0.00004201
34	Yes	18	0.00000001	0.00010843
35	Yes	18	0.00000001	0.00011270
36	Yes	18	0.00000001	0.00004613
37	Yes	18	0.00000001	0.00008886
38	Yes	18	0.00000001	0.00010268
39	Yes	15	0.00000001	0.00005186
40	Yes	15	0.00000001	0.00006871
41	Yes	15	0.00000001	0.00006321
42	Yes	15	0.00000001	0.00006198
43	Yes	15	0.00000001	0.00010003
44	Yes	15	0.00000001	0.00006135
45	Yes	15	0.00000001	0.00005459
46	Yes	15	0.00000001	0.00007575
47	Yes	15	0.00000001	0.00008903
48	Yes	15	0.00000001	0.00006507
49	Yes	15	0.00000001	0.00006010
50	Yes	15	0.00000001	0.00009132

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	98 - 88	15.302	47	1.2966	0.0077
L2	88 - 45.67	12.597	47	1.2827	0.0077
L3	49.34 - 0	3.937	47	0.7475	0.0025

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.00	APX16PV-16PVL	47	15.302	1.2966	0.0078	23882
88.00	PiROD 13' Low Profile Platform	47	12.597	1.2827	0.0077	12012
80.00	Andrew 2' w/Radome	47	10.501	1.2255	0.0072	6814

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	98 - 88	64.409	18	5.4595	0.0315
L2	88 - 45.67	53.051	18	5.4001	0.0316
L3	49.34 - 0	16.620	18	3.1561	0.0103

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
98.00	APX16PV-16PVL	18	64.409	5.4595	0.0331	5891
88.00	PiROD 13' Low Profile Platform	18	53.051	5.4001	0.0330	2961
80.00	Andrew 2' w/Radome	18	44.238	5.1601	0.0304	1658

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
L1	98 - 88 (1)	TP16.5x12.75x0.375	10.00	0.00	0.0	18.9968	-3094.07	854857.00	0.004
L2	88 - 45.67 (2)	TP25.16x16.5x0.1875	42.33	0.00	0.0	14.4149	-9249.96	992754.00	0.009
L3	45.67 - 0 (3)	TP34x24.0342x0.25	49.34	0.00	0.0	26.7806	-15633.30	1815350.00	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L1	98 - 88 (1)	TP16.5x12.75x0.375	20624.83	357424.17	0.058	0.00	357424.17	0.000
L2	88 - 45.67 (2)	TP25.16x16.5x0.1875	313133.33	494525.83	0.633	0.00	494525.83	0.000
L3	45.67 - 0 (3)	TP34x24.0342x0.25	844425.00	1260441.67	0.670	0.00	1260441.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	98 - 88 (1)	TP16.5x12.75x0.375	2298.62	427428.00	0.005	0.00	561606.67	0.000
L2	88 - 45.67 (2)	TP25.16x16.5x0.1875	9418.63	496377.00	0.019	637.88	991416.67	0.001
L3	45.67 - 0 (3)	TP34x24.0342x0.25	12078.40	907676.00	0.013	635.78	2526783.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	98 - 88 (1)	0.004	0.058	0.000	0.005	0.000	0.061 ✔	1.000	4.8.2 ✔
L2	88 - 45.67 (2)	0.009	0.633	0.000	0.019	0.001	0.643 ✔	1.000	4.8.2 ✔
L3	45.67 - 0 (3)	0.009	0.670	0.000	0.013	0.000	0.679 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	98 - 88	Pole	TP16.5x12.75x0.375	1	-3094.07	854857.00	6.1	Pass
L2	88 - 45.67	Pole	TP25.16x16.5x0.1875	2	-9249.96	992754.00	64.3	Pass
L3	45.67 - 0	Pole	TP34x24.0342x0.25	3	-15633.30	1815350.00	67.9	Pass
							Summary	
						Pole (L3)	67.9	Pass
						RATING =	**67.9**	**Pass**

Sprint

PROJECT: MIMO UPGRADE

SITE NAME: SPRINT LAYDON CT2507

SITE CASCADE: CT52XC073-B

SITE ADDRESS: 69 WHEELER STREET
NEW HAVEN, CT 06512

SITE INFORMATION

SITE ADDRESS:
69 WHEELER STREET
NEW HAVEN, CT 06512

PROPERTY OWNER:

ZONING JURISDICTION:
NEW HAVEN

ZONING DISTRICT:

POWER COMPANY:
NORTHEAST UTILITIES
(800) 286-2000

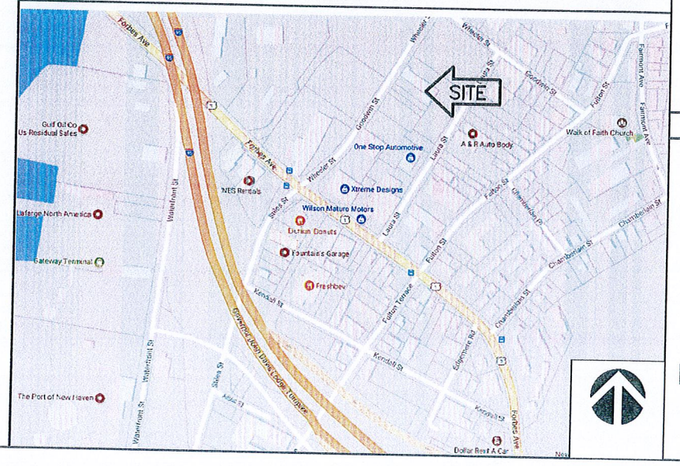
COUNTY:
NEW HAVEN

GEOGRAPHIC COORDINATES (NAD83):
LAT: 41° 04' 31.52"N
41.07542222°
LONG: 73° 31' 09.60"W
(-73.51938889°)

SPRINT CONSTRUCTION MANAGER:
NAME:
PHONE:
EMAIL:

AREA MAP

LOCATION MAP



PROJECT DESCRIPTION

- (1) EXISTING CW EQUIPMENT RACK & (1) EXISTING SPRINT GPS UNIT TO REMAIN
- (2) EXISTING SPRINT MW DISH ANTENNAS TO REMAIN
- REMOVE (11) EXISTING IDEN ANTENNAS
- REMOVE (3) EXISTING CW ANTENNAS
- REMOVE (3) EXISTING CW RRHS
- INSTALL (3) NEW 800/1900 MHz ANTENNAS
- INSTALL (3) NEW MIMO ANTENNAS
- INSTALL (6) NEW 800 MHZ RRHS
- INSTALL (3) NEW 1900 MHZ RRHS
- INSTALL (1) NEW MIMO UPGRADE HYBRID CABLE
- INSTALL (3) NEW 1-1/4" HYBRID CABLES
- INSTALL (1) NEW ELTEK I-CAB CABINET
- INSTALL (1) NEW ELTEK E-CAB CABINET
- INSTALL (1) NEW SPRINT SPRINT GPS UNIT
- INSTALL (9) NEW 'COMMSCOPE' PART#MT-547-72 MOUNTING PIPES

APPLICABLE CODES

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT OF THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

- 2015 INTERNATIONAL BUILDING CODE AS ADOPTED BY THE STATE OF CONNECTICUT
- NEC 2014, AS ADOPTED BY THE STATE OF CONNECTICUT
- NFPA 780 – LIGHTNING PROTECTION CODE
- ANSI/TIA-222G TELECOM STRUCTURAL STANDARD

DIG SAFE

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

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR
www.cbyd.com

CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

DRAWING INDEX

SHEET NO:	SHEET TITLE	REV
T-1	TITLE SHEET	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	PARTIAL SITE PLAN	0
A-2	EQUIPMENT LAYOUT	0
A-3	TOWER ELEVATION	0
A-4	ANTENNA LAYOUT	0
A-5	MIMO DIAGRAMS	0
A-6	CABLE DETAILS	0
A-7	EQUIPMENT DETAILS	0
A-8	ANTENNA MOUNTING DETAILS	0
E-1	ELECTRIC PLAN & NOTES	0
E-2	GROUNDING DETAILS	0
E-3	ELECTRICAL DETAILS	0

PROFESSIONAL LICENSE

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED ARCHITECT UNDER THE LAWS OF THE STATE OF CONNECTICUT

STATE OF CONNECTICUT
NO. 10137
REGISTERED ARCHITECT

EXPIRES: 07-31-18 SIGNED: 6/29/18

Sprint
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
TEL: (201) 684-4000
FAX: (201) 684-4223

Cherundolo Consulting
1280 ROUTE 46 WEST
PARSIPPANY, NJ 07054
TELEPHONE: 646-544-5324

WESTCHESTER SERVICES LLC
604 FOX GLEN
BARRINGTON, IL 60010
TELEPHONE: 847-277-0070
FAX : 847-277-0080
AE@westchesterservices.com

JOHN M. BANKS ARCHITECT
604 FOX GLEN
BARRINGTON, IL 60010
TELEPHONE: 847-277-0070
FAX : 847-277-0080

NO.	DATE	DESCRIPTION
0	04.27.18	FINAL CD

DRAWN BY: SH
CHECKED BY: JMB
JOB NUMBER: CT52XC073-B
ARCHITECT: JOHN BANKS

SEAL

SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

SECTION 01 100 – SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND 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, 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–200–(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

NATIONALLY RECOGNIZED CODES AND STANDARDS:
THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS, INCLUDED
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–"NEW") 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 INSTITUDE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (PCA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
P. SGEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOICATION (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 INTERNATIONAL BUILDING CODE.

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

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.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

USE OF JOB SITE:
CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING 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 OF 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 PM 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 CONTRACTORS STAFF AND OFFICE THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS.

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMP UTILITIES AND FACILITIES NECESSARY EXCEPT OTHERWISE INDICATED IN CONSTRUCTION DOCUMENTS. TEMP UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSABLE FALSITIES, TELECOM SERVICES, PROVIDE TEMP UTILITIES AND FACILITIES ACCORDANCE WITH OSHA AND AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE CO. 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 ALLLOWED IN CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE A&E DURING ALL PHASED OF WORK.

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

EXISTING CONDITIONS:
NOTIFY SPRINT CM 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 RFDS IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON PRECEPT SHALL:
1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES
3. TAKE RESPONSIBILITIES FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN 24 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 RECEIPT DOCUMENTATION IN ACCORDANCE W/COMPANY PRACTICE
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE W/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.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITIONS
1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITIONS 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 EXPOSE TO INDIVIDUALS.
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 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, PADS & 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
15. INSTALLED FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS
16. INSTALL ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EX. TOWER 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 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 ACTIVATIONS PER APPLICABLE MOPS

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BU NOT LIMITED TO THE FOLLOWING
1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION REQUESTED BY SPRINT
2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON–LINES 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 & 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 &/OR UPLOADED INTO SMS
1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. PRE–CONSTRUCTION MEETING NOTES.

SECTION –1 400–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 FOLLOWING TO SITERRA AS APPLICABLE 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 COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS FOR 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:
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 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 USIING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B.REQUIRED THIRD PARTY TESTS
1. SITE RESISTANCE TO EARTH TEST PER NP–3 2–201
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. SITE RESISTANCE TO EARTH TEST
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES &/OR AS A RESULT OF TESTING

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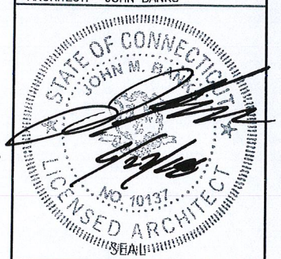
NO.	DATE	DESCRIPTION
0	04.27.18	FINAL CD

DRAWN BY: SH
CHECKED BY: JMB
JOB NUMBER: CT52XC073–B
ARCHITECT: JOHN BANKS



SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
SPRINT SPECIFICATIONS

SHEET NUMBER
SP-1

C. REQUIRED 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
5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN 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 COMMENCEMENT.
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 COAX/CABLE 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 YORK. THE FOLLOWING LIST REPRESENTS MIN. REQUIREMENTS AND MIN 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 BHE 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 II 700-ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRUS, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRUS:
THE NUMBER AND TYPE OF ANTENNAS AND RRUS TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER CONSTRUCTION DRAWINGS AND APPLICABLE MANUFACTURER'S REQUIREMENT.

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

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHOW, 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 SPECS 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 & DC CABLES ABOVE BREAKOUT ENCLOSURE, WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES
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 & DC CABLES ABOVE BREAKOUT ENCLOSURE, WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES
    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 LIENS 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
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-EN2012-001, 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 OR 2" ELEC 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 ELEC TAPE EXTENDING 2" BEYOND SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 7 16: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800-INSTALLATION OF MULTIMODAL BASE STATIONS AND RELATED EQUIPMENT;

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DIST 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 MISC MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND 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 OR 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 SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRINT-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.

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NO.	DATE	DESCRIPTION
0	04.27.18	FINAL CD

DRAWN BY: SH
CHECKED BY: JMB
JOB NUMBER: CT52XC073-B
ARCHITECT: JOHN BANKS

STATE OF CONNECTICUT
JOHN M. BANKS
No. 10137
LICENSED ARCHITECT
SEAL

SITE NAME
SPRINT LAYDON
CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
SPRINT SPECIFICATIONS

SHEET NUMBER
SP-2

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 LOARD 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 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 LOATIONS 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 UNDERWRITER'S 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 MAYBE 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 THE 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 (21 MM)

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, WEATHERPROOFED, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS FORM 8 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, 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.

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 RODS.

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 INSIE.

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

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NO.	DATE	DESCRIPTION
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JOB NUMBER: CT52XC073-B
ARCHITECT: JOHN BANKS

STATE OF CONNECTICUT
JOHN M. BANKS
LICENSED ARCHITECT
NO. 10137
SEAL

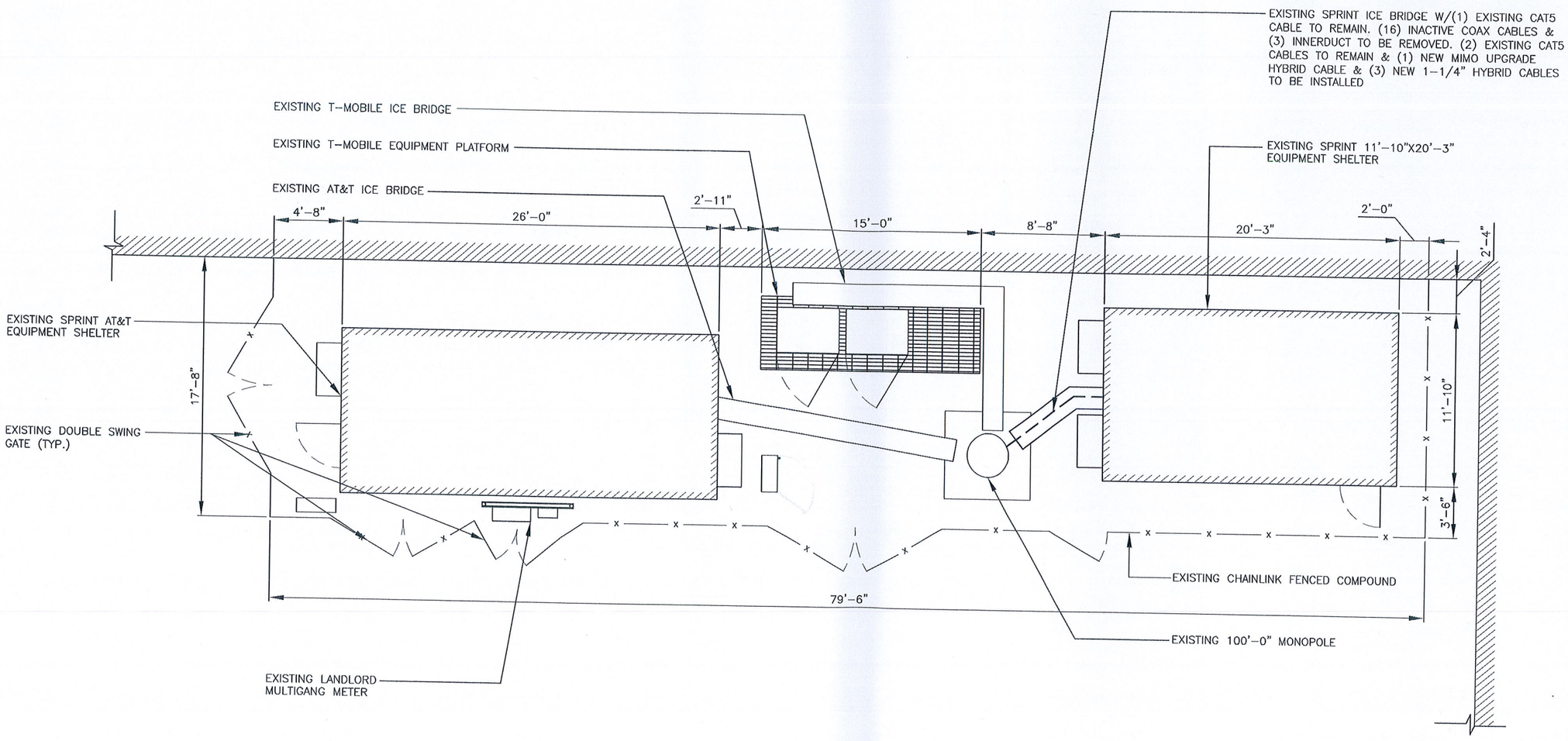
SITE NAME
SPRINT LAYDON
CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
SPRINT SPECIFICATIONS

SHEET NUMBER
SP-3



1 A-1 PARTIAL SITE PLAN
SCALE: 1/8"=1'-0"

NORTH

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STATE OF CONNECTICUT JOHN M. BANKS No. 10137 LICENSED ARCHITECT SEAL

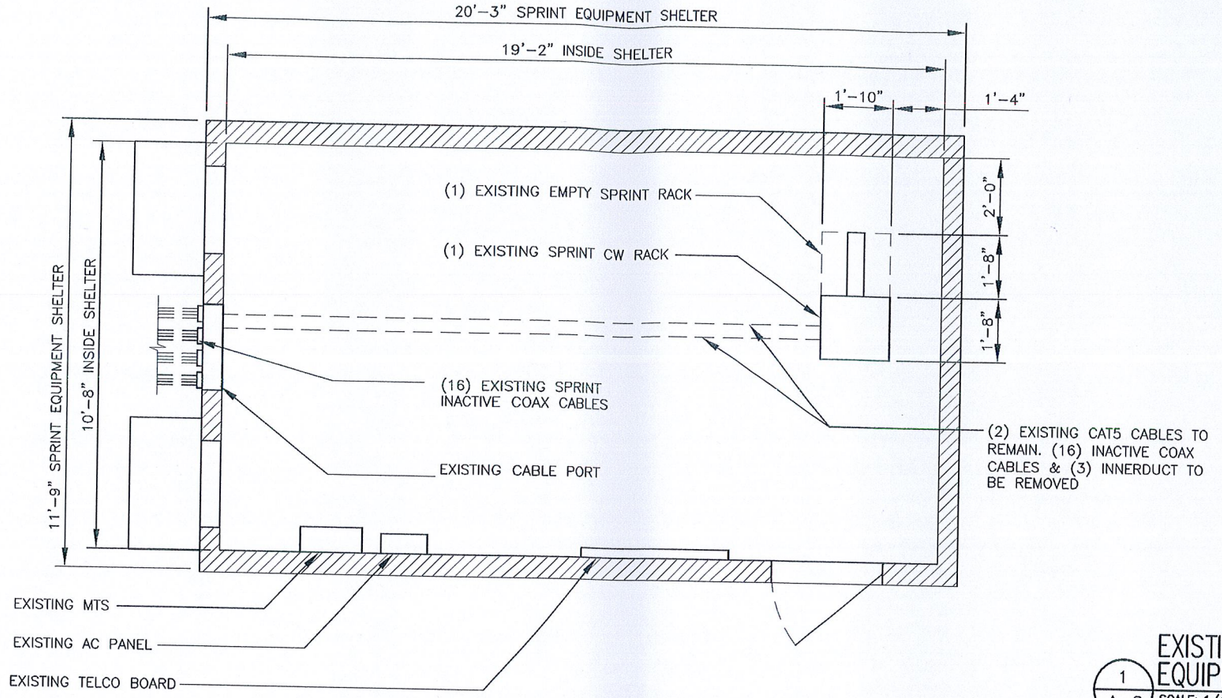
SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

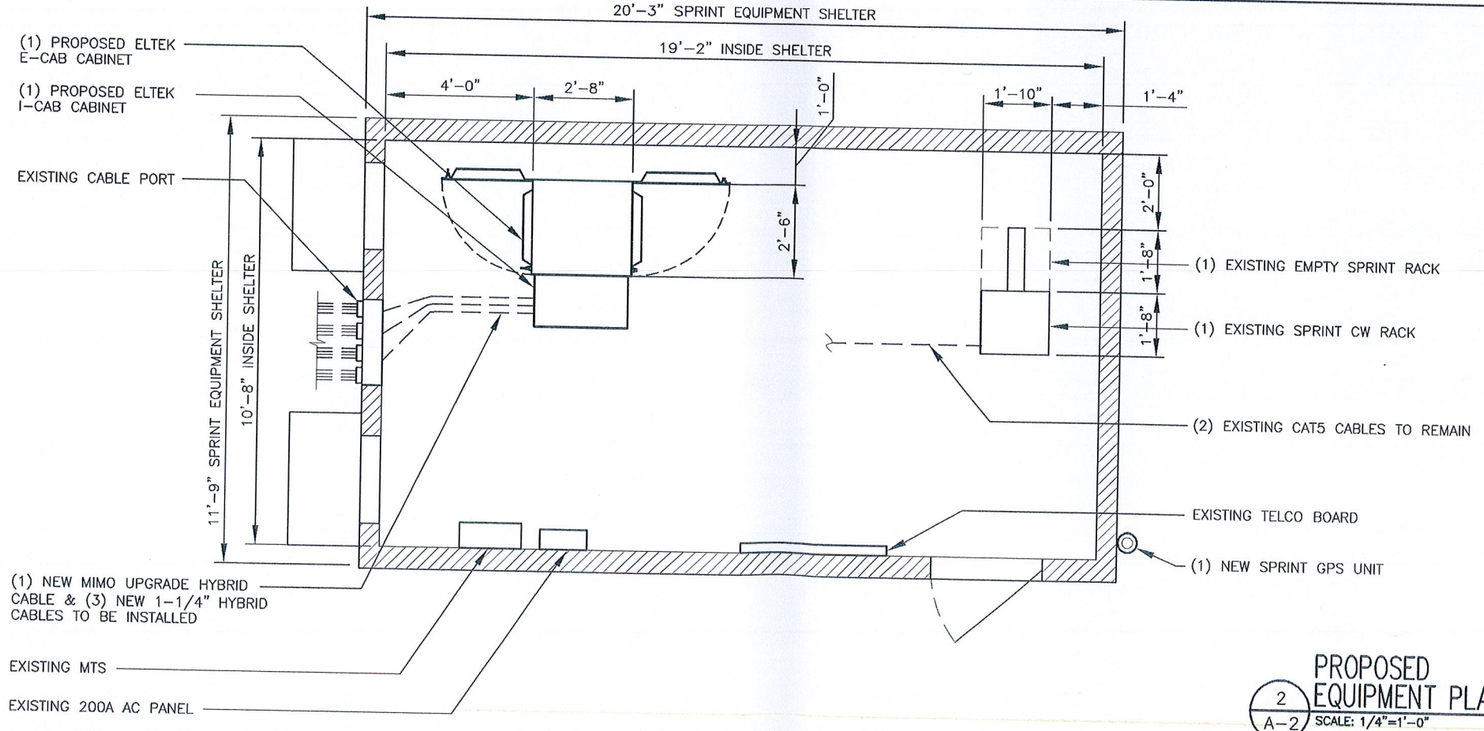
SHEET TITLE
PARTIAL SITE PLAN

SHEET NUMBER
A-1



1 A-2 EXISTING EQUIPMENT PLAN
SCALE: 1/4"=1'-0"

NORTH



2 A-2 PROPOSED EQUIPMENT PLAN
SCALE: 1/4"=1'-0"

NORTH

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STATE OF CONNECTICUT JOHN M. BANKS NO. 10137 LICENSED ARCHITECT SEAL

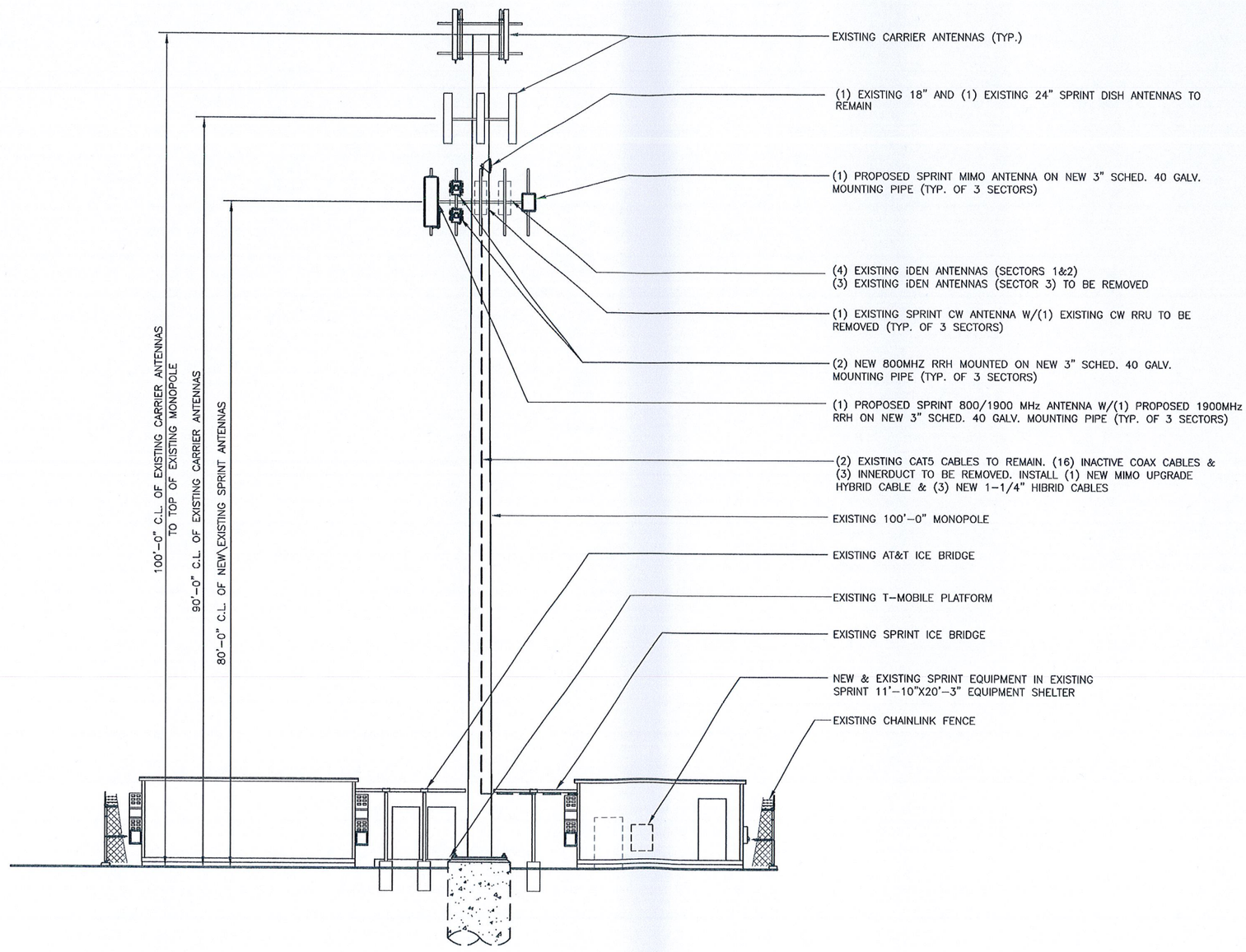
SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
EQUIPMENT LAYOUT

SHEET NUMBER
A-2



1 / A-3 MONOPOLE TOWER ELEVATION (NORTH)
SCALE: 1"=15'-0"

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STATE OF CONNECTICUT · JOHN M. BANKS · 04/27/18 · NO. 20137 · LICENSED ARCHITECT · SEAL

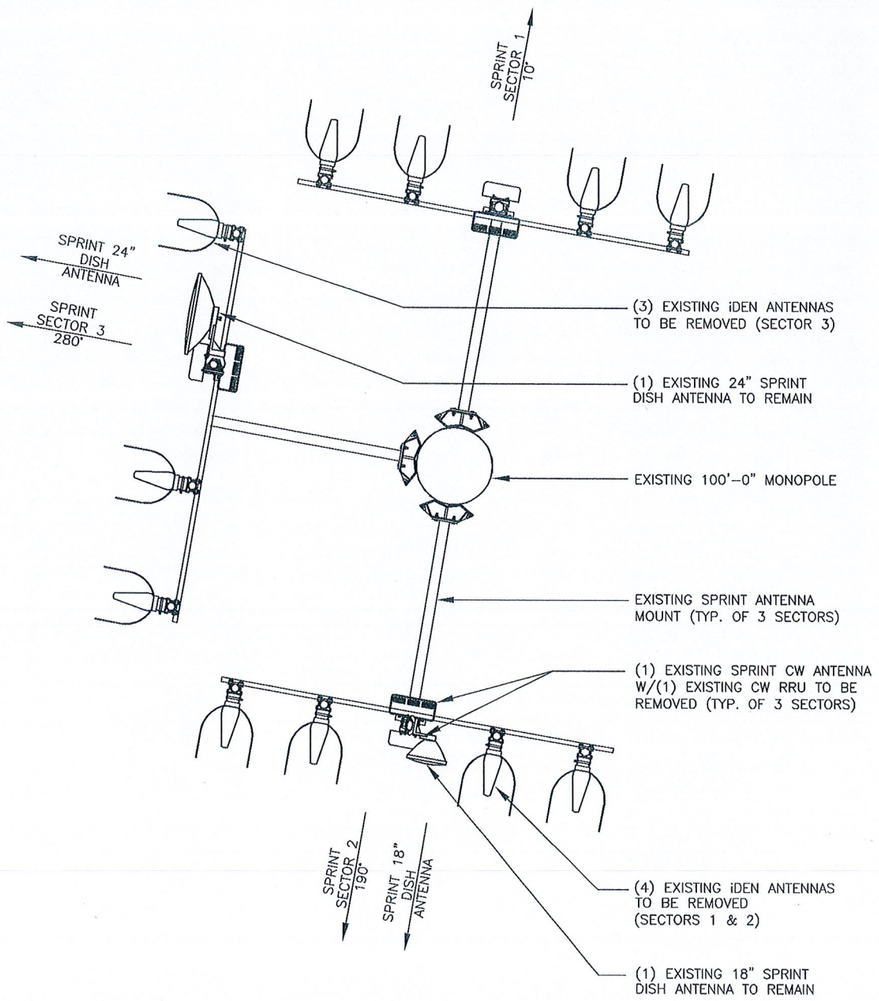
SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

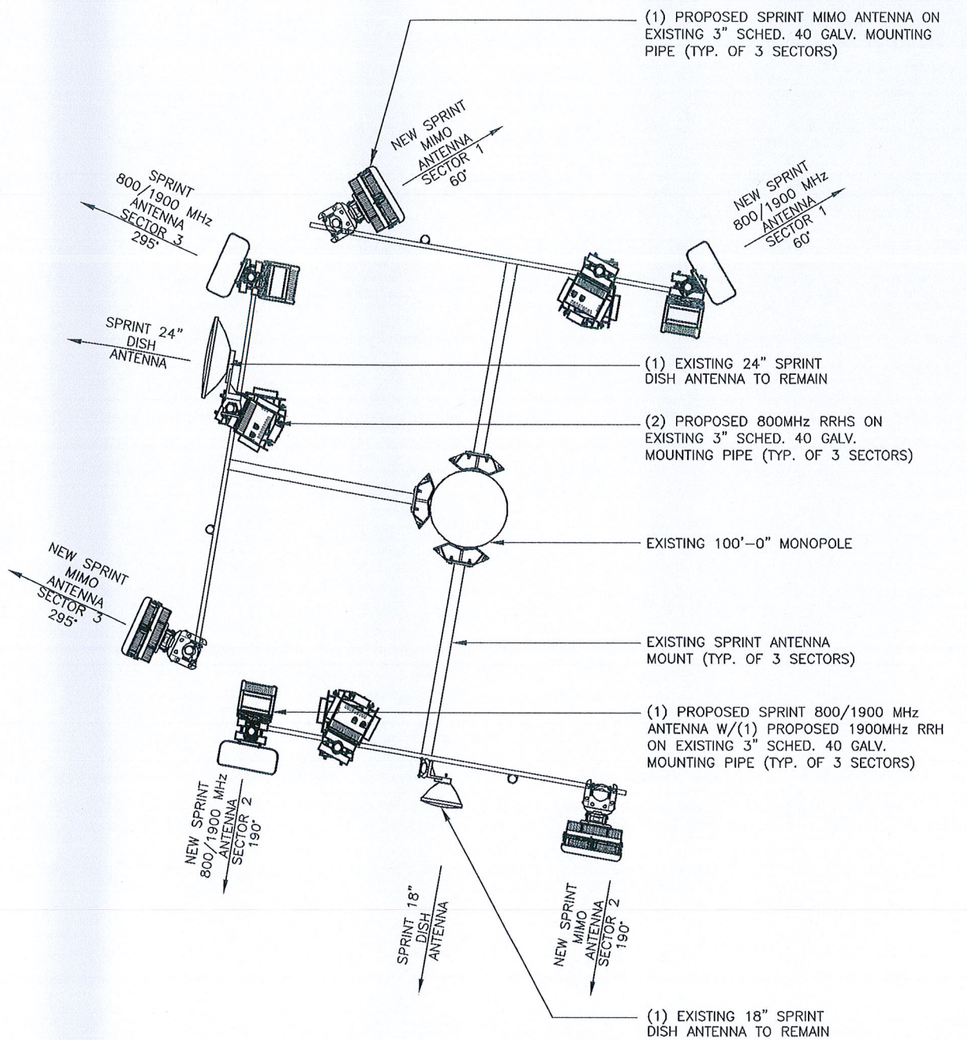
SHEET TITLE
TOWER ELEVATION

SHEET NUMBER
A-3



1 A-4 EXISTING ANTENNA PLAN
SCALE: 1/4"=1'-0"

NORTH



2 A-4 PROPOSED ANTENNA PLAN
SCALE: 1/4"=1'-0"

NORTH

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STATE OF CONNECTICUT JOHN M. BANKS 10131 LICENSED ARCHITECT
SEAL

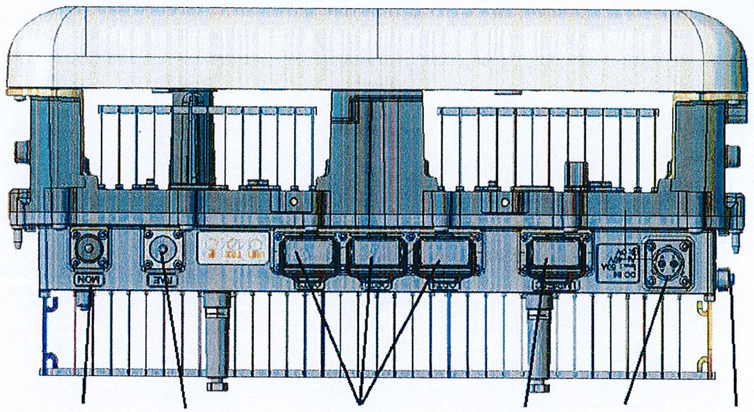
SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
ANTENNA LAYOUT

SHEET NUMBER
A-4



1 / A-5 MIMO CONNECTORS DETAIL
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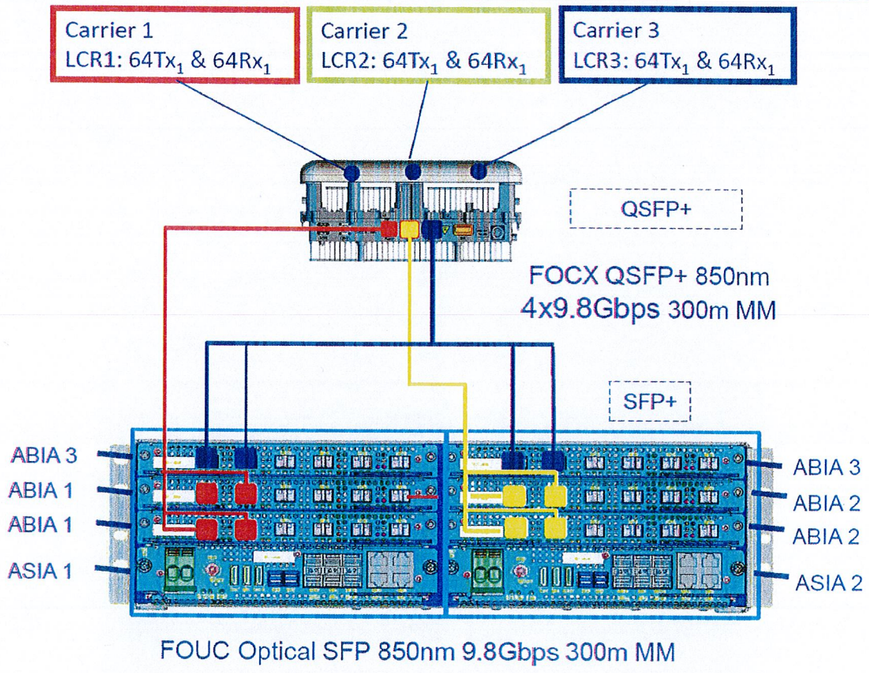
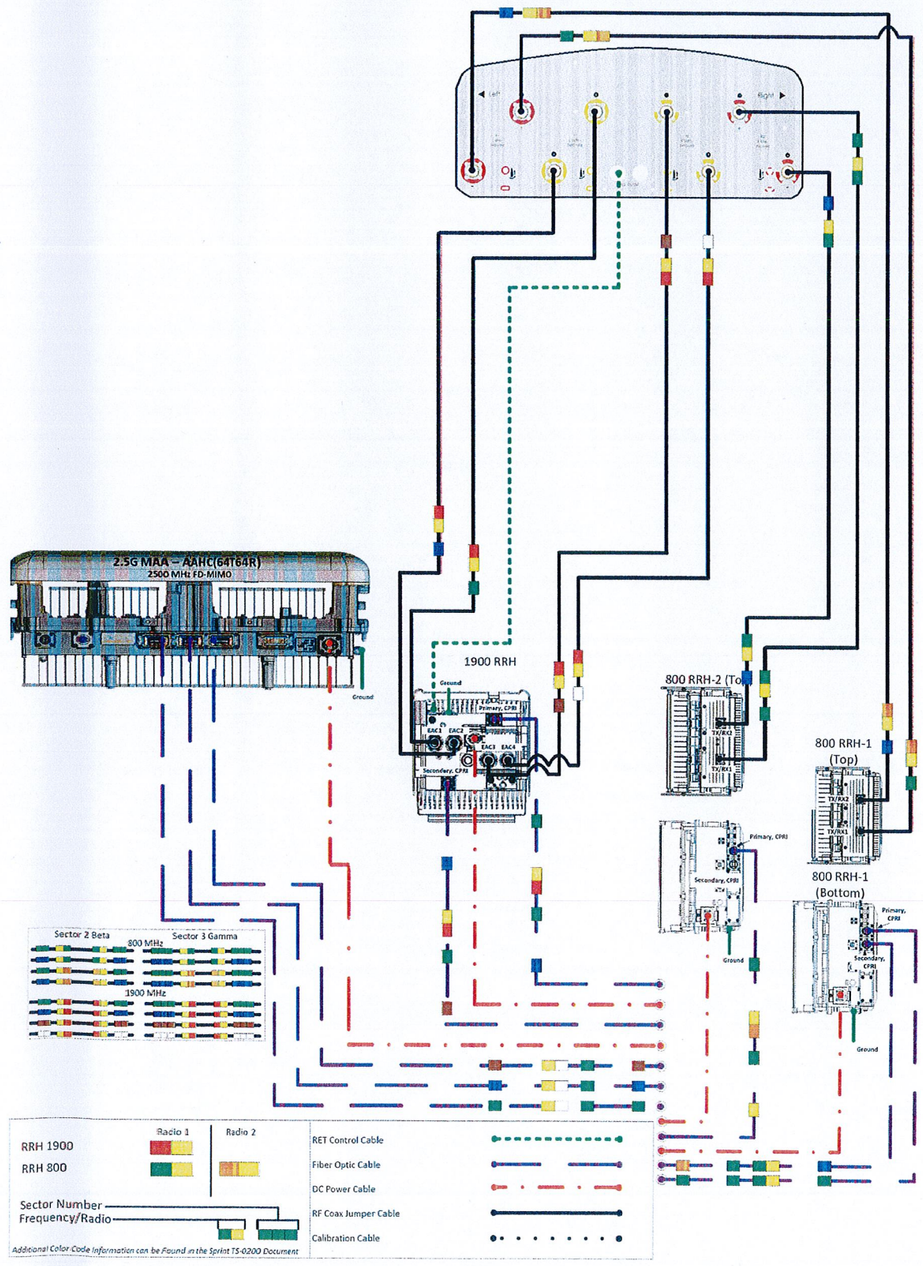


2 / A-5 64T64R DIAGRAM
SCALE: N.T.S.

MIMO + NNVV-65B-R4 w/o FILTERS



3 / A-5 MIMO + 800/1900 MHz PLUMBING DIAGRAM
SCALE: N.T.S.

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NO. 10137
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SEAL

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69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
MIMO DIAGRAMS

SHEET NUMBER
A-5

Nokia-A
New Build Hybrid Selection Table

Nokia-A Scenarios	Cable Description	Cable Length (ft)	Diameter (in)	Weight (lbs/ft)
1 Cable per Sector (1)1900 (2)800 (1)mMIMO or 8T8R	4 pairs of 6AWG DC Conductors with 24 Multi-Mode Fiber Pairs	0-120	1.376	1.354
1 Cable per Sector (1)1900 (2)800 (1)mMIMO or 8T8R	4 pairs of 4AWG DC Conductors with 24 Multi-Mode Fiber Pairs	121-200	1.545	1.875
1 Cable per Sector (1)1900 (2)800 (1)mMIMO(WITH BI-WIRE) or 8T8R	5 pairs of 4AWG DC Conductors with 24 Multi-Mode Fiber Pairs	201-375	1.619	2.161

** All Fiber Pairs Terminate in SENKO IP-LC at Tower Top*

mMIMO Addition Non-Standard Structure Hybrid Selection Table

Nokia-A Scenarios	Cable Description	Cable Length (ft)	Diameter (in)	Weight (lbs/ft)
1 Cable per mMIMO Radio WITH SPARES	6 pairs of 4AWG DC Conductors with 48 Multi-Mode Fiber Pairs (12' in cabinet)	30	1.689	2.307

** All Fiber Pairs Terminate in SENKO IP-LC at Tower Top.*

mMIMO Addition Non-Standard Structure Trunk Selection Table

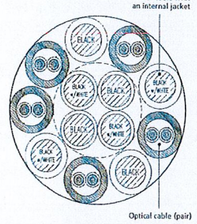
Nokia-A Scenarios	Cable Description	Cable Length (ft)	Diameter (in)	Weight (lbs/ft)
1 Cable per mMIMO Radio WITH SPARES	16 Multi-Mode Fiber Pairs	0-375	0.41	0.091

** All Fiber Pairs Terminate in SENKO IP-LC at Tower Top*

MIMO CABLE LENGTHS				
SECTOR	DESCRIPTION	QTY	DIMENSIONS	PART/MODEL#
SECTOR 1	6-PAIRS 4 AWG +48 MM FIBER-PAIRS	1	115'-0"	MIMO UPGRADE HYBRID 1.689"ø

1 / A-6 MIMO CABLE LENGTHS & DETAIL
SCALE: N.T.S.

Structure			
Outer Conductor Armor:	Corrugated Aluminum	[mm (in)]	36.0 (1.42)
Jacket:	Polyethylene, PE	[mm (in)]	39.0 (1.54)
UV-Protection:	Individual and External Jacket		Yes
Mechanical Properties			
Weight, Approximate		[kg/m (lb/ft)]	1.78 (1.20)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	0.9 (0.27)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.64)
Fiber Optic Properties			
Version			Multi-mode
Quantity, Fiber Count			5 pairs
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
DC Power Cable Properties			
Size		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count			4 (2 pairs)
Size		[mm² (AWG)]	13.3 (6)
Quantity, Wire Count			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.1 (0.24)
Standards (Meets or exceeds)			ICEA S-95-658, T-29-520 UL Type XHHW-2, VW-1 IEEE-383 (1974) RoHS Compliant
Environment			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)



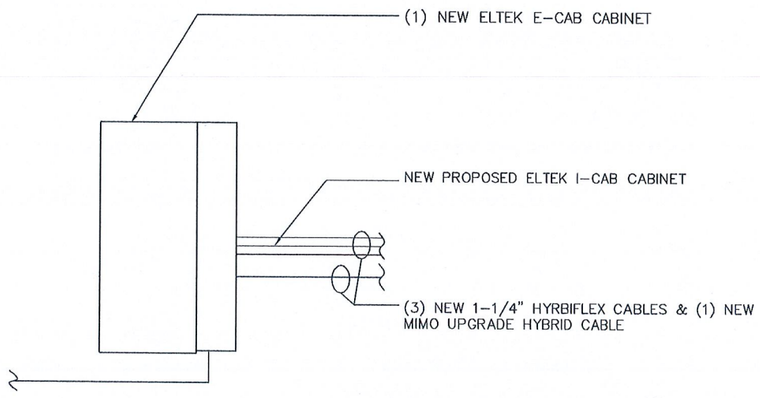
Construction Detail

HB114-1-0813U4-M5J

- DC conductor and fiber needs one full sector (includes CPRI's for CDMA):
  - Massive MIMO: 12 fiber pairs and 1 pair DC conductor (Nokia/ALU)
  - 1900 RRH: 2 fiber pairs and 1 pair DC conductor
  - 800 RRH no.1: 2 fiber pairs and 1 pair DC conductor
  - 800 RRH no.2: 1 fiber pair and 1 pair DC conductor
- Total need is 17 Pairs of Multimode fiber and 4 pair DC conductors plus spares.

MIMO CABLE LENGTHS				
SECTOR	DESCRIPTION	QTY	DIMENSIONS	PART/MODEL#
SECTOR 1	1-1/4" HYBRIFLEX CABLE	1	115'-0"	HB114-1-0813U4-M5J
SECTOR 2	1-1/4" HYBRIFLEX CABLE	1	115'-0"	HB114-1-0813U4-M5J
SECTOR 3	1-1/4" HYBRIFLEX CABLE	1	115'-0"	HB114-1-0813U4-M5J

2 / A-6 800/1900 CABLE LENGTHS & DETAIL
SCALE: N.T.S.



3 / A-6 EQUIPMENT SCHEMATIC
SCALE: N.T.S.

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1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
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NO.	DATE	DESCRIPTION
0	04.27.18	FINAL CD

DRAWN BY: SH
CHECKED BY: JMB
JOB NUMBER: CT52XC073-B
ARCHITECT: JOHN BANKS

STATE OF CONNECTICUT · JOHN M. BANKS · NO. 10137 · LICENSED ARCHITECT
SEAL

SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
CABLE DETAILS

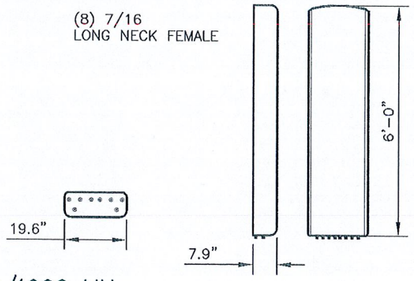
SHEET NUMBER
A-6

COMMSCOPE ANTENNA NNVV-65B-R4

DIMENSIONS, HxWxD: (72"x19.6"x7.8")

WEIGHT, WITH OUT PRE-MOUNTED BRACKETS: 77.4 lbs

CONNECTOR: (8) 7/16 LONG NECK FEMALE



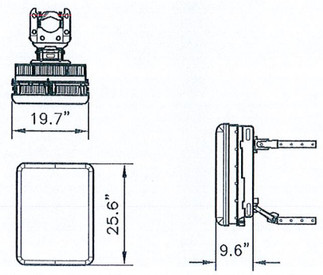
1 / A-7 800/1900 MHz PROPOSED ANTENNA SPECIFICATIONS

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

NOKIA MIMO AAHC ANTENNA

DIMENSIONS, HxWxD: 25.6"x19.7"x9.64"

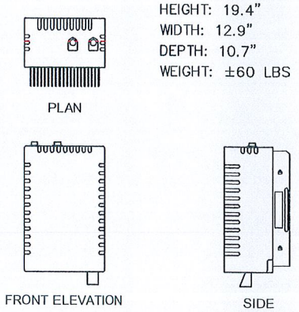
WEIGHT: 103.7 lbs



2 / A-7 MIMO ANTENNA SPECIFICATIONS

SCALE:

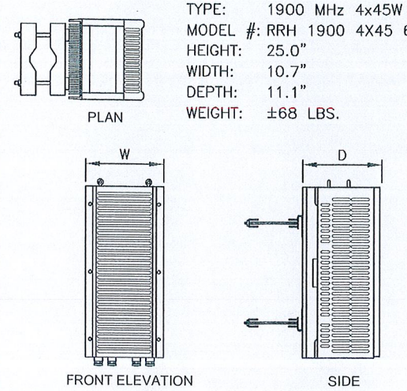
TYPE: 800 MHz 2x50W
MODEL #: FD-RRH-2x50-800
HEIGHT: 19.4"
WIDTH: 12.9"
DEPTH: 10.7"
WEIGHT: ±60 LBS



3 / A-7 800 MHz RRH DETAIL

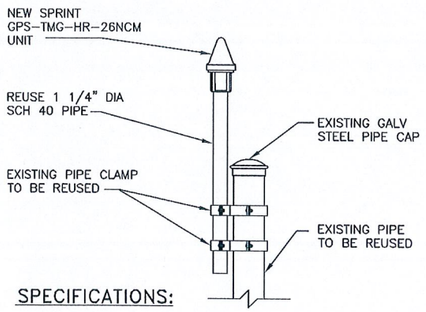
SCALE:

TYPE: 1900 MHz 4x45W
MODEL #: RRH 1900 4X45 65MHz
HEIGHT: 25.0"
WIDTH: 10.7"
DEPTH: 11.1"
WEIGHT: ±68 LBS.



4 / A-7 1900 MHz RRH DETAIL

SCALE:

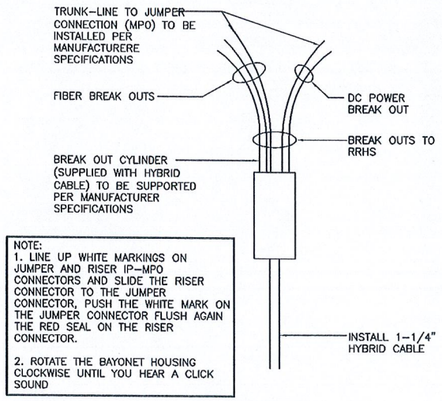


SPECIFICATIONS:

HEIGHT: 5"
DIAMETER: 3.2"
WEIGHT: 0.6 LBS.

5 / A-7 GPS UNIT DETAIL

SCALE: N.T.S.

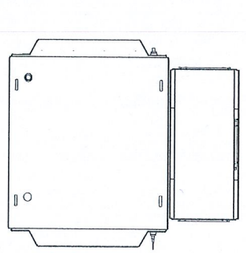


NOTE:
1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR, PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.

2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND

6 / A-7 HYBRID BREAKOUT

SCALE: N.T.S.



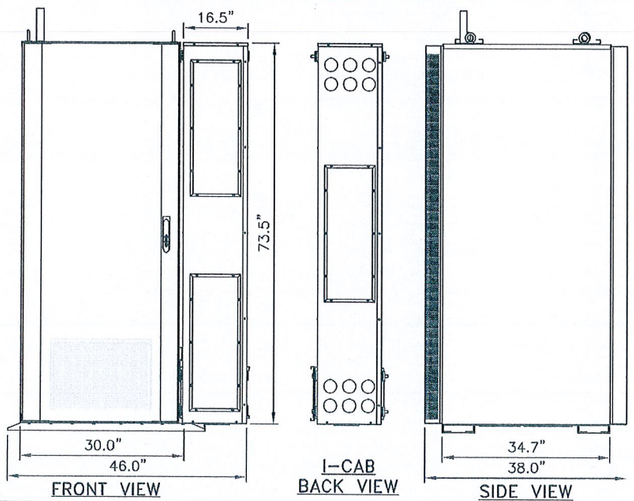
TOP VIEW

E-CAB & I-CAB

DIMENSIONS HxWxD: 73.5"x30.0"x38.0"

EMPTY WEIGHT: 505lbs

FULLY LOADED WEIGHT: 1,381lbs



7 / A-7 ELTEK E-CAB & I-CAB DETAIL

SCALE: N.T.S.

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STATE OF CONNECTICUT JOHN M. BANKS NO. 19137 LICENSED ARCHITECT SEAL

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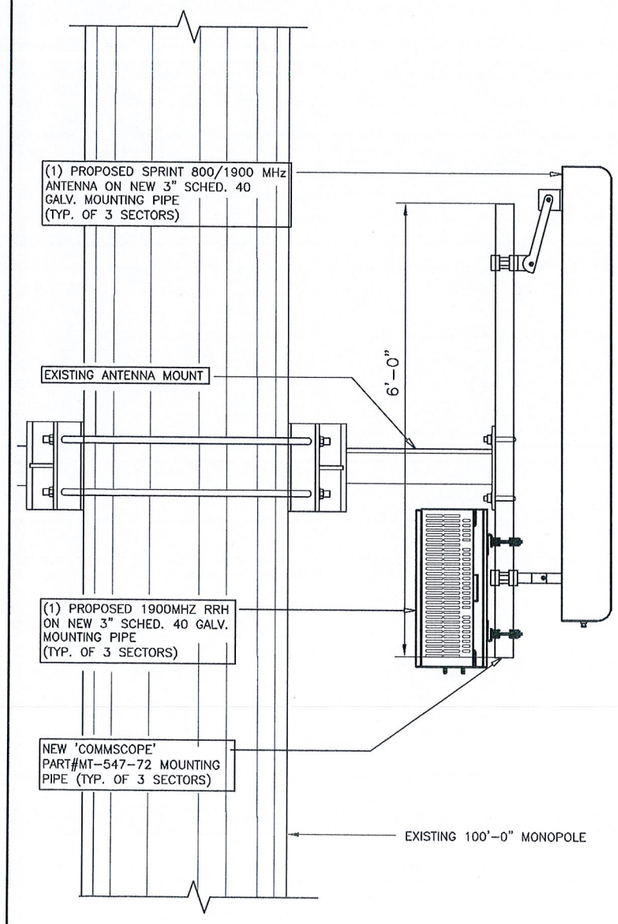
NEW HAVEN COUNTY

SHEET TITLE

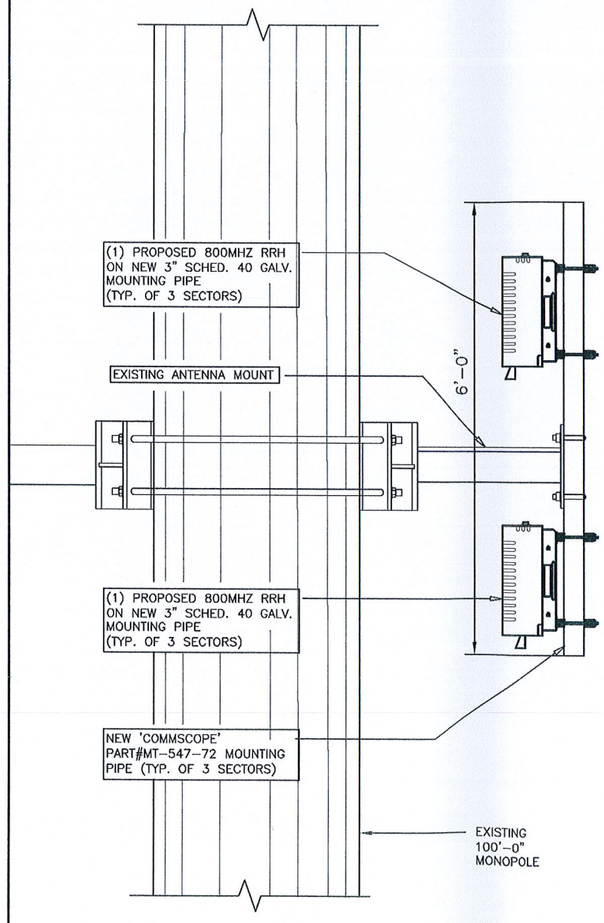
EQUIPMENT DETAILS

SHEET NUMBER

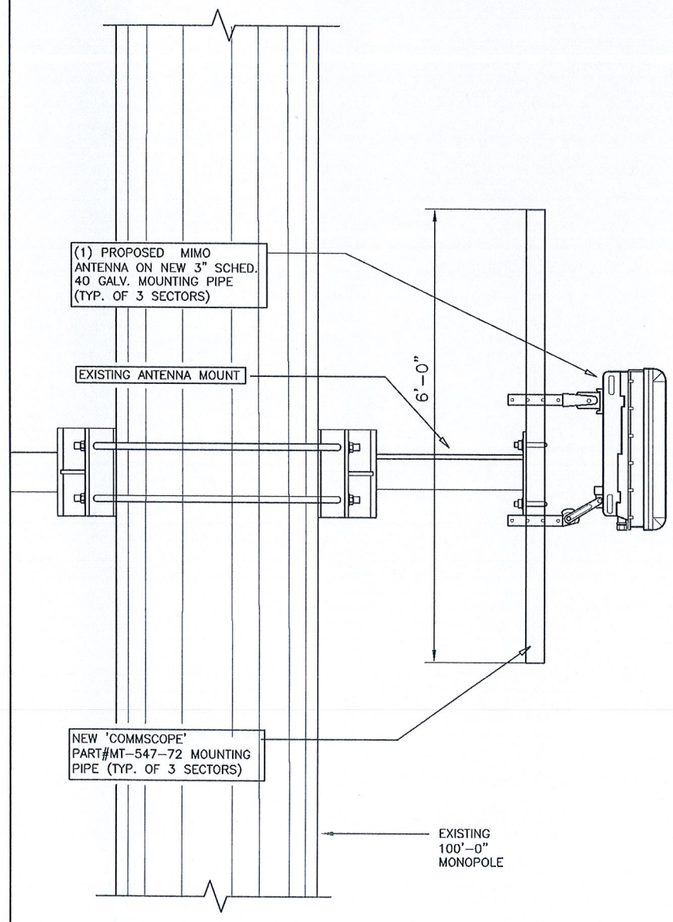
A-7



1 A-8 TYPICAL 800/1900 MHz ANTENNA/RRH MOUNTING DETAIL
SCALE: 1/2"=1'-0"



2 A-8 TYPICAL 800 MHz RRH MOUNTING DETAIL
SCALE: 1/2"=1'-0"



3 A-8 MIMO ANTENNA MOUNTING DETAIL
SCALE: 1/2"=1'-0"

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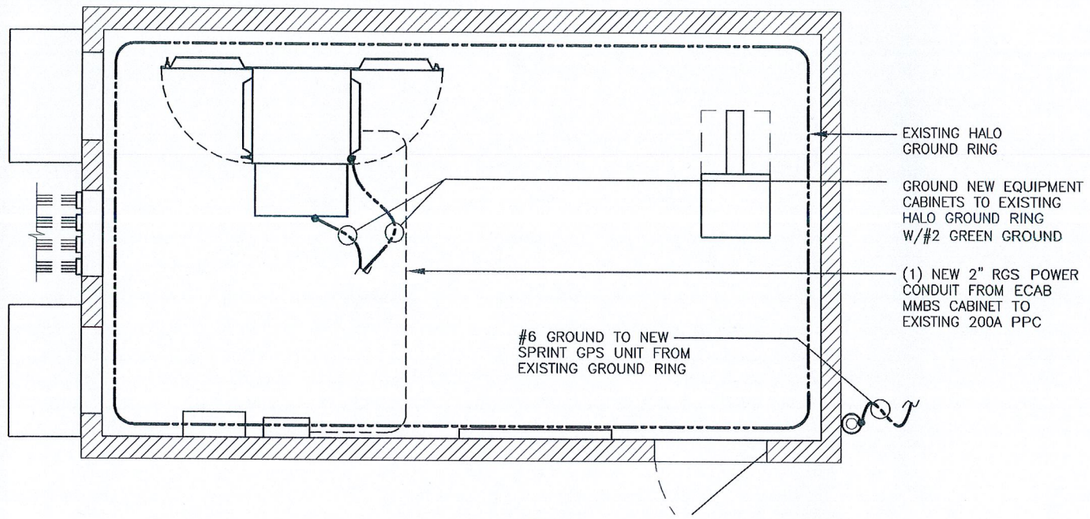
NEW HAVEN COUNTY

SHEET TITLE
ANTENNA MOUNTING DETAILS

SHEET NUMBER
A-8



1 / E-1 PROPOSED ELECTRIC PLAN
SCALE: 1/4"=1'-0"

GROUNDING NOTES:

1 ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.

2 IF THE AC PANEL IN THE POWER CABINET IS WIRED AS SERVICE ENTRANCE, THE AC SERVICE GROUND CONDUCTOR SHALL BE CONNECTED TO GROUND ELECTRODE SYSTEM. WHEN THE AC PANEL IN THE POWER CABINET IS CONSIDERED A SUB-PANEL, THE GROUND WIRE SHALL BE INSTALLED IN THE AC POWER CONDUIT. THE INSTALLATION SHALL BE PER LOCAL AND NATIONAL ELECTRIC CODE (NFPA-70).

3 EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL. OTHERWISE, THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES. LONG BARREL LUGS OR DOUBLE CRIMP CLAMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH ANTIOXIDANT (COPPER SHIELD) BEFORE MAKING THE CONNECTIONS. THE MANUFACTURER'S TORQUE RECOMMENDATIONS ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS SHALL BE FOLLOWED.

4 THE ANTENNA CABLES SHALL BE GROUNDED AT THE TOP AND BOTTOM OF THE VERTICAL RUN FOR LIGHTING PROTECTION. THE ANTENNA CABLE SHIELD SHALL BE BONDED TO A COPPER GROUND BUSS AT THE LOWER MOST POINT OF A VERTICAL RUN JUST BEFORE IT BEGINS TO BEND TOWARD THE HORIZONTAL PLANE. WIRE RUNS TO GROUND SHALL BE KEPT AS STRAIGHT AND SHORT AS POSSIBLE. ANTENNA CABLE SHIELD SHALL BE GROUNDED JUST BEFORE ENTERING THE CELL CABINET. ANY ANTENNA CABLES OVER 200 FEET IN LENGTH SHALL ALSO BE EQUIPPED WITH ADDITIONAL GROUNDING AT MID-POINT.

5 ALL GROUNDING CONDUCTORS INSIDE THE BUILDING SHALL BE RUN IN CONDUIT RACEWAY SYSTEM, AND SHALL BE INSTALLED AS STRAIGHT AS PRACTICAL WITH MINOR BENDS TO AVOID OBSTRUCTIONS. THE BENDING RADIUS OF ANY #2 GROUNDING CONDUCTOR IS 8". PVC RACEWAY MAY BE FLEXIBLE OR RIGID PER THE FIELD CONDITIONS. GROUNDING CONDUCTORS SHALL NOT MAKE CONTACT WITH ANY METALLIC CONDUITS, SURFACES OR EQUIPMENT.

6 PROVIDE PVC SLEEVES WHERE GROUNDING CONDUCTORS PASS THROUGH THE BUILDING WALLS AND /OR CEILINGS.

7 INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUSS IN THE PANEL BOARD.

8 GROUND ANTENNA BASES, FRAMES, CABLE RACKS AND OTHER METALLIC COMPONENTS WITH #2 GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.

9 GROUND COAXIAL SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.GROUND FIELD TEST PROCEDURE:
A. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A "FALL OF POTENTIAL" TEST ON THE NEW SUPPLEMENTAL GROUND FIELD PRIOR TO FINAL CONNECTION OF THE GROUNDING SYSTEM TO EQUIPMENT. THE TEST SHALL BE PERFORMED BY A QUALIFIED AND CERTIFIED TESTING AGENT. PROVIDE INDEPENDENT TEST RESULTS TO THE PROJECT MANAGER FOR REVIEW. THE GROUND SYSTEM RESISTANCE TO EARTH GROUND SHALL NOT EXCEED FIVE (5) OHMS. IF THE GROUND TEST EXCEEDS THE MAXIMUM OF 5 OHMS

GROUNDING LEGEND (ITEMS IN THIS LEGEND ONLY APPLY AS DETAILED IN GROUNDING PLAN):

(A) GROUNDING RING. #2 AWG SOLID BARE TINNED COPPER WIRE

(B) GROUND ROD

(C) INSPECTION WELL

(D) STEEL EQUIPMENT PLATFORM GROUNDING

(E) STEEL EQUIPMENT GROUNDING

(F) ICE BRIDGE GROUNDING AT EACH POST,

(G) NEW GROUND RING BONDED TO EXISTING GROUND RING,

(H) EXISTING GROUND RING. FIELD DETERMINE EXACT LOCATION.

(J) SPRINT EQUIPMENT CABINET GROUNDING, TYP OF 3

GROUNDING LEGEND

- GROUND RING
- GROUND ROD
- INSPECTION WELL
- CADWELD CONNECTION (EXOTHERMIC WELD)
- MECHANICAL CONNECTION

CADWELD CONNECTIONS OR APPROVED EQUAL		BURNDY CONNECTIONS OR APPROVED EQUAL
 PARALLEL HORIZONTAL CONDUCTORS — PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES — TYPE PT	 HORIZONTAL STEEL SURFACE — TO FLAT STEEL SURFACE OR HORIZONTAL PIPE — TYPE HS	 BOND JUMPER — FIELD FABRICATED GREEN STRANDED INSULATED — TYPE 2-YA-2
 THROUGH CABLE TO GROUND ROD — THROUGH CABLE TO TOP OF GROUND ROD — TYPE GT	 VERTICAL STEEL SURFACE — CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE — TYPE VS	 COPPER LUGS — TWO HOLE - LONG BARREL LENGTH — TYPE YA-2
 VERTICAL PIPE — CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES — TYPE VS		

TYPICAL CADWELD TYPE CONNECTIONS
NO SCALE

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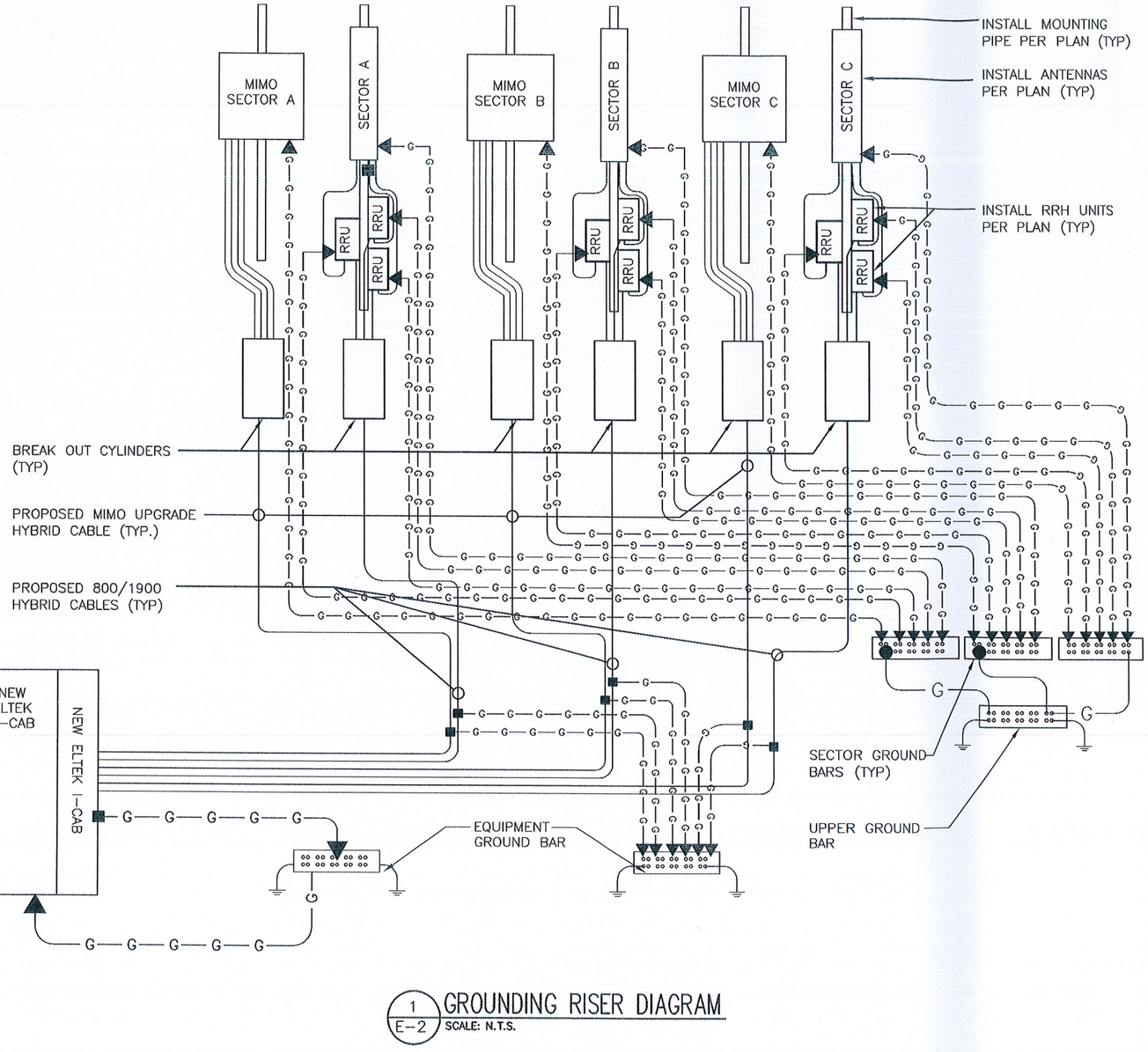
SHEET TITLE
ELECTRIC PLAN & NOTES

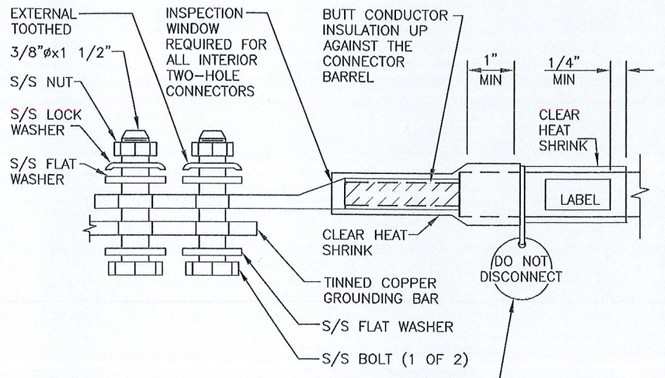
SHEET NUMBER
E-1

SYMBOL LEGEND

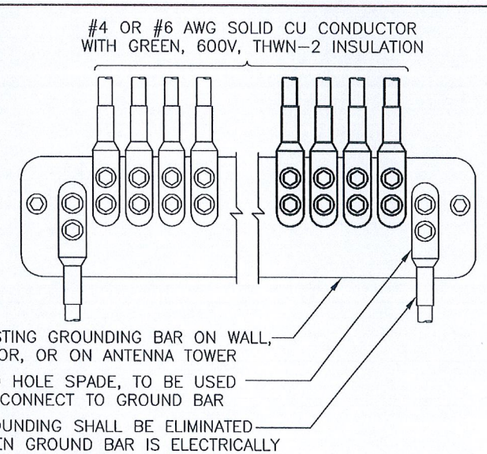
- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION



1 / E-2 GROUNDING RISER DIAGRAM
SCALE: N.T.S.



2 / E-2 TWO HOLE LUG
SCALE: N.T.S.



1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

3 / E-2 GROUND CONDUCTOR INSTALLATION
SCALE: N.T.S.

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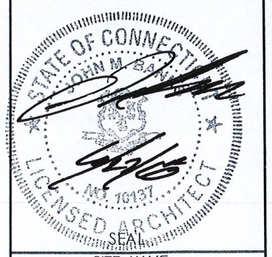

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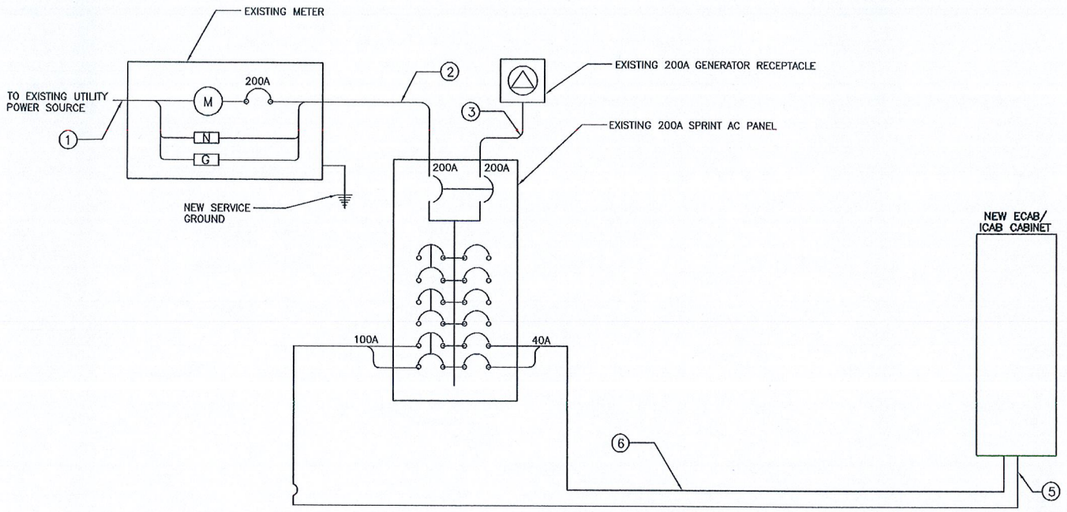
SHEET TITLE
GROUNDING DETAILS

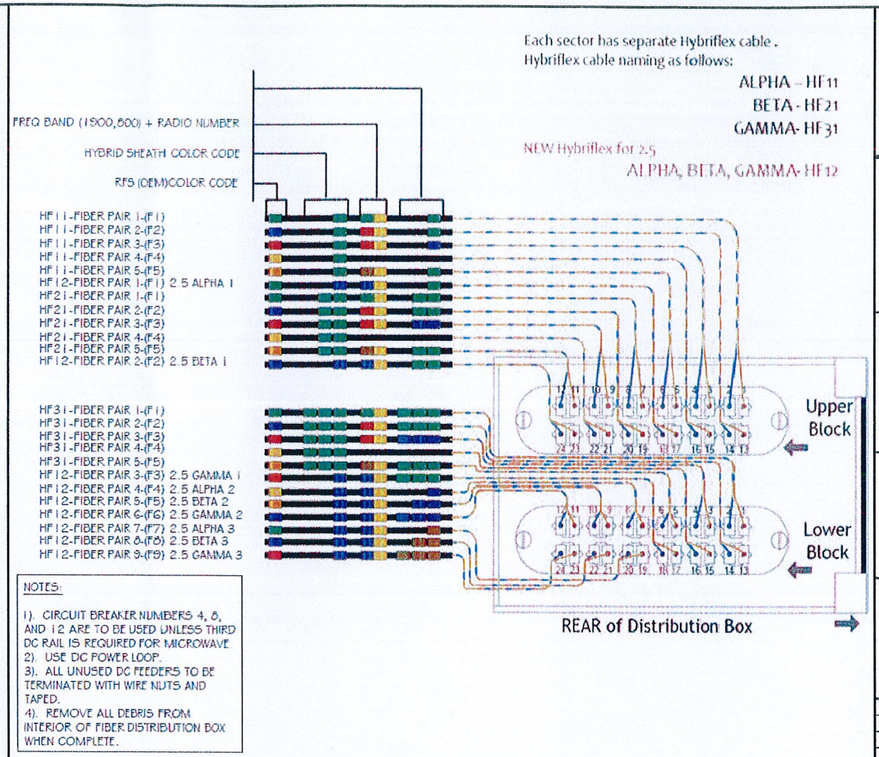
SHEET NUMBER
E-2



1 E-3 ELECTRICAL ONE-LINE DIAGRAM
SCALE: N.T.S.

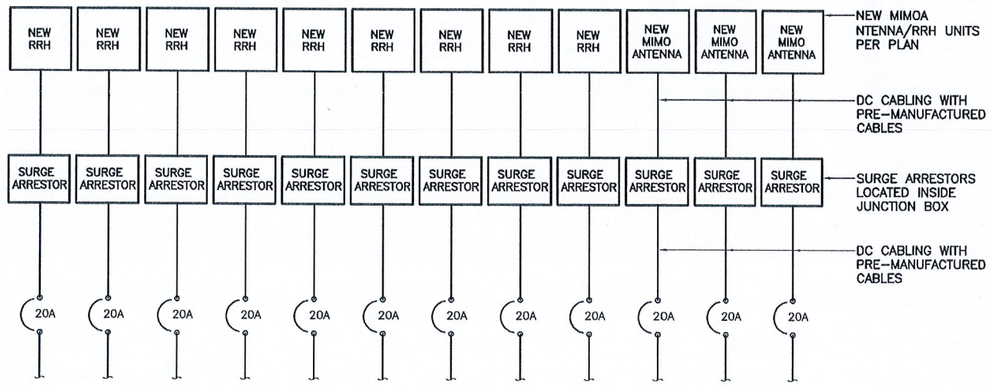
CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	(2) #4/0+(1)#2 IN 2" CONDUIT
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	(2) #4/0+(1)#2 IN 2" CONDUIT
3	TRANSFER & LOAD CTR.	GENERATOR RECEPTACLE	(2) #4/0+(1)#2 IN 2" CONDUIT
4	TRANSFER & LOAD CTR.	NEW SPRINT BCAB CABINET	N/A
5	TRANSFER & LOAD CTR.	NEW SPRINT E-CAB/I-CAB CABINET	(2) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT
6	TRANSFER & LOAD CTR.	NEW MIMO EQUIPMENT	(3) #8 IN 1" CONDUIT

NOTE: CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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.

2 E-3 TYPICAL DC POWER DISTRIBUTION
SCALE: N.T.S.



3 E-3 DC ONE-LINE DIAGRAM
SCALE: N.T.S.

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JOHN M. BANKS ARCHITECT
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BARRINGTON, IL 60010
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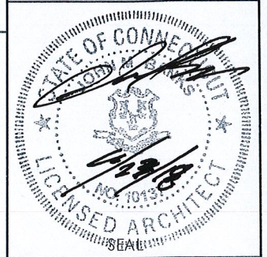
NO.	DATE	DESCRIPTION
0	04.27.18	FINAL CD

DRAWN BY: SH
CHECKED BY: JMB
JOB NUMBER: CT52XC073-B
ARCHITECT: JOHN BANKS



SITE NAME
SPRINT LAYDON CT2507

SITE NUMBER
CT52XC073-B

SITE LOCATION
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-3