



Together with Nextel

10 Industrial Ave, Suite 3
Mahwah, NJ 07430
Phone: (845)499-4712
Jennifer Notaro
Real Estate Consultant

September 5, 2014

Hand Delivered

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

CC to Property Owner
Town of Waterford, Waterford Utility Commission
1000 Hartford Turnpike, Waterford, CT 06385

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 45R Fargo Road, Waterford, CT 06385. Known to Sprint Spectrum L.P. as site CT03XC112.

Dear Ms. Bachman:

In order to accommodate technological changes, implement Code Division Multiple Access (“CDMA”) and/or Long Term Evolution (“LTE”) capabilities, and enhance system performance in the state of Connecticut, Sprint Spectrum L.P. plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of 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 and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

CDMA employs Spread-Spectrum technology and special coding scheme to allow multiple users to be multiplexed over the same physical channel.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

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 to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more CDMA transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, 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 applicable standard for uncontrolled environments as calculated for a mixed frequency site.

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

Please feel free to call me at (845)-499-4712 or email JNotaro@Transcendwireless.com with questions concerning this matter. Thank you for your consideration.

Sincerely,

Jennifer Notaro
Real Estate Consultant

RADIO FREQUENCY FCC REGULATORY COMPLIANCE
MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT03XC112

Douglas Hill Wayer Tank

450 Fargo Road
Waterford, CT 06385

July 2, 2014

EBI Project Number: 62143746

July 2, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC112 - Douglas Hill Wayer Tank

Site Total: 9.29% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 450 Fargo Road, Waterford, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 public 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 public 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.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 450 Fargo Road, Waterford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

- 1) 3 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
- 2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
- 3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
- 4) 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.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB 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.

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20, RFS APXV9ERR18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXV9ERR18-C-A20 has a 14.9 dBd gain value at its main lobe at 1900 MHz and 11.9 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline for the proposed antennas is **140 feet** above ground level (AGL).
- 8) 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 calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT03XC112 - Douglas Hill Wayer Tank
Site Address	450 Fargo Road, Waterford, CT, 06385
Site Type	Water Tank

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	140	134	1/2 "	0.5	0	208.04	0.42%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	140	134	1/2 "	0.5	0	39.00	0.14%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	140	134	1/2 "	0.5	0	138.69	0.49%
Sector total Power Density Value:																1.04%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	140	134	1/2 "	0.5	0	208.04	0.42%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	140	134	1/2 "	0.5	0	39.00	0.14%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	140	134	1/2 "	0.5	0	138.69	0.49%
Sector total Power Density Value:																1.04%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXV9ERR18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	4.9	140	134	1/2 "	0.5	0	165.25	0.33%
3a	RFS	APXV9ERR18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	1.9	140	134	1/2 "	0.5	0	27.61	0.10%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	140	134	1/2 "	0.5	0	138.69	0.49%
Sector total Power Density Value:																0.92%

Site Composite MPE %	
Carrier	MPE %
Sprint	3.01%
Nextel	2.91%
Town of Waterford	3.37%
Total Site MPE %	9.29%

Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **3.01% (1.04% from sector 1, 1.04% from sector 2 and 0.92% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **9.29%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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



Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803



May 22, 2014

Mike Kithcart
Transcend Wireless
48 Spruce Street, Oakland, NJ 07436

SUBJECT: STRUCTURAL ASSESSMENT

**SITE: DOUGLAS HILL WATER TANK (CT03XC112-P)
450 FARGO ROAD
WATERFORD, NEW LONDON COUNTY, CONNECTICUT 06385
RAMAKER & ASSOCIATES PROJECT NUMBER: 28722**

Dear Mr. Kithcart:

This structural assessment is a review of the loading condition changes at the above referenced site. Ramaker & Associates (RAMAKER) was specifically tasked to investigate loading changes associated with the Transcend Wireless (TRANSCEND) project associated with the construction/installation of new Sprint (SPRINT) equipment. Assuming the conditions outlined below, it is the finding of RAMAKER that the existing structure(s) and MODIFIED antenna and RRH mounts will adequately support the proposed SPRINT modifications.

In order to complete the structural assessment, RAMAKER utilized records and information gathered in order to prepare this report's findings, including:

- 1) Construction drawings by RAMAKER, job number 28722, dated May 13, 2014,
- 2) A site visit conducted by RAMAKER,
- 3) As-built construction drawings by Tectonic Engineering & Surveying Consultants P.C., dated August 21, 2013,
- 4) As-built construction drawings by Goodkind & O'Dea, Inc., dated December 21, 1998,
- 5) Structural Analysis by Tectonic Engineering & Surveying Consultants P.C., dated December 12, 2012,
- 6) Previously procured data by RAMAKER during other site due diligence activities, or
- 7) Were assumed (noted as such on existing loading)

RAMAKER understands that the current SPRINT antenna loading consists of:

- (2) RFS APXVSP18-C-A20 Panel Antennas (Alpha and Gamma sectors)
- (1) RFS APXV9ERR18-C-A20 Panel Antenna (Beta sector)
- (3) ALU 800 MHz RRH Units (1 per sector)
- (3) ALU 800 MHz Notch Filters (1 per sector)
- (3) ALU 1900 MHz RRH Units (1 per sector)

RAMAKER understands that the proposed SPRINT antenna loading will consist of:

- (3) RFS APXV9TM14-ALU-120 Panel Antennas (1 per sector)
- (3) ALU 2.5 GHz RRH Units (1 per sector)

To summarize our findings, SPRINT currently has three (3) panel antennas and six (6) RRH units installed on three (3) individual pipe mounts. SPRINT is proposing to install three (3) new 2.5GHz panel antennas (1 per sector) and three (3) new 2.5GHz RRH units (1 per sector) on three (3) modified pipe mounts at a centerline elevation of 140 feet AGL. A structural analysis determined that the modified mounting structures are adequate under proposed loading conditions.

By engineering calculation and inspection, the modified antenna and RRH mounting structures are capable of supporting the proposed SPRINT 2.5 equipment deployment without causing an overstress condition in the antenna and RRH mounting structures. The modified antenna mounting structures

shall be installed per the associated construction drawings by RAMAKER prior to any new equipment being installed.

This assessment is inclusive of the entire antenna and RRH mounting structure, including pipe mounts, mounting hardware, and all other aspects of the mounting structure that will support the SPRINT 2.5 equipment deployment.

RAMAKER understands that SPRINT is not proposing any modifications to the existing steel plinth. Therefore, no assessment of the existing steel plinth was completed.

By engineering calculation and inspection, the existing water tower structure is capable of supporting the proposed SPRINT 2.5 equipment deployment without causing an overstress condition in the water tower structure. Therefore, it is RAMAKER's assessment that the existing water tower structure will adequately support the proposed equipment configuration.

In review of the information presented above, it is the finding of RAMAKER that no further assessment is required and the structure(s) will provide adequate support for the modifications proposed by TRANSCEND on behalf of SPRINT.

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

1. Missing, corroding, and/or deteriorating members,
2. Improper manufacturing and/or construction, or
3. Improper maintenance.

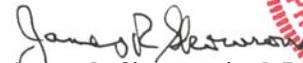
The loading configuration used in the analysis is based on information provided by TRANSCEND, who is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If you are aware of any information contrary to that contained herein, or if you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact RAMAKER. RAMAKER is not liable for any representation, recommendation or conclusion not expressly stated herein.

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

Sincerely,

RAMAKER & ASSOCIATES, INC.


Joshua M. Opseth
Engineering Technician


James R. Skowronski, P.E.
Supervising Engineer



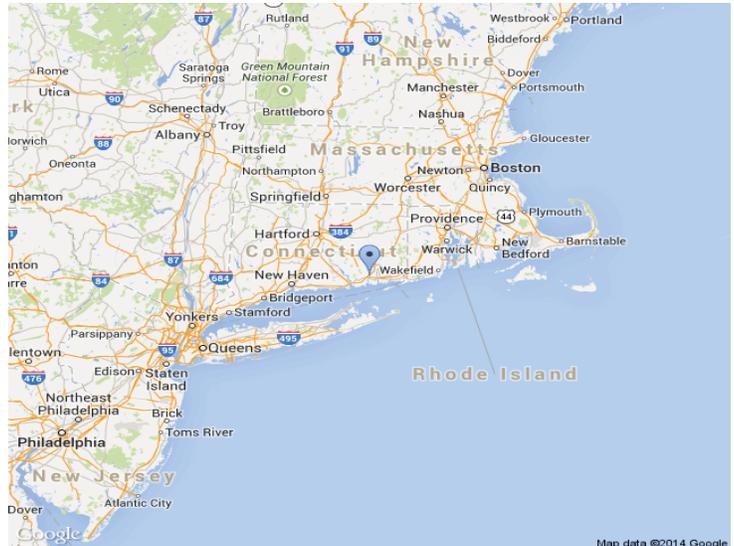
Search Results

Latitude: 41.3864
Longitude: -72.1728

**ASCE 7-10 Wind Speeds
(3-sec peak gust MPH*):**

Risk Category I: 123
Risk Category II: 133
Risk Category III-IV: 143
MRI 10 Year: 79**
MRI 25 Year: 89**
MRI 50 Year: 98**
MRI 100 Year: 108**

ASCE 7-05: 118
ASCE 7-93: 85



*MPH(Miles per hour)

**MRI Mean Recurrence Interval (years)

Users should consult with local building officials
to determine if there are community-specific wind speed
requirements that govern.

WIND SPEED WEB SITE DISCLAIMER:

While the information presented on this web site is believed to be correct, ATC assumes no responsibility or liability for its accuracy. The material presented in the wind speed report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the wind speed report provided by this web site. Users of the information from this web site assume all liability arising from such use. Use of the output of this web site does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site(s) described by latitude/longitude location in the wind speed report.



1120 Dallas Street Sauk City, WI 53583
(608) 643-4100
FAX (608) 643-7999
e-mail: ramaker@ramaker.com

JOB 28722 (CT03XC112-P)
SHEET NO 1 OF 1
CALCULATED BY JMO DATE 05/21/14
CHECKED BY _____ DATE _____
SCALE nts

TIA-222 Section 2.6.6.4 Topographic Factor

2.6.6.2 Topographic Categories

The topographic category for a structure shall be assessed as being one of the following:

1. Category 1: No abrupt changes in general topography, e.g. flat or rolling terrain, no wind speed-up consideration shall be required.
2. Category 2: Structures located at or near the crest of an escarpment. Wind speed-up shall be considered to occur in all directions. Structures located vertically on the lower half of an escarpment or horizontally beyond 8 times the height of the escarpment from its crest, shall be permitted to be considered as Topographic Category 1.
3. Category 3: Structures located in the upper half of a hill. Wind speed-up shall be considered to occur in all directions. Structures located vertically on the lower half of a hill shall be permitted to be considered as Topographic Category 1.
4. Category 4: Structures located in the upper half of a ridge. Wind speed-up shall be considered to occur in all directions. Structures located vertically on the lower half of a ridge shall be permitted to be considered as Topographic Category 1.

Exposure Category **C** $K_e = 1.00$
Topographic Category **3** $K_t = 0.53$
 $f = 2.00$

$z = 140.0$ ft height of antennas above ground level
 $H = 147.0$ ft height of hill
 $K_h = 6.7$

$K_{zt} = 1.16$



1120 Dallas Street
 Sauk City, WI 53583
 Phone: (608) 643-4100
 Fax: (608) 643-7999

Job: 28722
 Project: DOUGLAS HILL WATER TANK (CT03XC112-P)
 By: JMO
 Date: 5/22/2014

Water Tower Information

AWWA D100-05

Tank Class	2
Water tank capacity	750000 gal
Ball Diameter	64.5 ft
Ball Height	52 ft
Ball Thickness Upper Half	0.3125 in
Ball Thickness Lower Half (Avg)	0.88375 in
Ball CL Height	111.5 ft
Shaft OD	15.213 ft
Shaft ID	15 ft
Shaft Length	61 ft
Shaft CL Height	55 ft
Top of Shaft Thickness	1.127 in
Bottom of Shaft Thickness	1.426 in
Bell Inside Diameter	27.83 ft
Bell Height	24.5 ft
Bell CL Height	11.053 ft
Bottom of Bell Thickness	1.113 in
Number of Anchor Bolts	36
Anchor Bolt Diameter	2.25 in
Anchor Bolt Type	A36
Bolt Circle Diameter	29.83 ft
Overall Tank Height	137.5 ft

Wt ball	166.75 kips
Access Tube (added weight to Wt ball)	
Shaft OD	3.5 ft
Shaft Thickness	0.3125 in
Shaft Length	52 ft
Wt shaft	150.90 kips
Wt bell	86.08 kips
Misc DL	20.19 kips
Base Plate, Riser, Overflow, Ladders, etc. = 5% of (Wt _{ball} + Wt _{shaft} + Wt _{bell})	

Wind Loads

$$P_w = q_z G C_f$$

Pw Ball	26.5 psf	kz Ball	1.29
Pw Shaft	27.4 psf	kz Shaft	1.12
Pw Bell	26.9 psf	kz Bell	1.09
Area Ball	2664.9 sq ft		
Area Shaft	928.0 sq ft		
Area Bell	527.3 sq ft		
Wind load on Ball	70.7 k		
Wind load on Shaft	25.5 k		
Wind load on Bell	14.2 k		
Moment at top of shaft	1839.0 k-ft		
Moment at top of bell	6930.4 k-ft		
Moment at bottom of bell	9444.1 k-ft		

Axial Loads

Water Load	6256.3 k
Tower Load	423.9 k
Antennas + Handrail/Mounts	0.6 k
Total	6680.8 k

Wind Load On Appurtenances

Antennas + Handrail/Mounts	7032.0 lb
Add'l Moment at top of shaft	410.2 k-ft
Add'l Moment at top of bell	839.2 k-ft
Add'l Moment at bot. of bell	1011.5 k-ft
Total Moment at top of shaft	2249.2 k-ft
Total Moment at top of bell	7769.6 k-ft
Total Moment at bot. of bell	10455.6 k-ft

	Full	Empty
Total Weight at top of shaft	6443.8	187.6 k
Total Weight at top of bell	6594.7	338.5 k
Total Weight at bot. of bell	6680.8	424.5 k

Check Stresses	Top of Shaft		Top of Bell		Bottom of Bell	
Radius	90.564 in		90.713 in		167.537 in	
Thickness	1.127 in		1.426 in		1.113 in	
fa	10048.1 psi		8113.8 psi		5702.2 psi	
fb	932.1 psi		932.1 psi		1274.4 psi	
(t/R)c	0.0035372		0.0035372		0.0035372	
t/R	0.0124443		0.0157199		0.0066433	
F _L	17950.7 psi		18000.0 psi		12811.0 psi	
C' _c	126.3		126.1		149.5	
Radius of gyration	64.0 in		64.1 in		118.5 in	
KL/r	22.9		22.8		5.0	
Kφ	1.000000		1.000000		1.000000	
Fa	17950.7	56.0%	18000.0	45.1%	12811.0	44.5%
Fb	17950.7	5.2%	18000.0	5.2%	12811.0	9.9%
fa / 1.33 Fa + fb / 1.33 Fb	OK	46.0%	OK	37.8%	OK	40.9%

Check Anchor Bolts

Number of Bolts	36	
Bolt Diameter	2.25 in	
Root Diameter	2.03 in	
Root Area	3.25 sq in	
Bolt Circle Diameter	29.83 ft	
Allowable Stress	15.00 ksi	
Moment at Base	10455.6 k-ft	
Max. Bolt Tension	27.2 k	(Eqn. 3-41)
Allowable Tension	64.8 k	(See Table 4)
Capacity	41.9%	OK

Check Moment % Increase

Moment w/o Antennas	9444.1 k-ft
Moment w/ Antennas	10455.6 k-ft
% Increase	10.7%

Pedisphere Wind Load Determination - AWWA D100-05

Code	AWWA D-100		
Exposure	C		Exposure Category (Section 3.1.4.2)
V	118	mph	Basic Wind Speed (Figure 6-1, ASCE 7-05)
I	1.15		Importance Factor (3.1.4)
G	1		Gust-Effect Factor (Eq 3-1 page 12)

Num.	Antenna	Top of Shaft	Top of Bell	Bottom of Bell
		OTM @ 86 ft (lb-ft)	OTM @ 25 ft (lb-ft)	OTM @ 0 ft (lb-ft)
1	15' Omni	55663.9	109991.9	131812.1
2	APXV9TM14-ALU-120	47057.7	95301.7	114678.4
3	TD-RRH8x20	30992.1	62765.5	75526.9
4	APXV9ERR18-C-A20	19300.3	39087.3	47034.5
5	APXVSP18-C-A20	38600.7	78174.5	94068.9
6	1900MHz 4x40W RRH	17981.3	36415.9	43820.0
7	800MHz 2x50W RRH	15780.4	31958.5	38456.3
8	Pipe3STD x 10 ft	24623.2	49867.2	60006.2
9	Pipe2STD x 10 ft	16743.8	33909.7	40804.2
10	Pipe2STD x 5 ft	13953.2	28258.1	34003.5
11	2 FT DISH	11425.1	23138.3	27842.8
12	L2-1/2X2-1/2X3/16 x 3.5 ft	118117.6	250322.7	303421.5
13				
14				
15				
16				
17				
18				
19				
20				
		410239 lb-ft	839191 lb-ft	1011475 lb-ft
		410.2 k-ft	839.2 k-ft	1011.5 k-ft



1120 Dallas Street
 Sauk City, WI 53583
 Office: (608) 643-4100

Job: 28722
 Project: DOUGLAS HILL WATER TANK (CT03XC112-P)
 By: JMO
 Date: 5/22/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

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

Occupancy: III Classification of Structures (Table 2-1)
 Exposure: C Exposure Category
 V: 118 mph Basic Wind Speed (Annex B)
 I: 1.15 Importance Factor (Table 2-3)
 K_{zt}: 1.16 Topographic Factor (2.6.6.4)
 K_d: 0.95 Wind Direction Probability Factor (Table 2-2)
 G_h: 1.10 Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C _a	A _f	F = q _z G _h C _a A _a
15' Omni	180.0 in	3.0 in	60.0	Round	1.200	3.75 sf	307.4 lb
APXV9TM14-ALU-120	56.3 in	12.6 in	4.5	Flat	1.287	4.93 sf	431.3 lb
TD-RRH8x20	26.1 in	18.6 in	1.4	Flat	1.200	3.37 sf	275.1 lb
APXV9ERR18-C-A20	72.0 in	11.9 in	6.1	Flat	1.358	5.95 sf	549.1 lb
APXVSPP18-C-A20	72.0 in	11.9 in	6.1	Flat	1.358	5.95 sf	549.1 lb
1900MHz 4x40W RRH	25.1 in	11.1 in	2.3	Flat	1.200	1.93 sf	157.9 lb
800MHz 2x50W RRH	19.0 in	13.0 in	1.5	Flat	1.200	1.72 sf	140.0 lb
Pipe3STD x 10 ft	120.0 in	3.5 in	34.3	Round	1.200	2.92 sf	238.0 lb
Pipe2STD x 10 ft	120.0 in	2.4 in	50.4	Round	1.200	1.98 sf	161.9 lb
Pipe2STD x 5 ft	60.0 in	2.4 in	25.2	Round	1.200	0.99 sf	80.9 lb
2 FT DISH	24.0 in	0.0 in	1.0	Generic	1.551	3.14 sf	331.3 lb
L2-1/2X2-1/2X3/16 x 3.5 ft	42.0 in	2.5 in	16.8	Flat	1.727	0.73 sf	85.0 lb



1120 Dallas Street
 Sauk City, WI 53583
 Office: (608) 643-4100

Job: 28722
 Project: DOUGLAS HILL WATER TANK (CT03XC112-P)
 By: JMO
 Date: 5/22/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

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

Occupancy:	III	Classification of Structures (Table 2-1)
Exposure:	C	Exposure Category
V:	118 mph	Basic Wind Speed (Annex B)
I:	1.15	Importance Factor (Table 2-3)
K _{zt} :	1.16	Topographic Factor (2.6.6.4)
K _d :	0.95	Wind Direction Probability Factor (Table 2-2)
G _h :	1.10	Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C _a	A _f	F = q _z G _h C _a A _a
15' Omni	180.0 in	3.0 in	60.0	Round	1.200	3.75 sf	307.4 lb
APXV9TM14-ALU-120	56.3 in	6.3 in	8.9	Flat	1.465	2.46 sf	245.3 lb
TD-RRH8x20	26.1 in	6.7 in	3.9	Flat	1.262	1.21 sf	104.2 lb
APXV9ERR18-C-A20	72.0 in	7.9 in	9.1	Flat	1.470	3.95 sf	395.1 lb
APXVSPP18-C-A20	72.0 in	7.0 in	10.3	Flat	1.509	3.50 sf	359.7 lb
1900MHz 4x40W RRH	25.1 in	10.7 in	2.3	Flat	1.200	1.86 sf	152.1 lb
800MHz 2x50W RRH	19.0 in	12.2 in	1.6	Flat	1.200	1.61 sf	131.4 lb
Pipe3STD x 10 ft	120.0 in	3.5 in	34.3	Round	1.200	2.92 sf	238.0 lb
Pipe2STD x 10 ft	120.0 in	2.4 in	50.4	Round	1.200	1.98 sf	161.9 lb
Pipe2STD x 5 ft	60.0 in	2.4 in	25.2	Round	1.200	0.99 sf	80.9 lb
2 FT DISH	24.0 in	0.0 in	1.0	Generic	0.344	3.14 sf	73.5 lb
L2-1/2X2-1/2X3/16 x 3.5 ft	42.0 in	2.5 in	16.8	Flat	1.727	0.73 sf	85.0 lb



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Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

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

Occupancy:	II	Classification of Structures (Table 2-1)
Exposure:	C	Exposure Category
V:	118 mph	Basic Wind Speed (Annex B)
z:	140 ft	Height above ground level to the center of the antenna
I:	1.00	Importance Factor (Table 2-3)
K _z :	1.36	Velocity Pressure Coefficient (2.6.5.2)
K _{zt} :	1.16	Topographic Factor (2.6.6.4)
K _d :	0.95	Wind Direction Probability Factor (Table 2-2)

q_z = 53.4 psf

G_h: 1.00 Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C _a	A _f	F = q _z G _h C _a A _a	
Pipe3STD x 10 ft	120.0 in	3.5 in	34.3	Round	0.889	2.92 sf	138.3 lb	13.8 plf
Pipe2STD x 2.25 ft	27.0 in	2.4 in	11.3	Round	0.897	0.45 sf	21.4 lb	9.5 plf
L2-1/2X2-1/2X3/16 x 3.5 ft	42.0 in	2.5 in	16.8	Flat	1.727	0.73 sf	67.2 lb	19.2 plf
APXV9TM14-ALU-120	56.3 in	12.6 in	4.5	Flat	1.287	4.93 sf	338.5 lb	
TD-RRH8x20	26.1 in	18.6 in	1.4	Flat	1.200	3.37 sf	215.9 lb	



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 Date: 5/22/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

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

Occupancy:	II	Classification of Structures (Table 2-1)
Exposure:	C	Exposure Category
V:	118 mph	Basic Wind Speed (Annex B)
z:	140 ft	Height above ground level to the center of the antenna
I:	1.00	Importance Factor (Table 2-3)
K _z :	1.36	Velocity Pressure Coefficient (2.6.5.2)
K _{zt} :	1.16	Topographic Factor (2.6.6.4)
K _d :	0.95	Wind Direction Probability Factor (Table 2-2)

q_z = 53.4 psf

G_h: 1.00 Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C _a	A _f	F = q _z G _h C _a A _a	
Pipe3STD x 10 ft	120.0 in	3.5 in	34.3	Round	0.889	2.92 sf	138.3 lb	13.8 plf
Pipe2STD x 2.25 ft	27.0 in	2.4 in	11.3	Round	0.897	0.45 sf	21.4 lb	9.5 plf
L2-1/2X2-1/2X3/16 x 3.5 ft	42.0 in	2.5 in	16.8	Flat	1.727	0.73 sf	67.2 lb	19.2 plf
APXV9TM14-ALU-120	56.3 in	6.3 in	8.9	Flat	1.465	2.46 sf	192.5 lb	
TD-RRH8x20	26.1 in	6.7 in	3.9	Flat	1.262	1.21 sf	81.8 lb	



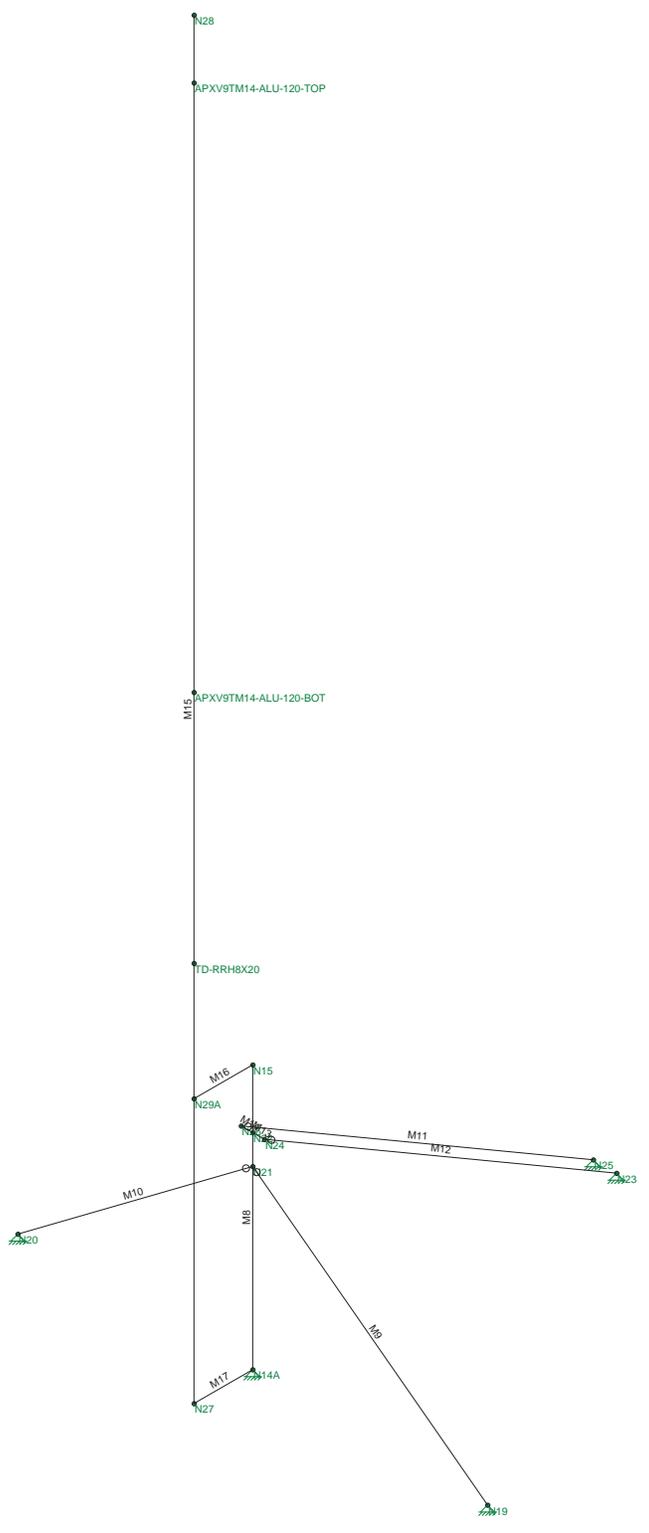
1120 Dallas Street
Sauk City, WI 53583
Office: (608) 643-4100

Job: 28722
Project: DOUGLAS HILL WATER TANK (CT03XC112-P)
By: JMO
Date: 5/22/2014

Stud Weld Check (Nelson Capacitor Discharge Stud Weld)

Shear Check		Tension Check			
V (lb)		P (lb)			
2705		2676			
<hr/>		<hr/>			
3250	8	4300	8		
Vu (lb)	# bolts	Pu (lb)	# bolts		
10.4%		7.8%			
				=	0.182
					≤ 1 - OK

Note: Assumed 3/8" stud welds.



Envelope Only Solution

RAMAKER & ASSOCIATES

JMO

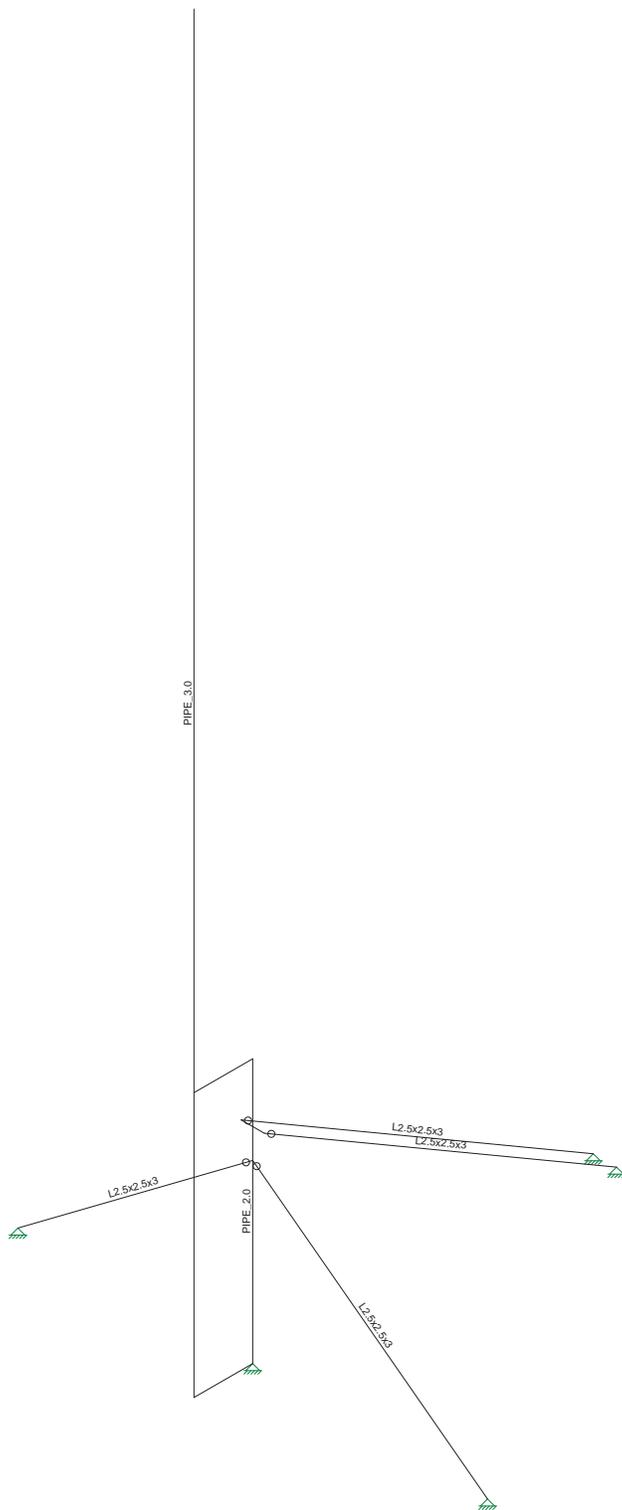
28722

DOUGLAS HILL WATER TANK (CT03XC112-P)

SK - 1

May 22, 2014 at 8:13 AM

28722 Mount.r3d



Envelope Only Solution

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28722

DOUGLAS HILL WATER TANK (CT03XC112-P)

SK - 2

May 22, 2014 at 8:14 AM

28722 Mount.r3d



Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	Gr. 33	29000	11154	.3	.65	.49	33	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
5	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
6	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
7	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	new pipe mount	PIPE 3.0	Beam	Pipe	A53 Gr. B	Typical	2.07	2.85	2.85	5.69
2	ex pipe mount	PIPE 2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
3	kicker	L2.5x2.5x3	Beam	Single Angle	Gr. 33	Typical	.901	.535	.535	.011

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M8	N15	N14A			ex pipe mount	Beam	Pipe	A53 Gr. B	Typical
2	M9	N19	N21		90	kicker	Beam	Single Angle	Gr. 33	Typical
3	M10	N20	N21		180	kicker	Beam	Single Angle	Gr. 33	Typical
4	M11	N25	N26		90	kicker	Beam	Single Angle	Gr. 33	Typical
5	M12	N23	N24		180	kicker	Beam	Single Angle	Gr. 33	Typical
6	M13	N24	N22			RIGID	None	None	RIGID	Typical
7	M14	N26	N22			RIGID	None	None	RIGID	Typical
8	M15	N28	N27			new pipe mount	Beam	Pipe	A53 Gr. B	Typical
9	M16	N29A	N15			RIGID	None	None	RIGID	Typical
10	M17	N27	N14A			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N14A	6.79	5	-.58	0	
2	N15	6.79	7.25	-.58	0	
3	N19	8.79	5	-.58	0	
4	N20	4.79	5	-.58	0	
5	N21	6.79	6.5	-.58	0	
6	N22	6.79	6.75	-.58	0	
7	N23	6.8892	5	-3.58	0	
8	N24	6.8892	6.75	-.58	0	
9	N25	6.6908	5	-3.58	0	
10	N26	6.6908	6.75	-.58	0	
11	N27	6.79	5	-.08	0	
12	N28	6.79	15.25	-.08	0	
13	APXV9TM14-ALU-120-TOP	6.79	14.75	-.08	0	
14	APXV9TM14-ALU-120-BOT	6.79	10.25	-.08	0	
15	TD-RRH8X20	6.79	8.25	-.08	0	
16	N29A	6.79	7.25	-.08	0	



Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N14A	Reaction	Reaction	Reaction				
2	N15							
3	N19	Reaction	Reaction	Reaction				
4	N20	Reaction	Reaction	Reaction				
5	N21							
6	N22							
7	N23	Reaction	Reaction	Reaction				
8	N24							
9	N25	Reaction	Reaction	Reaction				
10	N26							
11	N27							
12	N28							
13	APXV9TM14-ALU-...							
14	APXV9TM14-ALU-...							
15	TD-RRH8X20							
16	N29A							

Joint Loads and Enforced Displacements (BLC 1 : DL)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...]
1	APXV9TM14-ALU-120-TOP	L	Y	-27.5
2	APXV9TM14-ALU-120-BOT	L	Y	-27.5
3	TD-RRH8X20	L	Y	-70

Joint Loads and Enforced Displacements (BLC 2 : WLz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...]
1	APXV9TM14-ALU-120-TOP	L	Z	-169.2
2	APXV9TM14-ALU-120-BOT	L	Z	-169.2
3	TD-RRH8X20	L	Z	-215.9

Joint Loads and Enforced Displacements (BLC 3 : WLx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...]
1	APXV9TM14-ALU-120-TOP	L	X	-96.3
2	APXV9TM14-ALU-120-BOT	L	X	-96.3
3	TD-RRH8X20	L	X	-81.8

Member Distributed Loads (BLC 2 : WLz)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M9	PZ	-19.2	-19.2	0	0
2	M10	PZ	-19.2	-19.2	0	0
3	M11	PZ	-19.2	-19.2	0	0
4	M12	PZ	-19.2	-19.2	0	0

Member Distributed Loads (BLC 3 : WLx)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M8	X	-13.8	-13.8	0	0
2	M9	PX	-19.2	-19.2	0	0
3	M10	PX	-19.2	-19.2	0	0
4	M11	PX	-19.2	-19.2	0	0
5	M12	PX	-19.2	-19.2	0	0
6	M15	X	-9.5	-9.5	0	0



Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...)	Surface(P...
1	DL	DL		-1		3			
2	WLz	WLZ				3		4	
3	WLx	WLX				3		6	
4	LL1	LL							
5	LL2	None							

Load Combinations

	Description	Sol...	PDelta	SR...	BLC Factor									
1	1.4DL	Yes	Y	DL	1.4									
2	1.2DL+1.6WLz	Yes	Y	DL	1.2	WLZ	1.6							
3	1.2DL-1.6WLz	Yes	Y	DL	1.2	WLZ	-1.6							
4	1.2DL+1.6WLx	Yes	Y	DL	1.2	WLX	1.6							
5	1.2DL-1.6WLx	Yes	Y	DL	1.2	WLX	-1.6							
6	1.2DL+1.6(0.75WLz+0.75...	Yes	Y	DL	1.2	WLZ	1.2	WLX	1.2					
7	1.2DL+1.6(0.75WLz-0.75...	Yes	Y	DL	1.2	WLZ	1.2	WLX	-1.2					
8	1.2DL-1.6(0.75WLz-0.75...	Yes	Y	DL	1.2	WLZ	-1.2	WLX	1.2					
9	1.2DL-1.6(0.75WLz+0.75...	Yes	Y	DL	1.2	WLZ	-1.2	WLX	-1.2					
10	1.2DL+1.5LLend	Yes	Y	DL	1.2	LL	1.5							
11	1.2DL+1.5LLmid	Yes	Y	DL	1.2	5	1.5							
12	1.2DL+1.5LL+10%1.6WLz	Yes	Y	DL	1.2	LL	1.5	WLZ	.16					
13	1.2DL+1.5LL-10%1.6WLz	Yes	Y	DL	1.2	LL	1.5	WLZ	-.16					
14	1.2DL+1.5LL+10%1.6WLx	Yes	Y	DL	1.2	LL	1.5	WLX	.16					
15	1.2DL+1.5LL-10%1.6WLx	Yes	Y	DL	1.2	LL	1.5	WLX	-.16					
16	1.2DL+1.5LL+10%1.6(0.7...	Yes	Y	DL	1.2	LL	1.5	WLZ	.12	WLX	.12			
17	1.2DL+1.5LL+10%1.6(0.7...	Yes	Y	DL	1.2	LL	1.5	WLZ	.12	WLX	-.12			
18	1.2DL+1.5LL-10%1.6(0.7...	Yes	Y	DL	1.2	LL	1.5	WLZ	-.12	WLX	.12			
19	1.2DL+1.5LL-10%1.6(0.7...	Yes	Y	DL	1.2	LL	1.5	WLZ	-.12	WLX	-.12			
20	1.2DL+1.5LL+10%1.6WLz	Yes	Y	DL	1.2	5	1.5	WLZ	.16					
21	1.2DL+1.5LL-10%1.6WLz	Yes	Y	DL	1.2	5	1.5	WLZ	-.16					
22	1.2DL+1.5LL+10%1.6WLx	Yes	Y	DL	1.2	5	1.5	WLX	.16					
23	1.2DL+1.5LL-10%1.6WLx	Yes	Y	DL	1.2	5	1.5	WLX	-.16					
24	1.2DL+1.5LL+10%1.6(0.7...	Yes	Y	DL	1.2	5	1.5	WLZ	.12	WLX	.12			
25	1.2DL+1.5LL+10%1.6(0.7...	Yes	Y	DL	1.2	5	1.5	WLZ	.12	WLX	-.12			
26	1.2DL+1.5LL-10%1.6(0.7...	Yes	Y	DL	1.2	5	1.5	WLZ	-.12	WLX	.12			
27	1.2DL+1.5LL-10%1.6(0.7...	Yes	Y	DL	1.2	5	1.5	WLZ	-.12	WLX	-.12			
28	DL		Y	DL	1									
29	WLz		Y	WLZ	1									
30	WLx		Y	WLX	1									

Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
1	N14A	max	1659.135	5	2675.508	3	2136.646	3	0	1	0	1	0	1
2		min	-1659.135	4	-2152.459	2	-2002.773	2	0	1	0	1	0	1
3	N19	max	1222.41	4	947.455	5	38.425	2	0	1	0	1	0	1
4		min	-1280.07	5	-894.842	4	-38.381	3	0	1	0	1	0	1
5	N20	max	1280.07	4	947.455	4	38.425	2	0	1	0	1	0	1
6		min	-1222.41	5	-894.842	5	-38.381	3	0	1	0	1	0	1



Envelope Joint Reactions (Continued)

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
7	N23	max	54.044	4	1320.788	7	2273.929	7	0	1	0	1	0	1
8		min	-52.681	5	-1341.292	8	-2329.983	8	0	1	0	1	0	1
9	N25	max	52.681	4	1320.788	6	2273.929	6	0	1	0	1	0	1
10		min	-54.044	5	-1341.292	9	-2329.983	9	0	1	0	1	0	1
11	Totals:	max	950.07	4	338.287	1	1148	2						
12		min	-950.07	5	289.96	9	-1148	3						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

Member	Shape	Code Ch...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc ...	phi*Pnt [...]	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M8	PIPE 2.0	.465	.75	4	.355	.492		8	30237.7...	32130	1871.625	1871.625	1... H1-1b
2	M9	L2.5x2.5x3	.092	1.224	7	.005	0	y	2	22196.9...	26759.7	799.859	1777.295	1... H2-1
3	M10	L2.5x2.5x3	.092	1.224	6	.005	2.5	z	2	22196.9...	26759.7	799.859	1777.295	1... H2-1
4	M11	L2.5x2.5x3	.183	1.7	6	.006	3.473	y	4	18654.6...	26759.7	799.859	1681.476	1... H2-1
5	M12	L2.5x2.5x3	.183	1.7	7	.006	0	z	4	18654.6...	26759.7	799.859	1681.476	1... H2-1
6	M15	PIPE 3.0	.544	7.901	3	.123	8.008		8	37156	65205	5748.75	5748.75	1 H1-1b

Sprint®



PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: DOUGLAS HILL WATER TANK

SITE CASCADE: CT03XC | | 2-P

SITE ADDRESS: 450 FARGO ROAD
WATERFORD, CT 06385

SITE TYPE: 138'-6" WATER TANK



6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251



1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com



48 SPRUCE STREET
OAKLAND, NJ 07346

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



Signature: *James R. Skowronski* Date: 9/02/2014

MARK	DATE	DESCRIPTION
ISSUE	FINAL	DATE ISSUED 09/02/2014

PROJECT TITLE:
**DOUGLAS HILL WATER TANK
CT03XC | | 2-P**

PROJECT INFORMATION:
450 FARGO ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 28722
SHEET NUMBER: T-1

SITE INFORMATION

PROPERTY OWNER:
TOWN OF WATERFORD
WATERFORD UTILITY COMMISSION
PH.: 800-922-4455

SITE ADDRESS:
450 FARGO ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41° 23' 11.0034" (41.38639)
LONGITUDE: 72° 10' 22.0044" (-72.172779)

ZONING JURISDICTION:
TOWN OF WATERFORD

ZONING DISTRICT:
I-G GENERAL INDUSTRIAL

POWER COMPANY:
CONNECTICUT LIGHT AND POWER
PH.: (888) 783-6617

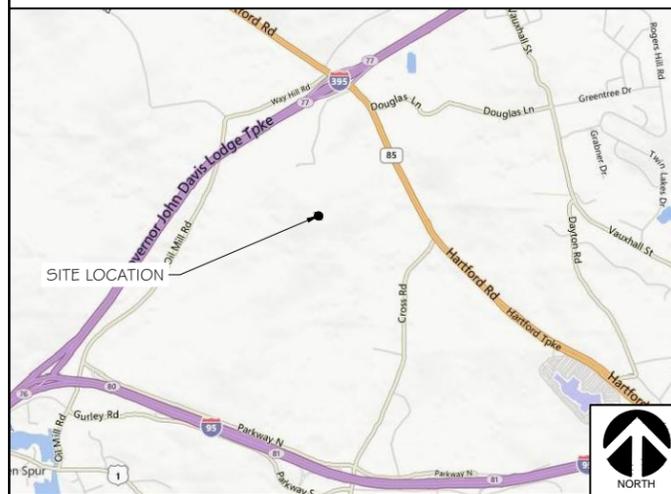
AAV PROVIDER:
AT&T
PH.: (888) 944-0447

SPRINT CONSTRUCTION MANAGER:
NAME: MIKE DELIA
PHONE: (781) 316-6348
E-MAIL: michael.delia@sprint.com

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

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

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

- INSTALL NEW 2.5 EQUIPMENT IN EXISTING BTS CABINET
*(1) RECTIFIER SHELF AND (3) RECTIFIERS
*(1) BASE BAND UNIT
- INSTALL NEW BATTERY STRING IN EXISTING BATTERY CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRH'S ON WATER TOWER
- INSTALL (1) FIBER CABLE AND (2) FIBER JUMPERS
- INSTALL (27) ANTENNA / RRH JUMPERS

APPLICABLE CODES

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

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



SECTION 01 100 - SCOPE OF WORK

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

RELATED DOCUMENTS:

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

PRECEDENCE:

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

NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

DEFINITIONS:

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

SITE FAMILIARITY:

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

POINT OF CONTACT:

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

ON-SITE SUPERVISION:

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

DRAWINGS REQUIRED AT JOBSITE:

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

USE OF JOB SITE:

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

UTILITY SERVICES:

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

PERMITS/FEES:

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

CONTRACTOR:

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

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

TEMPORARY UTILITIES AND FACILITIES:

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

ACCESS TO WORK:

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

DIMENSIONS:

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

EXISTING CONDITIONS:

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:

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

RECEIPT OF MATERIAL AND EQUIPMENT:

A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

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

DELIVERABLES:

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

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:

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

GENERAL REQUIREMENTS FOR CONSTRUCTION:

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

FUNCTIONAL REQUIREMENTS:

- A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
- B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
- C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
- D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - 1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
 - 2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
 - 3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
 - 4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
 - 5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
 - 6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
 - 7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
 - 8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
 - 9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.

10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.

- 11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
- 12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
- 13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
- 14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER.
- 15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
- 16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
- 17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
- 18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
- 19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
- 20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:

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

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

TESTS AND INSPECTIONS:

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

SUBMITTALS:

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

TESTING BY THIRD PARTY AGENCY:

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



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OAKLAND, NJ 07346

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



Signature: *James R. Skowronski* Date: 9/02/2014

MARK	DATE	DESCRIPTION
ISSUE PHASE	FINAL	DATE ISSUED 09/02/2014

PROJECT TITLE:
DOUGLAS HILL WATER TANK CTO3XC112-P

PROJECT INFORMATION:
450 FARGO ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER	28722
SHEET NUMBER	SP-1

5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HERewith IN THE TOWER INSTALLATION SPECIFICATIONS.
 6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HERewith IN THE ASPHALT PAVING SPECIFICATIONS.
 7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HERewith IN THE CONCRETE PAVING SPECIFICATIONS.
 8. TESTING REQUIRED HERewith UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
 9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION
- D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING
- E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
 2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
 3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
 4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE. PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
 5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
 6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

- A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.
- B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
 2. FIBER TESTS:
 3. JURISDICTION FINAL INSPECTION DOCUMENTATION
 4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
 5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
 6. LIEN WAIVERS AND RELEASES.
 7. POST -CONSTRUCTION HEIGHT VERIFICATION
 8. JURISDICTION CERTIFICATE OF OCCUPANCY
 9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
 10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
 11. CELL SITE UTILITY SETUP
 12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
 13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
 14. LIST OF SUB CONTRACTORS
 15. APPROVED PERMITTING DOCUMENTS
 16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
 - a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER 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 PFC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:

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

DEFICIENCY CORRECTIONS:

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

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

- A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.
- B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

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

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

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

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, 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 BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:

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

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

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

ANTENNA INSTALLATION:

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

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

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

HYBRID CABLE INSTALLATION:

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

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

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

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

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

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

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CX5 SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

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

SUMMARY:

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

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

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

DC CIRCUIT BREAKER LABELING

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

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

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

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

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

SUPPORTING DEVICES:

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

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

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

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



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Certification & Seal:

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



Signature: *James R. Skowronski* Date: 9/02/2014

MARK	DATE	DESCRIPTION
ISSUE	FINAL	DATE ISSUED 09/02/2014

PROJECT TITLE:
DOUGLAS HILL WATER TANK
CTO3XC112-P

PROJECT INFORMATION:
450 FARGO ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER	28722
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 LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
 - 2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

- A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
- B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

- A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
- B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
- C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
- D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
- E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
- F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

- A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
- B. CABLE TERMINATION FITTINGS FOR CONDUIT
 - 1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.
 - 2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.
- C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.
- D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
- E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

- A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.
- B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.
- C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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



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James R. Skowronski
 Signature: _____ Date: 9/02/2014

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ISSUE	FINAL	DATE ISSUED 09/02/2014

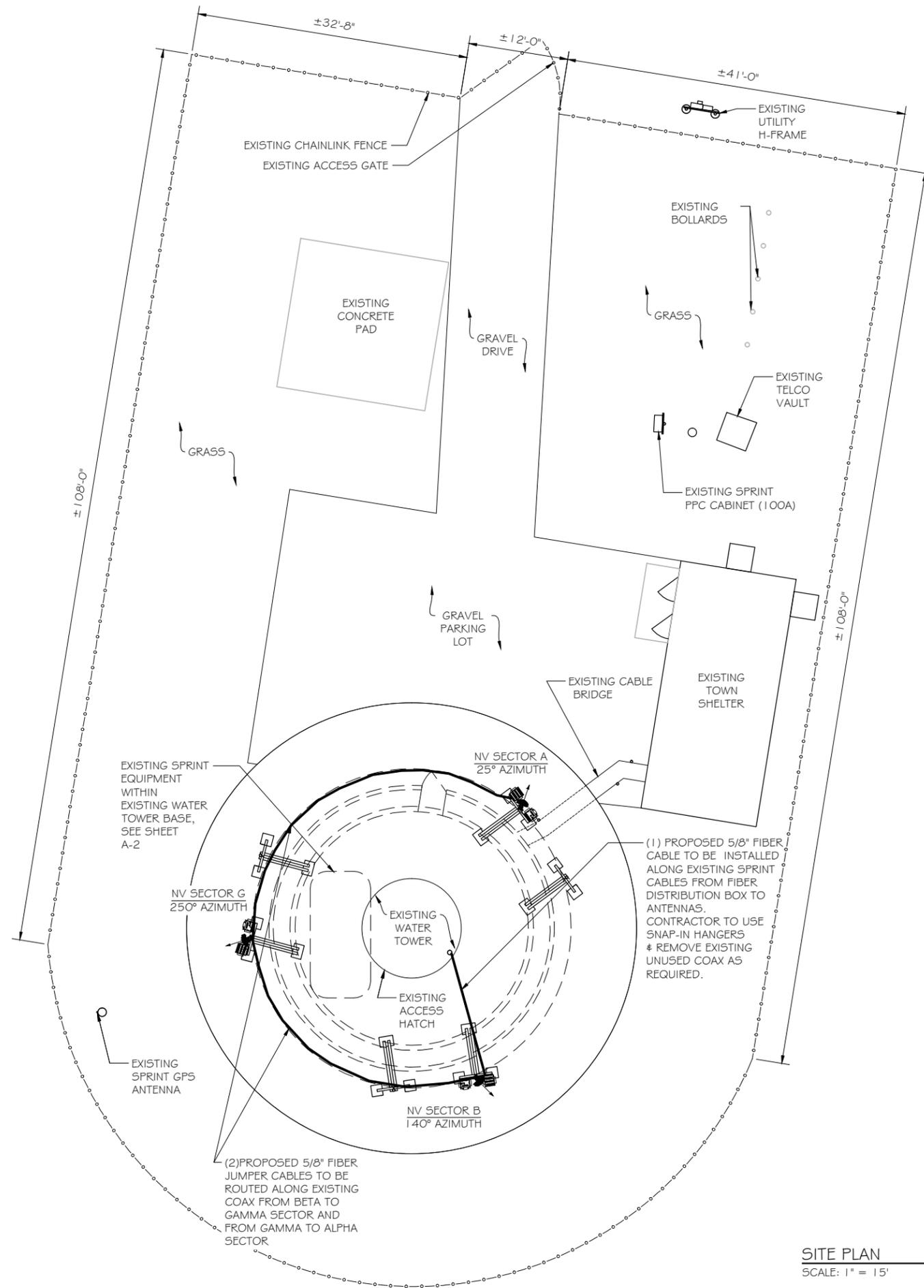
PROJECT TITLE:
DOUGLAS HILL WATER TANK
CT03XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER	28722
SHEET NUMBER	SP-3



SITE PLAN
 SCALE: 1" = 15'



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PROJECT TITLE:
DOUGLAS HILL WATER TANK
CT03XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
SITE PLAN

0 7.5' 15' 30'

11" x 17" - 1" = 15'
 22" x 34" - 1" = 7.5'

PROJECT NUMBER: **28722**
 SHEET NUMBER: **A-1**



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James R. Skowronski Signature: _____ Date: 9/02/2014

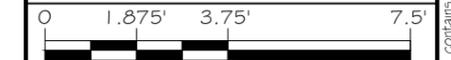
MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 09/02/2014

PROJECT TITLE:
DOUGLAS HILL WATER TANK
CTO3XC112-P

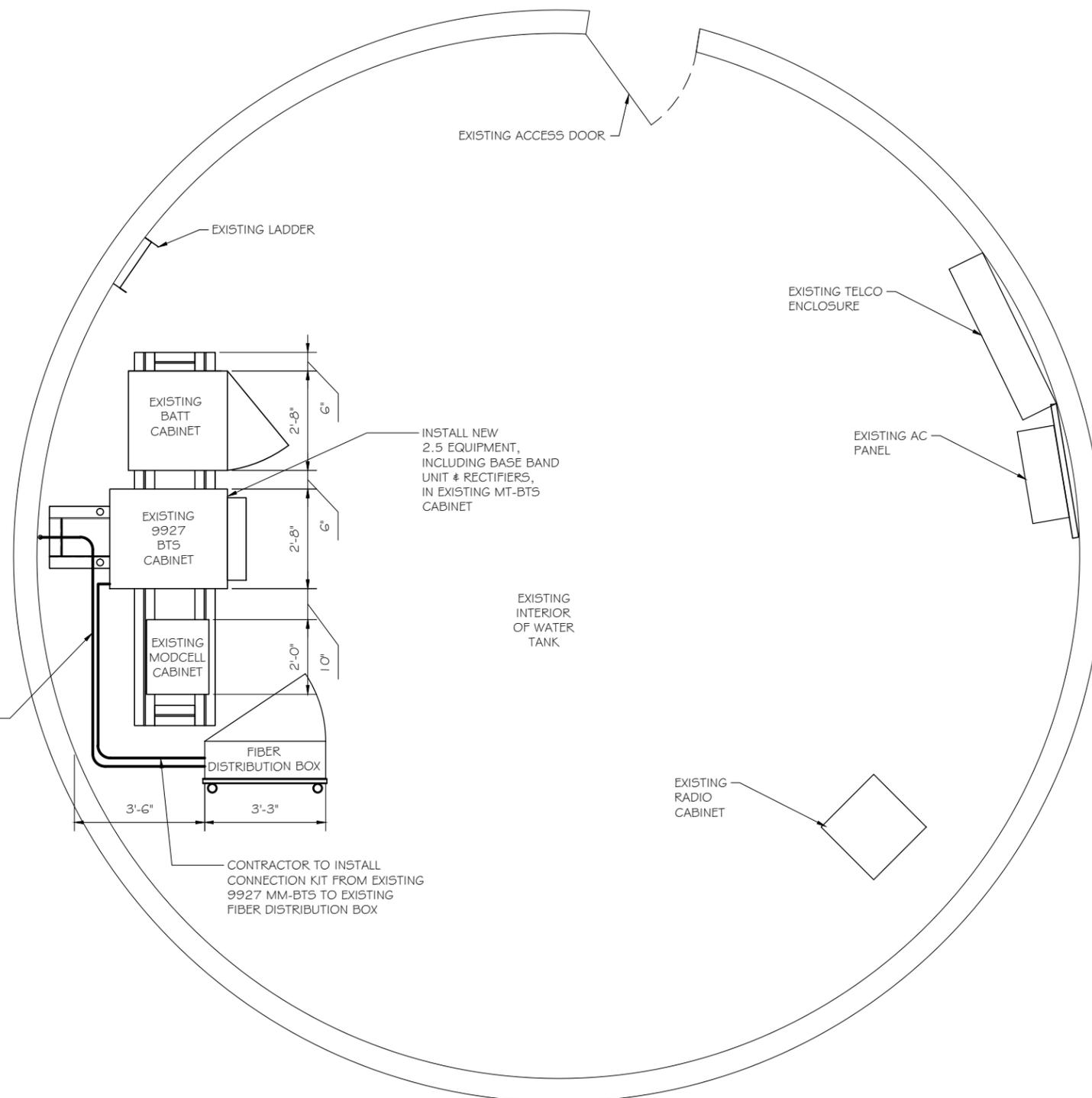
PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
EQUIPMENT PLAN



11" x 17" - 1" = 3.75'
 22" x 34" - 1" = 1.875'

PROJECT NUMBER: 28722
 SHEET NUMBER: A-2



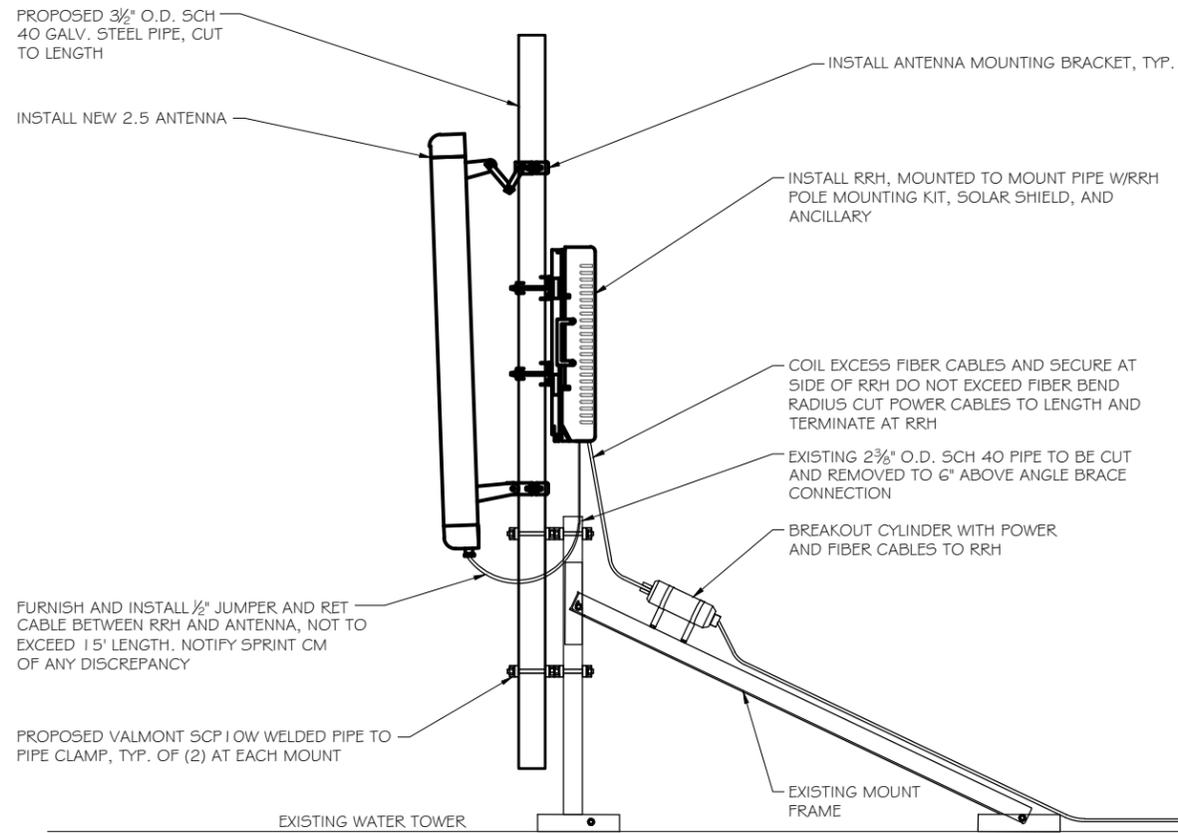
(1) PROPOSED 5/8" FIBER CABLE TO BE ROUTED ALONG EXISTING CABLES FROM FIBER DISTRIBUTION BOX, TO CABLE TRAY AND UP THE TOWER TO BETA SECTOR ANTENNA. USE SNAP-IN HANGERS, SPACED MAX. 4'-0" O.C. AS NEEDED.

INSTALL NEW 2.5 EQUIPMENT, INCLUDING BASE BAND UNIT & RECTIFIERS, IN EXISTING MT-BTS CABINET

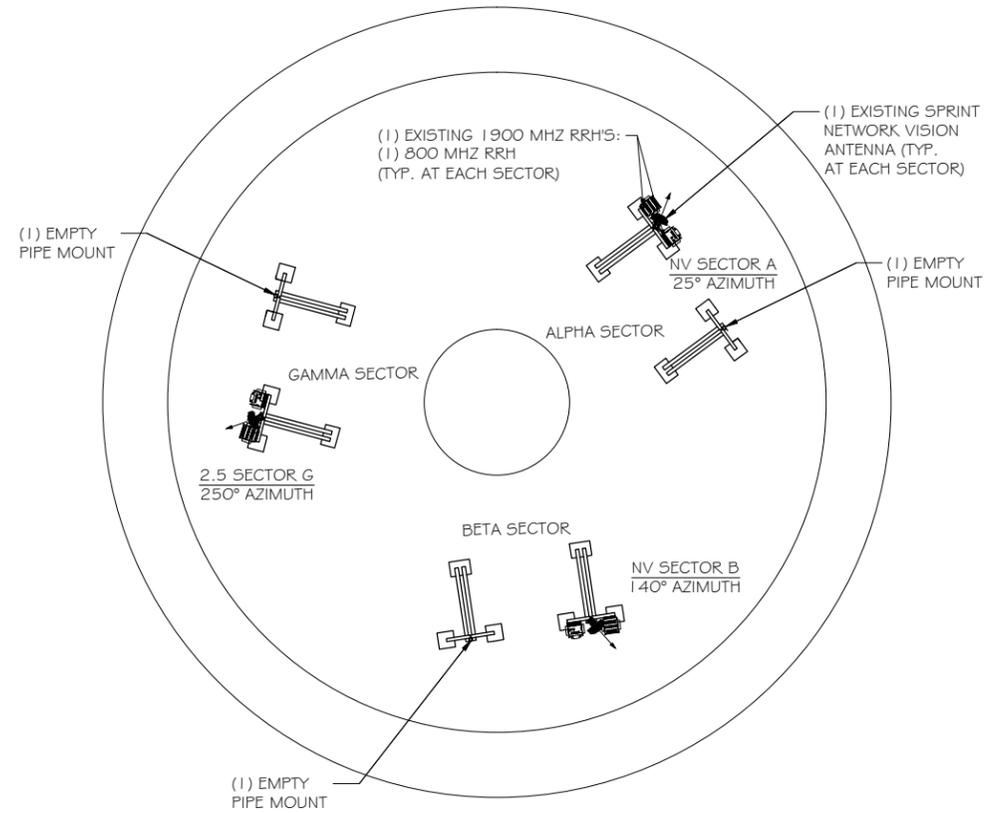
CONTRACTOR TO INSTALL CONNECTION KIT FROM EXISTING 9927 MM-BTS TO EXISTING FIBER DISTRIBUTION BOX

EQUIPMENT PLAN
 SCALE: 1" = 3.75'

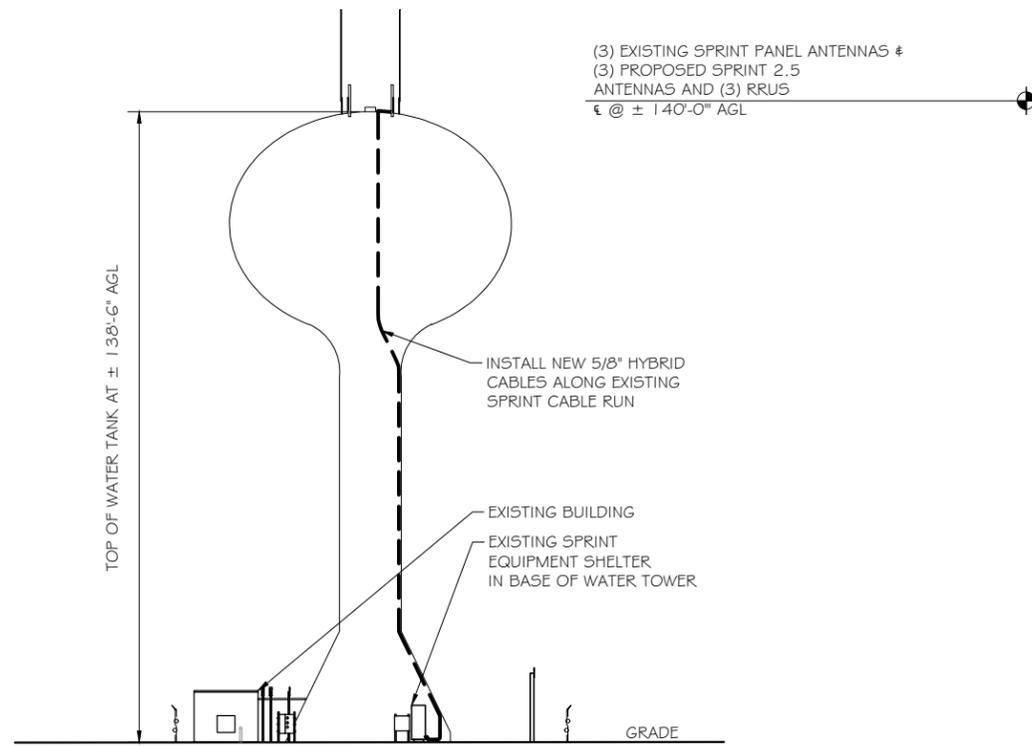
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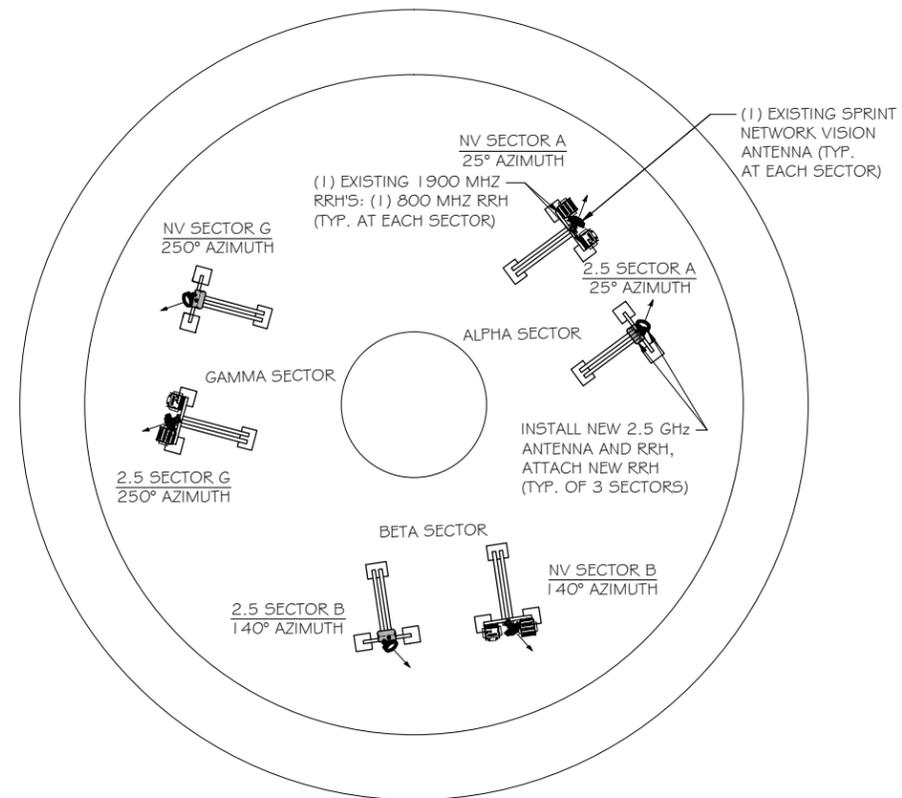
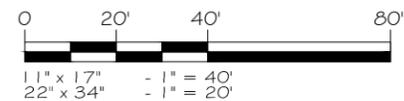
ANTENNA & RRH MOUNTING DETAILS
 SCALE: NTS



EXISTING ANTENNA ARRAY
 SCALE: NTS



BUILDING ELEVATION
 SCALE: 1" = 40'



PROPOSED ANTENNA ARRAY
 SCALE: NTS



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James R. Skowronski Signature: 9/02/2014 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE	FINAL	DATE ISSUED	09/02/2014
-------------	-------	-------------	------------

PROJECT TITLE:
DOUGLAS HILL WATER TANK
CT03XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
BUILDING ELEVATIONS & ANTENNA DETAILS

SCALE:
 AS NOTED

PROJECT NUMBER: 28722
 SHEET NUMBER: A-3



RFDS Sheet

General Site Information

Site ID	CT03XC112
Market	Northern Connecticut
Region	Northeast
MLA	N/A
Structure Type	Water tank
BTS Type	

Equipment Vendor	Alcatel-Lucent
Latitude	41.38639
Longitude	-72.172779
LL SITE ID	N/A

Solution ID	
-------------	--

Siterra SR Equipment type	
Equipment Vendor	Alcatel-Lucent

Incremental Power Draw needed by added Equipment	N/A
--	-----

Base Equipment

BBU Kit	ALU BBU Kit
BBU Kit Qty	1
Growth Cabinet	None
Growth Cabinet Qty	N/A
Growth Cabinet Dimensions	N/A
Growth Cabinet Weight	N/A

Top Hat	None
Top Hat Qty	N/A
Top Hat Dimensions	N/A
Top Hat Weight (lbs)	N/A

RF Path Information

RRH	TD-RRH8x20-25
RRH Qty	3
RRH Dimensions	26.1"x18.6"x6.7"
RRH Weight. lbs.	70
RRH Mount Weight. Lbs.	10
Power and Fiber Cable	ALU FIBER ONLY
Cable Qty	1
Weight per foot. Lbs.	0.242
Diameter. Inches.	0.73
Length Ft.	170 (calculated as antenna height plus 20%)
Coax Jumper	TBD
Coax Jumper Qty	27
Coax Jumper Length. Feet.	15
Coax Jumper Weight	1.7
Coax Jumper Diameter. Inches	0.5
AISG Cable	COMMSCOPE ATCB-0B01-006
AISG Cable Qty	3
AISG Diameter. Inches.	0.315
AISG Cable length.	8'
Weight of entire AISG cable. Lbs.	1.3

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna make/model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna qty	1	1	1
Antenna Dimensions. Inches	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"
Antenna Weight. Lbs	55.12	55.12	55.12
Antenna Mounting Kit Weight. Lbs.	11.5	11.5	11.5
CL Height	140	140	140
Antenna Azimuth	25	140	250
Antenna Mechanical Downtilt	0	0	0
Antenna etilt	-2	-2	-2

*RFDS SHEET WAS GENERATED BY RAMAKER & ASSOCIATES FROM PLAN OF RECORD (POR) PROVIDED BY SPRINT. CONTRACTOR SHALL VERIFY AND OBTAIN FINAL RFDS FROM SPRINT CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.



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NOTES:

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

MARK	DATE	DESCRIPTION
ISSUE	FINAL	DATE ISSUED 09/02/2014

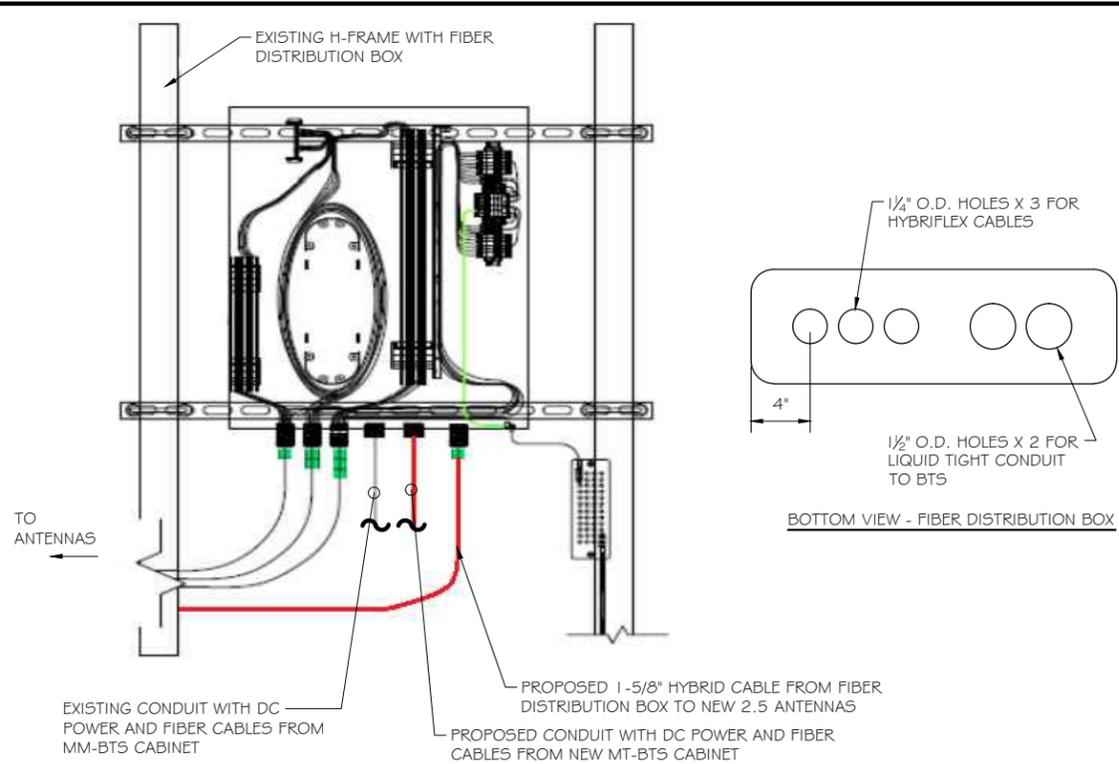
PROJECT TITLE:
DOUGLAS HILL WATER TANK
CT03XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

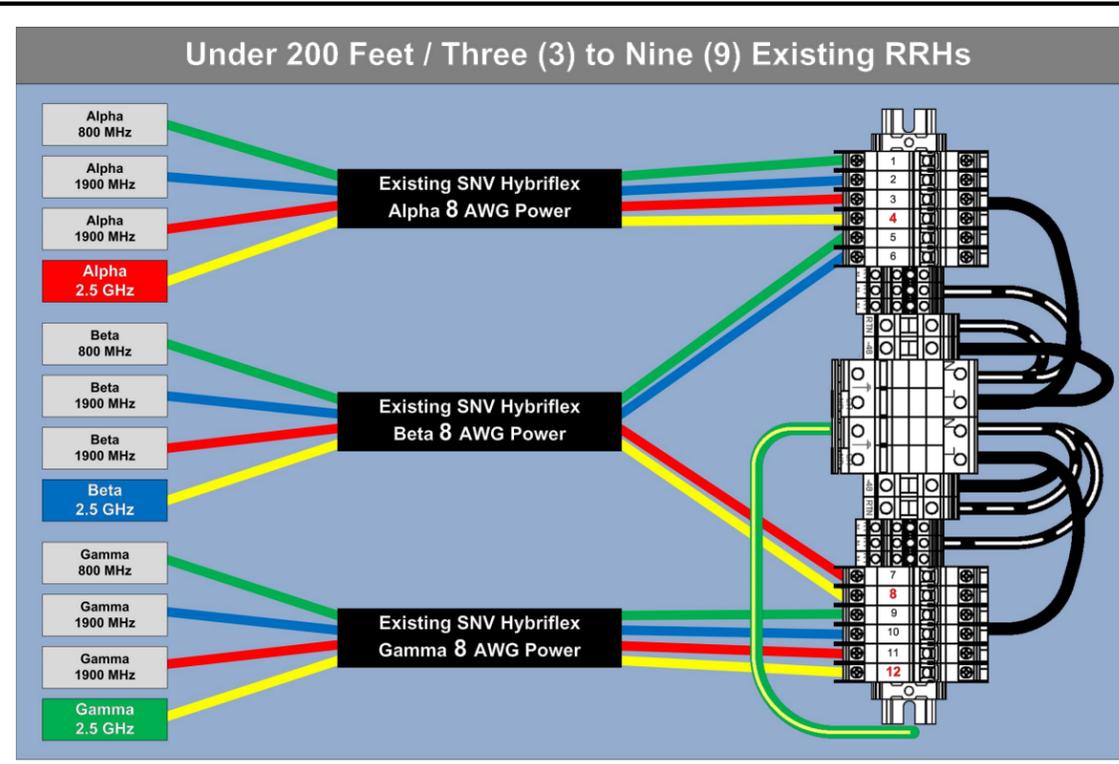
SHEET TITLE:
 RF DATA SHEET

SCALE:
 AS NOTED

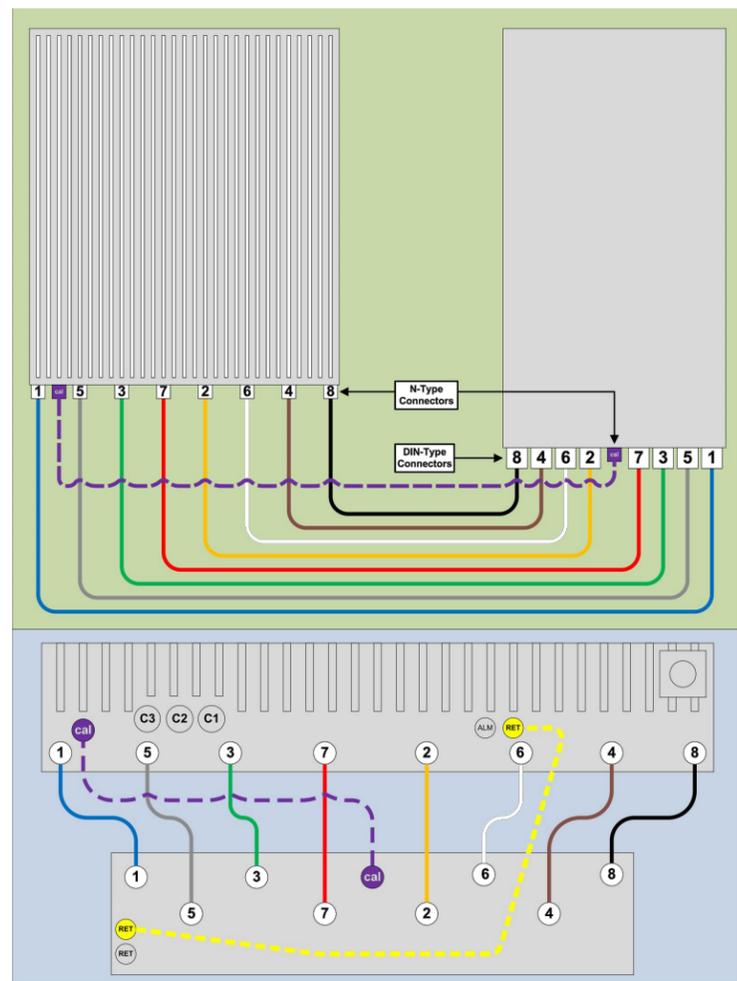
PROJECT NUMBER	28722
SHEET NUMBER	A-4



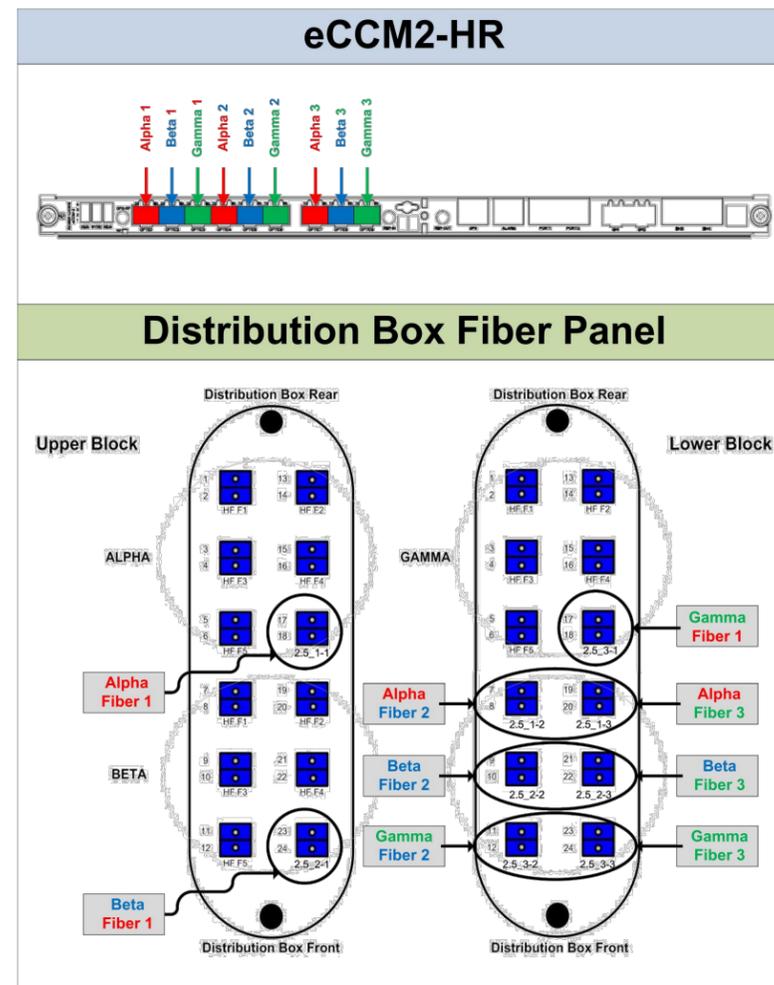
TYPICAL FIBER DISTRIBUTION BOX DETAIL
 SCALE: NTS



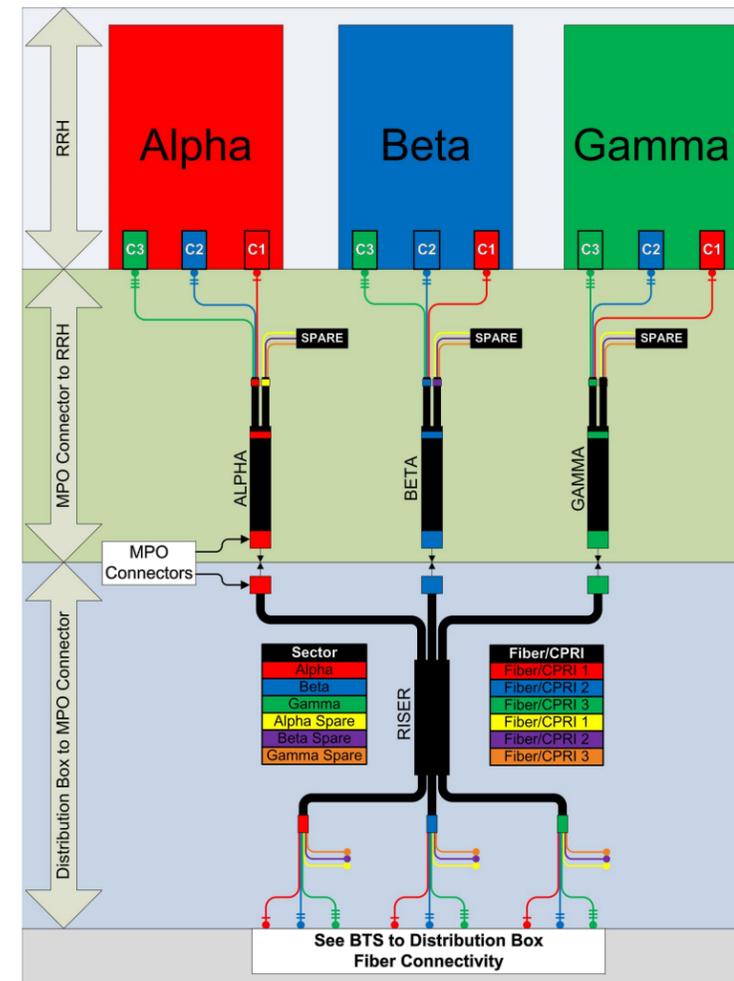
RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL
 SCALE: NTS



8T8R DETAIL
 SCALE: NTS



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL
 SCALE: NTS



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL
 SCALE: NTS



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MARK	DATE	DESCRIPTION
ISSUE	FINAL	DATE ISSUED 09/02/2014

PROJECT TITLE:
DOUGLAS HILL WATER TANK
 CTO3XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

FIBER PLUMBING DIAGRAM

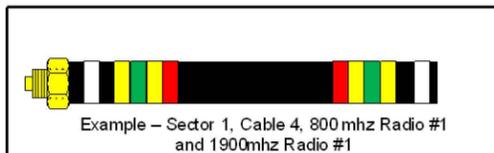
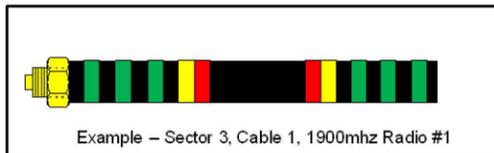
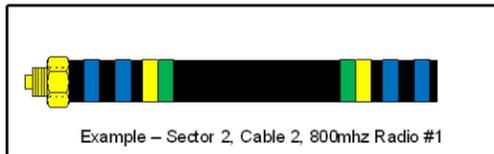
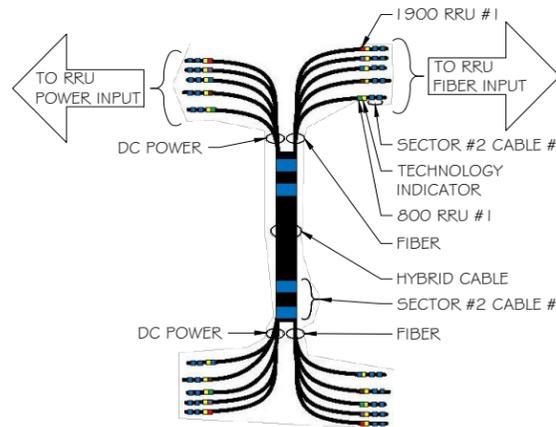
SCALE:
 AS NOTED

PROJECT NUMBER: 28722
 SHEET NUMBER: A-5

2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange



COLOR CODING CHARTS
 SCALE: NTS

CABLE MARKING NOTES

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



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Signature: *James R. Skowronski* Date: 9/02/2014

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ISSUE	FINAL	DATE ISSUED 09/02/2014

PROJECT TITLE:
DOUGLAS HILL WATER TANK
CTO3XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE:
 AS NOTED

PROJECT NUMBER: 28722
 SHEET NUMBER: A-6

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
 MANUF:RFS

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

RFS HYBRIFLEX RISER CABLE SCHEDULE

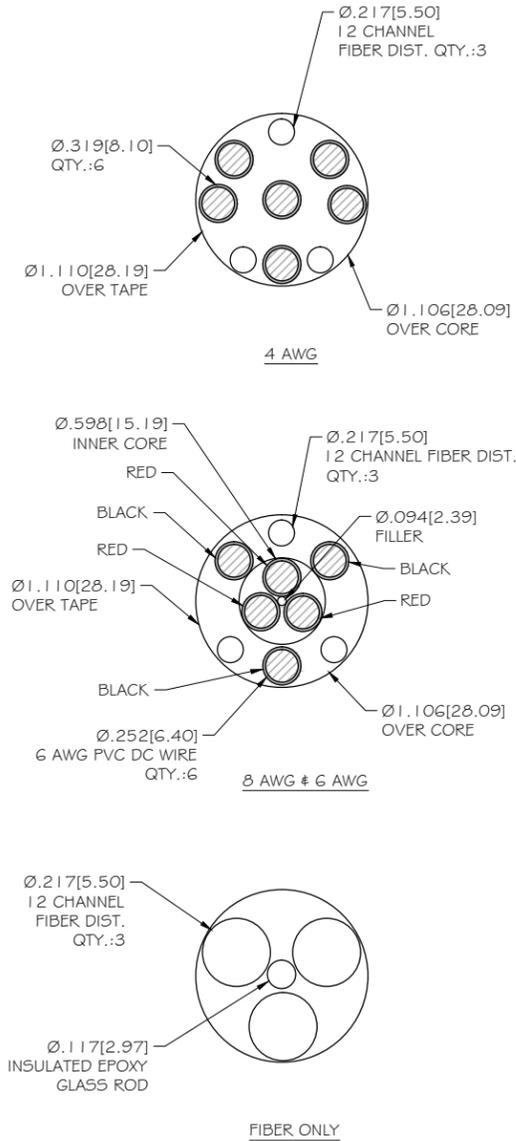
FIBER ONLY (EXISTING DC POWER)	Hybrid cable	
	MN-HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN-HB058-M12-075F	75 ft
	MN-HB058-M12-100F	100 ft
	*MN-HB058-M12-125F	125 ft
	MN-HB058-M12-150F	150 ft
	MN-HB058-M12-175F	175 ft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

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

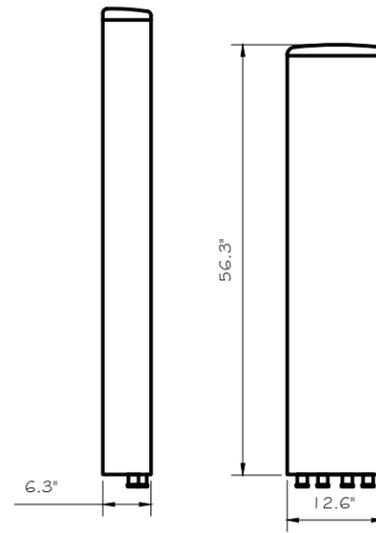
FIBER ONLY	Hybrid Jumper cable	
	MN-HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN-HBF012-M3-10F1	10 ft
	MN-HBF012-M3-15F1	15 ft
SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY		
8 AWG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

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

FIBER CABLE CROSS SECTION & DATA
 SCALE: NTS

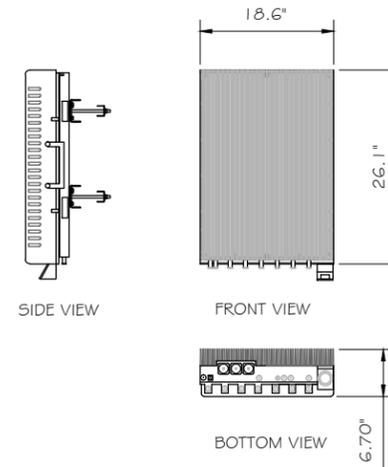


RFS: APXV9TM14-ALU-120



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

2.5 ANTENNA DETAIL
 SCALE: NTS



ALCATEL-LUCENT: TD-RRH8x20
 HxWxD = (26.1" x 18.6" x 6.7")
 WEIGHT = 70 lbs.

2.5 RRH DETAIL
 SCALE: NTS



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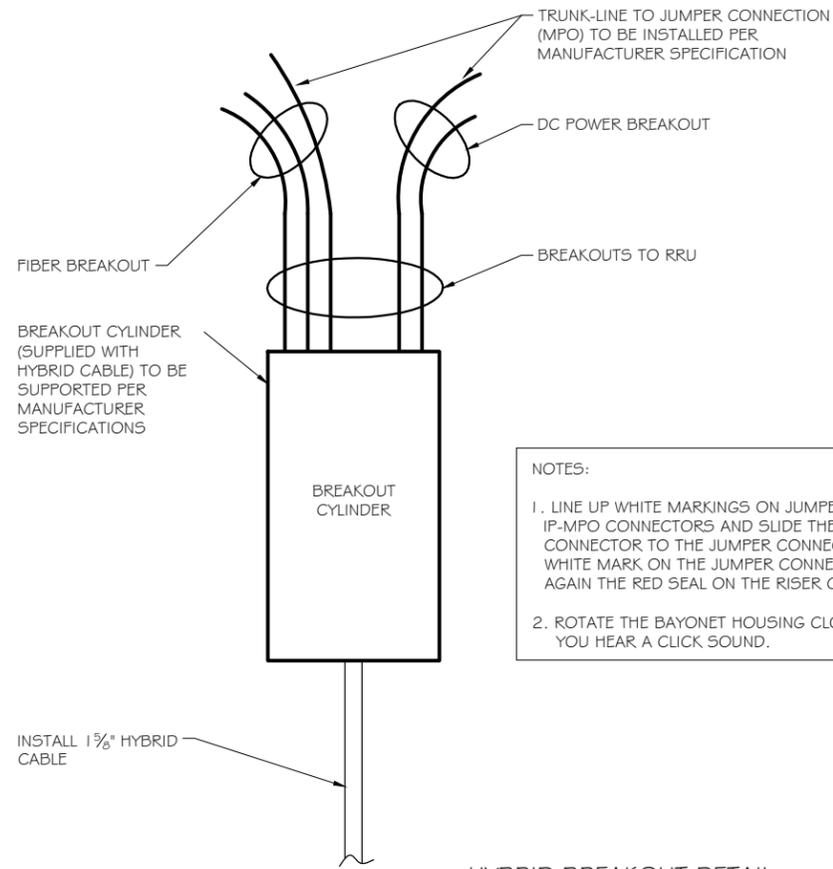
PROJECT TITLE:
DOUGLAS HILL WATER TANK
CTO3XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE:
 AS NOTED

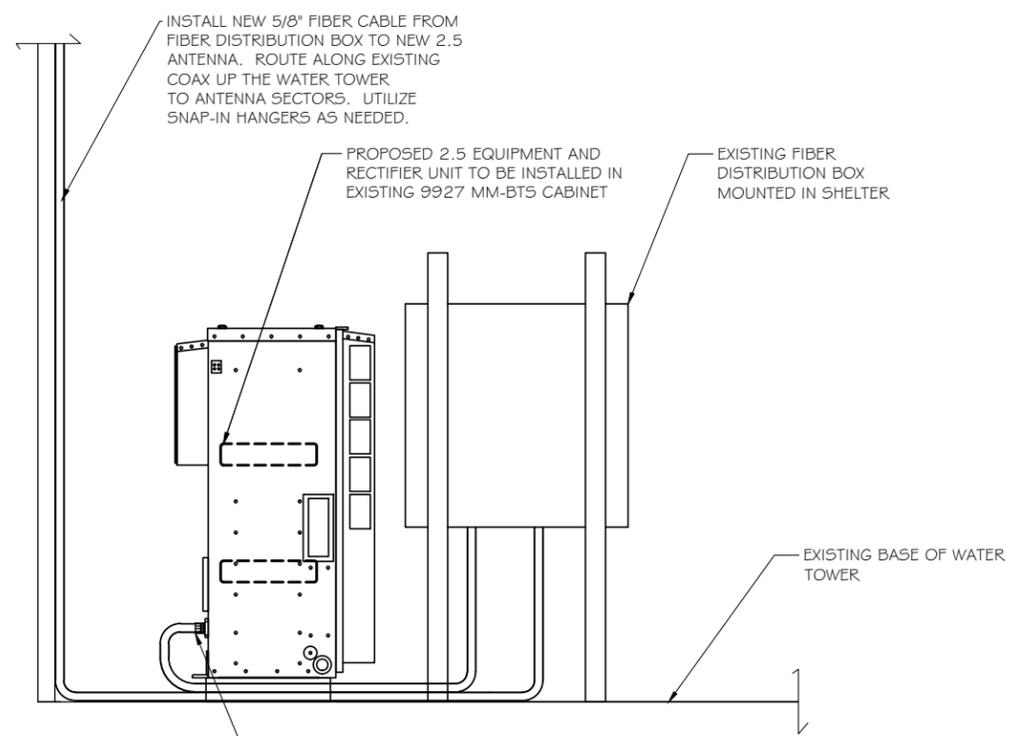
PROJECT NUMBER	28722
SHEET NUMBER	A-7



NOTES:

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

HYBRID BREAKOUT DETAIL ①
 SCALE: NTS

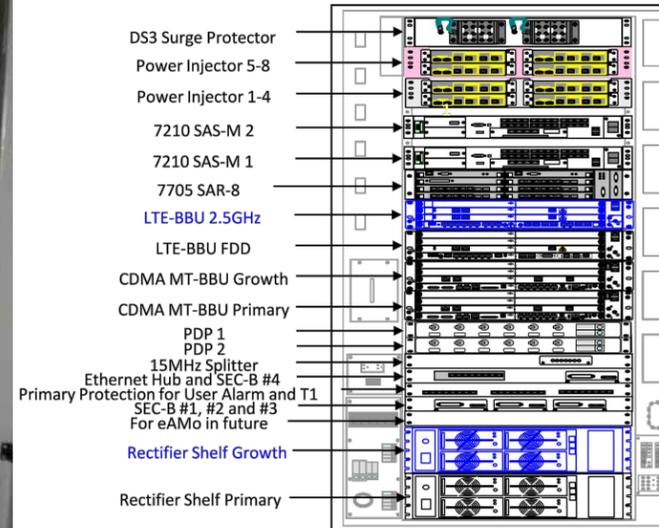


PROVIDE 2" METALLIC HUB AND RIGID CONDUIT CONNECTOR AND INSTALL CONNECTION KIT FROM EXISTING 9927 MM-BTS CABINET TO EXISTING FIBER DISTRIBUTION BOX WITH DC POWER & FIBER CABLES

CABLE ROUTE FROM CABINET ②
 SCALE: NTS



EXISTING BBU CABINET ③
 SCALE: NTS



EXISTING MMBS CABINET ④
 SCALE: NTS



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Signature: *James R. Skowronski* Date: 9/02/2014

MARK	DATE	DESCRIPTION
ISSUE	FINAL	DATE ISSUED 09/02/2014

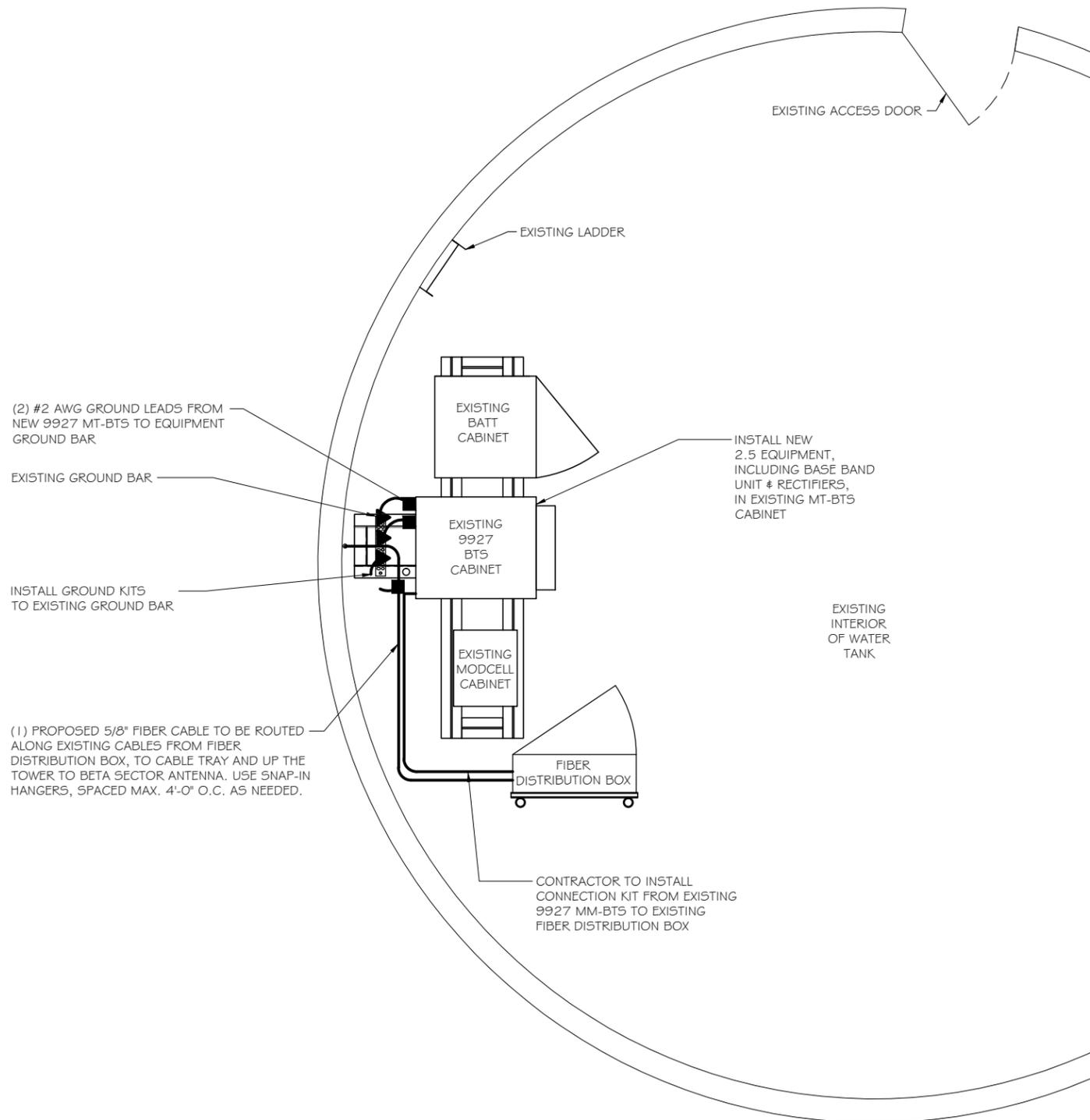
PROJECT TITLE:
DOUGLAS HILL WATER TANK CTO3XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

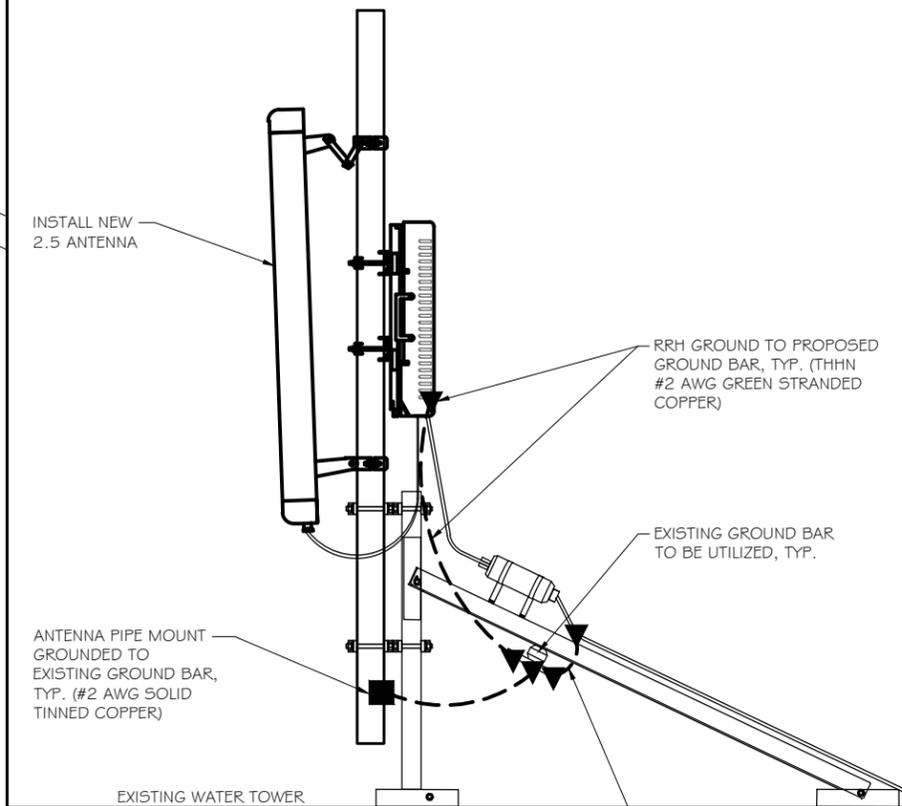
SHEET TITLE:
EQUIPMENT DETAILS

SCALE:
 AS NOTED

PROJECT NUMBER: 28722
 SHEET NUMBER: A-8



EQUIPMENT UTILITY & GROUNDING PLAN
 SCALE: NTS



ANTENNA GROUNDING DETAIL
 SCALE: NTS

GROUNDING NOTES:

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

LEGEND:	
---	EXISTING GROUND CABLE
---	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
---	PROPOSED ELECTRIC



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ISSUE PHASE: FINAL DATE ISSUED: 09/02/2014

PROJECT TITLE:
 DOUGLAS HILL WATER TANK
 CTO3XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

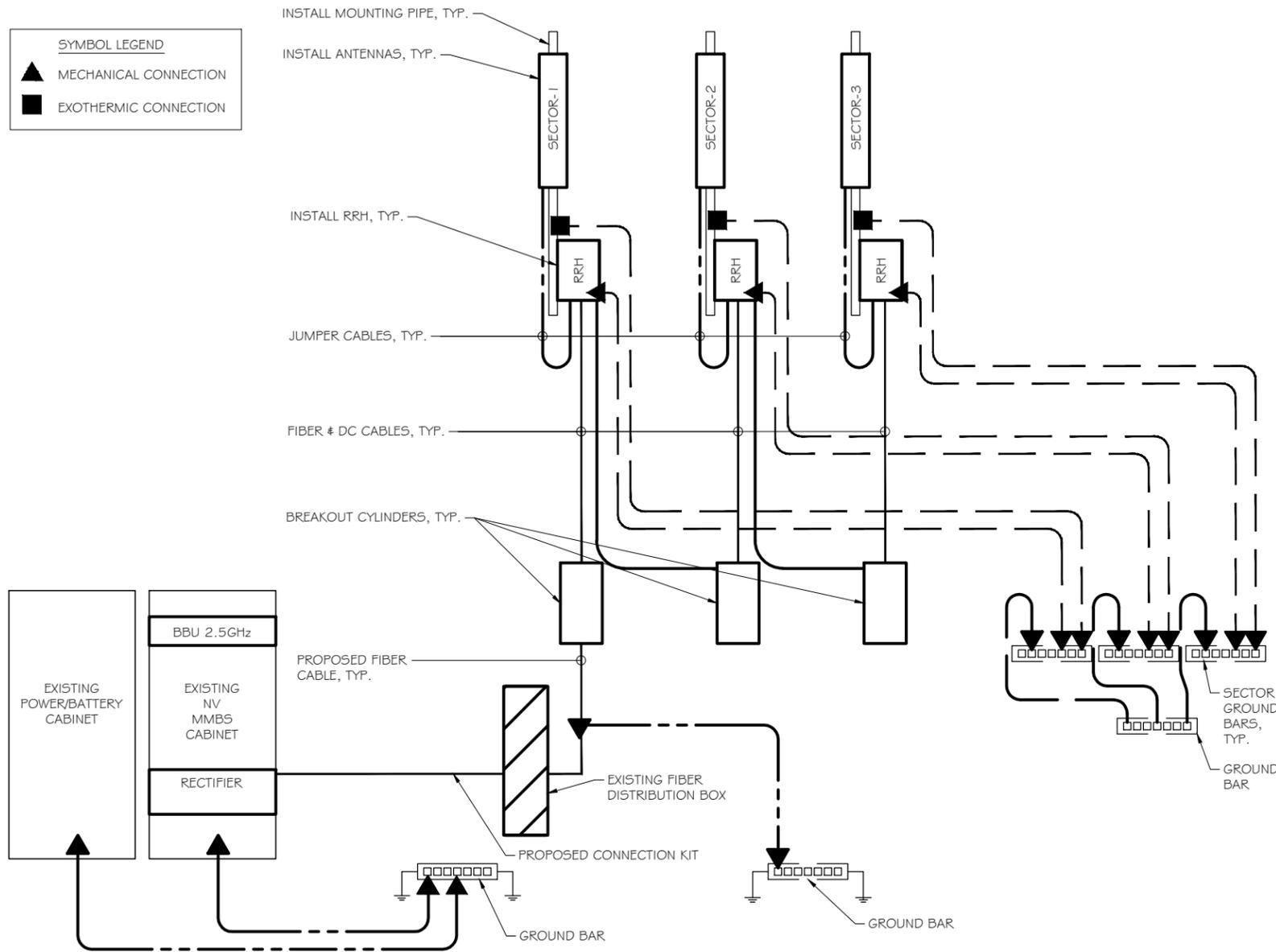
SHEET TITLE:
 EQUIPMENT UTILITY &
 GROUNDING PLAN

SCALE:
 AS NOTED

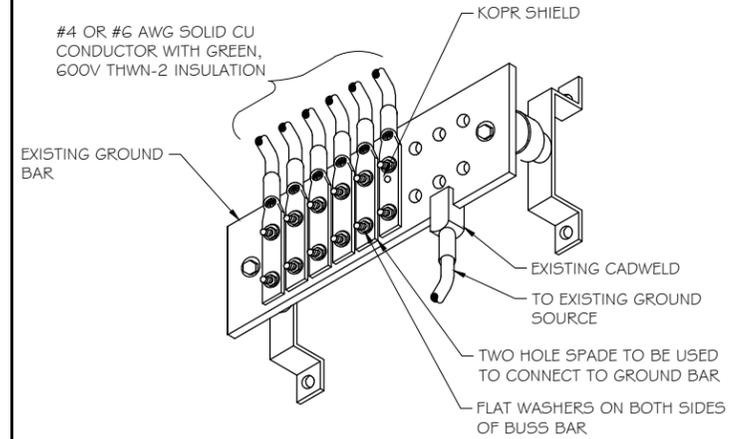
PROJECT NUMBER: 28722
 SHEET NUMBER: E-1

SYMBOL LEGEND

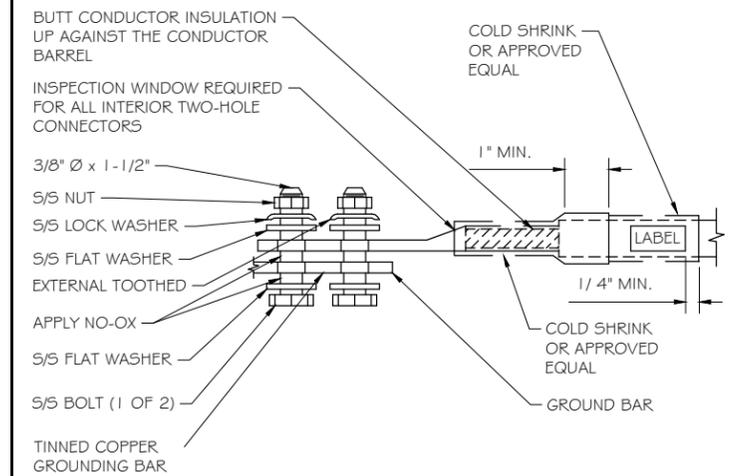
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION



GROUNDING RISER DIAGRAM
 SCALE: NTS



GROUNDING CONDUCTOR INSTALLATION
 SCALE: NTS



TWO-HOLE LUG
 SCALE: NTS



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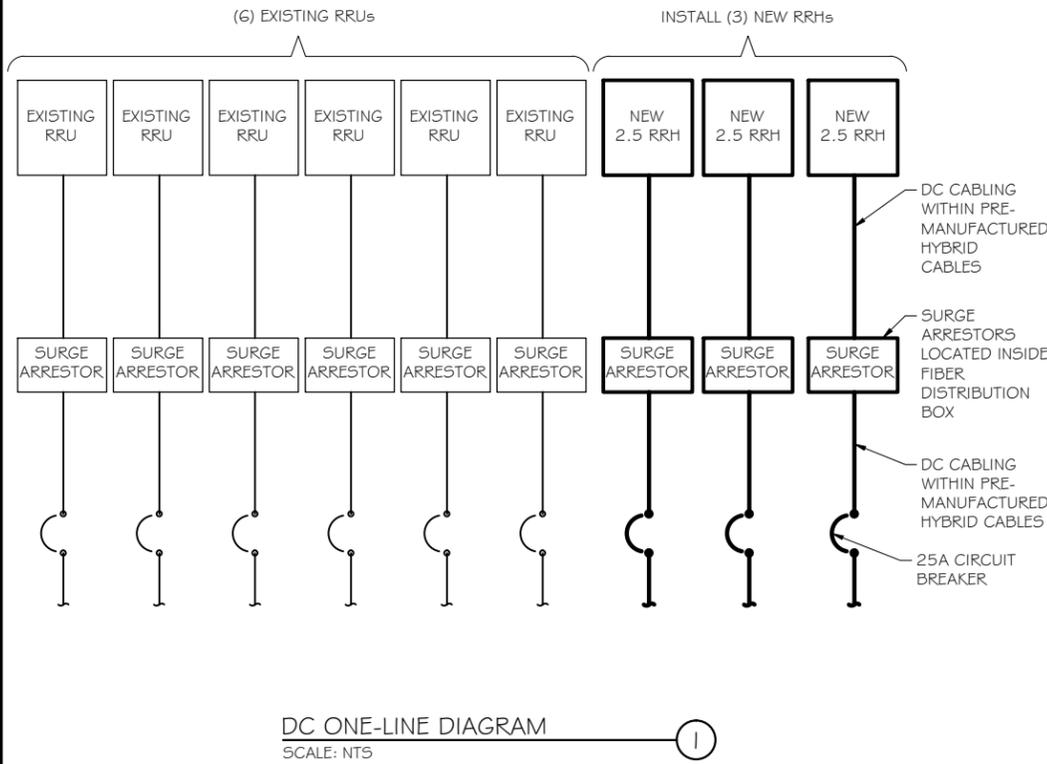
PROJECT TITLE:
DOUGLAS HILL WATER TANK
CT03XC112-P

PROJECT INFORMATION:
 450 FARGO ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

SHEET TITLE:
GROUNDING DETAILS

SCALE:
 AS NOTED

PROJECT NUMBER	28722
SHEET NUMBER	E-2



A/C PANEL SCHEDULE

VOLTAGE:	240V/1 20	PANEL STATUS:	EXISTING	N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP	MODEL NUMBER:	TBD	INTERNAL TVSS:	YES
MOUNT:	GROUND	PHASE:	1	WIRE:	3
ENCLOSURE TYPE:	NEMA 3R	BUSS RATING:	200 AMP	GROUND BAR:	YES
		NEUTRAL BAR:	YES		

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	BLANK (UNUSED)	-	-	-							7
2	BLANK (UNUSED)	-	-	-			ON	2	60	SURGE PROTECTION	8
3	MBTS1	100	2	ON			OFF	2	60	BOOSTER CABINET	9
4	NOT LABELED	30	2	OFF			ON	1	20	G.F.C.I. RECEPTACLE	11
6							-	-	-	BLANK (UNUSED)	12

A/C PANEL SCHEDULE
 SCALE: NTS



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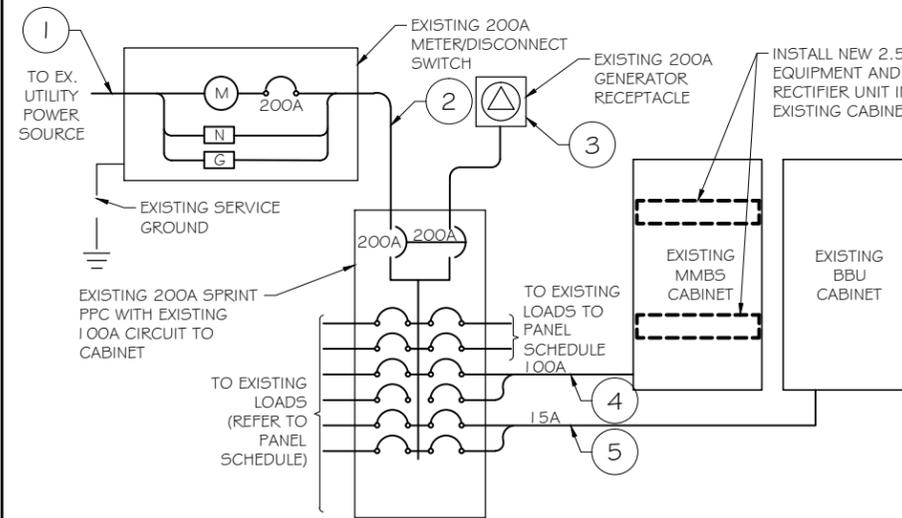
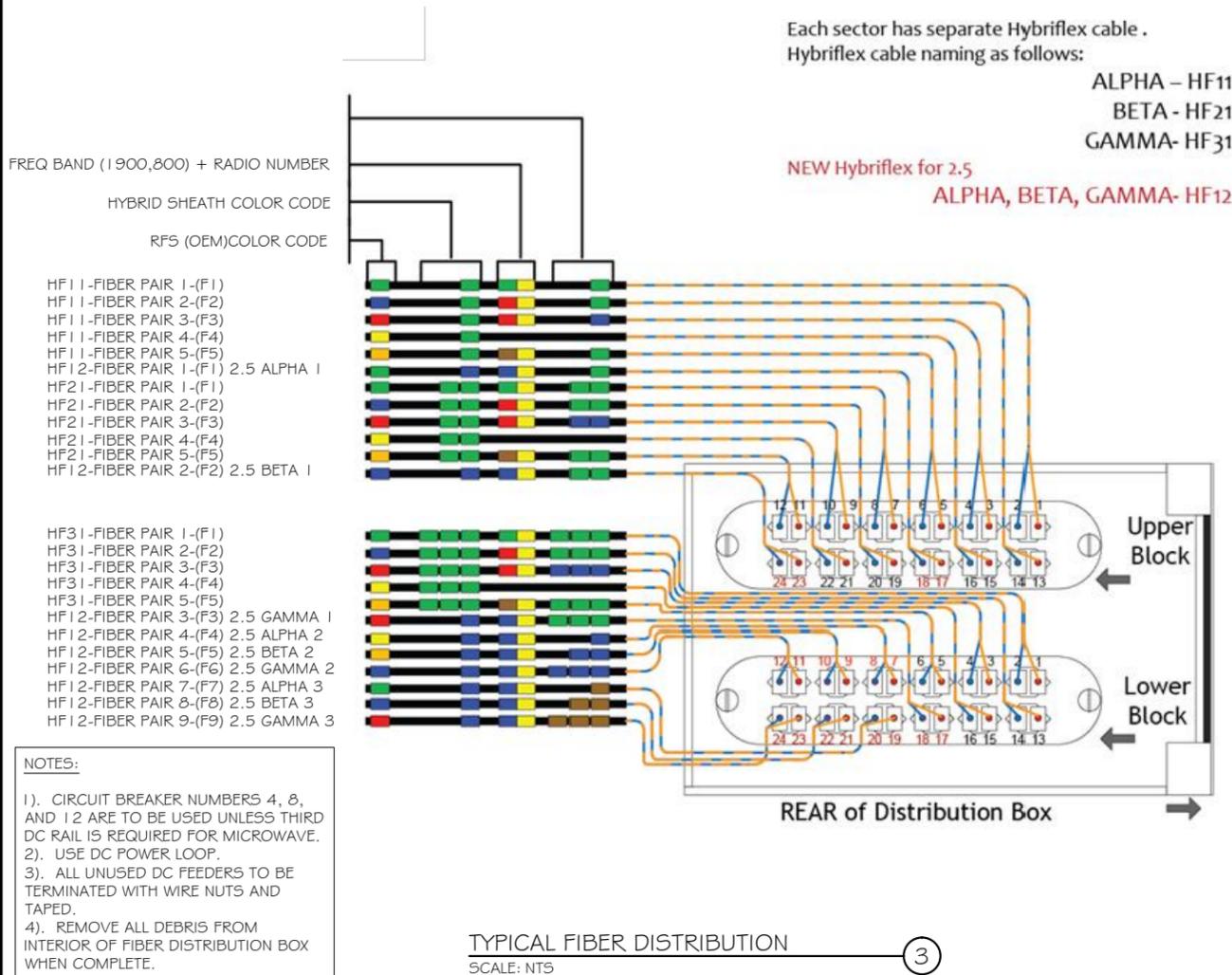


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CIRCUIT SCHEDULE

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

ELECTRICAL ONE-LINE DIAGRAM
 SCALE: NTS