



## **TOWERCO**

**TECHNICAL REPORT TO THE TOWN OF BRANFORD  
PROPOSED WIRELESS TELECOMMUNICATIONS FACILITY  
FOR USE BY AT&T AND OTHER WIRELESS CARRIERS**

**–ROSE HILL ROAD FACILITY–**

**TowerCo 2013, LLC (TowerCo)  
5000 Valleystone Drive  
Cary, North Carolina**

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## INTRODUCTION

TowerCo 2013, LLC (“TowerCo”) is a Delaware Limited Liability Company with its headquarters located in Cary, North Carolina. TowerCo develops/builds, owns and leases numerous communications towers for the infrastructure needs of wireless service providers in the United States.

TowerCo respectfully submits this Technical Report to the Towns of Branford and East Haven (“Towns”) pursuant to Section 16-50/ of the Connecticut General Statutes. TowerCo proposes to construct a wireless telecommunications tower facility on a 2 acre parcel of land owned by Paul Santa Barbara (the “Parcel”) with access from Rose Hill Road. The anchor tenant on this project is New Cingular Wireless PCS, LLC (“AT&T”) which has entered into a long term lease with TowerCo for use of the proposed tower facility. The cellular tower facility is proposed to allow AT&T and other FCC licensed wireless carriers to provide their services in this area of the State.

This Technical Report has been prepared to provide the Towns with information concerning AT&T’s need for a facility in this area of the State (Section 1), the site selection process (Section 2), the facility design (Section 3), current status of environmental assessments for the project (Section 4) and a visibility analysis (Section 5). This information is provided for purposes of a technical consultation with the Towns as provided for in Section 16-50/ of the Connecticut General Statutes and prior to any Siting Council application which may be filed.

## ATTACHMENT 1

## SECTION 1

### STATEMENT OF PUBLIC NEED

The proposed facility along Rose Hill Road in Branford will provide reliable wireless communications services to a large area including State Highway 142, Route 1 (West Main Street), Interstate 95, Burban Drive, Alps Road and other local roads in Branford and East Haven. The facility is needed in conjunction with other existing and proposed facilities for AT&T to provide reliable 4G LTE wireless services to the public that are not currently provided in this part of the State. Attached is a Radio Frequency Engineering Report with coverage plots depicting the "Current Coverage" provided by AT&T's existing facilities in this area of the state and "Proposed Coverage" as predicted from the proposed facilities together with existing service from adjacent sites. Additional statistics regarding the overall area, population and roadway miles of expanded and reliable service in the community are included in AT&T's report.

# Radio Frequency Analysis Report

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CT2454SA  
45 Rose Hill Road, Branford, CT



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October 30, 2014



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## 1. Overview

C Squared Systems was retained by New Cingular Wireless PCS, LLC (“AT&T”) to investigate the extent of coverage that could be potentially obtained by constructing the proposed wireless communications facility at 45 Rose Hill Road, Branford, CT at 130 feet AGL.

AT&T is licensed by the FCC to provide wireless communications services throughout the State of Connecticut including the Town of Branford where the proposed facility would be located.

This report addresses AT&T’s need for the proposed wireless facility and confirms that there are no other suitable existing structures that could address the coverage gaps and required capacity relief for their wireless communications network. The coverage analysis completed by C Squared Systems confirms: AT&T has a gap in reliable service in Branford, and that the Proposed Facility provides AT&T with coverage in that service gap. Included as attachments in this report are coverage maps detailing the existing network and expected coverage from the proposed facility, pertinent site information, terrain and network layout maps.

## 2. Technology Advances & Design Evolution

AT&T provides digital voice and data services using 3<sup>rd</sup> Generation (3G) UMTS technology in the 800 MHz and 1900 MHz frequency band, and is in the midst of deploying advanced 4<sup>th</sup> Generation (4G) services over LTE technology in the 700 MHz and 1900 MHz frequency bands as allocated by the FCC. As part of their network expansion and ongoing technology advancements in Connecticut and elsewhere in the Country, the 4G LTE network rollout will build on the existing 3G data services that utilize UMTS technology. These data networks are used by mobile devices for fast web browsing, media streaming, and other applications that require broadband connections. The mobile devices that benefit from these advanced data networks are not limited to basic handheld phones, but also include devices such as smartphones, PDA’s, tablets, and laptop air-cards. With the evolving rollout of 4G LTE services and devices, AT&T customers will have even faster connections to people, information, and entertainment.

It is important to note that with AT&T’s migration from 3G to 4G services come changes in the base station infrastructure and resultant changes in the operating thresholds required by the LTE network. In the past, AT&T has presented receive signal thresholds of -74 dBm for their in-building coverage threshold and -82 dBm for their in-vehicle coverage threshold. Those thresholds were based on network requirements to support 2G/3G data speeds and past usage demand. Today, customers expect low latency and faster data speeds as evidenced by increasing data usage trends and customer demand.

AT&T’s 4G LTE technology is designed to thresholds of -83 dBm and -93 dBm for their 700 MHz LTE and -86 dBm and -96 dBm for their 1900 MHz LTE.<sup>1</sup> The stronger thresholds (-83 dBm and -86 dBm) yield greater throughputs and improved customer experience. The -93 dBm and -96 dBm thresholds are the minimum acceptable levels required to meet customer expectations for 4G service.

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<sup>1</sup> The threshold range differences between the 700 MHz and 1900 MHz frequency bands directly correlates to the type branch diversity receivers deployed in AT&T’s receiver design.

### 3. Coverage Objective

There is a significant coverage deficiency in the existing AT&T wireless communications network along State Highway 142, Route 1 (West Main Street), Interstate 95, Burban Drive, Alps Road and the surrounding residential areas in Branford, CT. In addition to the gaps in coverage, the sites currently serving the targeted area are in need of capacity relief due to the amount of usage in the area. A deficiency in coverage is evidenced by the inability to adequately and reliably transmit/receive quality calls and/or utilize data services offered by the network. Seamless reliable coverage provides users with the ability to successfully originate, receive, and maintain quality calls and/or utilize data applications throughout a service area. While adequate overlapping coverage is required for users to be able to move throughout the service area and reliably “hand-off” between cells in order to maintain uninterrupted connections, excessive overlap can be detrimental to service quality in an LTE system.

Due to terrain characteristics and the distance between the targeted coverage area and the existing sites, AT&T's options to provide services in this area are quite limited (maps of the terrain in this area and the distance to neighboring AT&T sites from the proposed site are included as Attachments 1 & 2, respectively.) AT&T's network requires a deployment of antennas throughout the area to be covered. These antennas are connected to receivers and transmitters that operate in a limited geographic area known as a “cell.” AT&T's wireless network, including their wireless handsets and devices, operate by transmitting and receiving low power radio frequency signals to and from these cell sites. The signals are transferred to and from the landline telephone network and routed to their destinations by sophisticated electronic equipment. The size of the area served by each cell site is dependent on several factors, including the number of antennas used, the height at which the antennas are deployed, the topography of the land, vegetative cover and natural or man-made obstructions in the area. As customers move throughout the service area, the transmission from the portable devices is automatically transferred to the AT&T facility with the best connection to the device, without interruption in service provided that there is overlapping coverage from the cells.

In order to define the extent of the coverage gap to be filled, both propagation modeling and real-world drive testing has been conducted in the area of Branford around the subject areas. Propagation modeling uses PC software to determine the network coverage based on the specific technical parameters of each site including, but not limited to, location, ground elevation, antenna models, antenna heights, and also databases of terrain and ground cover in the area. Drive testing consists of traveling along area roadways in a vehicle equipped with a sophisticated setup of test devices and receivers that collect a variety of network performance metrics. The data are then processed and mapped in conjunction with the propagation modeling to determine the coverage gaps.

Analysis of the propagation modeling and drive testing in and around Branford reveal that AT&T's network is unreliable throughout much of the area due to gaps in coverage, heavy usage on the existing sites in the area, and that there is a service deficiency as a result. In order to fill in these coverage gaps and improve the network reliability to Branford, a new facility is needed in the area.

While AT&T holds licenses in the 700 MHz, 800 MHz (Cellular), 1900 MHz (PCS) and 2300 MHz (WCS) bands, this report will focus on the 1900 MHz LTE coverage since it is this layer that is deficient in Branford and will be essential to AT&T's 4G platform, which is currently being rolled out throughout the market.

Table 1 below approximates the current coverage gap of AT&T's 1900 MHz (PCS) LTE technology in the vicinity of the proposed site.

<b>Existing 1900 MHz LTE Coverage Gap</b>		
<b>Population:<sup>2</sup></b>	( $\geq$ -86 dBm)	16,747
	( $\geq$ -96 dBm)	6,890
<b>Area (mi<sup>2</sup>):</b>		
	( $\geq$ -86 dBm)	5.95
	( $\geq$ -96 dBm)	3.15
<b>Roadway (mi):</b>		
	Main:	3.98
	Secondary:	22.06
	<b>Total:</b>	<b>26.04</b>

Table 1: Estimated Existing Coverage Gap Statistics

<sup>2</sup> Population figures are based upon 2010 US Census Block Data

Included with this report are Attachments 1-7, which are explained below and help describe AT&T's network in and around Branford, and the need for the proposed facility.

- Attachment 1: “*3D Terrain Map*” details the terrain features around the area of deficient service being targeted by the proposed site in Branford. These terrain features play a key role in determining site designs and dictating the unique coverage achieved from a given location. This map is included to provide a visual representation of the ridges and valleys that must be considered when siting a wireless facility. The darker green and blue shades correspond to lower elevations, whereas the yellow and red shades indicate higher elevations.
- Attachment 2: “*Map of Distance to Neighbor Sites – Branford* ” provides an overview of AT&T's network of sites in the area, with distances shown from the proposed Branford site to the existing sites in the surrounding area.
- Attachment 3: “*Neighbor Site Data and Distance to Proposed Site*” provides site specific information of existing neighboring sites used to perform the coverage analysis provided in Attachments 4 and 5.
- Attachment 4: “*Existing 1900 MHz LTE Coverage*” *Current AT&T Network* ” depicts 1900 MHz LTE coverage from existing sites and demonstrates that there are currently gaps in 1900 MHz LTE coverage effecting service along State Highway 142, Route 1 (West Main Street), Interstate 95, Burban Drive, Alps Road, and the surrounding residential neighborhoods and roads in Branford and East Haven. The coverage shown is where the signal strengths are > -86 dBm (minimum level required for reliable high quality service and performance at 1900 MHz) and > -96 dBm (the minimum required for adequate level of service at 1900 MHz).
- Attachment 5: “*Existing & Proposed 1900 MHz LTE Coverage*” (*with Branford Site in the AT&T Network*) shows how this proposed site would fill in the existing coverage gaps and improve AT&T's 1900 MHz LTE network within the targeted areas, as detailed in Table 2.
- Attachment 6: “*Connecticut DOT Average Annual Daily Traffic Data – Branford*” shows the available vehicular traffic volume data for the subject area from the Connecticut Department of Transportation. This data shows as many as 19,700 vehicles per day passing through the subject area on Route 1 (West Main Street) near the border of Branford with East Haven, and as many as 4,300 vehicles passing through State Highway 142
- Attachment 7: *Connecticut DOT Average Annual Daily Traffic Data – East Haven* shows the available vehicular traffic volume data for the subject area from the Connecticut Department of Transportation. This data shows as many as 21,400 vehicles per day passing through the subject area on Route 1 ( Main Street) near the East Haven/Branford border, and as many as 21,900 vehicles passing through State Highway 142 near the intersection with Coe Avenue.

Table 2 below lists the incremental coverage statistics that were compiled for the proposed site.

<b>Incremental Coverage from Proposed Site (1900 MHz)</b>		
<b>Population Coverage:<sup>3</sup></b>	( $\geq$ -86 dBm)	4,975
	( $\geq$ -96 dBm)	3,923
<b>Area Covered (mi<sup>2</sup>):</b>		
	( $\geq$ -86 dBm)	1.31
	( $\geq$ -96 dBm)	1.46
<b>Roadway Coverage (mi):</b>		
	Main:	2.52
	Secondary:	13.98
	<b>Total:</b>	<b>16.5</b>

Table 2: Coverage Statistics

<sup>3</sup> Population figures are based upon 2010 US Census Block Data

## 4. Conclusion

AT&T has identified an area of deficient coverage affecting a significant portion of Branford, CT, including key traffic corridors through the residential areas of the town. The proposed Branford facility will bring the needed fill-in coverage to significant portions of State Highway 142, Route 1 (West Main Street), Interstate 95, Burban Drive, Alps Road, and the residential neighborhoods in the vicinity of these roads, all of which are currently within this area of deficient coverage. In addition to the needed fill-in coverage, the proposed site will improve dominance, and offload the sites currently serving the targeted area, which are in need of capacity relief due to the amount of usage in the area.

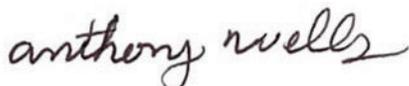
No existing structures were identified and available that would be able to satisfy the coverage and capacity requirements needed for this area. The location and the minimum height selected were chosen to achieve an optimal balance between meeting coverage objectives, overcoming the tree line for signal propagation, minimizing the aesthetic impact to the community, and future collocation.

As discussed in this report and depicted in the attached plots, the proposed AT&T site will provide the public need for service in this area, by providing an appropriate coverage footprint for the Branford community along with effective connectivity to the rest of AT&T's existing network.

Without a site in this area, at the height requested, significant gaps in service will exist within the Town of Branford, and the identified public need for reliable wireless services in this area will not be met.

## 5. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate.

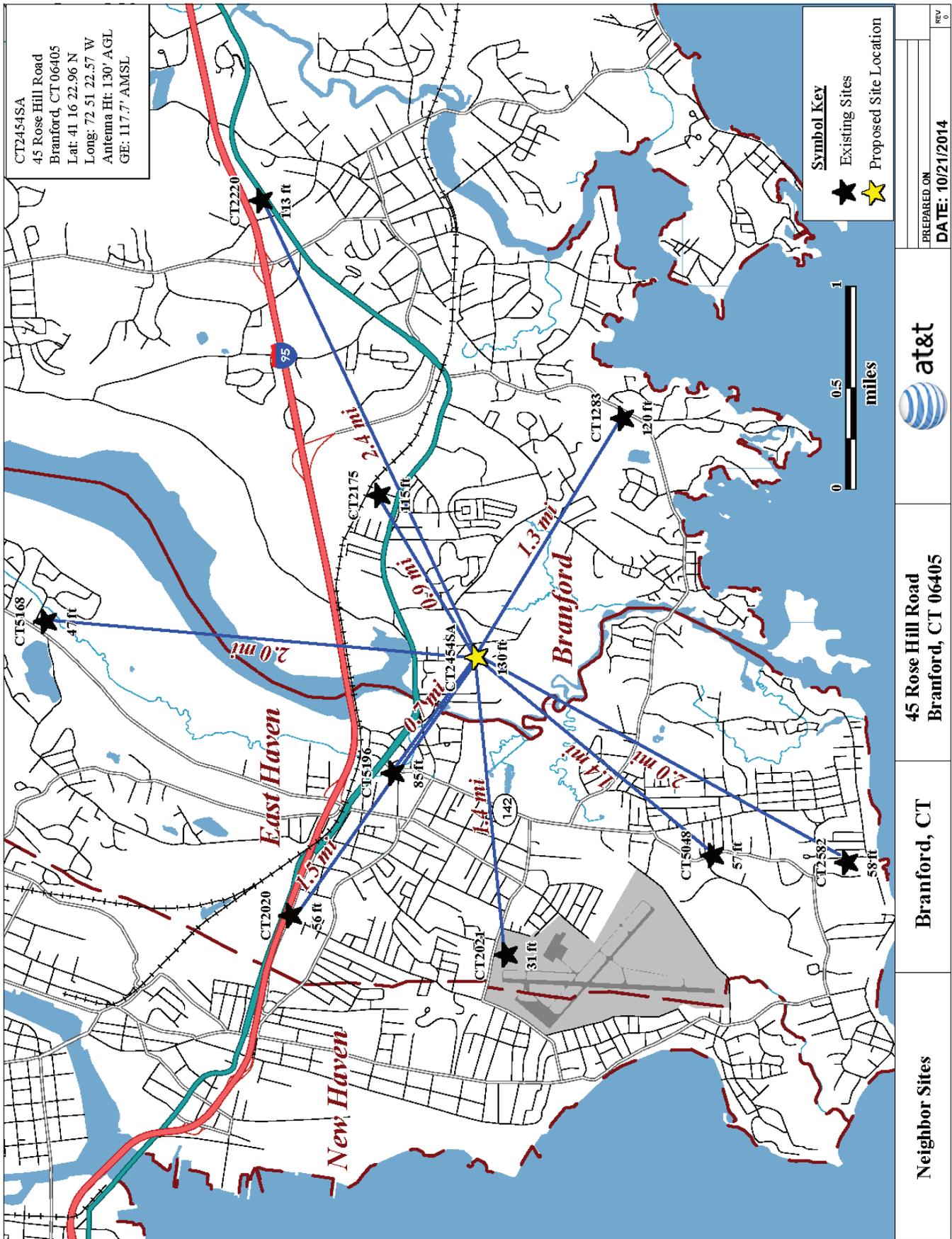


Anthony Wells  
C Squared Systems, LLC

October 22, 2014

Date





PREPARED ON \_\_\_\_\_  
 DATE: 10/21/2014  
 REV 0



45 Rose Hill Road  
 Branford, CT 06405

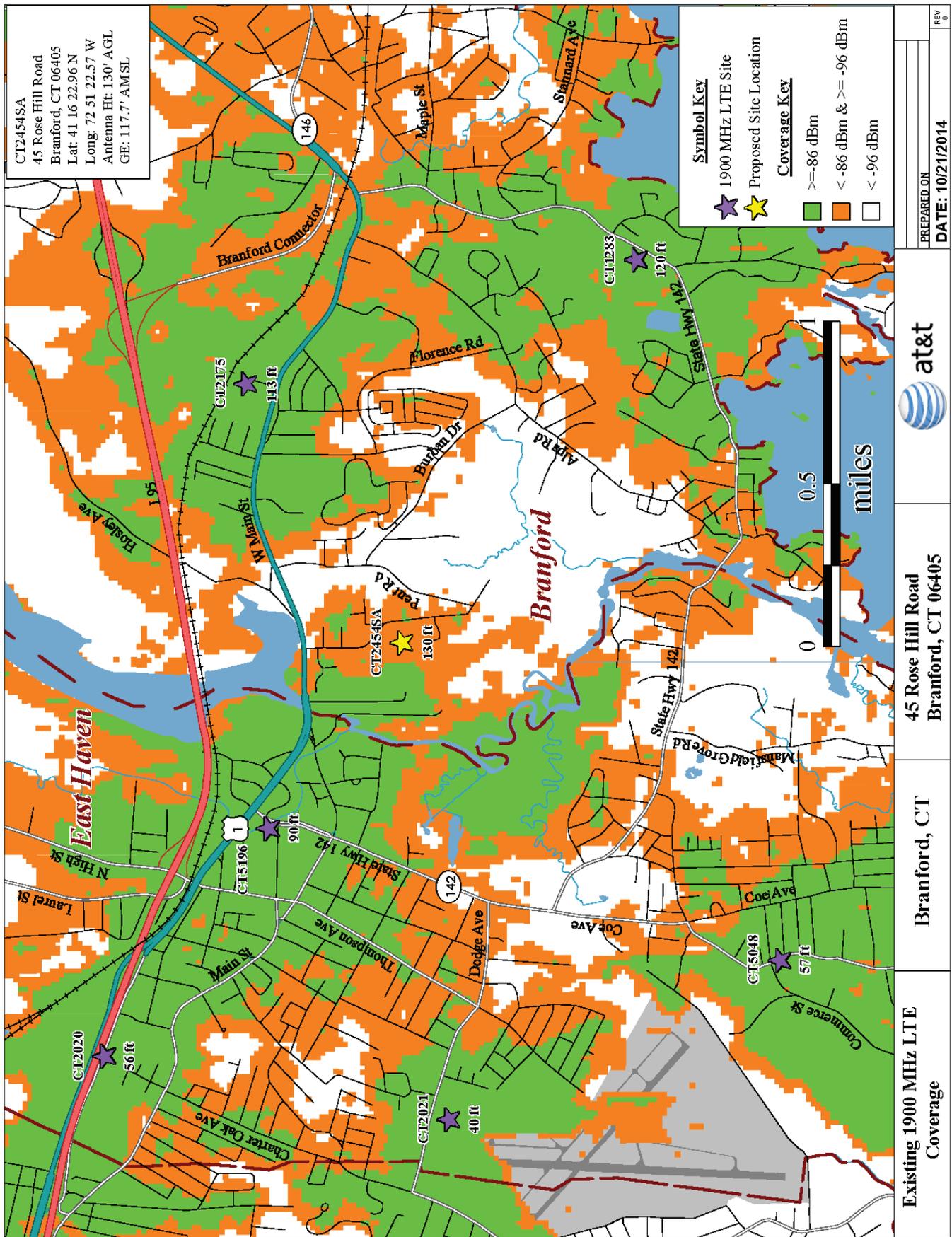
Branford, CT

Neighbor Sites

Attachment 2: Map of Distance to Neighbor Sites – Branford

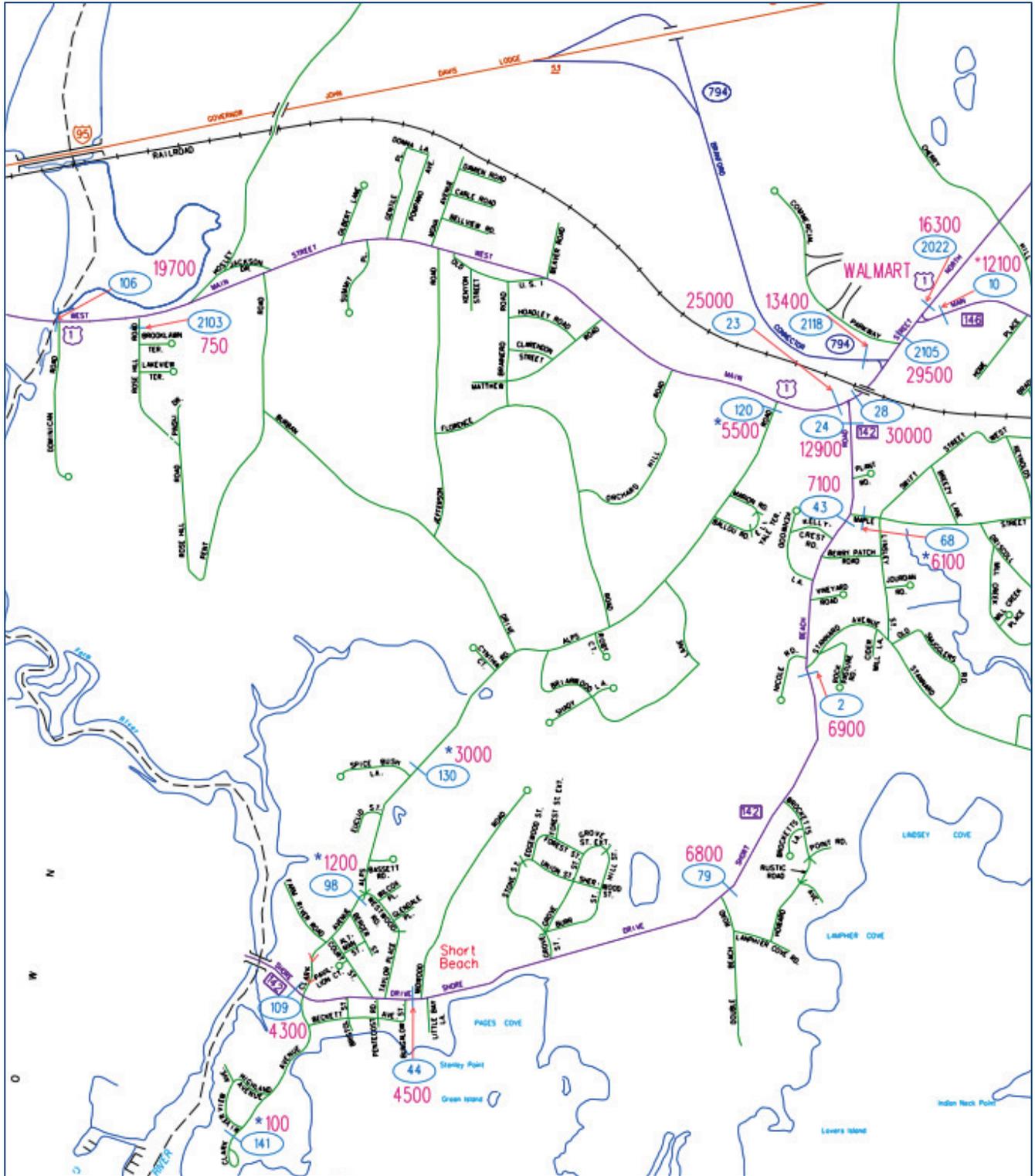
Site ID	Address	Town	Latitude	Longitude	Antenna Centerline (feet)	Distance to Proposed Site (miles)	Structure Type	Ground Elevation (feet)
CT5168	875 North High Street	East Haven	41.304	-72.8537	47	2.0	Stealth	46
CT2020	96 Frontage Road	East Haven	41.2865	-72.88152	56	1.5	Billboard-Sign	22
CT5196	65 Messina Drive	East Haven	41.2792	-72.86805	85	0.7	Rooftop	15
CT2021	290 Dodge Avenue	East Haven	41.2711	-72.88526	31	1.4	Rooftop	25
CT5048	259 Commerce Street	East Haven	41.2564	-72.87584	57	1.4	Monopole	36
CT2582	111 South Shore Drive	East Haven	41.2468	-72.87653	58	2.0	Stealth	44
CT2175	4 Beaver Road	Branford	41.2802	-72.84175	115	0.9	Lattice	96
CT1283	171 Short Beach Drive	Branford	41.2628	-72.83443	120	1.3	Monopole	58
CT2220	150 North Main Street	Branford	41.2886	-72.81386	113	2.4	Monopole	60

Attachment 3: Neighbor Site Data and Distance to Proposed Site

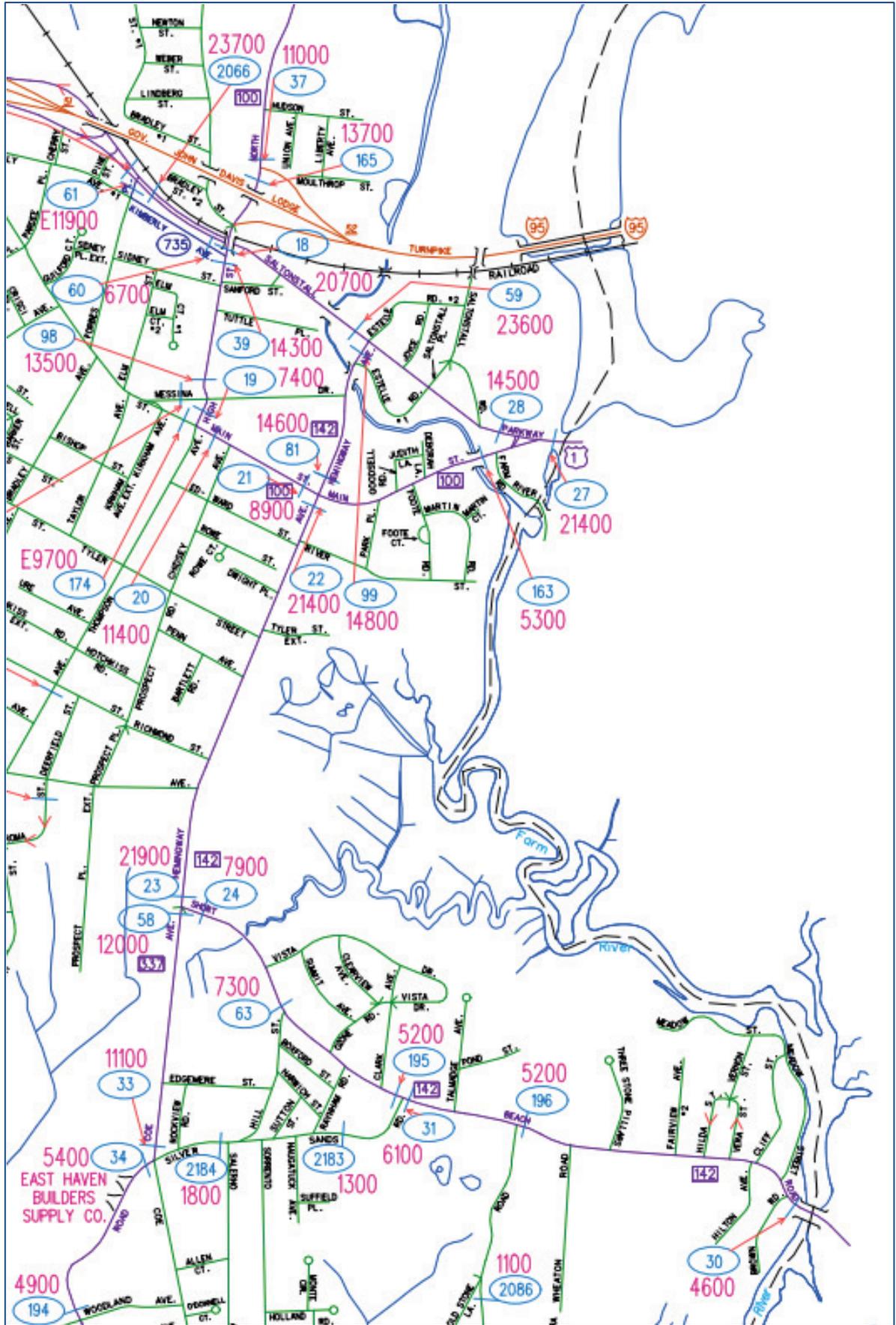


Attachment 4: "Existing 1900 MHz LTE Coverage" (Current AT&T Network)





Attachment 6: Connecticut DOT Average Annual Daily Traffic Data – Branford



Attachment 7: Connecticut DOT Average Annual Daily Traffic Data – East Haven

ATTACHMENT 2

## SECTION 2

### SITE SEARCH SUMMARY

A search area is developed to initiate a site selection process in an area where network service improvements are required for a specific carrier and/or carriers. The search area is a general geographic region where the installation of a wireless facility would address identified service problems while still allowing for orderly integration of a new facility into a network such as AT&T's. The technical and site selection criteria used by wireless carriers include hand-off, frequency reuse, and interference among other factors. In any site search area, site acquisition specialists seek to avoid the unnecessary proliferation of towers and to reduce the potential adverse environmental effects of a needed facility, while simultaneously seeking sites that RF engineers will qualify as being able to provide quality reliable service to the community.

Once a potential candidate is selected through the identification process, site acquisition teams review any applicable zoning ordinance or other guidance documentation. The most preferred candidates are generally considered to be existing structures that can be used or extended. In order to be viable, a candidate must provide adequate service and be "leasable". Within this particular area of Branford and East Haven, Connecticut, there are no existing commercial towers or tall non-tower structures located within the identified search area. The service objective is intended to improve service in the Beacon Hill area of Branford and East Haven. This area is populated by single family residences, some commercial buildings and several senior (multi-family) resident facilities.

TowerCo investigated eleven (11) potential sites within the site search area, one of which is the current primary candidate being pursued in conjunction with AT&T. Site acquisition specialists found these sites to be either adequate and

available for the siting of a wireless facility or, for the reasons cited below, unavailable or rejected by RF engineers for AT&T's service requirements.

1. Address: 45 Rose Hill Road

Owner: Paul Santa Barbara

Map/Block/Lot: A08-000-003-00016

Zoning District: Residential 4 (R-4)

Lot Size: 2.0 acres

*This is the Primary Site Candidate. This site was chosen because it has relative ground elevation (118 AGL+/-) in which a tower could be constructed and provide adequate service based on the surrounding terrain and tree cover. There is a business named Waste Tech Family Refuse LLC located on the property which is a dumpster rental, rubbish removal and recycling services company.*

2. Address: 115 - 149 Rose Hill Road

Owner: State of Connecticut - Town of Branford - Beacon Hill Preserve

Map/Block/Lot: A10/A09-004.003.1 & A09-000-003-00002

Zoning District: Residential 4 (R-4)

Lot size: 70+ acres

*This site was not chosen because it is preserved as open space. This site also was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objective. Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected."*

3. Address: 56 Rose Hill Road

Owner: Edward J and Sandra L Parzych

Map/Block/Lot: A08-000-003-00024

Zoning District: Residential 4 (R-4)

Lot size: 2.9 acres

*This site was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objective. This location has significantly less ground elevation (71 AGL+/-) than the candidate site. There is a business named National Carting, LLC located on the property which provides almost identical services as the one located on the primary candidate. Per AT&T's Radio Frequency engineer site "Marginal incremental coverage compared to primary, RF rejected."*

4. Address: 249 West Main

Owner: Lakeview Center Associates, LLC Branford Equities LLC c/o  
Delaurentis Management

Map/Block/Lot: A08-000-006-00015

Zoning District: Local Business (BL)

Lot size: 10.2 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives. In addition, there is insufficient space to install a wireless facility without removal of trees that buffer the site and an adjacent residential area. Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected."*

5. Address: 61 Burban Drive

Owner: Benedictines of Jesus Crucified, Inc., the Connecticut Hospice

Map/Block/Lot: B09/000/004/00001

Zoning District: Residential 4 (R-4)

Lot size: 6.3 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 39 AGL+/-). Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected."*

6. Address: 65-99 Burban Drive

Owner: St. Elizabeth's Church Corp.

Map/Block/Lot: B09/000/004/001.1

Zoning District: Residential 4 (R-4)

Lot size: 10 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 38 AGL+/-). Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected"*

7. Address: 100-150 Rose Hill Road

Owner: William Uresky

Map/Block/Lot: B09-000-001-00004

Zoning District: Residential 4 (R-4)

Lot size: 21.6 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 35 AGL+/-). In addition, the vast majority of this property (18.8 acres) are understood to be*

*wetlands. Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected"*

8. Address: 163 Alps Road

Owner: Branford Land Trust, Inc.

Map/Block/Lot: B09-000-008-00010 & C10-000-002-00002

Zoning District: Residential 4 (R-4) & Residential 4 (R-4)

Lot size: 19.2 Acres & 4.29 Acres

*These properties were not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 30 AGL+/-) and marshland status. Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected"*

9. Address: 173 Alps Road

Owner: Nationwide Health Properties Inc.

Map/Block/Lot: B09-000-008-00011

Zoning District: Residential 4 (R-4) - Approved PDDs - Planned Development District

Lot size: 19.5 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 32 AGL+/-). Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected"*

10. Address: 189 Alps Road

Owner: Branford Hills Realty Associates

Map/Block/Lot: B09-B10-001-00001

Zoning District: Residential 4 (R-4)

Lot size: 21.6 acres

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 21 AGL+/-). Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected"*

11. Address: 45-55 Alex Warfield Road

Owner: BRANFORD ELECTRIC RR ASSOC INC

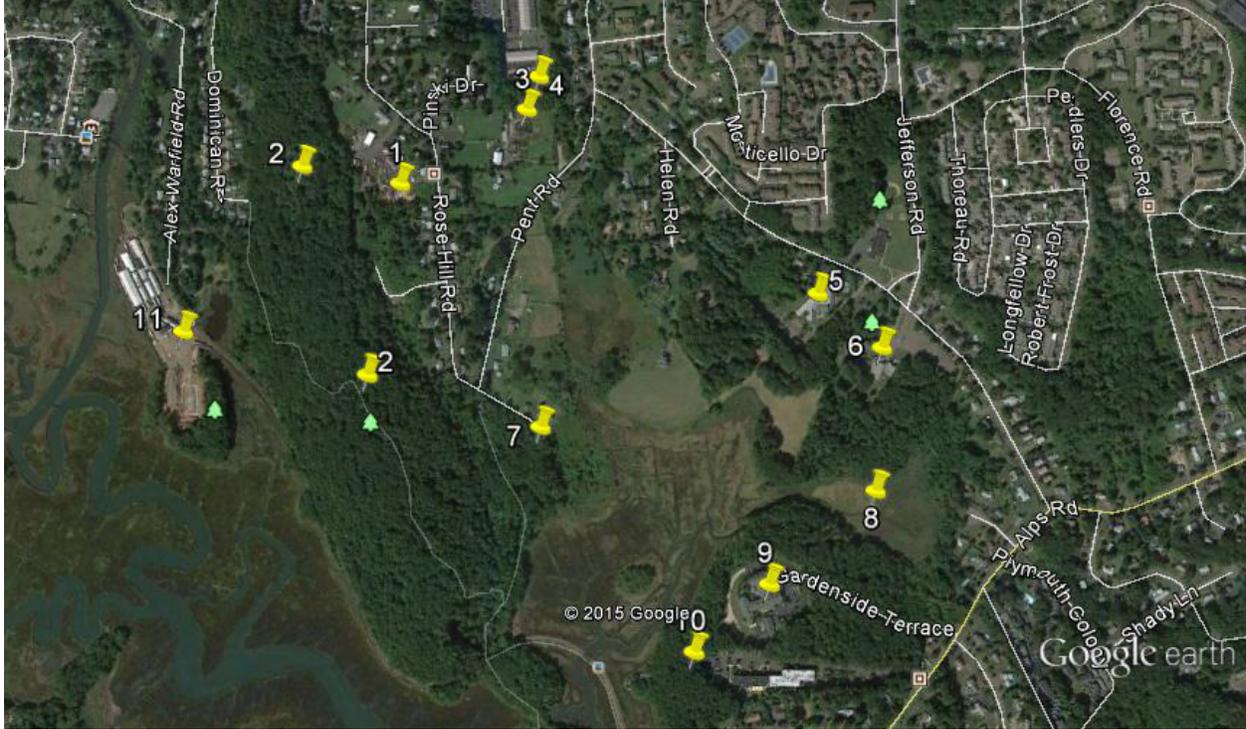
Map/Block/Lot: B10-000-001-00026

Zoning District: Residential 4 (R-4)

Lot Size: N/A

*This property was not selected as AT&T's Radio Frequency engineers determined it did not meet the service objectives (elevation 22 AGL+/-). Per AT&T's Radio Frequency engineer site "Does not provide sufficient coverage to be considered even backup, rejected" This landlord was also approached by the AT&T Site Acquisition Specialist and they were not interested.*

# SITE SEARCH MAP



## **EXISTING TOWER/CELL SITE LISTING**

There are approximately 44 listed wireless communications facilities located within four miles of the site search area for the proposed site in Branford. Each location is depicted on the following map, numbered in the order appearing on the list below. The existing facilities do not currently, and cannot be used to provide adequate 4G LTE service to the area of Branford and East Haven intended to be served by the proposed facility. Many of the towers and rooftop installations listed are in fact currently being used or proposed for use by AT&T to provide service outside of the area targeted for service by the proposed Facility.

# Existing Tower / Site Listing - 4 Mile Radius

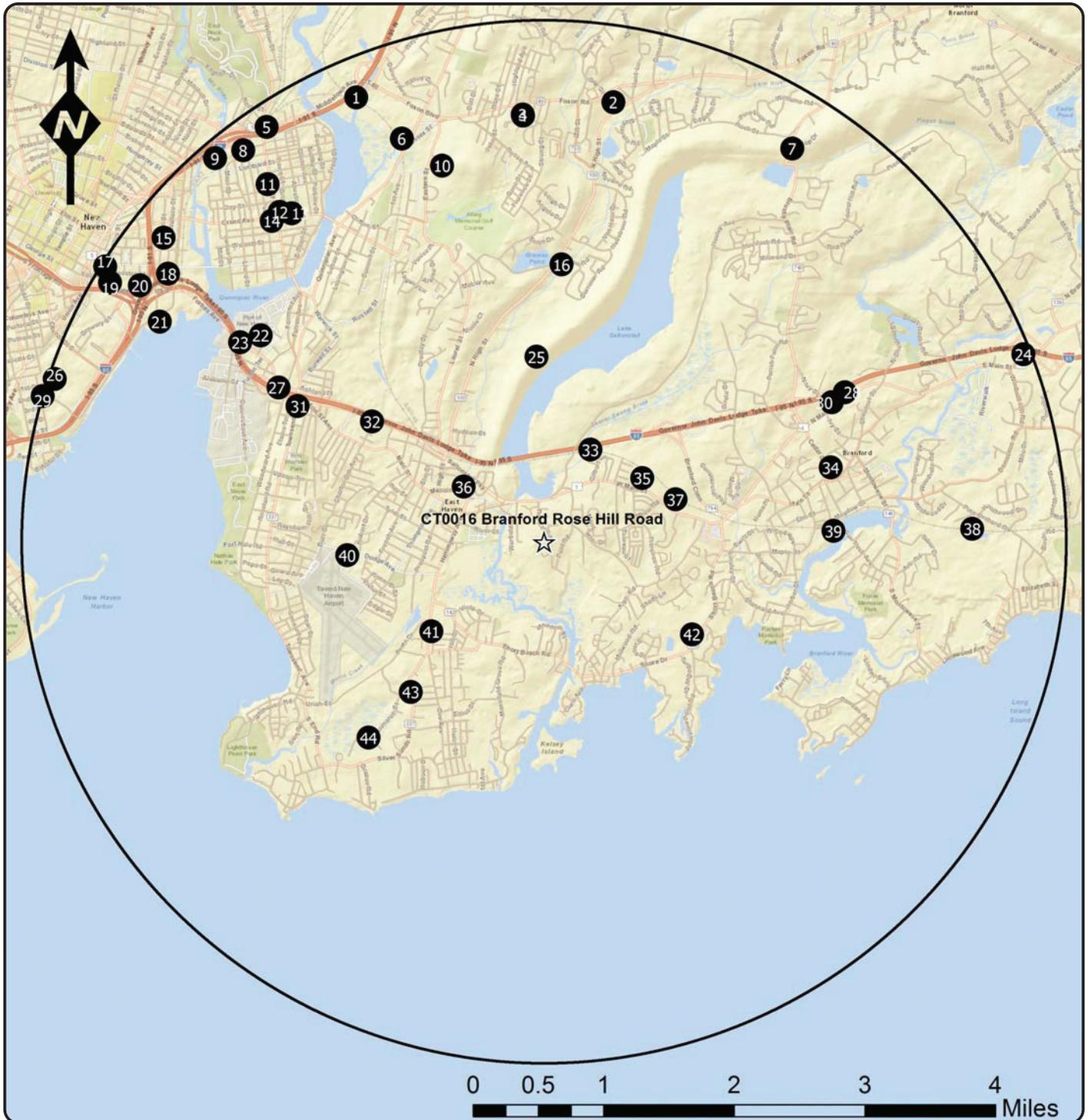
☆ CT0016 Branford Rose Hill Road  
 45 Rose Hill Road Branford, CT 06405  
 Lat, Lon: 41.273044, -72.856269  
 Proposed Tower Height: 134.0'

Tower ID	Owner	Address	Town	Latitude	Longitude	Height	Distance (miles)
1		159 Middletown Avenue	New Haven	41.3224	-72.8839	88'	3.7
2	AT&T	1270 North High Street	East Haven	41.3219	-72.8460	45'	3.4
3		836 Foxon Road	East Haven	41.3205	-72.8593		3.3
4	Sprint	836 Foxon Road	East Haven	41.3204	-72.8593	100'	3.3
5	Gillette, Joan	4 Middletown Avenue	New Haven	41.3191	-72.8971		3.8
6	UI	1100 Quinnipiac Ave.	New Haven	41.3178	-72.8772	79'	3.3
7	SCLP	405 Brushy Plain Rd	Branford	41.3168	-72.8197	154'	3.6
8		315 (319) Peck Street	New Haven	41.3165	-72.9005	67'	3.8
9	DOT	470 James St	New Haven	41.3156	-72.9047	140'	3.9
10		339 (363) Eastern Street	New Haven	41.3148	-72.8712		3.0
11		480 Ferry Street	New Haven	41.3127	-72.8969		3.5
12		355 Ferry Street	New Haven	41.3096	-72.8951	100'	3.2
13	Cathedral of Higher Praise	155 Grand Avenue	New Haven	41.3095	-72.8933	59'	3.2
14		230 Grand Avenue	New Haven	41.3086	-72.8963		3.2
15		133 Hamilton Street	New Haven	41.3067	-72.9122		3.7
16		875 N. High Street	East Haven	41.3038	-72.8536		2.1
17	Comcast Cable	630 Chapel Street	New Haven	41.3035	-72.9208		4.0
18		414 Chapel Street (151 East Street)	New Haven	41.3027	-72.9116		3.5
19		60 Warren Street	New Haven	41.3017	-72.9201		3.9
20	C. Cowles & Co.	83 Water Street	New Haven	41.3014	-72.9157		3.7
21		545 Long Wharf Drive	New Haven	41.2974	-72.9127		3.4
22		69 Wheeler Street	New Haven	41.2959	-72.8979	88'	2.7

23	Louis Canestri	153 Forbes St.	New Haven	41.2951	-72.9009	75'	2.8
24	Crown Castle	10 Sylvia Street	Branford	41.2939	-72.7856	125'	3.9
25	South Central CT Water Authority	45 Saltonstall Road	East Haven	41.2936	-72.8573	100'	1.4
26	Amtrak	Hallock Ave	New Haven	41.2910	-72.9282	100'	4.0
27	SBA	389 Forbes Ave	New Haven	41.2901	-72.8952	86'	2.4
28	Crown Castle	180 North Main St	Branford	41.2897	-72.8119	110'	2.6
29		1 Long Wharf Drive	New Haven	41.2891	-72.93	98'	4.0
30	Crown Castle	150 North Main St	Branford	41.2885	-72.8138	150'	2.5
31		1155 Townsend Avenue	New Haven	41.2880	-72.8924		2.2
32		96 Frontage Road	East Haven	41.2863	-72.8815		1.6
33		60 Hosley Avenue	Branford	41.2833	-72.8493	150'	0.8
34	Town of Branford	33 Laurel Street	Branford	41.2813	-72.8140	75'	2.3
35	American Tower	4 Beaver Rd	Branford	41.2801	-72.8417	125'	0.9
36		65 Frank Messina Drive	East Haven	41.2791	-72.8680		0.7
37	Crown Castle	850 West Main St	Branford	41.2777	-72.8368	130'	1.1
38	Florida Tower Partners	123 Pine Orchard Road	Branford	41.2745	-72.7931	125'	3.3
39		50 Maple Street	Branford	41.2742	-72.8136	100'	2.2
40		290 Dodge Avenue	East Haven	41.2715	-72.8851		1.5
41		441 (455) Coe Avenue	East Haven	41.2630	-72.8727		1.1
42	North Atlantic Towers	171 Short Beach Road	Branford	41.2627	-72.8344	120'	1.3
43	Stephen Viglione	259 Commerce Street	East Haven	41.2563	-72.8757	57'	1.5
44	SBA/Perelli & Sons	60 Commerce Street	East Haven	41.2512	-72.8819	70'	2.0

# Existing Tower / Site Listing - 4 Mile Radius

☆ CT0016 Branford Rose Hill Road  
45 Rose Hill Road Branford, CT 06405  
Lat, Lon: 41.273044, -72.856269  
Proposed Tower Height: 134.0'



ATTACHMENT 3

## SECTION 3

### GENERAL FACILITY DESCRIPTION

Rose Hill Road

A-8/0/3/16

Branford, Connecticut

Owner: Paul Santa Barbara

2 Acre Parcel

The proposed site is an approximately 2 acre parcel with an address of 45 Rose Hill Road, access from Rose Hill Road and owned by Paul Santa Barbara. The property is currently used as part of a dumpster rental refuse and recycling services company.

The proposed telecommunications facility includes an approximately 3600 s.f. lease area located in the southern portion of the parcel. The tower is proposed as a new self-supporting monopole 134' in height. AT&T would install up to twelve (12) panel antennas and related equipment at a centerline height of 130' above grade level (AGL) on the tower. The tower would be designed for future shared use of the structure by three additional FCC licensed wireless carriers. The plans show an FAA light and appurtenances to a height not to exceed 140' AGL. An AT&T 11'-5" x 16' equipment shelter would be installed at the tower base on a concrete pad within the tower compound together with provisions for a fixed emergency back-up power generator.

The tower compound would consist of a 3600 s.f. "L"-shaped area to accommodate AT&T's equipment and provide for future shared use of the facility by other carriers. The tower compound would be enclosed by an 8' high chain link fence. Vehicle access to the facility would be provided from Rose Hill Road over a proposed 15' wide access easement from the frontage on Rose Hill Road nearest for the tower site. The gravel access drive will run

across the parcel a distance of approximately 252' to the proposed tower compound and will include a 10' x 20' turn-around/parking area. Utility connections would be routed underground from an existing utility pole #37355 at Rose Hill Road.

## SITE AND FACILITY DESCRIPTION

### I. LOCATION

- A. COORDINATES: 41° 16' 22.96" N 72° 51' 22.57" W
- B. GROUND ELEVATION: 117.7'± AMSL
- C. USGS MAP: USGS 7.5 Quadrangle for Branford, CT
- D. SITE ADDRESS: 45 Rose Hill Road, Branford, CT 06405
- E. ZONING WITHIN ¼ MILE OF SITE: Abutting areas are zoned residential (R-4) to the north, south, and east. To the west and southwest is an open space parcel of land known as Beacon Hill Preserve.

### II. DESCRIPTION

- A. SITE SIZE: 2 acres (VOL 628, PAGE 348)
- B. LEASE AREA/COMPOUND AREA: 3600SF
- C. TOWER TYPE/HEIGHT: A 134' Monopole with top of antennas and appurtenances not to exceed 140' AGL.
- D. SITE TOPOGRAPHY AND SURFACE: Subject site is a mostly cleared parcel occupied by a commercial use that includes dumpster storage, small buildings and commercial trucks.
- E. SURROUNDING TERRAIN, VEGETATION, WETLANDS, OR WATER: The proposed compound is located in the southwestern portion of a 2 acre mostly cleared parcel. Immediately to the west is a large undisturbed wooded area that is part of the Beacon Hill Preserve. There are wetlands off-site to the west (±138').
- F. LAND USE WITHIN ¼ MILE OF SITE: Single family residential, commercial/industrial and farmland with a large open space parcel to the west/southwest.

### III. FACILITIES

A. POWER COMPANY: Connecticut Light and Power

B. POWER PROXIMITY TO SITE: 250'±

C. TELEPHONE COMPANY: Frontier

D. PHONE SERVICE PROXIMITY: 250'±

E. VEHICLE ACCESS TO SITE: Proposed 15' access easement to the site will be from Rose Hill Road, an existing public right of way (R.O.W.). The proposed driveway is ±252' long with a turnaround and parking space.

F. OBSTRUCTION: None known at this time.

G. AREA OF DISTURBANCE: Total area of disturbance is low and no trees will need to be removed.

### IV. LEGAL

A. PURCHASE [ ] LEASE [X]

B. OWNER: Paul Santa Barbara

C. ADDRESS: 51 Rose Hill Road  
Branford, CT 06405

D. DEED ON FILE AT: VOLUME 627, PAGE 349

## FACILITIES AND EQUIPMENT SPECIFICATION

### I. TOWER SPECIFICATIONS:

- A. MANUFACTURER: To be determined
- B. TYPE: Self-Supporting monopole
- C. HEIGHT: 134' AGL  
DIMENSIONS: Approximately 5' in diameter at the base, tapering to approximately 3.5' at the top.
- D. FAA TOWER LIGHTING: An FAA beacon light is required per the FAA report attached.

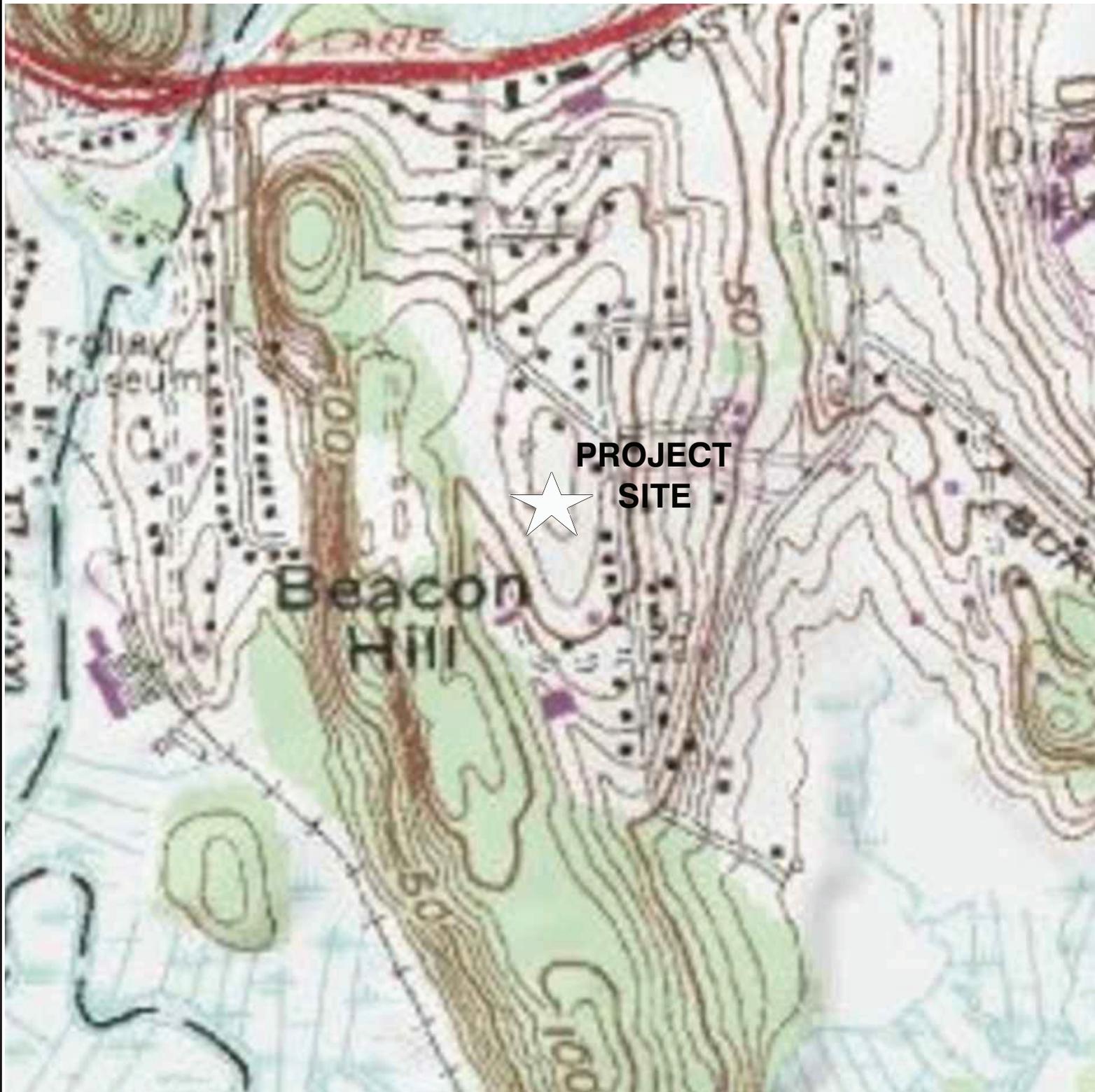
### II. TOWER LOADING:

- A. AT&T - up to 12 panel antennas
  - a. Model - Andrew SBNH-1D6565C or equivalent panel antenna
  - b. Antenna Dimensions - approximately 96"H x 12"W x 7"D
  - c. Position on Tower - 130' centerline AGL
  - d. Transmission Lines - MFG/Model: Commscope Aluminum; Size 1-5/8"
  - e. Remote Radio Heads & Surge Arrestor
- B. Future Carriers -Future wireless carriers to be determined.

### III. ENGINEERING ANALYSIS AND CERTIFICATION:

The tower will be designed in accordance with American National Standards Institute TIA/EIA-222-F "Structural Standards for Steel Antenna

Towers and Antenna Support Structures” and the 2003 International Building Code with 2005 Connecticut Amendment. The foundation design would be based on soil conditions at the site. The details of the tower and foundation design will be provided as part of any final Siting Council Development & Management Plan.



SOURCE: TERRAIN NAVIGATOR

SCALE: 1"=500'-0"



APPROX.  
TRUE NORTH



**SITE NO:** CT0016  
**SITE NAME:** BRANFORD ROSE HILL ROAD  
**ADDRESS:** 45 ROSE HILL ROAD  
 BRANFORD, CT 06405



TOWERCO 2013 LLC  
 5000 VALLEYSTONE DRIVE  
 CARY, NC 27519



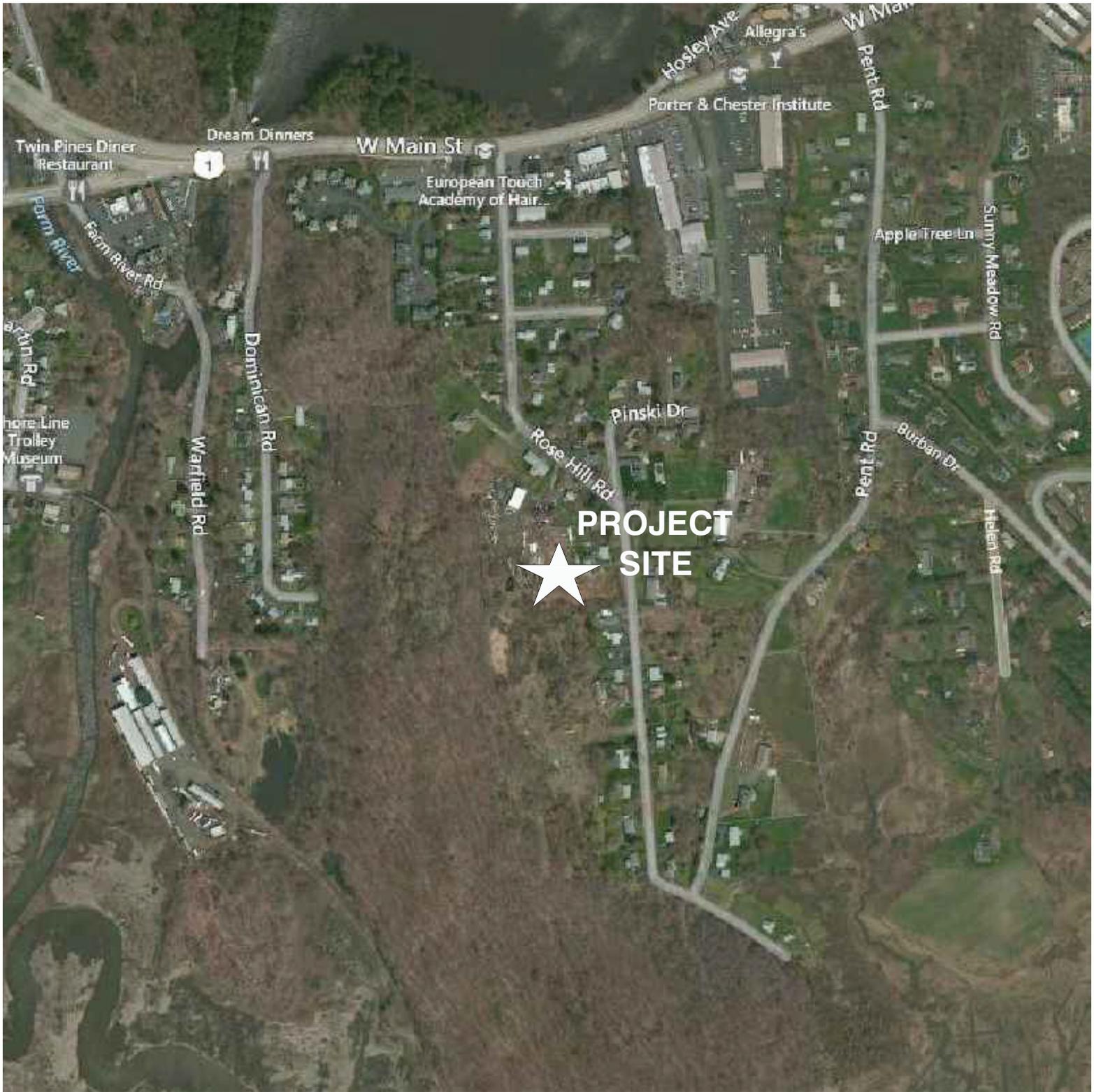
1400 OSGOOD STREET  
 BUILDING 20 NORTH, SUITE 3090  
 N. ANDOVER, MA 01845  
 TEL: (978) 557-5555  
 FAX: (978) 336-5566

TOPOGRAPHY  
 MAP

DRAWN BY:  
 KMS

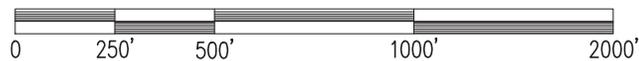
DATE:  
 10/01/2014

SCALE:  
 1"=500'



SOURCE: BING MAPS

SCALE: 1"=500'-0"



APPROX.  
TRUE NORTH



**SITE NO:** CT0016  
**SITE NAME:** BRANFORD ROSE HILL ROAD

**ADDRESS:** 45 ROSE HILL ROAD  
BRANFORD, CT 06405



TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519



1400 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5566

AERIAL PHOTO

DATE:  
10/01/2014

DRAWN BY:  
KMS

SCALE:  
1"=500'

**PROJECT INFORMATION**

SCOPE OF WORK:

- NEW TOWERCO COLOCATION 3,600± SQ.FT. FENCED LEASE AREA
- NEW TOWERCO 134'± MONOPOLE WITH LIGHTNING ROD AND FAA BEACON LIGHT
- NEW TOWERCO ACCESS ROAD AND UTILITIES
- NEW AT&T ANTENNAS: (4) ANTENNAS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (12) ANTENNAS
- NEW AT&T (9) RRUS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (27) RRUS
- (4) NEW AT&T RAYCAP SURGE SUPPRESSORS

ITEMS LISTED ABOVE TO BE MOUNTED ON THE PROPOSED 134' MONOPOLE

- NEW AT&T 11'-5" x 16'-0" EQUIPMENT SHELTER WITH 8'x11' PATIO FOR GENERATOR ON 11'-5" x 24'-0" CONCRETE PAD

(1) NEW AT&T GPS ANTENNA TO BE MOUNTED ON THE PROPOSED AT&T EQUIPMENT SHELTER

ITEMS LISTED ABOVE TO BE INSTALLED WITHIN THE PROPOSED COMPOUND

- (4) NEW AT&T EQUIPMENT RACK
- (1) NEW DC POWER PLANT
- (1) NEW BATTERY RACK

ITEMS LISTED ABOVE TO BE INSTALLED INSIDE THE PROPOSED AT&T 11'-5" X 16'-0" EQUIPMENT SHELTER

SITE ADDRESS: 45 ROSE HILL ROAD  
BRANFORD, CT 06405

LATITUDE: 41.273044° N  
LONGITUDE: 72.856269° W

TOWER OWNER: TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519

TYPE OF SITE: RAW LAND COLLOCATION MONOPOLE/INDOOR EQUIPMENT

TOWER HEIGHT: 134'-0"±

ANTENNA CENTERLINE HEIGHT: 130'-0"±

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



**SITE NAME: CT0016**  
**SITE NAME:**  
**BRANFORD-ROSE HILL ROAD**

**PROJECT TEAM**

COMPANY: TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519

ENGINEERING

COMPANY: HUDSON DESIGN GROUP, LLC. ADDRESS:  
1600 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
NORTH ANDOVER, MA 01845  
CONTACT: DANIEL P. HAMM, PE  
PHONE: (978) 557-5553 X222  
E-MAIL: daniel.hamm@hudsondesigngroupllc.com

SURVEY

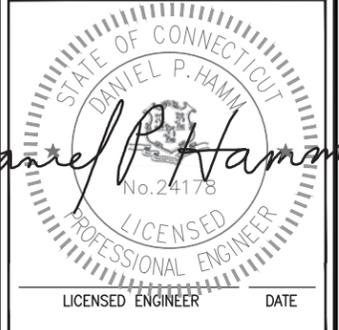
COMPANY: NORTHEAST SURVEY CONSULTANTS  
116 PLEASANT ST. SUITE 302  
P.O. BOX 109  
EASTHAMPTON, MA 01027  
PHONE: (413) 203-5144



TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519



1600 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



**DRAWING INDEX**

**REV**

**VICINITY MAP**

**GENERAL NOTES**

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<b>C-2</b>	<b>EXISTING CONDITIONS</b>	<b>1</b>
<b>C-3</b>	<b>SITE PLAN</b>	<b>3</b>
<b>A-1</b>	<b>COMPOUND PLAN &amp; ELEVATION</b>	<b>3</b>
<b>A-2</b>	<b>SHELTER DETAILS</b>	<b>3</b>
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- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF TOWERCO. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE TOWERCO REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

**REVISIONS**

REV. #	DATE	DESCRIPTION
3	10/23/14	REVISED PER COMMENTS
2	10/15/14	REVISED PER COMMENTS
1	10/09/14	ISSUED FOR REVIEW
0	10/02/14	ISSUED FOR REVIEW

PROJECT NO. CT0016	DESIGNED BY: DR DRAWN BY: KMS CHECKED BY: DPH	SCALE: AS SHOWN
-----------------------	---	--------------------

SITE NAME:  
**CT0016  
BRANFORD -  
ROSE HILL ROAD**

SITE ADDRESS:  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

SHEET TITLE:  
**TITLE SHEET**

SHEET NO:  
**T-1**

**ABUTTER'S LIST**

A8-0-3-15  
41 ROSE HILL ROAD  
DIANE R.  
SANTA BARBARA  
41 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-3-17  
51 ROSE HILL ROAD  
PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-3-18  
53 ROSE HILL ROAD  
PASQUALE SANTA  
BARBARA, JR.  
53 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-4-8  
81 PINSKI DRIVE  
EDGAR R. SURPRENANT  
81 PINSKI DRIVE  
BRANFORD, CT 06405

A8-0-4-9  
85 PINSKI DRIVE  
KEITH BERTRAND  
1 SPARROW HAWK CIRCLE  
CLIFTON PARK, NY 12065

A8-0-4-10  
44 ROSE HILL ROAD  
ROBERT P. SANTA  
BARBARA  
44 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-6-23  
50 ROSE HILL ROAD  
EDWARD J. PARZYCH  
56 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-6-23.1  
88 PINSKI DRIVE  
MARK A. BALZANO  
88 PINSKI DRIVE  
BRANFORD, CT 06405

A8-0-6-24  
56 ROSE HILL ROAD  
EDWARD J. PARZYCH  
56 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-6-26  
58 ROSE HILL ROAD  
JACKSON PEIRRE-LOUIS  
58 ROSE HILL ROAD  
BRANFORD, CT 06405

A8-0-6-27  
68 ROSE HILL ROAD  
JACKSON PEIRRE-LOUIS  
734 EAST MAIN STREET  
BRANFORD, CT 06405

A8-A9-3-3.2  
1 BEACON HILL ROAD  
SHEARWATER PROPERTIES  
INC.  
8 WILFORD ROAD  
BRANFORD, CT 06405

A8-A9-3-4  
61 ROSE HILL ROAD  
CHRISTOPHER GARGAMELLI  
61 ROSE HILL ROAD  
BRANFORD, CT 06405



**LOCUS**  
A8-0-3-16  
45 ROSE HILL ROAD  
PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405  
DEED 627-346  
AREA = 2 AC. ±

LINE	BEARING	DISTANCE
L1	S26°44'14"W	198.11'
L2	S02°29'16"E	30.72'
L3	S02°28'49"E	339.88'
L4	N88°09'04"E	182.14'
L5	N89°12'09"E	125.48'
L6	N05°47'57"W	151.70'
L7	S84°12'03"W	125.00'
L8	N05°47'57"W	100.00'
L9	S84°12'03"W	30.00'
L10	N05°47'57"W	92.02'
L11	N56°43'08"E	54.68'
L12	N39°13'08"E	81.22'
L13	N49°50'01"W	186.54'

- FIELD SURVEY DATE: 9/17/2014
  - HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83 2011)
  - VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD88)
  - ZONING: R-4
  - OWNER: PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405
  - SITE NAME: BRANFORD ROSE HILL ROAD
  - SITE NUMBER: CT0016
  - SITE ADDRESS: 45 ROSE HILL ROAD  
BRANFORD, CT 06405
  - APPLICANT: TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NH 27519
  - PARCEL AREA IS: 2 ACRES ±
  - TAX ID: A8-0-3-16
  - DEED REFERENCE: BOOK 627 PAGE 349
  - PLAN REFERENCES: PLAN 3223
- PLAN ENTITLED "PROPERTY OF THOMAS SANTA BARBARA JR., ROSE HILL ROAD, BRANFORD, CONNECTICUT SURVEYED DECEMBER 6, 1979" ON FILE AT BRANFORD TOWN OFFICES.

- THE HORIZONTAL DATUM AND VERTICAL DATUM WERE DERIVED FROM A POST-PROCESSED STATIC DUAL FREQUENCY GPS SURVEY.
- ALL UNDERGROUND UTILITY INFORMATION PRESENTED HEREON WAS DETERMINED FROM SURFACE EVIDENCE AND PLANS OF RECORD. ALL UNDERGROUND UTILITIES SHOULD BE LOCATED IN THE FIELD PRIOR TO COMMENCEMENT OF ALL SITE WORK. CALL DIGSAFE 1-800-322-4844 A MINIMUM OF 72 HOURS PRIOR TO PLANNED ACTIVITY.
- ACCORDING TO FEDERAL EMERGENCY MANAGEMENT AGENCY MAPS, THE MAJOR IMPROVEMENTS ON THIS PROPERTY ARE LOCATED IN AN AREA DESIGNATED AS ZONE X (NO SHADING), AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN.  
COMMUNITY PANEL NO. 09009 C 0463 J  
EFFECTIVE DATE: JULY 8, 2013
- FIELD SURVEY BY EDM TOTAL STATION.
- THIS IS NOT A BOUNDARY SURVEY.**
- LOCUS PROPERTY LINES ARE BASED UPON PLANS AND DEEDS OF RECORD, MONUMENTS FOUND AND THE TOWN OF BRANFORD GIS. ABUTTING PROPERTY LINES ARE FROM THE CITY OF BRANFORD GIS AND ARE APPROXIMATE ONLY.
- WETLANDS WERE OBSERVED BY NORTHEAST LAND & WATER, LLC.

**LEGEND**

- LOCUS PROPERTY LINE
- ABUTTERS PROPERTY LINE ±
- ZONING LINE
- 1,000' RADIUS LINE
- IPF/IRF ○ — IRON PIPE/ROD FOUND
- — CONC. BOUND FOUND
- △ — CALCULATED POINT
- ⊙ — TOWER CONTROL POINT

**SIGNATURE**

THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300B-1 THROUGH 20-300B-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS INC. ON SEPTEMBER 26, 1997.

TYPE OF SURVEY: IMPROVEMENT LOCATION SURVEY  
BOUNDARY SURVEY CATEGORY: DEPENDENT RESURVEY

CLASS OF ACCURACY: HORIZONTAL CLASS D  
VERTICAL CLASS V-2  
PURPOSE OF SURVEY: PROPOSED CELLULAR MONOPOLE

THIS DOCUMENT AND COPIES THEREOF ARE VALID ONLY IF THEY BEAR THE LIVE SIGNATURE AND EMBOSSED SEAL OF THE DESIGNATED PROFESSIONAL. UNAUTHORIZED ALTERATIONS RENDER ANY DECLARATION NULL AND VOID.

TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

*Charles G. Gidman*  
CHARLES G. GIDMAN, P.L.S.  
#70103

TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519

1600 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

NORTHEAST SURVEY CONSULTANTS  
116 PLEASANT ST. SUITE 302  
P.O. BOX 109  
EASTHAMPTON, MA 01027  
(413) 203-5144

REVISIONS

REV. #	DATE	DESCRIPTION
1	10/24/14	LEGAL DESCRIPTIONS
0	10/22/14	SUBMITTED FOR REVIEW

PROJECT NO. 14-164  
DESIGNED BY: -  
DRAWN BY: JGG  
CHECK'D BY: CGG  
SCALE: 1" = 150'

SITE NAME: CT0016  
BRANFORD ROSE HILL ROAD

LAND OWNER OF RECORD:  
PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405  
ASSESSOR'S ID: A8-0-3-16  
DEED BOOK 627 PAGE 348

SITE ADDRESS:  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

SHEET TITLE:  
ABUTTERS PLAN

SHEET NO.:  
C-1





**LEASE AREA DESCRIPTION:**

A certain lease area being part of tax lot AB-0-3-16 and described in deed 627-348, lying westerly of the right of way line of Rose Hill Road in the town of Branford, CT, and being further described as follows:  
Beginning at a point, said point being the northeast corner of the lease area to be described, said point also being S68°00'32"W a distance of 185.18' from an iron pipe found at the northeast corner of land now or formerly Paul Santa Barbara, running thence;

S 01°50'56" E a distance of 60.00', thence;  
S 88°09'04" W a distance of 90.00', thence;  
N 01°50'56" W a distance of 30.00', thence;  
N 88°09'04" E a distance of 60.00', thence;  
N 01°50'56" W a distance of 30.00', thence;  
N 88°09'04" E a distance of 30.00', thence;  
to the point of beginning, having an area of 3600 square feet or 0.083 acres, more or less.

**15' WIDE ACCESS EASEMENT DESCRIPTION:**

A certain 15' wide access easement lying on the westerly right of way line of Rose Hill Road in the town of Branford, CT, and being further described as follows:  
Beginning at a point, said point being the northeast corner of the access easement to be described, said point also being S05°47'57"E a distance of 77.02' from an iron pipe found at the northeast corner of land now or formerly Paul Santa Barbara, running thence;

S 05°47'57" E a distance of 15.00', thence;  
S 84°22'07" W a distance of 109.62', thence;  
S 80°48'37" W a distance of 71.33', thence;  
N 01°50'56" W a distance of 15.12', thence;  
N 80°48'37" E a distance of 16.10', thence;  
N 09°11'23" W a distance of 20.00', thence;  
N 80°48'37" E a distance of 15.00', thence;  
S 09°11'23" E a distance of 20.00', thence;  
N 80°48'37" E a distance of 38.77', thence;  
N 84°22'07" E a distance of 110.04',  
to the point of beginning, having an area of 3007 square feet or 0.069 acres, more or less.

**10' WIDE UTILITY EASEMENT DESCRIPTION:**

A certain 10' wide utility easement lying on the westerly right of way line of Rose Hill Road in the town of Branford, CT, and being further described as follows:  
Beginning at a point, said point being the northeast corner of the access easement to be described, said point also being S05°45'21"E a distance of 92.02' from an iron pipe found at the northeast corner of land now or formerly Paul Santa Barbara, running thence;

S 05°47'57" E a distance of 10.00', thence;  
S 84°22'07" W a distance of 109.34', thence;  
S 80°48'37" W a distance of 72.31', thence;  
N 01°50'56" W a distance of 10.08', thence;  
N 80°48'37" E a distance of 71.33', thence;  
N 84°22'07" E a distance of 109.62',  
to the point of beginning, having an area of 1813 square feet or 0.042 acres, more or less.

PROPOSED CENTER OF TOWER  
LAT: 41°16'22.96"  
LON: 72°51'22.57"  
N: 660231.20  
E: 970787.66  
GROUND EL: 118'±

LOCUS  
AB-0-3-16  
45 ROSE HILL ROAD  
PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405  
DEED 627-348  
AREA = 2 AC. ±

-CONTROL POINT-  
IRON ROD SET  
N: 660380.18  
E: 970727.64  
EL: 117.44'

-CONTROL POINT-  
IRON ROD SET  
N: 660344.96  
E: 970824.41

**15' WIDE ACCESS EASEMENT LINE TABLE**

A1	S05°47'57"E	15.00'
A2	N01°50'56"W	15.12'
A3	N80°48'37"E	16.10'
A4	N09°11'23"W	20.00'
A5	N80°48'37"E	15.00'
A6	S09°11'23"E	20.00'

**10' WIDE UTILITY EASEMENT LINE TABLE**

U1	S05°47'57"E	10.00'
U2	N01°50'56"W	10.08'

**LEGEND**

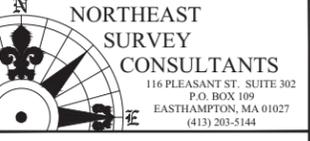
- LOCUS PROPERTY LINE
- ABUTTERS PROPERTY LINE ±
- TREE LINE
- WETLAND DELINEATION
- CONTOUR LINE
- IPF/IRF ○ — IRON PIPE/ROD FOUND
- CBF □ — CONC. BOUND FOUND
- ⊙ — TOWER CONTROL POINT
- ⊕ — DECIDUOUS TREE
- ⊞ — CATCH BASIN



TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519



1600 OSGOOD STREET  
BUILDING 20 NORTH, SUITE 3090  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



**REVISIONS**

REV. #	DATE	DESCRIPTION
1	10/24/14	LEGAL DESCRIPTIONS
0	10/13/14	SUBMITTED FOR REVIEW

PROJECT NO.	DESIGNED BY: -	SCALE:
14-164	DRAWN BY: JGG	1" = 30'
	CHECK'D BY: CGG	

**SITE NAME:** CT0016  
**BRANFORD ROSE HILL ROAD**  
LAND OWNER OF RECORD:  
PAUL SANTA BARBARA  
51 ROSE HILL ROAD  
BRANFORD, CT 06405  
ASSESSOR'S ID: AB-0-3-16  
DEED BOOK 627 PAGE 348

**SITE ADDRESS:**  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

**SHEET TITLE:**  
EXISTING  
CONDITIONS

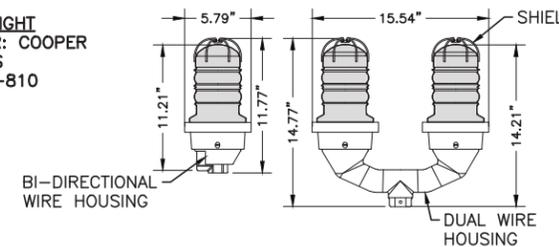
**SHEET NO.:**  
C-2





**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF THE PROPOSED STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

FAA BEACON LIGHT  
MANUFACTURER: COOPER  
CROUSE-HINDS  
MODEL No.: L-810



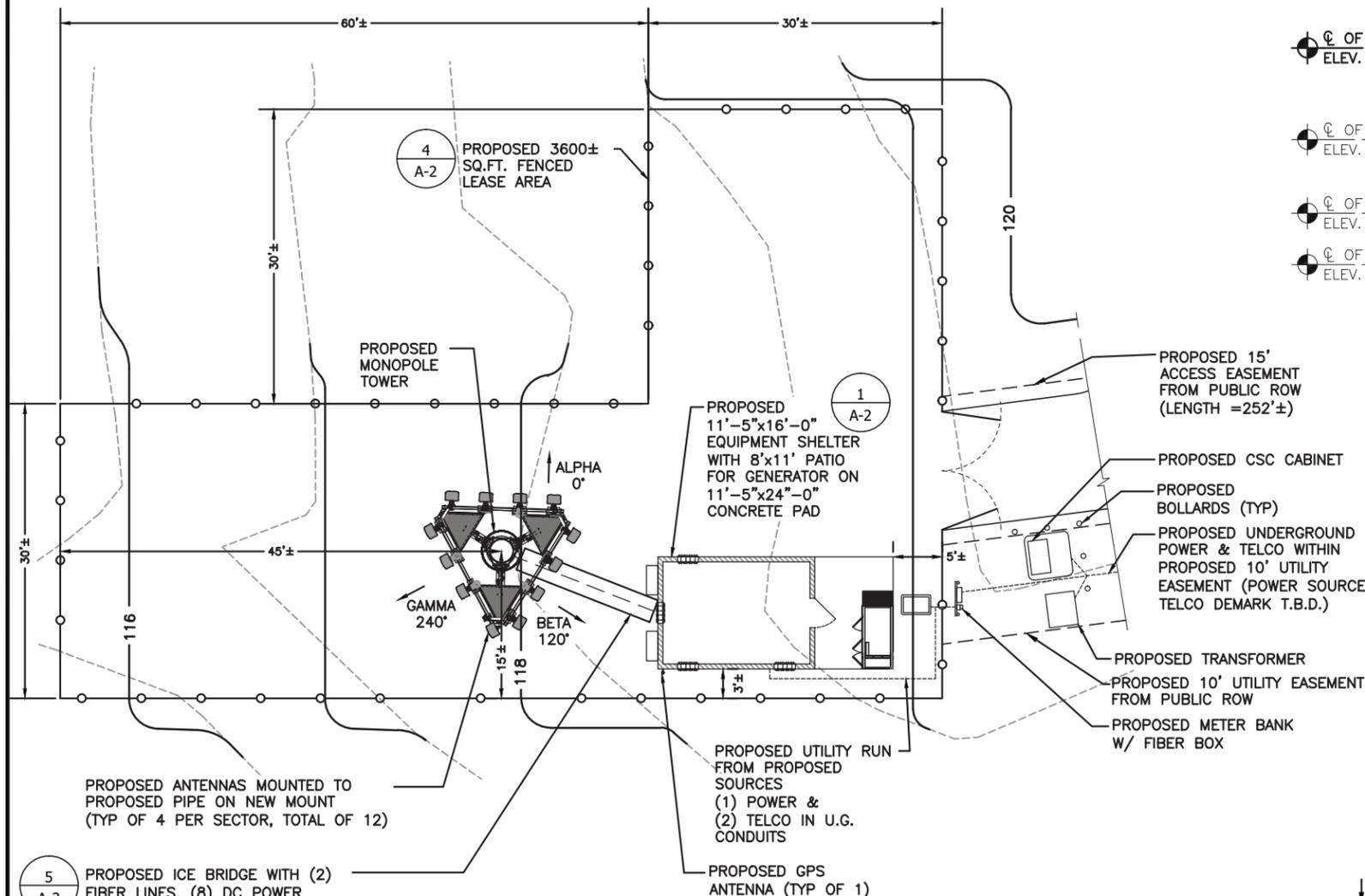
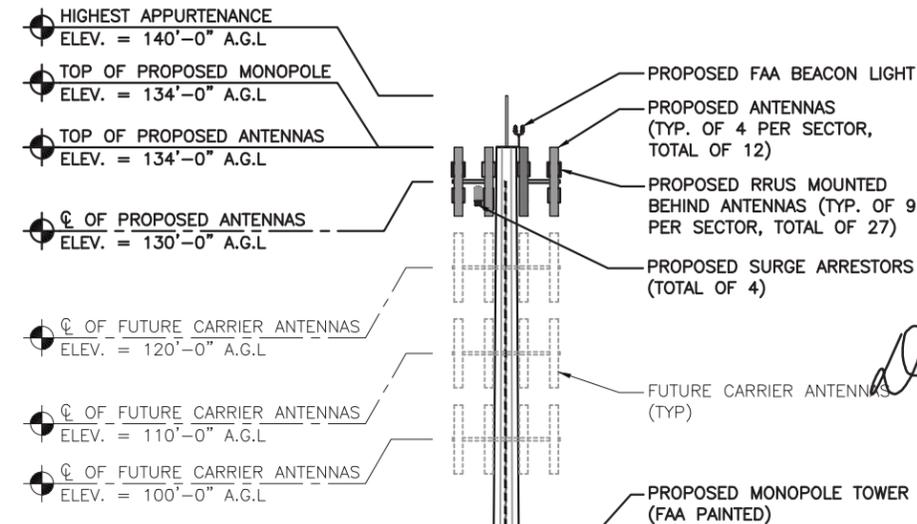
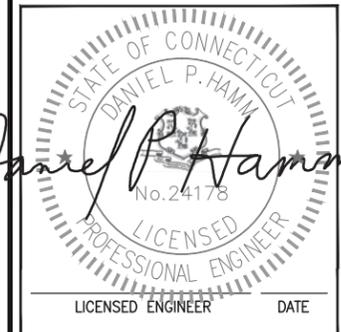
**DUAL BEACON LIGHT DETAIL**  
SCALE: N.T.S.



TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519



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**1 COMPOUND PLAN**  
SCALE: 1/8" = 1'-0"

**2 PROPOSED SOUTH ELEVATION**  
SCALE: 3/32" = 1'-0"

REVISIONS		
REV. #	DATE	DESCRIPTION
3	10/23/14	REVISED PER COMMENTS
2	10/15/14	REVISED PER COMMENTS
1	10/09/14	ISSUED FOR REVIEW
0	10/02/14	ISSUED FOR REVIEW

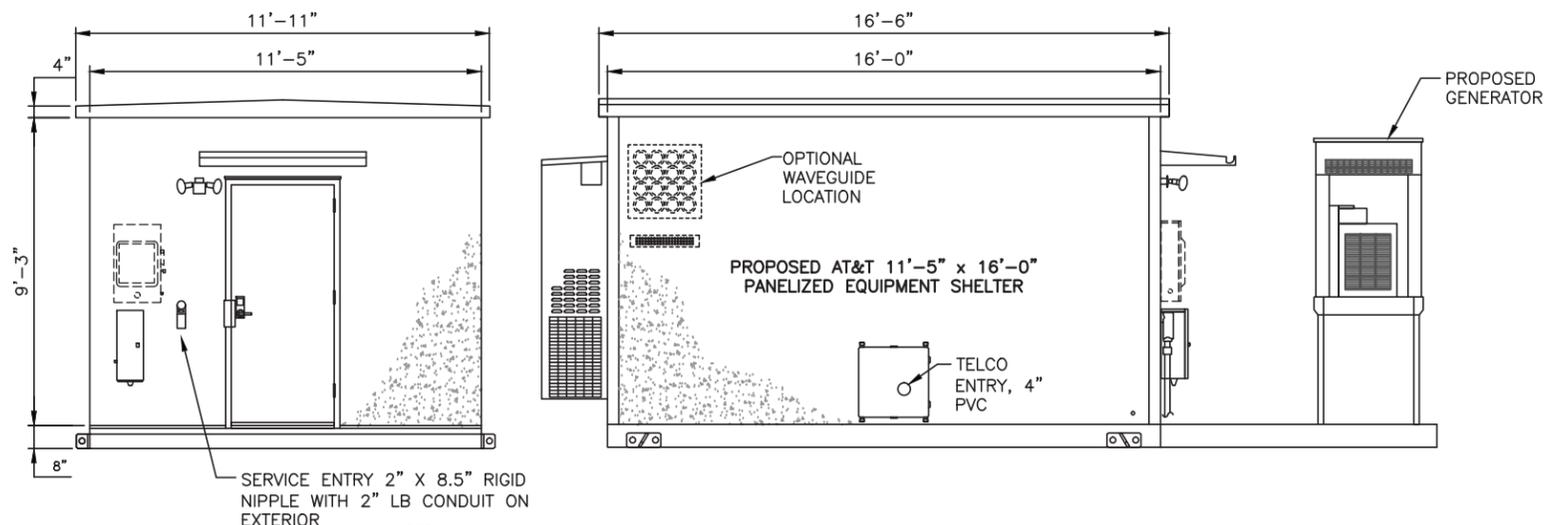
PROJECT NO.	DESIGNED BY: DR	SCALE:
CT0016	KMS	AS SHOWN

SITE NAME:  
**CT0016  
BRANFORD -  
ROSE HILL ROAD**

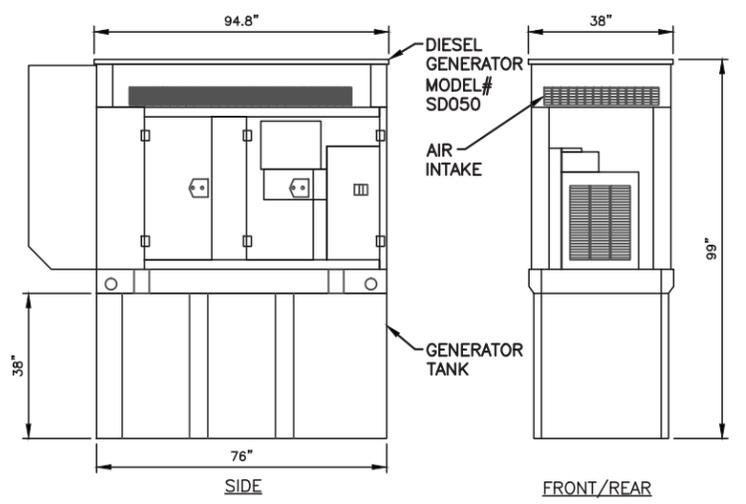
SITE ADDRESS:  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

SHEET TITLE:  
**COMPOUND PLAN AND  
ELEVATION**

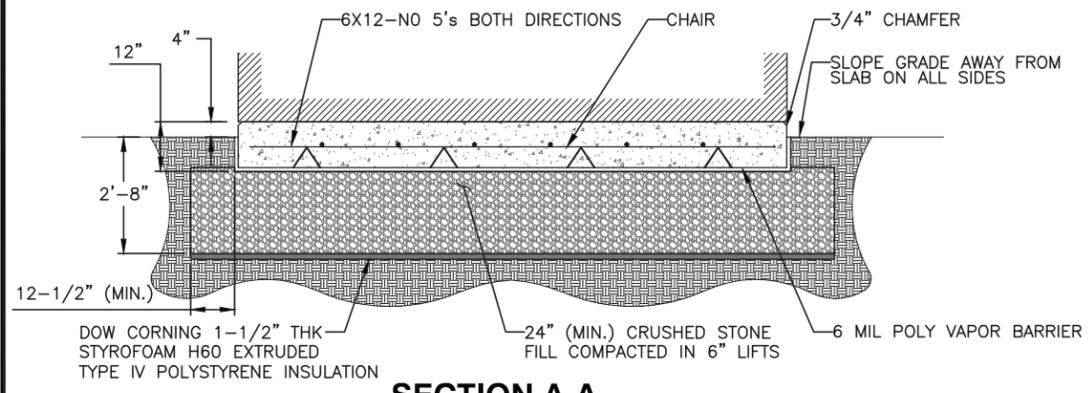
SHEET NO:  
**A-1**



1 TYPICAL SHELTER DETAILS  
A-2 SCALE: N.T.S.



2 GENERATOR DETAIL  
A-2 SCALE: N.T.S.



3 SHELTER FOUNDATION DETAIL  
A-2 SCALE: 1/2" = 1'-0"

FENCE NOTES

1. ALTERNATE FOOTINGS FOR ALL FENCE POSTS IN LEDGE: IF LEDGE IS ENCOUNTERED AT GRADE, OR AT A DEPTH SHALLOWER THAN 3'-6", CORE DRILL AN 8" DIA HOLE 18" INTO THE LEDGE. CENTER POST IN THE HOLE AND FILL WITH CONCRETE OR GROUT. IF LEDGE IS BELOW FINISH GRADE, COAT BACKFILLED SECTION OF POST WITH COAL TAR, AND BACKFILL WITH WELL-DRAINING GRAVEL.
2. ATTACH EACH GATE WITH 1-1/2" PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.

NOTE:  
ALL STEEL IS GALVANIZED. ALL BOLTS TO BE FURNISHED W/ WASHERS AND NUTS.

ANDREW ICE BRIDGE SUPPORT P/N WB-LB12-3 AND 12" CHANNEL P/N MT-F501 OR EQUAL

ANDREW TRAPEZE KIT FOR 2 RUNGS P/N WB-TD12 OR EQUAL

3" STD. (3.5" O.D.) PIPE COLUMN, ANDREW P/N MF-273 OR EQUAL (10" O.C.)

ANCHORED INTO CONCRETE EQUIPMENT PAD/TOWER/MONOPOLE FOUNDATION W/ 5/8"Ø HILTI-KWIK BOLTS 4 TOTAL (6" MIN. EMBEDMENT)

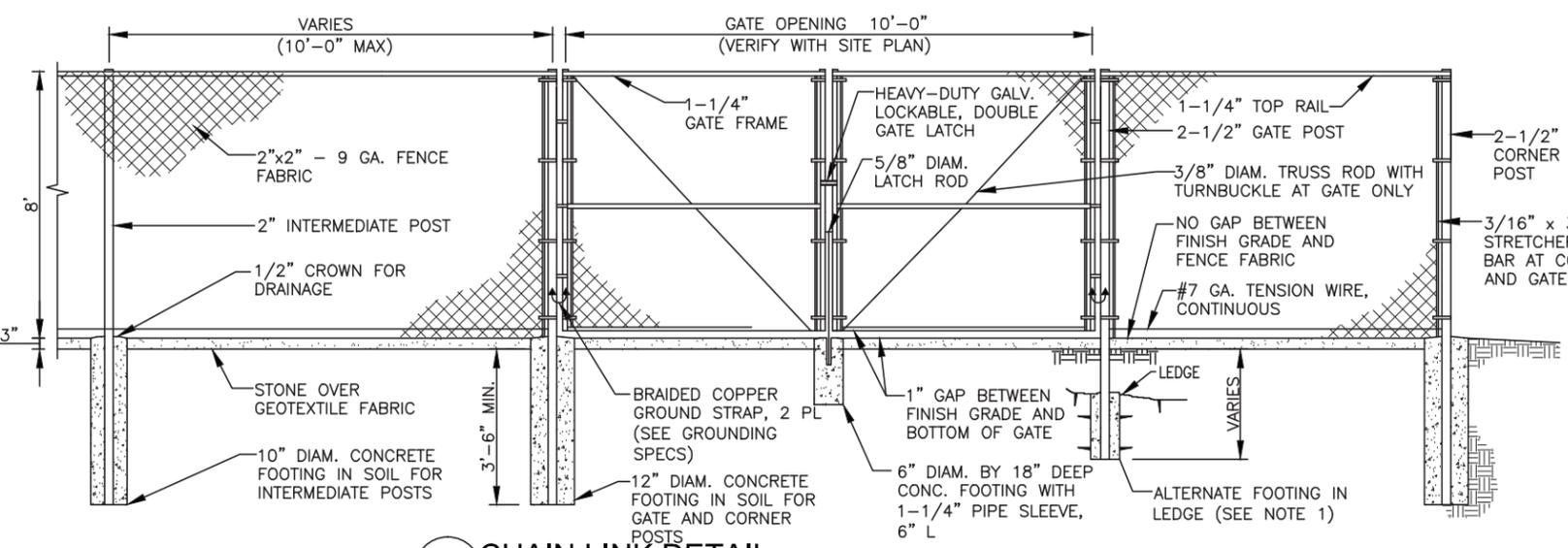
12"x12"x1/2" PLATE (TYP.)

EXISTING CONCRETE PAD

5/8"Ø BOLT, NUT, WASHER & LOCK WASHER  
12"x12"x1/2" PLATE (TYP.)

EXISTING GRATING

5 ICE BRIDGE DETAIL  
A-2 SCALE: N.T.S.



4 CHAIN LINK DETAIL  
A-2 SCALE: N.T.S.

**TowerCo**

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CARY, NC 27519

**Hudson Design Group**

1600 OSGOOD STREET  
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TEL: (978) 557-5553  
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STATE OF CONNECTICUT  
DANIEL P. HAMM  
No. 24178  
LICENSED PROFESSIONAL ENGINEER  
LICENSED ENGINEER DATE

REVISIONS		
REV. #	DATE	DESCRIPTION
3	10/23/14	REVISED PER COMMENTS
2	10/15/14	REVISED PER COMMENTS
1	10/09/14	ISSUED FOR REVIEW
0	10/02/14	ISSUED FOR REVIEW

PROJECT NO. CT0016  
DESIGNED BY: DR  
DRAWN BY: KMS  
CHECKED BY: DPH  
SCALE: AS SHOWN

SITE NAME:  
CT0016  
BRANFORD - ROSE HILL ROAD

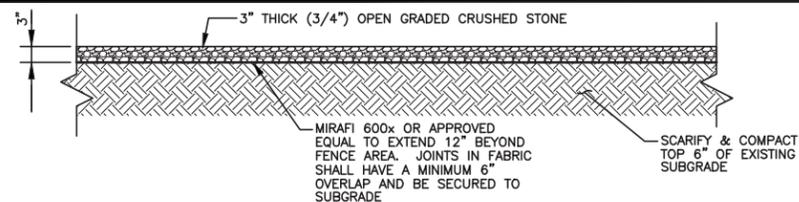
SITE ADDRESS:  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

SHEET TITLE:  
SHELTER DETAILS

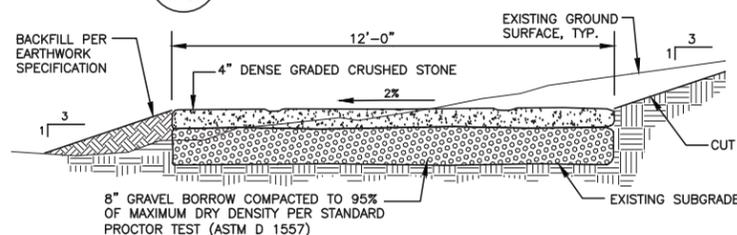
SHEET NO:  
A-2

*Daniel P. Hamm*

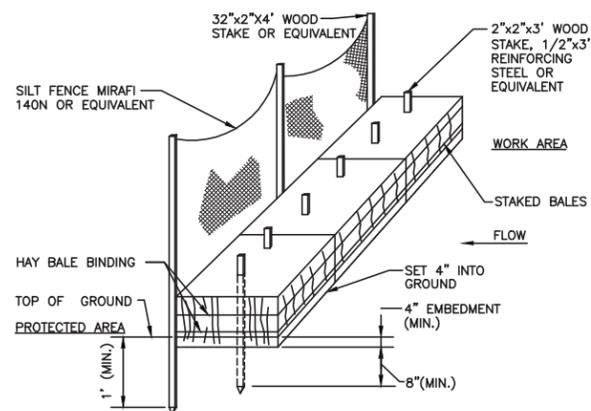
6'-8" MIN. IN AREAS SUBJECT TO PEDESTRIAN TRAFFIC



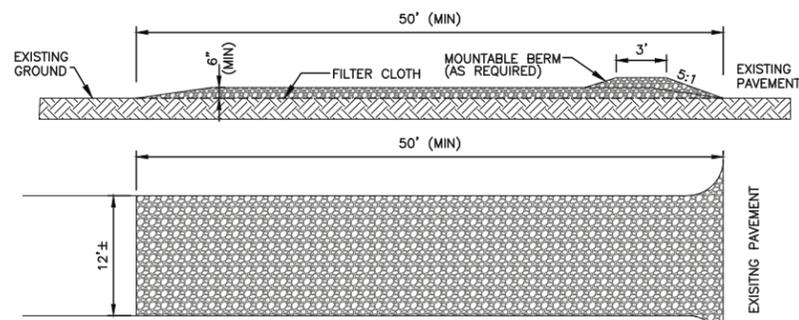
**1 COMPOUND PAVING DETAIL**  
A-3 SCALE: N.T.S.



**2 GRAVEL DRIVE DETAIL**  
A-3 SCALE: N.T.S.



**3 HAYBALE/SILT FENCE DETAIL**  
A-3 SCALE: N.T.S.



**NOTES:**

- STONE SIZE - USE 37 MM (1 1/2 IN.) STONE.
- LENGTH - NOT LESS THAN 15M (50 FT.)
- THICKNESS - NOT LESS THAN 150MM (6 IN.)
- WIDTH - 3.5 METER (TWELVE (12) FT.) MINIMUM.
- FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
- SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
- MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

**4 STABILIZED CONSTRUCTION ENTRANCE DETAIL**  
A-3 SCALE: N.T.S.

**EROSION CONTROL**

**CONSTRUCTION SEQUENCE**

- NOTIFY THE TOWN INLAND WETLANDS AGENT AT LEAST ONE WEEK PRIOR TO THE PRE-CONSTRUCTION MEETING.
- COMPLETE A "CALL BEFORE YOU DIG" PRIOR TO ANY ON SITE ACTIVITY. RECALL EVERY 30 DAYS.
- CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
- INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
- WOOD CHIPS GENERATED FROM CLEARING ACTIVITIES MAY BE USED AS A TEMPORARY STABILIZATION MEASURE IN ADDITION TO SILT FENCING & HAY BALES.
- INSTALL HAY BALES TO "BACK UP" SILTATION FENCE ALONG ALL DOWNGRADIANT WETLANDS BOUNDARIES.
- ESTABLISH ROADWAY CENTERLINE WITH GRADE STAKES AND OFF SETS.
- STOCKPILE EXCAVATED SOILS A MINIMUM OF 75 FEET FROM ANY WETLAND AREA.
- CONSTRUCT CLOSED DRAINAGE SYSTEM. PROTECT CULVERT INLETS WITH SEDIMENTATION BARRIERS.
- ROUGH GRADE DITCH STARTING FROM THE DOWNGRADIANT LOCATION
- INSTALL STONE LINING AND LEVEL SPREADERS AT CULVERT OUTLETS
- STABILIZE GRADED SLOPES.
- CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
- EXCAVATE FOR ANY SUBSURFACE UTILITIES.
- STOCKPILE EXCAVATED SOILS A MINIMUM OF 75 FEET FROM ANY WETLAND AREA.
- ESTABLISH SEDIMENT AND EROSION CONTROLS AROUND STOCKPILE SOILS.
- INSTALL UTILITY SERVICES
- INSTALL STORM DRAINAGE STARTING AT THE MOST DOWNGRADIANT LOCATION.
- INSTALL ALL RIP RAP AT OUTLETS FOR STORM DRAINAGE.
- INSTALL HAY BALE PROTECTION TO STORM DRAINAGE INLETS.
- INSTALL ROAD
- BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
- DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
- BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
- FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
- COMPLETE PERMANENT SEEDING AND LANDSCAPING.
- NO FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGRADED AREAS.
- AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

**IMPACT OF STORMWATER DURING CONSTRUCTION ACTIVITY**

ALL SEDIMENT CONTROLS, INCLUDING SILTATION FENCES AND HAY BALES MUST BE INSPECTED WEEKLY OR IMMEDIATELY AFTER A STORMWATER RUNOFF GENERATING EVENT. ALL SEDIMENT CONTROLS MUST BE MAINTAINED IN AN EFFECTIVE CONDITION.

IN THE EVENT THAT STORMWATER IS FLOWING IN THE EXISTING/PROPOSED DRAINAGE SWALE, THE FOLLOWING MUST BE NOTED:

- BY INSTALLING THE STORM DRAINAGE STARTING AT THE MOST DOWNGRADIANT LOCATION, AND BY CONSTRUCTION THE DITCH STARTING AT THE MOST DOWNGRADIANT LOCATION, STORMWATER FLOW WILL NOT BE IMPOUNDED DURING THE CONSTRUCTION ACTIVITY.
- ADDITIONAL MEASURES MUST BE TAKEN DURING TIMES OF RAIN OR FLOW. THESE INCLUDE THE CESSATION OF ALL CONSTRUCTION ACTIVITY IN THE DRAINAGE SWALES AT TIMES OF "HEAVY RAIN" OR "SIGNIFICANT FLOW" WHICH HAVE THE POTENTIAL TO CAUSE SOIL SCOURING. IN THE ABSENCE OF AN ON SITE AGREEMENT WITH THE TOWN INLAND WETLANDS AGENT.

**CONSTRUCTION SPECIFICATIONS - SILT FENCE**

- THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
- THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
- WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED.
- FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BULGES IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.

**MAINTENANCE - SILT FENCE**

- SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
- IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
- SEDIMENT SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACHED APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
- SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

**EROSION CONTROL MEASURES:**

THE CONTRACTOR (TO BE NAMED PRIOR TO ANY WORK BEING PERFORMED) IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFYING THE PLANNING AND ZONING OFFICE OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

- DISTURBED AREAS SHALL BE KEPT TO THE MINIMUM AREA NECESSARY TO CONSTRUCT THE ROADWAYS AND ASSOCIATED DRAINAGE FACILITIES.
- HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS REQUIRED. BARRIERS AND TRAPS ARE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
- BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY. NO SALT HAY SHALL BE USED.
- FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
- STOCKPILED MATERIALS SHALL BE PLACED ONLY IN NON RESTRICTED WETLAND AREAS ON PLANS. STOCKPILES SHALL BE PROTECTED BY SILTATION FENCE AND SEEDED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
- ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED. A MINIMUM OF 4 INCHES OF LOAM SHALL BE INSTALLED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA. SLOPES 2:1 OR GRATED TO BE STABILIZED WITH TURF REINFORCEMENT MAT TYPE P300P NORTH AMERICAN GREEN (1-800-772-2040), OR ENGINEER APPROVED EQUAL.
- APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

SEED MIX (SLOPES LESS THAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
RED TOP	2
	42

SLOPE MIX (SLOPES GREATER TAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
BIRDSFOOT TREEFOIL	8
	48

- AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
- PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
- ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW POINT SEDIMENTATION BARRIER.
- ALL STORM DRAINAGE OUTLETS WILL BE STABILIZED AND CLEANED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
- ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
- NO DISCHARGE SHALL BE DIRECTED TOWARDS ANY PROPOSED DITCHES, SWALES, OR PONDS UNTIL THEY HAVE BEEN PROPERLY STABILIZED.

**CONSTRUCTION SPECIFICATIONS - STRAW OR HAY BALES**

- BALES SHALL BE PLACED IN A ROW WITH THE ENDS TIGHTLY ADJOINING.
- EACH BALE SHALL BE EMBEDDED IN THE GROUND A MINIMUM OF 4 INCHES.
- BALES SHALL BE ANCHORED IN PLACE BY AT LEAST TWO STAKES DRIVEN THROUGH THE BALE. THE STAKES SHALL BE DRIVEN AT LEAST 18 INCHES INTO THE GROUND.
- BARRIERS SHALL BE INSPECTED AFTER EVERY RAINFALL AND PROMPTLY REPAIRED FOR REPLACED AS NECESSARY.
- BALES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED OF PROPERLY.

**MAINTENANCE - STRAW OR HAY BALES**

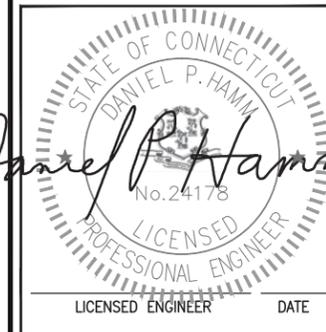
- STRAW OR HAY BALES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
- CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, UNDERCUTTING BENEATH THE BALES, AND FLOW AROUND THE END OF THE BALES.
- NECESSARY REPAIRS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
- SEDIMENT DEPOSITS SHOULD BE CHECKED AFTER EACH RAINFALL. THE DEPOSITS SHOULD BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF OF THE HEIGHT OF THE TABLE.
- SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE BARRIER HAS BEEN DISMANTLED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED USING THE APPROPRIATE VEGETATIVE BMP.



TOWERCO 2013 LLC  
5000 VALLEYSTONE DRIVE  
CARY, NC 27519



1400 OSGOOD STREET  
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FAX: (978) 336-5586



**REVISIONS**

REV. #	DATE	DESCRIPTION
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1	10/09/14	ISSUED FOR REVIEW
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PROJECT NO.	DESIGNED BY: DR	SCALE:
CT0016	KMS	AS SHOWN

**SITE NAME:**  
CT0016  
BRANFORD -  
ROSE HILL ROAD

**SITE ADDRESS:**  
45 ROSE HILL ROAD  
BRANFORD, CT 06405

**SHEET TITLE:**  
EROSION CONTROL  
NOTES AND DETAILS

**SHEET NO.:**  
A-3

# Schools and Day Cares - 2 Mile Radius

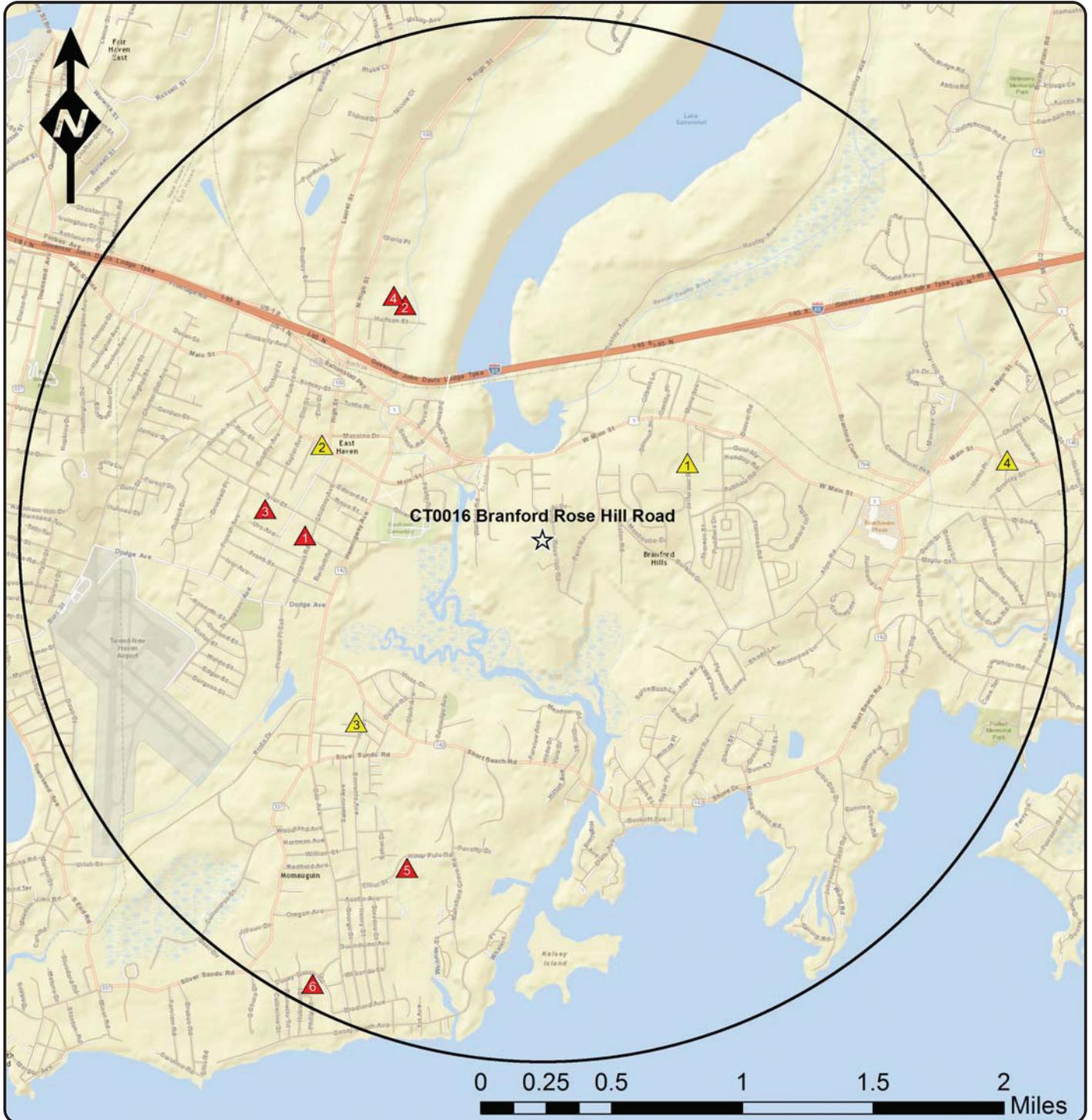
☆ CT0016 Branford Rose Hill Road  
45 Rose Hill Road , CT 06405  
Lat, Lon: 41.273044, -72.856269  
Proposed Tower Height: 134.0'

 School Number	School Type	School Name	Town	Distance (miles)
1	Elementary School	Tuttle Elementary	East Haven	0.9
2	Elementary School	Carbone Elementary	East Haven	1.0
3	Middle School	East Haven Academy	East Haven	1.1
4	Middle School	Joseph Melillo Middle	East Haven	1.1
5	Elementary School	Dc Moore Elementary	East Haven	1.4
6	Elementary School	Momauguin Elementary	East Haven	1.9

 Day Care Number	Child Day Care Facility Name	Town	Distance (miles)
1	Duck Pond Day Care- Branford	Branford	0.6
2	Old Stone Church Play School	East Haven	0.9
3	Kid's Connection Iii	East Haven	1.0
4	See Us Grow Childcare & Learning Center	Branford	1.8

# Schools and Day Cares - 2 Mile Radius

☆ CT0016 Branford Rose Hill Road  
45 Rose Hill Road Branford, CT 06405  
Lat, Lon: 41.273044, -72.856269  
Proposed Tower Height: 134'



ATTACHMENT 4

## SECTION 4

### ENVIRONMENTAL ASSESSMENT STATEMENT

#### I. PHYSICAL IMPACT

##### A. WATER FLOW AND QUALITY

The tower site is at a high point relative to surrounding terrain. To the west of the project a headwater wetland which is off-site and approximately 138' west/southwest from the proposed tower compound and access drive. The lease area and proposed areas of disturbance are located within an otherwise active commercial and cleared area of the parcel. No direct impact to any wetlands or watercourses are anticipated as a result of the tower site construction. The overall amount of impervious surface (approximately 300') is low in comparison to other development and storm water will be managed with Best Management Practices to be implemented during construction. (DEEP Sedimentation and Erosion Control manual 2002 and the ConnDot Drainage Manual.)

##### B. AIR QUALITY

Under ordinary operating conditions, the equipment that would be used at the proposed facility would emit no air pollutants of any kind. An emergency diesel fuel generator with secondary containment systems will comply with Connecticut Department of Energy and Environmental Protection ("CTDEEP") air standards for such facilities.

#### C. LAND

No tree removal is necessary. Modest clearing, grading and cut and fill will be required for the facility. The remaining land of the lessor would remain undisturbed by the construction and operation of the facility.

#### D. NOISE

The equipment to be in operation at the facility would not emit noise other than that provided by the operation of the installed heating, air-conditioning and ventilation system. Some construction related noise would be anticipated during facility construction, which is expected to take approximately four to six weeks. Temporary power outages could involve sound from the emergency generator.

#### E. POWER DENSITY

The cumulative worst-case calculation of power density from AT&T's operations at the facility would be 3.96% of the MPE standard. Attached is a copy of a Power Density Report for the facility.

#### F. VISIBILITY

The attached Visibility Analysis includes an evaluation of the anticipated potential visual impact of the proposed monopole, photographs of existing views and simulations of the proposed facility. Potential visibility was assessed within an approximately two (2) mile radius using a computer-based, predictive view shed model that was field verified. Areas from where the proposed Facility would be visible above the tree canopy year-round comprise a total of approximately 858+/- acres, with 670 of those acres being over open water or tidal marsh areas. When leaves are off the trees, seasonal views through intervening tree trunks and branches

are anticipated to occur over ±984 additional acres within the 8,042 acre study area. The proposed Facility will be located approximately 1.49 miles from Tweed Airport in New Haven. Accordingly, the FAA will require that the proposed tower structure be marked/lighted in accordance with all applicable FAA guidelines. No schools or licensed child day care centers are located within 250' of the site. Some views of the facility from the Short Beach Trail are also noted in the report.

## II. SCENIC, NATURAL, HISTORIC & RECREATIONAL VALUES

The Connecticut State Historic Preservation Officer ("SHPO") and the Connecticut Department of Energy and Environmental Protection ("CTDEEP") have been contacted and their reviews of the site are pending. To date, no direct impact to a historical or natural resource has been identified by the project's consultants. The site is also under evaluation in accordance with the FCC's regulations implementing the National Environmental Policy Act of 1969 ("NEPA") and no known impacts to federally recognized environmental resources are known at this time.

# NORTHEAST LAND & WATER, LLC

131 WEST MAIN STREET, SUITE 327, ORANGE, MA 01364

(413) 374-8876

MACLEODALEC@GMAIL.COM

November 12, 2014

Dan Stasz, RPLS  
Northeast Survey Consultants, PC  
P.O. Box 109  
Easthampton, MA 01027

RE: *Site Investigation for Wetlands: 45 Rose Hill Road, Branford, CT  
Tower Co. Project Number CT0016*

Dear Mr. Stasz:

On September 16, 2014, I visited an industrial site located at 45 Rose Hill Road in Branford, CT to determine whether areas subject to protection under Chapter 440, Sections 22a-28 through 22a-45d of Connecticut's General Statutes, the Inland Wetlands and Watercourses Regulations of the Town of Branford and other relevant environmental laws are present within and around the parcel. I have also reviewed additional sources of information to support and enhance my findings regarding the regulatory context within which projects might be pursued on this land.

I reviewed the site shown on the schematic plan provided to me and found a headwater wetland area at the base of a steep and heavily vegetated slope to the west of the potential project area. The wetland boundary was flagged in the field using consecutively numbered blue flagging. The potential project area itself is located within an active industrial site apparently engaged in recycling of various waste materials.

In Connecticut, wetland boundaries are delineated according to soil drainage classes, including floodplain soils, which are always considered to be wetland though they may be well-drained. This is based upon the assumption that hydric soils will either support a prevalence of hydrophytic vegetation, or can be restored to a prevalence of hydrophytic vegetation.

According to the online Soil Survey of New Haven County, CT (included), the soil beneath the potential project area is identified as Wethersfield loam, 3 – 8% slopes and 8 – 15% slopes (Units 87B and 87C). The Wethersfield series is described as “very deep, well drained loamy soils formed in dense glacial till on uplands, and as such is not a hydric soil. The adjacent soils are mapped as Ludlow silt loam, 3 – 8% slopes (Unit 40B). The Ludlow series is described as “moderately well drained soils formed in loamy lodgment till.” This is also not a hydric soil, though it clearly contains hydric inclusions and wetland area.

The Flood Insurance Rate Map (included) shows that the potential project site is not within the 100-year floodplain.

Review of the Connecticut Natural Heritage maps (Figure 3) shows that the site **IS SHOWN** within mapped habitat of listed species. This means that the project would undergo review by the Connecticut Natural Heritage program. However, as the lease area is to be located within the

## NORTHEAST LAND & WATER, LLC

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active industrial portion of the parcel, it is unlikely that this review will pose a barrier to project implementation.

It appears that implementation of this project as shown on the preliminary site plan provided, and in the context of the wetland area as it was found at the time of delineation, will likely have minimal to no impact on the nearby wetlands. I hope this information is useful to you. Please call if you have any further questions.

Sincerely,

Alec MacLeod, Principal  
Northeast Land & Water, LLC

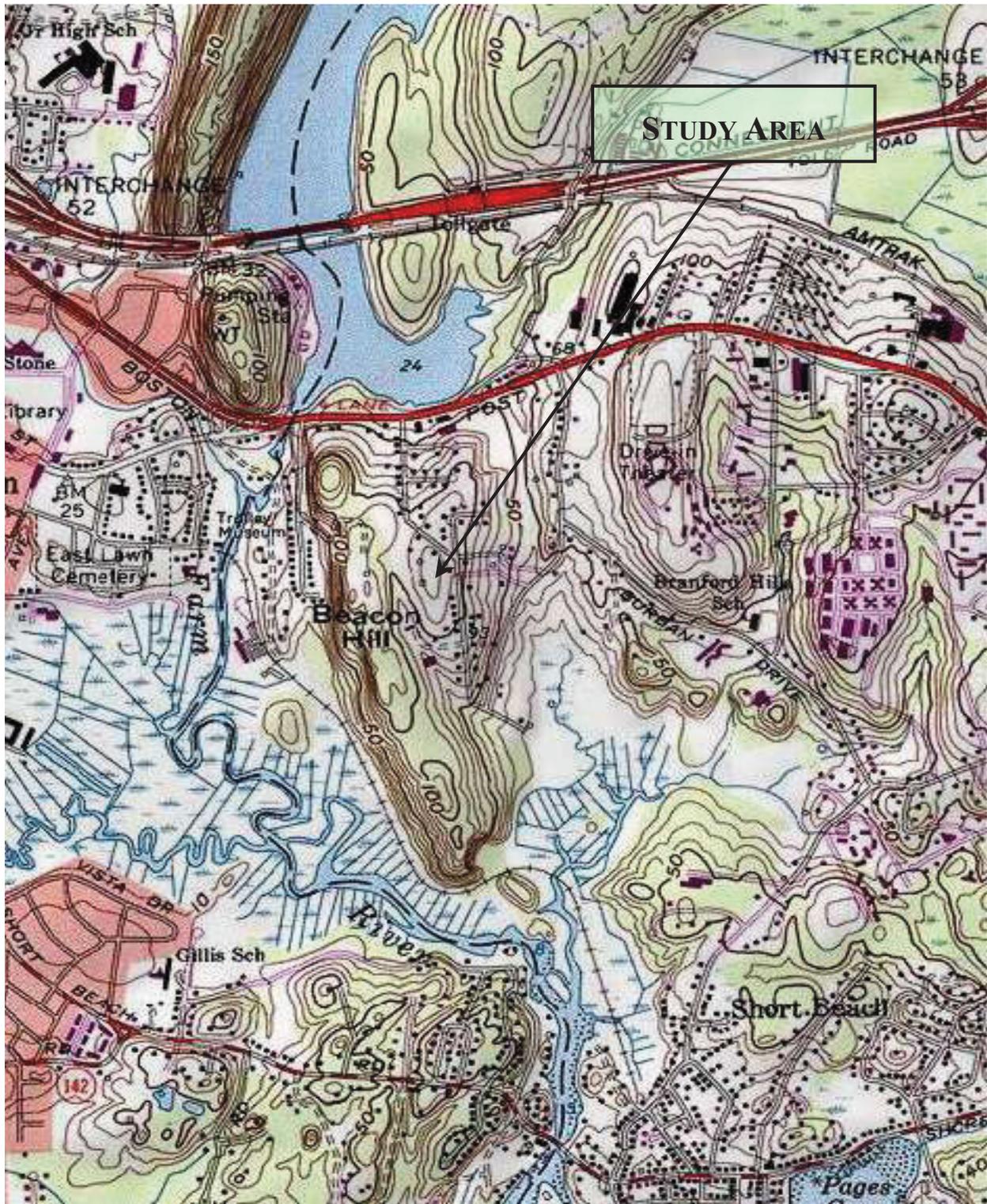


Figure 1. Locus. USGS Topographic Map

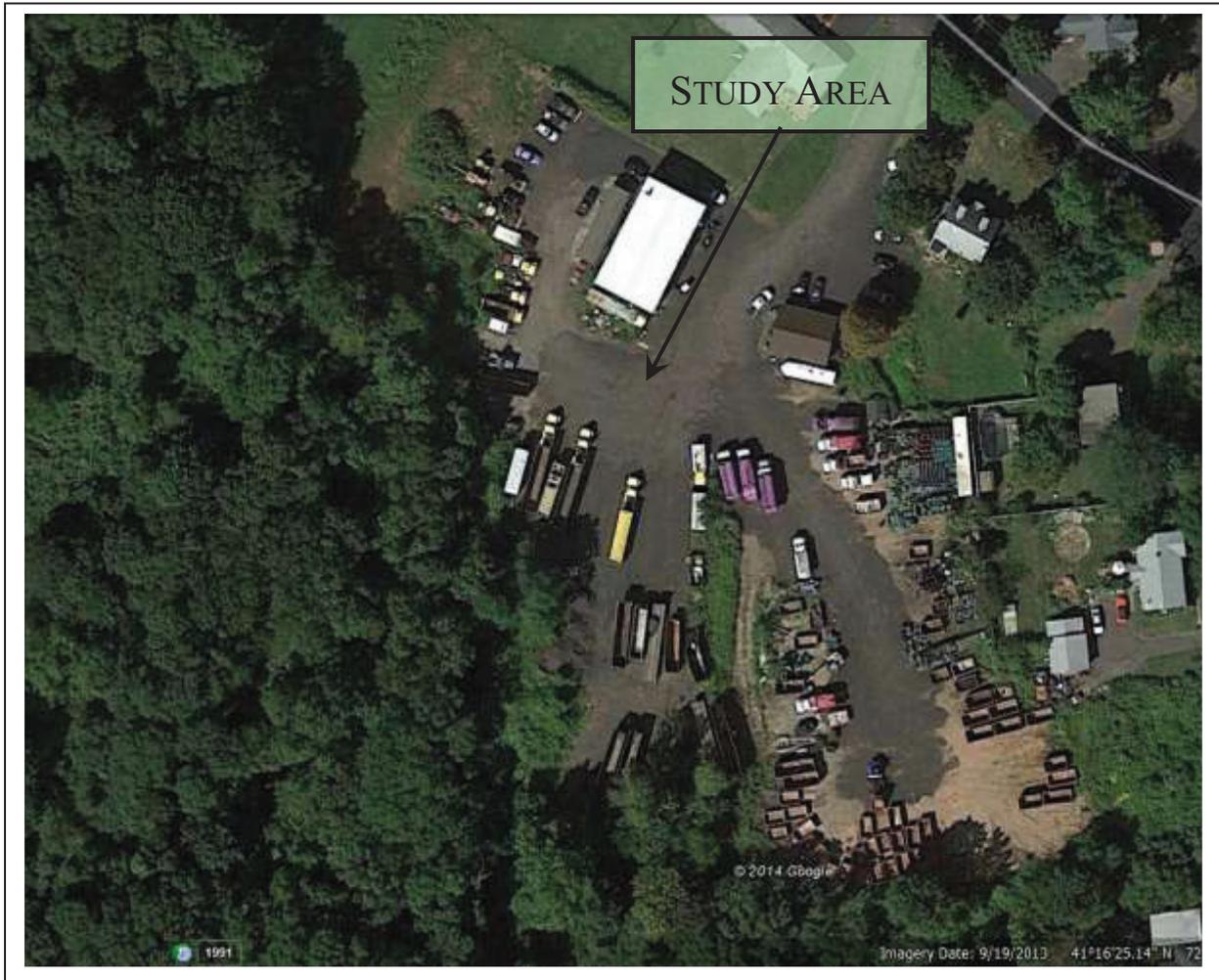


Figure 2. Aerial view of the study area (GoogleEarth)

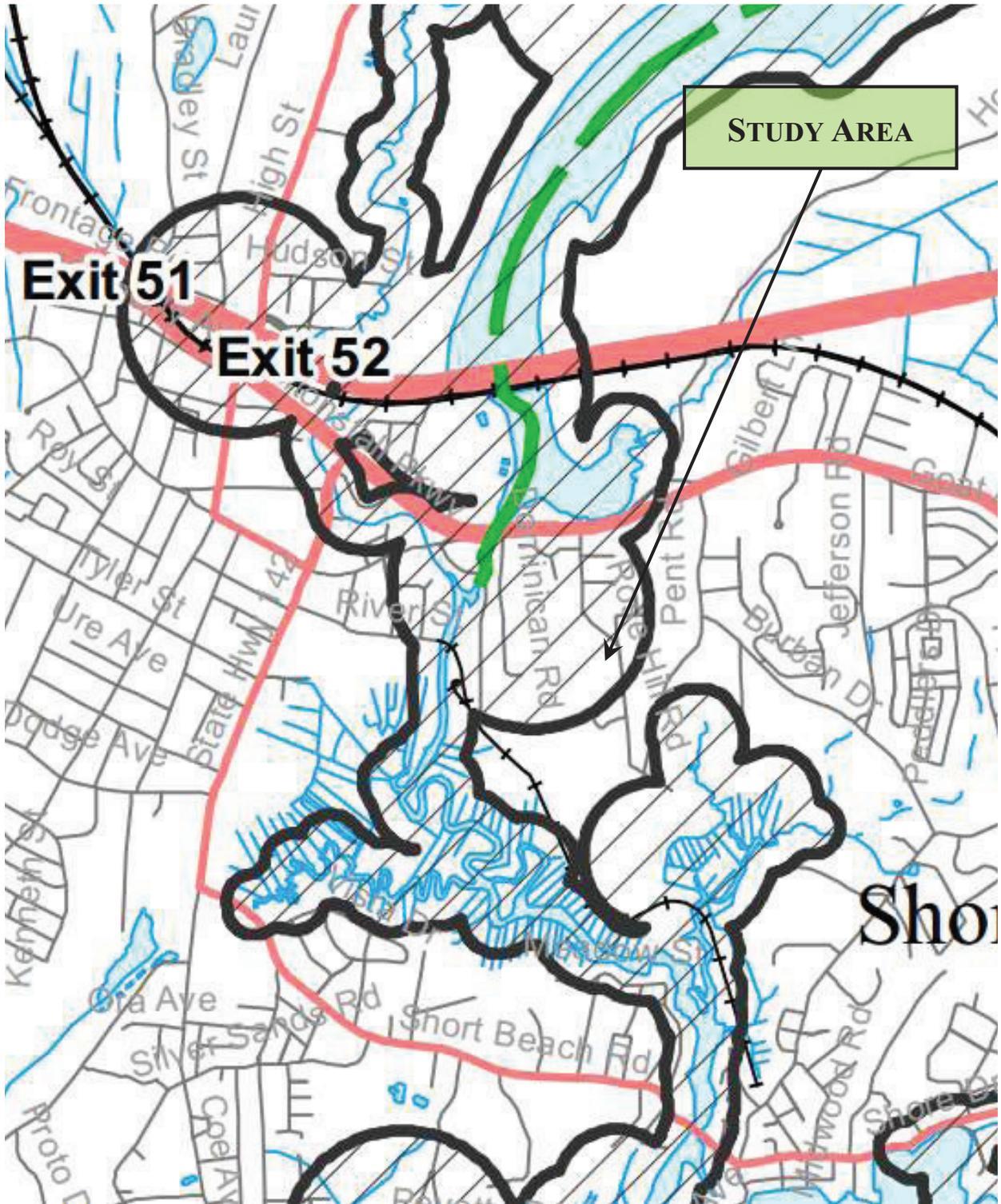


Figure 3. Connecticut Natural Heritage Map – online edition.



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76193

Aeronautical Study No.  
 2013-ANE-2363-OE

Issued Date: 06/05/2014

Amanda V. Fry  
 TowerCo 2013 LLC  
 5000 Valleystone Drive  
 Suite 200  
 Cary, NC 27519

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Monopole CT0016 Rose Hill  
 Location: Branford, CT  
 Latitude: 41-16-22.96N NAD 83  
 Longitude: 72-51-22.57W  
 Heights: 118 feet site elevation (SE)  
 140 feet above ground level (AGL)  
 258 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, paint/red lights - Chapters 3(Marked),4,5(Red),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

Any height exceeding 140 feet above ground level (258 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 12/05/2015 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before July 05, 2014. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Regulations & ATC Procedures Group, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on July 15, 2014 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact Cindy Whitten, at (816) 329-2528. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2013-ANE-2363-OE.

**Signature Control No: 203767476-220079795**

( DNH )

John Page

Manager, Obstruction Evaluation Group

Attachment(s)

Additional Information

Frequency Data

Map(s)

cc: FCC

**Additional information for ASN 2013-ANE-2363-OE**

Proposal: To construct a(n) Monopole to a height of 140 feet above ground level, 258 feet above mean sea level.

Location: The structure will be located 1.49 nautical miles east of HVN Airport reference point.

Part 77 Obstruction Standard(s) Exceeded:

Section 77.17 (a) (5) a height that affects an Airport Surface by penetrating

Section 77.19 (a) Horizontal Surface by 96 feet as applied to HVN.

Preliminary FAA study indicates that the above mentioned structure would:

have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.

have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.

not exceed traffic pattern airspace

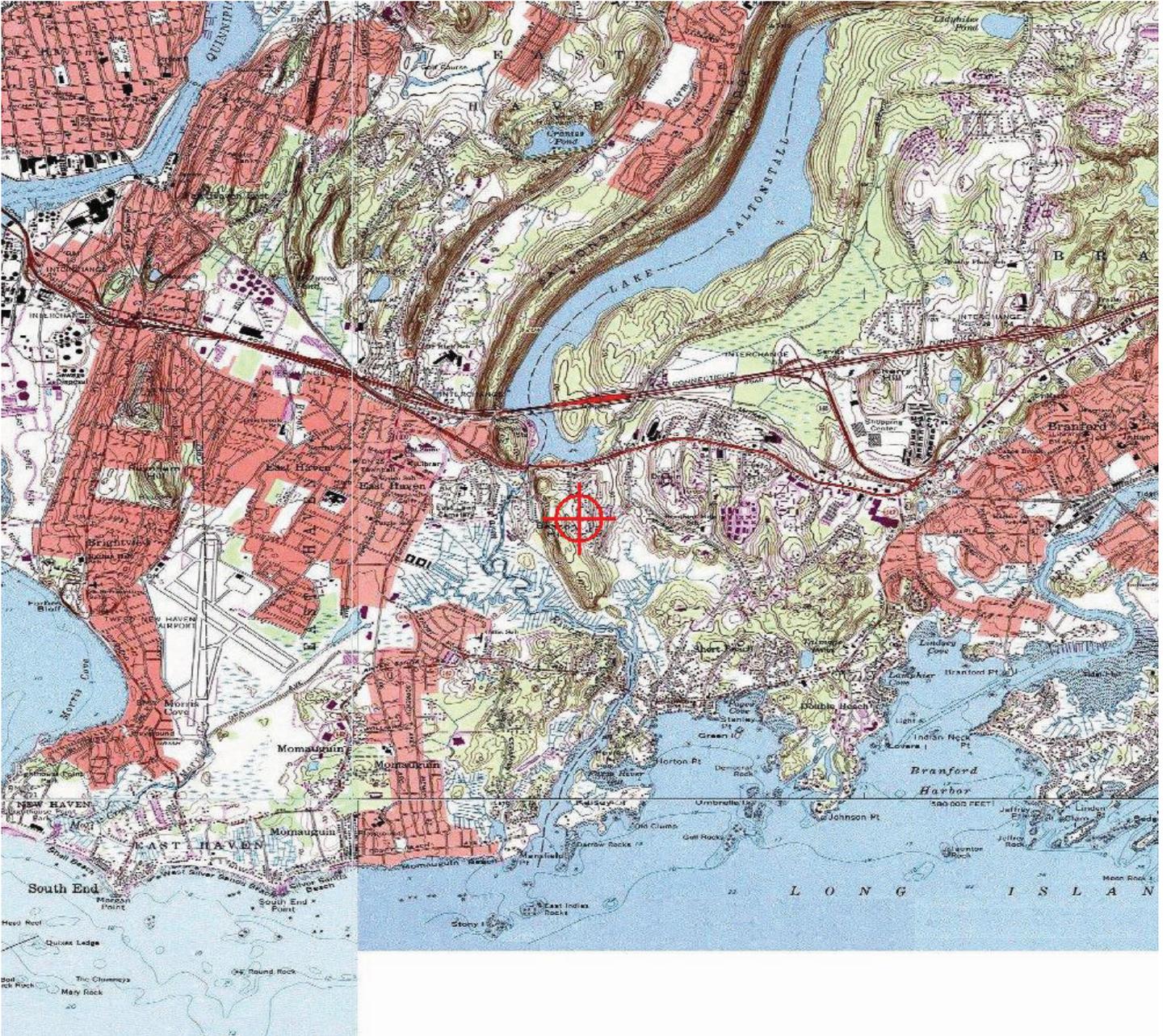
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.

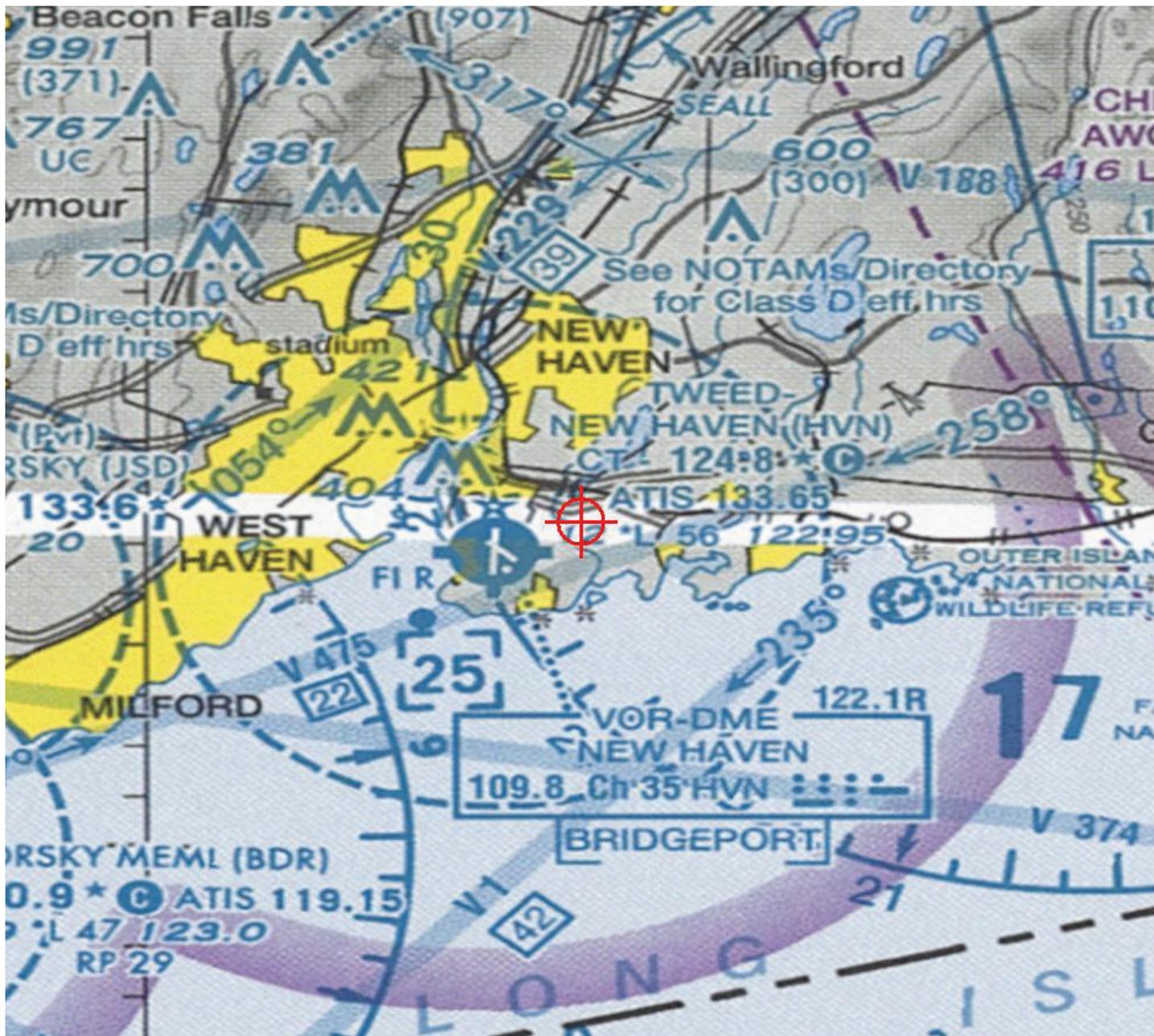
have no effect on any airspace and routes used by the military.

No objections were received from the public comment period.

**Frequency Data for ASN 2013-ANE-2363-OE**

<b>LOW FREQUENCY</b>	<b>HIGH FREQUENCY</b>	<b>FREQUENCY UNIT</b>	<b>ERP</b>	<b>ERP UNIT</b>
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W





Daniel L. Goulet  
 C Squared Systems, LLC  
 65 Dartmouth Drive  
 Auburn, NH 03032  
 603-644-2800  
 Dan.Goulet@csquaredsystems.com



October 31, 2014

Connecticut Siting Council

Subject: New Cingular Wireless PCS, LLC (“AT&T”) – (CT2454SA) – 45 Rose Hill Road, Branford, CT

Dear Connecticut Siting Council:

C Squared Systems has been retained by New Cingular Wireless PCS, LLC (“AT&T”) to investigate RF Power Density levels for the AT&T antenna arrays, to be installed on the proposed monopole tower, to be located at 45 Rose Hill Road, Branford, CT.

Calculations were done in accordance with FCC OET Bulletin 65. These worst-case calculations assume that all transmitters are simultaneously operating at full power and that there is 0 dB of cable loss. The calculation point is 6 feet above ground level to model the RF power density at the head of a person standing at the base of the tower.

Due to the directional nature of the proposed AT&T antennas, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to the Attachment for the vertical patterns of the proposed AT&T antennas. The calculated results below include a nominal 10 dB off-beam pattern loss to account for the lower relative gain directly below the antennas.

Location	Carrier	Vertical Distance to Antenna (Ft.)	Operating Frequency (MHz)	Number of Trans.	Effective Radiated Power (ERP) Per Transmitter (Watts)	Power Density (mw/cm <sup>2</sup> )	Limit	%MPE
Ground Level	AT&T UMTS	130	880	1	1028	0.0024	0.5867	0.41%
	AT&T UMTS	130	1900	1	1265	0.0030	1.0000	0.30%
	AT&T LTE	130	710	2	1254	0.0059	0.4733	1.24%
	AT&T LTE	130	880	1	1542	0.0036	0.5867	0.61%
	AT&T LTE	130	1900	2	1897	0.0089	1.0000	0.89%
	AT&T LTE	130	2300	1	2179	0.0051	1.0000	0.51%
<b>Total</b>								<b>3.96%</b>

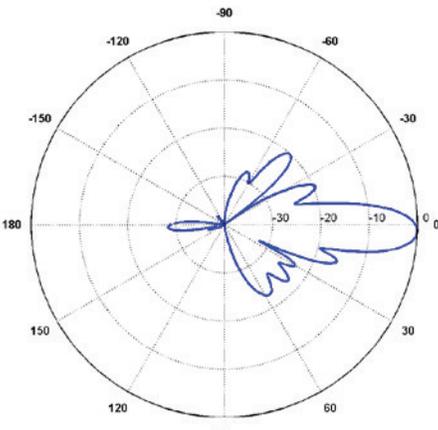
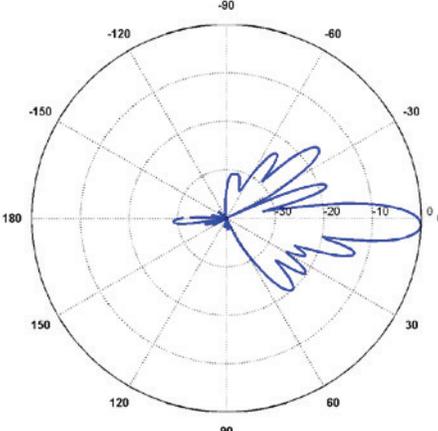
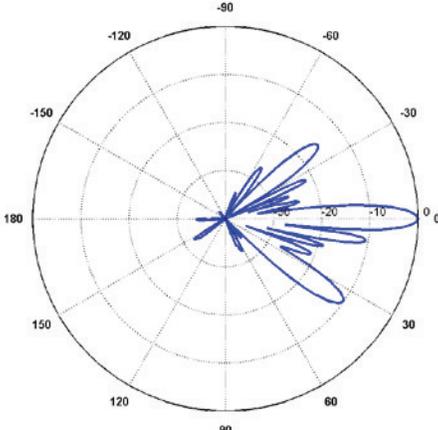
**Summary:** Under worst-case assumptions, RF Power Density levels for the proposed AT&T antenna arrays will not exceed **3.96%**<sup>1</sup> of the FCC MPE limit for General Public/Uncontrolled Environments.

Sincerely,

Daniel L. Goulet  
 C Squared Systems, LLC

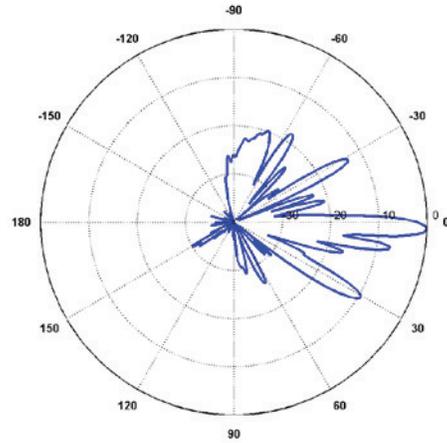
<sup>1</sup> The total %MPE is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

**Attachment: AT&T's Antenna Data Sheets and Electrical Patterns**

<p><b>750 MHz</b></p> <p>Manufacturer: CCI Products            Model #: HPA-65R-BUU-H8            Frequency Band: 698-806 MHz            Gain: 13.2 dBd            Vertical Beamwidth: 10.1°            Horizontal Beamwidth: 65°            Polarization: Dual Pol ± 45°            Size L x W x D: 92.4" x 14.8" x 7.4"</p>	
<p><b>850 MHz</b></p> <p>Manufacturer: CCI Products            Model #: HPA-65R-BUU-H8            Frequency Band: 824-894 MHz            Gain: 14.1 dBd            Vertical Beamwidth: 8.4°            Horizontal Beamwidth: 61°            Polarization: Dual Pol ± 45°            Size L x W x D: 92.4" x 14.8" x 7.4"</p>	
<p><b>1900 MHz</b></p> <p>Manufacturer: CCI Products            Model #: HPA-65R-BUU-H8            Frequency Band: 1850-1990 MHz            Gain: 15.0 dBd            Vertical Beamwidth: 5.6°            Horizontal Beamwidth: 62°            Polarization: Dual Pol ± 45°            Size L x W x D: 92.4" x 14.8" x 7.4"</p>	

**2300 MHz**

Manufacturer: CCI Products  
Model #: HPA-65R-BUU-H8  
Frequency Band: 2305-2360 MHz  
Gain: 15.6 dBd  
Vertical Beamwidth: 4.5°  
Horizontal Beamwidth: 60°  
Polarization: Dual Pol ± 45°  
Size L x W x D: 92.4" x 14.8" x 7.4"



ATTACHMENT 5

# Viewshed Analysis - Photographic Simulation Package

## Proposed AT&T Wireless Telecommunications Facility

CT0016

Branford Rose Hill Road

45 Rose Hill Road

Branford, CT 06405

- Proposed new 134 ft AGL monopole type tower
- Balloon Test completed 11/8/2014
- Photo Documentation completed 11/8/2014
- Visibility Analysis completed 11/18/2014

Package prepared by:

Virtual Site Simulations, LLC

9 walts way

Narragansett, Rhode Island 02882

(401)308-7067

Viewshed Analysis has not been verified. Results are Preliminary and the accuracy of the resulting data is not guaranteed and is not for redistribution



# Project Introduction

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At the request of Tower Co, Inc. and New Cingular Wireless PCS, LLC DBA "AT&T", Virtual Site Simulations, LLC (VSS) was contracted to provide a Viewshed/Visibility Analysis for a proposed telecommunications facility located at 45 Rose Hill Road, Branford, CT 06405. Hereafter referred to as "the Site". Tower Co, Inc. seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need to construct said facility. This Viewshed/Visibility Analysis was conducted to evaluate the potential visibility of the Facility within a 2 mile radius. This radius is defined as the "Study Area". The 8,042 acre Study Area encompasses the towns of Branford and East Haven Connecticut. A map labeled "Photolog" depicting the Study Area, and the proposed location of the Facility is provided in "attachment A".

The proposed telecommunications facility would consist of an approximate 134 foot tall above ground level ("AGL") Monopole type antenna structure with 12 panel antennas mounted at a centerline height of approximately 130 foot AGL. Associated unmanned equipment will be housed in an 11' 5" x 16' equipment shelter. The equipment shelter, diesel backup generator and other associated unmanned equipment for the proposed facility will be located on a proposed 11' 5" x 24' concrete pad located approximately 10' to the east of proposed tower. The tower, equipment shelter, generator and other associated unmanned equipment will be placed within a 60' x 90' "L" shaped fenced compound that is in the southwest corner of the parcel. Access to the Site is provided thru a 15' easement that traverses from the site to the east approximately 250 feet to Rose Hill Road.

## Site Description and Setting

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The proposed monopole type telecommunications facility is located on the host property designated by the Town of Branford Tax Assessor as parcel number A8-0-3-16. The host property consists of approximately 2 acres of that is currently occupied by a waste management company. Land use within the general vicinity of the host property is comprised of a mix of single family residential properties, commercial properties and some farmland. The Site is approximately .54 miles south of Connecticut RT 1 at the Rose Hill Road interchange and bounded by the Beacon Hill Preserve to the west. Connecticut RT 95 is approximately .8 miles to the north.

The Study Area contains approximately 1757 acres of surface water. Water bodies within the Study Area include; The Long Island Sound located approximately 1.25 miles to the south, the Farm River located .2 miles to the south west, the Beaver Swamp Brook located .25 miles to the north and a large portion of Lake Saltonstall located .75 miles to the north. Ground elevation within the Study Area ranges for sea level to approximately 200 feet AMSL and is characterized by rolling hills with moderate changes in elevation.

There are two CT Trail System Trails located within the Study Area. The Short Beach Trail, is a five mile trail that runs from north to south, then west thru the study area. It is 847 feet to the west of the proposed site at its closest point. The Saltonstall Trail begins at CT RT 1, its closest point to the site, .34 miles to the northwest and continues northwest for 2 miles.

There are no CT Blue Blazed Trails within the study area.

There are no schools within 250 feet of the proposed facility. The nearest school is the Tuttle Elementary School that is located .9 miles to the west. There are no licensed daycare facilities within 250 feet of the proposed facility. The nearest licensed daycare facility is the Duck Pond Daycare that is located .625 miles to northeast.

Tree cover within the Study Area consists of approximately 2175 acres of deciduous and coniferous tree species. The average tree height for was determined to be approximately 50 feet on average using the method outlined below.

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# Methodology

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A two mile radius surrounding the site is defined as the study area for this Viewshed Analysis. The Viewshed Analysis was conducted within the predefined study area using two different methods: computer modeling and on-site observation. Each method was used to verify the results of the other, providing the best possible prediction of locations that will have views of proposed telecommunications facility.

## Computer Modeling – Viewshed Analysis

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A combination of Image based and Digital Elevation Model (“DEM”) based data was used to perform this analysis. The primary software used was Environmental Systems Research Institute Inc. (ERSI) ArcGIS Spatial Analysis. This software allows the user to perform spatial analysis on imported maps and datasets. The maps and datasets used are documented in the “documentation” page at the end of this report. The maps and datasets are imported as layers within the software mapping program. Once imported, spatial analysis tools are used to evaluate each position within those layers from which the proposed facility may be visible. These tools allow for the input of: viewing reference height (assumed to be 5 foot AGL) and tower height (in this case 134 ft. AGL). The tools also take into account any layers that have been imported that may affect viewing location (i.e. topography, tree canopy, ground cover, buildings, roads etc.). In this case no current data sets exist that accurately depict the actual building or tree canopy heights. It was determined that averaging manual measurements of the existing tree canopy and building heights and manually inputting this data into the analysis would increase the accuracy of the model. Therefore, tree canopy elevations were measured randomly throughout the study area to obtain an average tree canopy height. A Lieca DISTO D2 infrared laser range finder developed by Lieca Geosystems, Inc. with a typical accuracy of +/- .06 “ was used to obtain these measurements. An average height of 50’ AGL was determined to be the most accurate representation of the existing tree canopy. Buildings within the study area are mainly single story commercial structures and two story single family residential properties. An average building height of 20 foot AGL was determined to best represent these types of structure. These averages were incorporated into their specific layers, and viewshed analysis tools were applied. The results of this computer model were then graphically layered on topographic and aerial maps. These maps can be found in Attachment B.

## On-site Observation & Documentation

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A balloon float test was conducted on November 8<sup>th</sup>, 2014 and used as the visual reference for site observations from locations throughout the study area. The balloon float test consisted of flying an approximately 4 ft. diameter helium-filled balloon to the top elevation of the proposed tower. The balloon was tethered to the location of the proposed tower, and its elevation was verified using the Lieca DISTO D2 described above. A preliminary viewshed analysis was done using the method outlined above to determine what areas were predicted to have views of the proposed site and to verify the computer model. Drive-by visual reconnaissance of the Study Area was then conducted using the preliminary viewshed analysis as a guide. Locations where the Balloon was visible and not visible were photo documented and a GPS track of reconnaissance areas was made. Reconnaissance areas were limited to public areas/roads, no private property was used in the on-site observations of this test.

Photo documentation of this test was accomplished using a Nikon AW110 16Mp digital camera set to use a 50mm focal length<sup>1 2</sup>. The Nikon AW110 was chosen because it has built-in XMP metadata files that embed the GPS location, light conditions and bearing to target within the image source data file. These photos document the necessary location and bearing data to ensure the accuracy of simulation location. This documentation was then incorporated into a computer model prediction. The on-site observations were used to adjust model assumptions as necessary.

## Photographic Documentation

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A number of photographs were chosen from the on-site documentations photos and used to prepare photorealistic simulations of the proposed telecommunications facility. GPS coordinates and bearing information recorded within the XMP metadata file of the documentation photos was used to generate virtual camera positions within a 3d model. The balloon in the documentation photos was used as a spatial reference to verify the proportions

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<sup>1</sup> "The lens that most closely approximates the view of the unaided human eye is known as the normal focal length lens. For the 35 mm camera format, which gives a 24 x 35mm image, the normal focal length is about 50mm" Warren Bruce Photography, West Publishing Company, Egan, MN c 1993 (page 70)

<sup>2</sup> 50 mm focal length is based on 35mm film photography. Since Digital photographic sensors are not the same size as 35mm film ALL digital photography focal lengths must be corrected

and height of the proposed tower. Site plan information, field observations and 3D models were then used in these simulations to portray relative scale and location of the proposed structure. The photo simulations were then created using a combination of the 3d model and photo rendering software. These simulations and the existing site photographs provided for reference are attached.

Eight photographs were used for site simulations and were taken from the following locations:

Image #	Location	Latitude:	Longitude:	Distance to site		Orientation
1	Pent Road 2	41.27842	-72.85204	+/- 0.44	Miles	North West
2	Pent Road 1	41.27601	-72.85225	+/- 0.30	Miles	North West
3	Rose Hill Rd	41.27463	-72.85639	+/- 0.11	Miles	North
4	Monticello Drive	41.27440	-72.84903	+/- 0.40	Miles	West
5	Rose Hill Rd South	41.27178	-72.85522	+/- 0.11	Miles	South West
6	Rose Hill Rd south	41.27046	-72.85503	+/- 0.19	Miles	South
7	Short Beach Rd	41.26602	-72.87066	+/- 0.88	Miles	South East
8	Short Beach Road	41.26139	-72.86411	+/- 0.90	Miles	South East

# Visibility Analysis Results

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The Results of the of viewshed analysis are provided on the visibility analysis map attached at the end of this report within Attachment B. Predicted estimate of year round views of the proposed tower facility are from approximately 858 acres. Approximately 670 Acres (+/- 78 percent) of this acreage occurs over open water or tidal marsh areas. Year round views of the top of the facility are predicted from a +/- 1800 foot section of the Short Beach Trail that is within the tidal area .5 miles to south of the site. The remaining +/-188 acres of potential year round views are mainly contained within 2 areas; 1. An area of approximately 72 acres that is 1.5 mile to west/southwest of the site within the Tweed New Haven Regional Airport facility that is not publicly accessible. And, 2. An area of approximately 63 acres of scattered and consistent year round views to east/southeast immediately adjacent to the host property. Land use in this area, along Rose Hill Road, Pent Road, Burban Drive and Sunny Meadow Drive, is largely residential with some farmland and open space. The remaining acreage with predicted year round views is scattered within the study area and is largely over 1 mile from the site.

Predicted seasonal views of the proposed facility are from an additional approximate 984 acres. With the majority of that acreage, approximately 717 acres (+/- 73 percent), being from viewing locations over .5 miles away. These views are therefore predicted to be distant and partially obscured by tree cover. Approximately 246 acres (+/- 25 percent) of the remaining acreage within .5 miles of the site is contained within an area immediately adjacent to the site to the west. This area contains the Beacon Hill Preserve and the East Haven Marsh Wildlife Area. This area also contains a portion of the Short Beach Trail. An approximate 2000 foot of this trail is expected to have some seasonal views of the proposed site. Seasonal views within these areas are predicted to be partially obscured by existing tree cover. The remaining acreage within .5 miles of the site with seasonal views, approximately 21 acres, is scattered within the residential/farmland areas to east and southeast of the site.

# Documentation

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Sources used for Visibility Analysis located at:

Proposed Wireless Telecommunications Facility  
CT0016 Branford Rose Hill Road  
45 Rose Hill Road  
Branford, CT 06405

## **Maps and datasets /consulting documents:**

United States Geological Survey - USGS Topographical quadrangles (2011-2012)

National Resource Conservation Service -NAIP aerial photography (2010, 2012)

UCONN- Center for Land Use Education and Research

- LiDAR data (2000)
- Land Use/Ground Cover (2006)

DEEP- Connecticut Department of Energy and Environmental Protection

- Open Space (1997)
- DEEP Property(2007)
- Historic Places (2008)

United States Census (2010) – Landmark Polygon Features

Connecticut Forest & Park Association (CFPA) – Blue Blazed Trails (2014)

Connecticut.Gov eLicensing Website – Child Daycare & Group Daycare Homes Roster (2014)

Environmental Systems Research Institute Inc (ERSI) – CT state boundaries/counties (2010)  
2013 National Geographic Society

Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

## **Limitations:**

This report and the analysis herein does not claim to depict all locations, or the only locations from which the proposed facility will be visible; it is intended to provide a representation of those areas where proposed facility is likely to be visible.

# Attachment A

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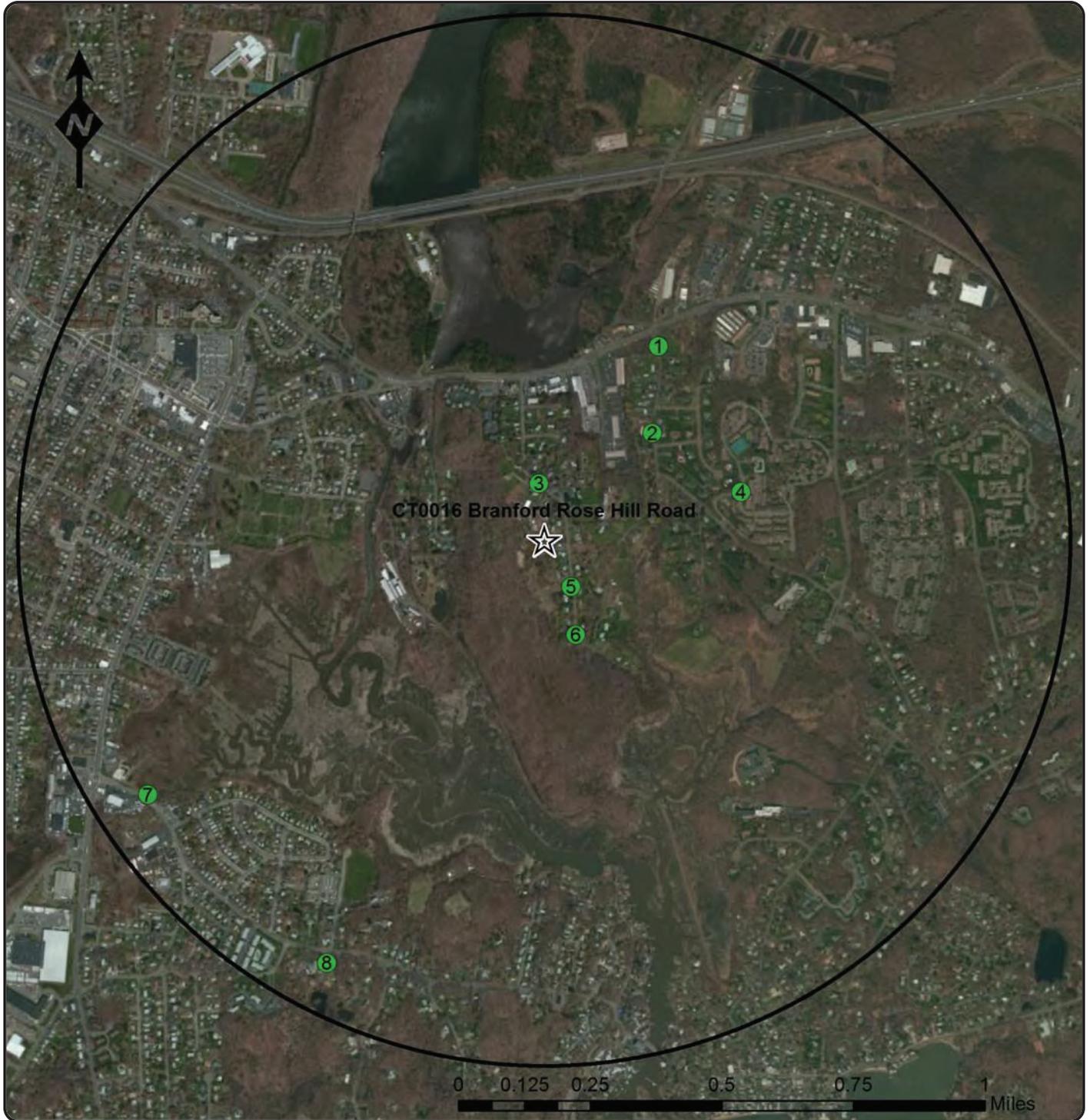
Site Study Map - Photolog, Photographic Documentation,  
Photographic Simulations

CT0016  
Branford Rose Hill Road  
45 Rose Hill Road  
Branford, CT 06405



# Photolog - 1 Mile Radius

☆ CT0016 Branford Rose Hill Road  
45 Rose Hill Road , CT 06405  
Lat, Lon: 41.273044, -72.856269  
Proposed Tower Height: 134.0'



Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
1	Pent Road 2	41.27842 -72.85204	+/- 0.44 Miles	North West	207.65	Year Round

Site: CT0016 Branford Rose Hill Road

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution



Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
1	Pent Road 2	41.27842 -72.85204	+/- 0.44 Miles	North West	207.65	Year Round

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
2	Pent Road 1	41.27601 -72.85225	+/- 0.30 Miles	North West	227.34	Seasonal

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
2	Pent Road 1	41.27601 -72.85225	+/- 0.30 Miles	North West	227.34	Seasonal

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
3	Rose Hill Rd	41.27463 -72.85639	+/- 0.11 Miles	North	181.53	Year Round

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
3	Rose Hill Rd	41.27463 -72.85639	+/- 0.11 Miles	North	181.53	Year Round

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
4	Monticello Dr	41.27440 -72.84903	+/- 0.40 Miles	West	251.04	Seasonal

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
4	Monticello Dr	41.27440 -72.84903	+/- 0.40 Miles	West	251.04	Seasonal

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
5	Rose Hill Rd South	41.27178 -72.85522	+/- 0.11 Miles	South West	324.26	Year Round

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
5	Rose Hill Rd South	41.27178 -72.85522	+/- 0.11 Miles	South West	324.26	Year Round

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
6	Rose Hill Rd south	41.27046 -72.85503	+/- 0.19 Miles	South	338.33	Seasonal

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
6	Rose Hill Rd south	41.27046 -72.85503	+/- 0.19 Miles	South	338.33	Seasonal

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
7	Short Beach Rd	41.26602 -72.87066	+/- 0.88 Miles	South East	58.55	Year Round

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
7	Short Beach Rd	41.26602 -72.87066	+/- 0.88 Miles	South East	58.55	Year Round

Site: CT0016 Branford Rose Hill Road

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
8	Short Beach Road	41.26139 -72.86411	+/- 0.90 Miles	South East	26.97	Year Round

Site: CT0016 Branford Rose Hill Road

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
8	Short Beach Road	41.26139 -72.86411	+/- 0.90 Miles	South East	26.97	Year Round

Site: CT0016 Branford Rose Hill Road

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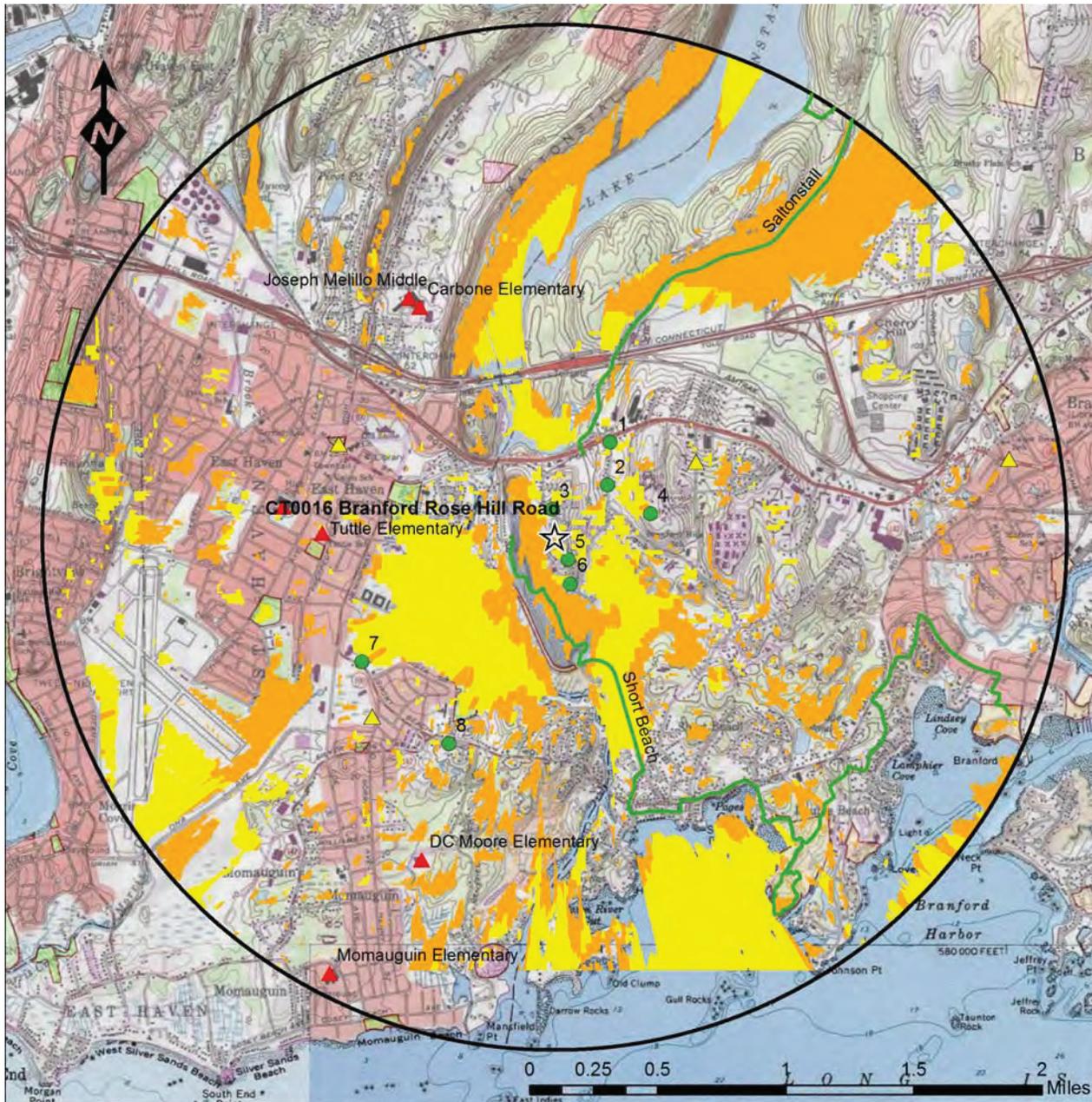
# Attachment B

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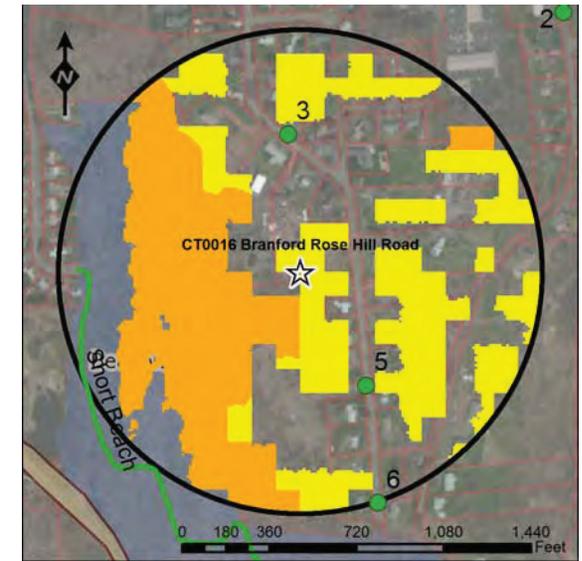
## Visibility/Viewshed Analysis Map

CT0016  
Branford Rose Hill Road  
45 Rose Hill Road  
Branford, CT 06405





Visibility Analysis - Topo Base



Visibility Analysis - Aerial View - 1000 ft radius

**Legend:**

- ☆ CT0016 Tower Location
- Picture Location
- 2 Mile Radius Study Area
- Predicted Year Round Visibility (leaf on) +/-858 Acres
- Predicted Seasonal Visibility (leaf off) +/-984 Acres
- Protected Properties (State, CTDEP, May 2007)
- Protected Properties (Municipal, CTDEP, May 2007)
- Protected Properties (Municipal, CTDEP, May 2007)
- Federal Open Space (CTDEP, May 2007)
- Blue Blazed Trails (CFPA 2014)
- CT Statewide Trail System
- ▲ Schools (CTDEP 2008)
- ▲ Licensed Daycare Facilities (CT.Gov DB 2014)

**Notes:**

- Map compiled by VSS November 2014
- Viewshed analysis completed using ESRI ArcGIS Spatial Analyst
- Proposed monopole tower height of 134.0' ALG
- Tree Canopy estimated at an average height of 50'
- Viewing height assumed to be 5' AGL
- Study area defined as 2 mile radius centered at proposed tower
- Data sources noted on Documentation page of Viewshed report
- Visibility analysis maps and representations contained herein depict where proposed facility may potentially be visible based on best data available and site conditions at the time data was collected. This study does not claim to depict all locations where facility may be visible.



Proposed AT&T Wireless Communications Facility  
 CT0016 Branford Rose Hill Road  
 45 Rose Hill Road  
 Branford, CT 06405

