ARX WIRELESS INFRASTRUCTURE, LLC

TECHNICAL REPORT
PROPOSED WIRELESS TELECOMMUNICATION FACILITY

43 OSGOOD AVE
NEW BRITAIN, CT 06111

Arx Wireless Infrastructure, LLC
110 Washington Ave
North Haven, CT 06473

Table of Contents

Introduction

Arx Wireless Infrastructure, LLC ("ARX") submits this Technical Report to the City of New Britain ("City" or "New Britain") pursuant to Connecticut General Statutes §16-50(e). ARX proposes to install a wireless telecommunications facility (the "Facility") on an approximately 2.62+/- acre parcel located at 43 Osgood Ave, New Britain and owned by Osgood Avenue Property, LLC (the "Property" or the "Site"). The Facility would consist of a 104' foot monopole structure (not to exceed 104' with antennas) within a 50' x 50' fenced equipment compound (within a 75' x 75' leased area) surrounded by a chain link fence, located behind an existing commercial warehouse building. The tower would accommodate the antenna arrays of New Cingular Wireless PCS, LLC ("AT&T") and three future wireless carriers. If approved, the Facility would provide enhanced wireless communications and improved 911 service in this area of New Britain.

The purpose of this Technical Report is to provide the City with information concerning the Facility. Section 1 addresses the need for the proposed Facility. Section 2 details the site selection process, including an analysis of other sites considered and rejected by ARX. Section 3 describes the Site, the design of the Facility, and the environmental effects, if any, associated with the Facility.

Correspondence and/or communications regarding this Technical Report should be addressed to the attorneys for ARX:

Cohen and Wolf, P.C.
1115 Broad Street
Bridgeport, CT 06604
(203) 368-0211

Attention: David A. Ball, Esq.
Philip C. Pires, Esq.

SECTION 1

Site Justification

The proposed Facility is necessary to allow AT&T to provide wireless service in the City of New Britain. AT&T is licensed by the Federal Communications Commission ("FCC") to provide wireless communication service throughout the State of Connecticut, including New Haven County. AT&T's FCC licenses require the construction and build-out of their wireless networks within their respective federally licensed service areas, which include the City of New Britain.

The proposed 104 foot monopole at 43 Osgood Ave, New Britain, Connecticut, will allow AT&T to provide necessary in-building residential and in-vehicle coverage, if they are permitted to locate at the 100' foot level. AT&T's location at the 100' foot level will provide much needed coverage in the area within the proposed coverage footprint. With the development of the proposed Facility, residential customers would have reliable in-vehicle and in-building coverage for their voice and data needs as well as reliable coverage for E-911 services.

In addition to the attached Statement of Need and Power Density Calculations, included are propagation plots prepared by AT&T that depict (1) coverage from existing and approved surrounding sites, and (2) coverage from the proposed Site in conjunction with existing and approved sites. Together, these propagation plots demonstrate AT&T's need for a site in the area of the proposed Facility, and the effectiveness of the proposed Facility in meeting the need for wireless service in this area of New Britain.

SECTION 2

Site Search Process and Selection

Connecticut General Statutes § 16-50*l* requires ARX to provide the City with a technical report considering, *inter alia*, "the site selection process." When filing its application for a certificate of environmental compatibility and public need with the Connecticut Siting Council, ARX must include a statement that describes "the narrowing process by which other possible sites were considered and eliminated." Regs., Conn. State Agencies § 16-50j-74(j). In accordance with these requirements, this Technical Report details the description of the general site search process, the identification of the target search area, and the alternative locations considered for development of the proposed Facility.

As a tower infrastructure provider, ARX is in direct consultation with individual carriers and uses its overall knowledge and understanding of existing wireless carrier networks to identify geographical areas where wireless service is unreliable. ARX only pursues a site search for a new tower when it is clear that a new tower facility will be required, and all other options have been evaluated and/or exhausted. When conducting a site search, ARX's radio frequency engineers, in consultation with the appropriate wireless carrier radio frequency engineers, identify search areas central to the necessary geographical coverage area. In this case, AT&T identified a need for wireless coverage in this area of New Britain and have agreed to support an application by ARX to construct a new facility in this location to provide the coverage required.

ARX is sensitive to State and local desires to minimize the construction of new towers, and it does not pursue development of a new facility where an acceptable existing structure can be found. In general, ARX's site acquisition personnel study the area in and near the search area to determine whether any suitable structure exists. If ARX cannot find a structure with appropriate height and structural capabilities, it turns to industrial and commercial areas or individual parcels that have appropriate environmental and land use characteristics. The list of potential locations is limited by the willingness of property owners to make their properties available for a telecommunications facility. Radio frequency engineers study potentially suitable and available locations to determine whether those locations will meet the technical requirements for a telecommunications facility. The list of possible alternative sites may be further narrowed by ARX's analysis of potential environmental effects and benefits. The weight given to relevant factors varies for each search, depending on the nature of the area and the availability of potential sites.

Section 16-50j-74(j) of the Regulations of Connecticut State Agencies requires the submission of a statement that describes "the narrowing process by which other possible sites were considered and eliminated." In accordance with this requirement, descriptions of the general site search process, the identification of the applicable search area, and

the alternative locations considered for development of the proposed telecommunications facility in New Britain are provided below.

Site Search Process

A site search ring is selected in an area where wireless service gaps have been identified. In any search ring or search area, ARX seeks to avoid the unnecessary proliferation of towers and to reduce the potential adverse environmental effects of the cell site, while at the same time maximizing the quality of service provided from a particular facility. These objectives are achieved by initially locating existing towers and other sufficiently tall structures within and near the site search area. If any are found, they are evaluated to determine whether they are capable of supporting a carrier's telecommunications antennas and related equipment at a location and elevation that satisfies its technical requirements.

The list of available locations may be further reduced if, after preliminary negotiations, the property owners withdraw a site from further consideration. From among the remaining locations, the proposed sites are selected by eliminating those that have greater potential for adverse environmental effects and fewer benefits to the public (i.e., those requiring taller towers; those with substantial adverse environmental impacts; or those with limited ability to share space with other public or private telecommunications service providers). It should be noted that in any given site search, the weight afforded to factors considered in the selection process will vary depending upon the availability and nature of sites within the search area.

Sites Investigated

1. **Owner: Osgood Avenue Property, LLC**

   Map Block and Lot: C5B/115

   Site Location 43 Osgood Avenue: 2.62 acres

This location is the Property on which ARX proposes to construct the Facility.

ARX determined that the Property is preferable to the other properties in the area. The Property is an approximately 2.62 acre parcel designated as a commercial warehouse in the City's records. There are no trees that will need to be removed to construct the Facility. Access to and from the Site is from the rear of the Property off of Beach Street, so there is no need to create new access to the Property to reach the Facility.

2. **Owner: Daughters of Mary of the Immaculate Conception, Inc.**

   Map Block and Lot D4B 2

   Site Location: 314 Osgood Avenue

   Property Size: 131.09 acres

   This site was deemed unusable due to lack of interest from the owner.

   ARX sent two separate letters to the owner by certified mail. ARX has received no answer from the owner.

3. **Owner: Sacred Heart of Jesus**

   Map Block and Lot: D4A 1

   Site Location: 662 Burritt Street

   Property Size: 34.09 acres

   This site was deemed unusable due to lack of interest from the owner.

   ARX sent two separate letters to the owner by certified mail. ARX has received no answer from the owner.

4. **Owner: Holy Trinity Greek Catholic Church Cemetery Association.**

   Map Block and Lot: D3D 21

   Site Location: 285 Osgood Avenue

   Property Size: 2.96 acres

   This site was deemed unusable due to lack of interest from the owner.

   ARX sent two separate letters to the owner by certified mail. ARX has received no answer from the owner. ARX personnel also contacted the cemetery, and the owner is not interested.

5. Owner: Holy Cross Church Corporation

Map Block and Lot: C5B 7

Site Location: 221 Farmington Avenue

Property Size: 4.1 acres

This site was deemed unusable due to lack of interest from the owner.

ARX sent two separate letters to the owner by certified mail. ARX has received no answer from the owner.

SECTION 3

PROPOSED SITE AND FACILITY

43 Osgood Avenue
New Britain, CT 06460

Map Block & Lot C5B 115
2.62+/- Acres

GENERAL SITE AND FACILITY DESCRIPTION

The Site is an approximately 2.62+/- acre parcel, with a designated land use (as reflected in the City's records) as a "commercial warehouse". The Property is presently developed with a vacant commercial warehouse building that is over 30,000 square feet in size. The Site is situated on the west side of Farmington Avenue with Richmond avenue to the north and Beach Street to the west.

ARX is proposing to construct a telecommunications facility consisting of a 104'-tall monopole with AT&T equipment and antennas, situated within a 50' x 50' fenced equipment compound within a 75' x 75' leased area, located behind the existing commercial warehouse building. A 20'-wide utility easement originating off Beach Street would provide the Site with underground utilities and vehicular access. The antennas affixed to the top of the monopole will consist of AT&T panel antennas, mounted in three sectors, at a centerline height of 100'.

SITE EVALUATION REPORT

I. LOCATION

A. COORDINATES: N 41° 41' 07.87"
W 72°47' 25.06"

B. GROUND ELEVATION: 344 +/- feet AMSL (Proposed)

C. USGS MAP: 7.5 Minute Series Topographic Quadrangle Map, New Britain, Connecticut, 2015

D. SITE ADDRESS: 43 Osgood Avenue
New Britain, CT 06051

E. ZONING CLASSIFICATION: Parcel is zoned S3 and current use is designated as "Commercial Warehouse," as reflected in the City's records.

II. DESCRIPTION

A. COMPOUND SIZE: 2,500 square feet

B. TOWER TYPE/HEIGHT: 104 foot monopole with antenna to 104 feet

C. SURROUNDING TERRAIN, VEGETATION, WETLANDS, OR WATER: The existing terrain consists of a commercially developed piece of Property consisting of a commercial building. There are no wetlands located on the Property.

D. LAND USE WITHIN ¼ MILE OF SITE: A mix of commercial/industrial, retail, and residential development.

E. LOCATION OF ALL SCHOOLS NEAR SITE: The closest school is E.C. Goodwin Technical High School, located approximately 0.73 mile to the west at 735 Slater Road in New Britain. The nearest commercial day care center is Learn 'n Play Childcare, located approximately 0.82 mile to the southeast at 357 Allen Street in New Britain.

III. FACILITIES

A. POWER COMPANY: Eversource

B. POWER PROXIMITY TO SITE: Existing utility pole on Beach Street is 250'+/- West of the Site.

C. TELEPHONE COMPANY: Frontier Communications

D. PHONE SERVICE PROXIMITY: Existing utility pole on Beach Street is 250'+/- West of the Site.

E. VEHICLE ACCESS TO SITE: Access to the proposed Facility would be across an existing paved parking lot between the two buildings.

F. OBSTRUCTION: None

IV. LEGAL

A. PURCHASE [ ] LEASE [X]

B. OWNER: Osgood Avenue Property LLC

C. ADDRESS: 119 Liberty Street, Newington, Connecticut 06511

D. DEED ON FILE AT: Book 1911/Page 0487 and Book 1941/Page 0368

FACILITIES AND EQUIPMENT SPECIFICATIONS
(TOWER & EQUIPMENT)

I. TOWER SPECIFICATIONS

A. MANUFACTURER: TBD

B. TYPE: Monopole

C. HEIGHT: 104'

D. DIMENSIONS: TBD

II. TOWER LOADING

A. AT&T

1. MODEL: TBD

2. DIMENSIONS: TBD

3. ANTENNAS: 12 antennas on a low profile mount

4. TOWER POSITION: 100 AGL at the center of the antenna array

5. TRANSMISSION LINES: TBD

B. FUTURE CARRIERS: 3 additional carriers

III. ENGINEERING ANALYSIS AND CERTIFICATION:

All work shall be in accordance with the 2015 International Building Code, as modified by the 2018 Connecticut supplement, including the TIA/EIA-222 revision G "structural standards for steel antenna towers and supporting structures," 2018 Connecticut Fire Safety Code and 2009 amendments, National Electrical Code, and local codes. The foundation design will be based on soil conditions at the Site.

ENVIRONMENTAL ASSESSMENT STATEMENT

I. PHYSICAL IMPACT

A. WATER FLOW AND QUALITY

No water flow and/or water quality changes are anticipated as a result of the construction or operation of the Facility. The construction, operation and maintenance of the Facility would not adversely impact any wetlands. There are no wetlands on the Property or floodplains proximate to the Site. *See attached Wetland Inspection.*

B. AIR QUALITY

Under ordinary operating conditions, the equipment located at this Facility would emit no air pollutants of any kind. For limited periods during power outages, a generator will be utilized.

C. LAND

Grading would be required for development of the Facility. The remainder of the Property would remain unchanged by the construction and operation of the Facility.

D. NOISE

The Facility equipment after construction would not emit any noise other than the installed heating, air conditioning, ventilation systems, and in the event of a power outage, the proposed self-contained diesel generator. Some noise is anticipated during the construction of the Facility, which is expected to take approximately 10 weeks.

E. POWER DENSITY

Facility is compliant with FCC/ANSI standards. *See attached Statement of Need and Power Density Calculations.*

F. VISIBILITY

The Preliminary Visual Assessment provides initial viewshed mapping and an evaluation of the proposed visibility within a two-mile radius of the Site. Visibility of the tower is predicted to include up to 47 acres year-round and 80 acres seasonally (cumulatively, ±1.6% of the 8,042-acre Study Area). The preliminary viewshed mapping will be field verified in the near future via a balloon float. An updated report with photo-simulations will be

prepared for inclusion in the Application to the Connecticut Siting Council. *See attached Preliminary Visual Assessment dated October 20, 2020.* In addition, the Federal Aviation Administration has concluded that the Facility does not exceed obstruction standards and will not be a hazard to air navigation, based on conditions that ARX will meet. *See attached Determination of No Hazard to Air Navigation dated November 3, 2020.*

II. SCENIC, NATURAL, HISTORIC & RECREATIONAL VALUES

ARX has retained All-Points Technology Corporation to evaluate the Facility in accordance with the FCC's regulations implementing the National Environmental Policy Act of 1969 ("NEPA"). A copy of the NEPA will be included in the Application to the Connecticut Siting Council.

Heritage Consultants, LLC ("Heritage") conducted a Preliminary Archaeological Assessment based on an examination of data obtained from the Connecticut State Historic Preservation Office (CT-SHPO) as well as GIS data. Heritage states that the proposed project area contains a "low/no probability" that it will contain archaeological resources. Heritage concludes that no additional archaeological survey in this area will be required prior to construction. *See attached Preliminary Archaeological Assessment dated September 22, 2020.*

TAB 1

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Exposure

CT1430

43 Osgood Avenue, New Britain, CT 06053

October 19, 2020

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installation of the AT&T antenna arrays on a new monopole tower located at 43 Osgood Avenue in New Britain, CT. The coordinates of the tower are 41° 41' 7.87" N, 72° 47' 25.06" W.

AT&T is proposing the following:

1) Install six (6) multi-band antennas (two per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % Maximum Permissible Exposure of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet updated 07/15/2020.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

ERP = Effective Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Calculation Results

Table 1 below outlines the cumulative power density information for the AT&T equipment at the site. The proposed antennas are directional in nature; therefore, 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 Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
AT&T	100	763	1	3541	0.0144	0.5087	2.83%
AT&T	100	2100	1	9890	0.0403	1.0000	4.03%
AT&T	100	2300	1	6153	0.0251	1.0000	2.51%
AT&T	100	739	1	3156	0.0128	0.4927	2.61%
AT&T	100	885	1	3883	0.0158	0.5900	2.68%
AT&T	100	1900	1	5877	0.0239	1.0000	2.39%
						Total	**17.05%**

Table 1: Carrier Information

5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level is **17.05% of the FCC General Population/Uncontrolled limit.**

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, ANSI/IEEE Std. C95.1 and ANSI/IEEE Std. C95.3.

Report Prepared By: Marc Salas
RF Engineer
C Squared Systems, LLC

October 19, 2020
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

October 20, 2020
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[2]

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

(B) Limits for General Population/Uncontrolled Exposure[3]

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

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

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[2] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[3] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

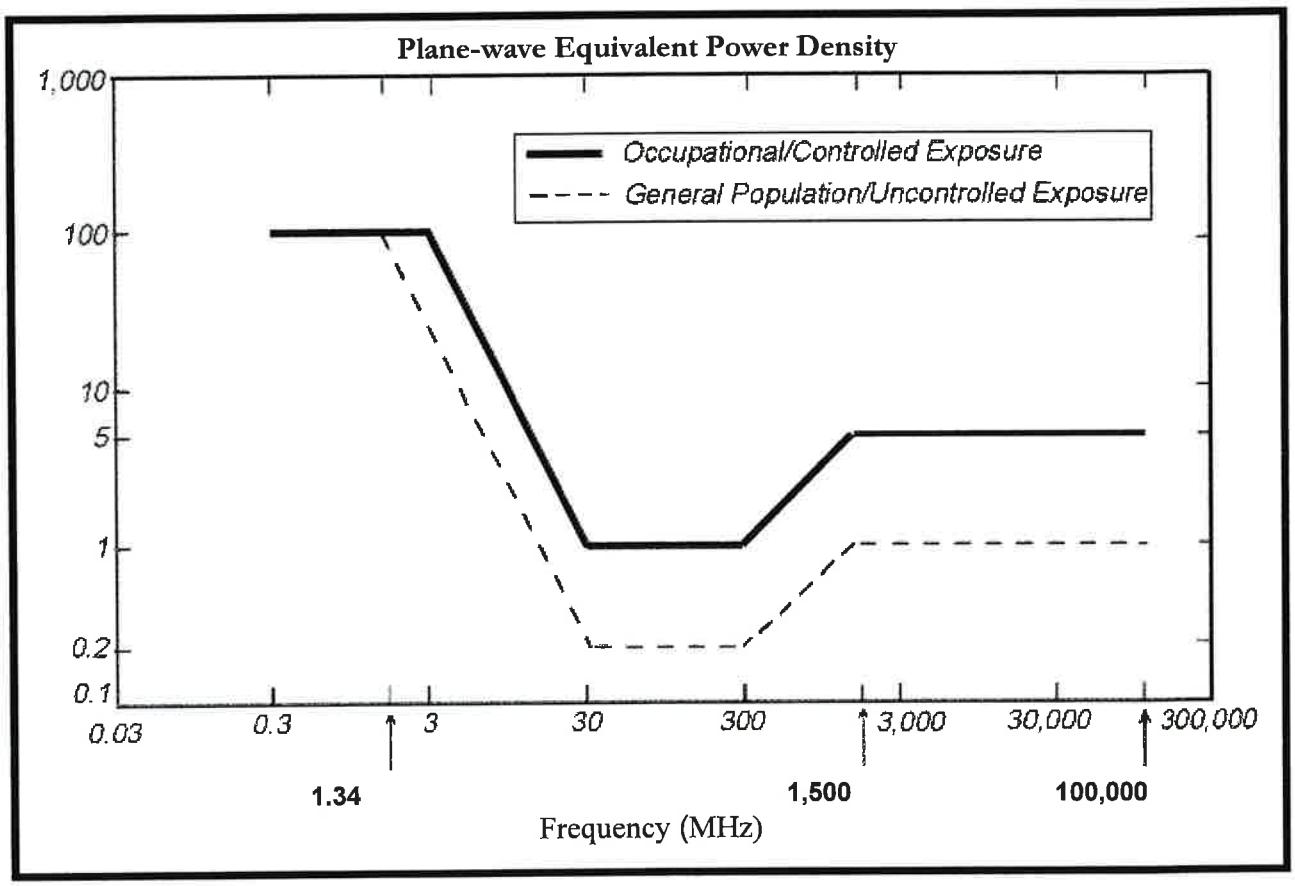
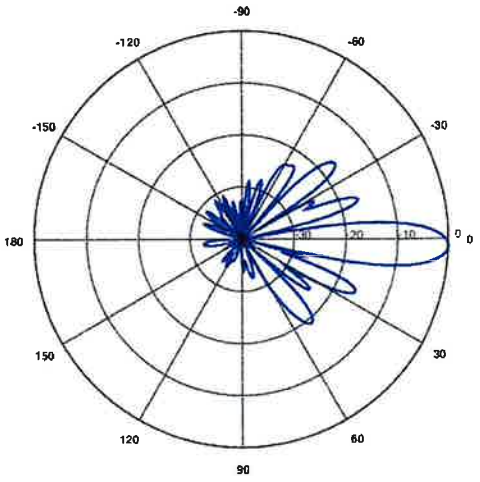


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

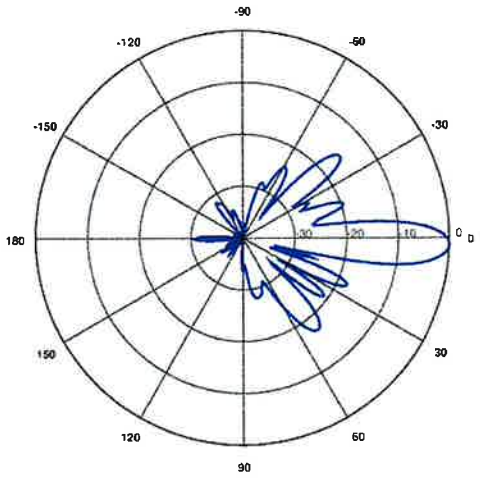
739 MHz

Manufacturer:	CCI Products
Model #:	DMP65R-BU8D
Frequency Band:	698-798 MHz
Gain:	12.95 dBd
Vertical Beamwidth:	9.5°
Horizontal Beamwidth:	75°
Polarization:	Dual Linear 45°
Size L x W x D:	96.0" x 20.7" x 7.7"



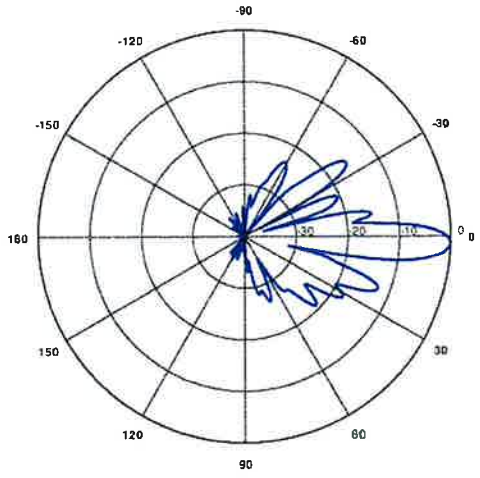
763 MHz

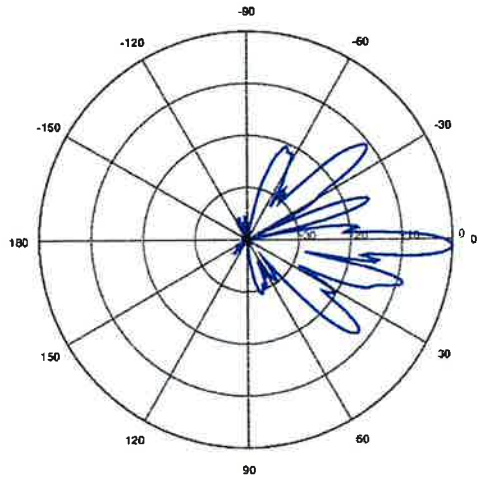
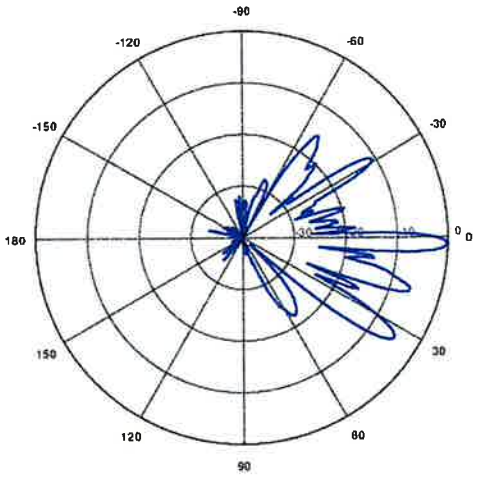
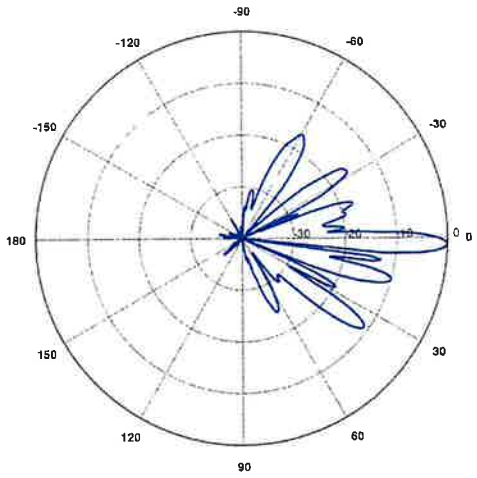
Manufacturer:	CCI Products
Model #:	TPA65R-BU8D
Frequency Band:	698 - 806MHz
Gain:	13.45 dBd
Vertical Beamwidth:	9.5°
Horizontal Beamwidth:	74°
Polarization:	Dual Linear 45°
Size L x W x D:	96.0" x 20.7" x 7.7"



885 MHz

Manufacturer:	CCI Products
Model #:	DMP65R-BU8D
Frequency Band:	824 - 896 MHz
Gain:	13.85 dBd
Vertical Beamwidth:	8.0°
Horizontal Beamwidth:	64°
Polarization:	Dual Linear 45°
Size L x W x D:	96.0" x 20.7" x 7.7"



1900 MHz Manufacturer: CCI Products Model #: DMP65R-BU8D Frequency Band: 1850-1990 MHz Gain: 15.65 dBd Vertical Beamwidth: 5.1° Horizontal Beamwidth: 68° Polarization: Dual Linear 45° Size L x W x D: 96.0" x 20.7" x 7.7"	
2100 MHz Manufacturer: CCI Products Model #: TPA65R-BU8D Frequency Band: 1920-2180 MHz Gain: 16.15 dBd Vertical Beamwidth: 4.7° Horizontal Beamwidth: 67° Polarization: Dual Linear 45° Size L x W x D: 96.0" x 20.7" x 7.7"	
2300 MHz Manufacturer: CCI Products Model #: TPA65R-BU8D Frequency Band: 2300 - 2400 MHz Gain: 15.85 dBd Vertical Beamwidth: 4.1° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 96.0" x 20.7" x 7.7"	

TAB 2

Radio Frequency Analysis Report

CT1430
43 Osgood Avenue, New Britain, CT

October 23, 2020

C Squared Systems

C Squared Systems, LLC
65 Dartmouth Drive, A3
Auburn, NH 03032

Phone: (603) 644-2800
Fax: (603) 644-2801
Support@csquaredsystems.com

Table of Contents

List of Tables

List of Attachments

1. Overview

C Squared Systems was retained by New Cingular Wireless PCS, LLC ("AT&T") to evaluate the proposed wireless communications facility at 43 Osgood Avenue, New Britain, CT at 100 feet AGL, hereinafter referred to as "CT1430".

AT&T is licensed by the FCC to provide wireless communications services throughout the State of Connecticut including the Town of New Britain where the proposed facility would be located. The proposed facility has been selected as suitable for implementation of the National Public Safety Broadband Network ("NPSBN"), while also addressing a substantial gap in 4G LTE coverage for AT&T's network.

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 in their wireless communications network.

The coverage analysis completed by C Squared Systems confirms: AT&T has a gap in reliable service in New Britain, and that Candidate "CT1430" 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 3rd Generation (3G) UMTS technology in the 800 MHz and 1900 MHz frequency band, and advanced 4th Generation (4G) services over LTE technology in the 700 MHz and 1900 MHz frequency bands as allocated by the FCC. 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. 4G LTE services and devices have enabled AT&T customers to have even faster connections to people, information, and entertainment.

AT&T will also deploy FirstNet services from this facility. FirstNet is a federal agency with a mandate to create a nationwide, interoperable public safety broadband network for first responders. First responders across the country currently rely on more than 10,000 separate radio networks which oftentimes do not interoperate with one another. By deploying a nationwide broadband public safety network built specifically to meet the communications needs of first responders, the FirstNet network will provide a solution to the decades-long interoperability and communications challenges first responders have experienced, and which was highlighted by the 9/11 Commission's 2004 Final Report.

FirstNet selected AT&T to build, manage and operate the National Public Safety Broadband Network ("NPSBN") using FirstNet's Band 14 spectrum (Call Sign WQQE234, 20 MHz of the 700 MHz spectrum), together with AT&T's own wireless network. Using a combination of new and existing wireless facilities, AT&T provides prioritized, preemptive wireless services for first responders across Connecticut, New England and nationwide, while also improving 4G LTE coverage for AT&T customers.

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.[1] 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.

3. Coverage Objective

There is a significant coverage deficiency in the existing AT&T wireless communications network along Farmington Avenue and Eddy Glover Boulevard and the neighboring residential and business/retail areas in New Britain, referred to herein as the "targeted 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 data applications throughout a service area. Appropriate overlapping coverage is required for users to be able to move throughout the service area and reliably "hand-off" between cells to maintain uninterrupted connections.

AT&T is expanding and enhancing their 4G LTE high-speed wireless broadband services throughout New England by filling in existing coverage gaps and addressing capacity, interference, and high-speed broadband issues. In addition to improving 4G LTE coverage for AT&T customers, AT&T is also building, managing and operating the National Public Safety Broadband Network using FirstNet's 700 MHz Band 14 spectrum, in order to provide prioritized, preemptive wireless services for first responders across Connecticut, New England and nationwide.

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 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 New Britain. 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.

[1] 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.

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

Included in this report are Attachments 1 through 5, which are explained below to help describe AT&T's 4G network deployment in and around New Britain, and the need for the proposed facility.

- Attachment 1: "*CT1430 Area Terrain Map*" details the terrain features around the area of deficient service being targeted by the proposed site in New Britain. 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 orange, red and white shades indicate higher elevations.
- Attachment 1: "*CT1430 Neighbor Site Data*" provides site specific information of existing neighboring sites used to perform the coverage analysis provided in Attachments 1 and 4.
- Attachment 3: "*CT1430 Existing 700 MHz LTE Coverage" for the Current AT&T Network* depicts 700 MHz LTE coverage from existing sites and demonstrates that there are currently gaps in 700 MHz LTE coverage effecting service within the targeted area. The coverage shown is where the signal strengths are: > -83 dBm (minimum level required reliable, high quality service and performance at 700 MHz) and, > -93 dBm (minimum required for adequate level of service at 700 MHz). In an effort to provide the required levels of coverage to these areas, AT&T is proposing to install a wireless facility at the Osgood Avenue location.
- Attachment 4: "*CT1430 Existing 700 MHz LTE Coverage with Proposed Site*" shows how this proposed site would fill in the existing coverage gaps and improve AT&T's 700 MHz LTE network.
- Attachment 5: *Connecticut DOT Average Annual Daily Traffic Data* – New Britain shows the available vehicular traffic volume data for the subject area from the Connecticut Department of Transportation. This data shows as many as 9,200 vehicles per day passing through Farmington Avenue adjacent to the proposed site.

Table 1 below lists the coverage statistics compiled for the AT&T's 700 MHz 4G LTE network with the deployment of the Proposed Site.

	Incremental Coverage from Proposed Site (700 MHz)	
Population:[2]	(≥ -83 dBm)	5,089
	(≥ -93 dBm)	1,456
Business Pops: [3]	(≥ -83 dBm)	410
	(≥ -93 dBm)	86
Area (mi²):	(≥ -83 dBm)	0.59
	(≥ -93 dBm)	0.21
Roadway (mi):	Main (-93 dBm):	0.3
	Secondary (-93 dBm):	3.9
	Total (-93 dBm):	**4.2**

Table 1: Coverage Statistics

[2] Population figures are based upon 2010 US Census Block Data

[3] Employee population counts are based upon the 2011 U.S. Census Bureau LEHD database.

4. Conclusion

AT&T has identified an area of deficient coverage affecting a significant portion of New Britain CT, including key traffic corridors through the residential and business/retail areas of the Town. Candidate "CT1430" will bring the needed fill-in coverage to significant portions of Farmington Avenue and Eddy Glover Boulevard and the residential neighborhoods and business/retail areas in the vicinity of the proposed location

No existing structures were identified and available that would be able to satisfy the coverage requirements needed for this area.

As discussed in this report and depicted in the attached plots, the proposed interim AT&T site will provide a substantial portion of the coverage being lost to the "Target Area" while maintaining effective connectivity to the rest of AT&T's existing network. In addition to providing improved LTE service to AT&T's customers to throughout the targeted areas of New Britain, AT&T is providing enhanced services for first responders through the implementation of FirstNet's National Public Safety Broadband Network ("NPSBN").

5. Statement of Certification

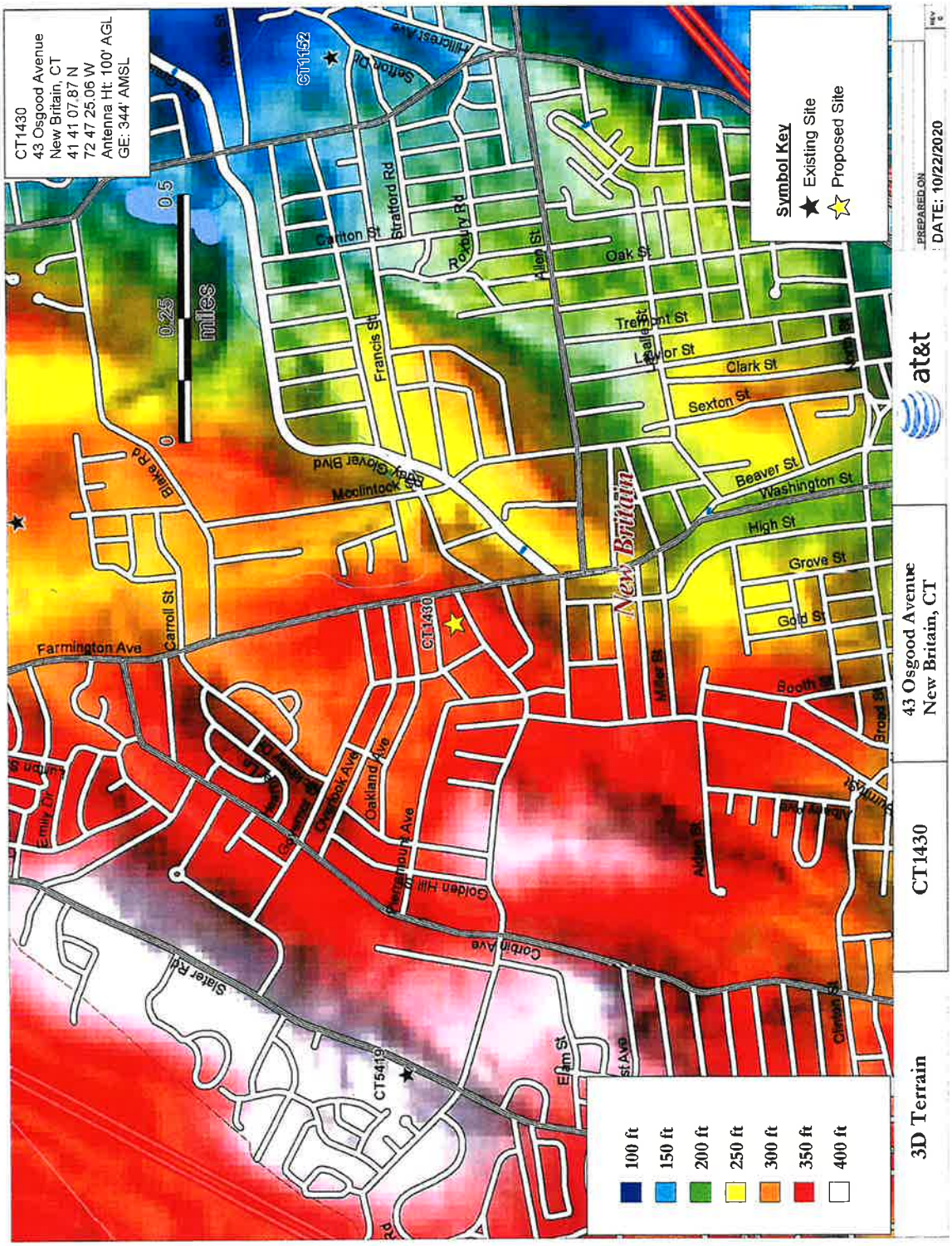
I certify to the best of my knowledge that the statements in this report are true and accurate.

October 23, 2020

Martin J. Lavin
C Squared Systems, LLC

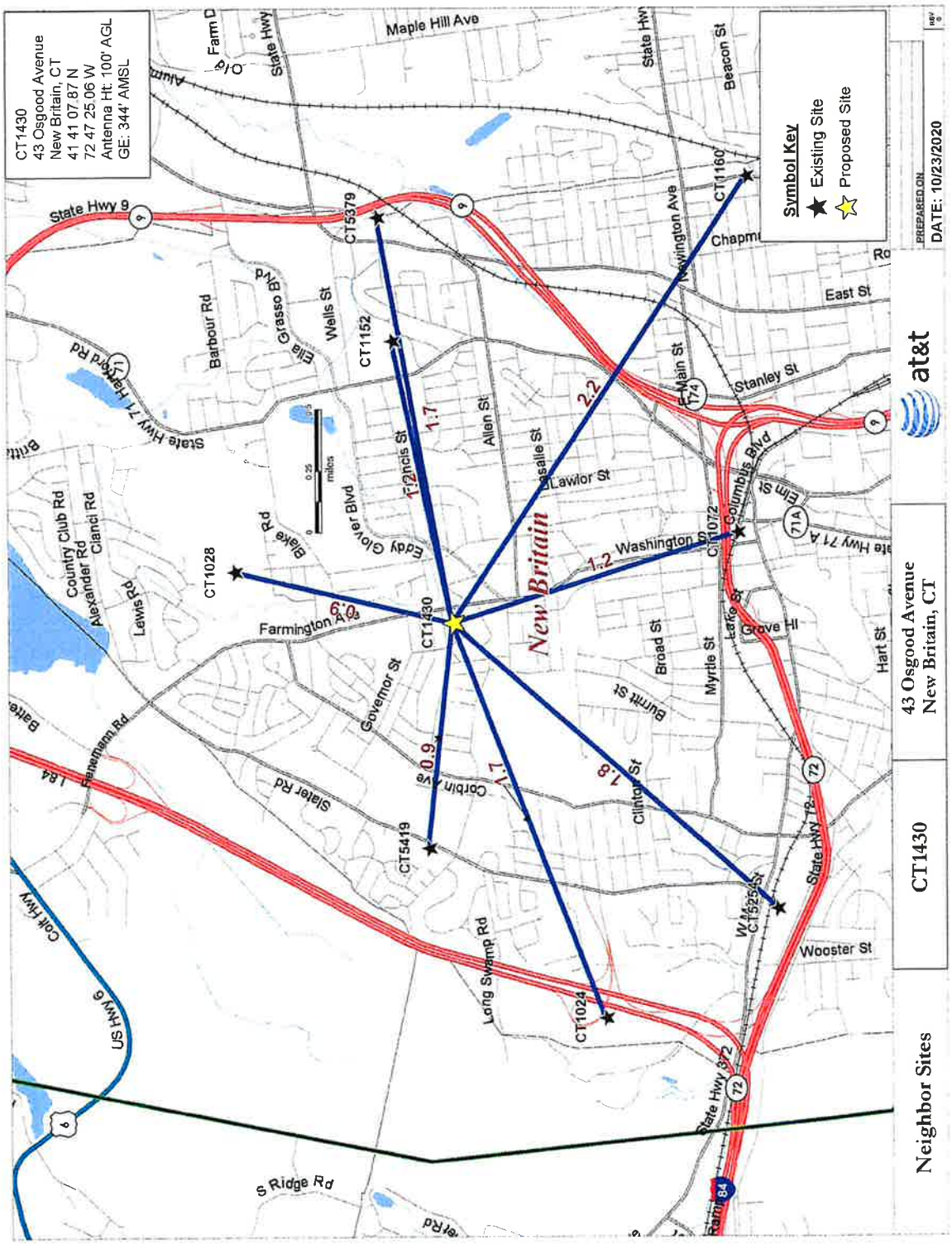
Date

6. Attachments

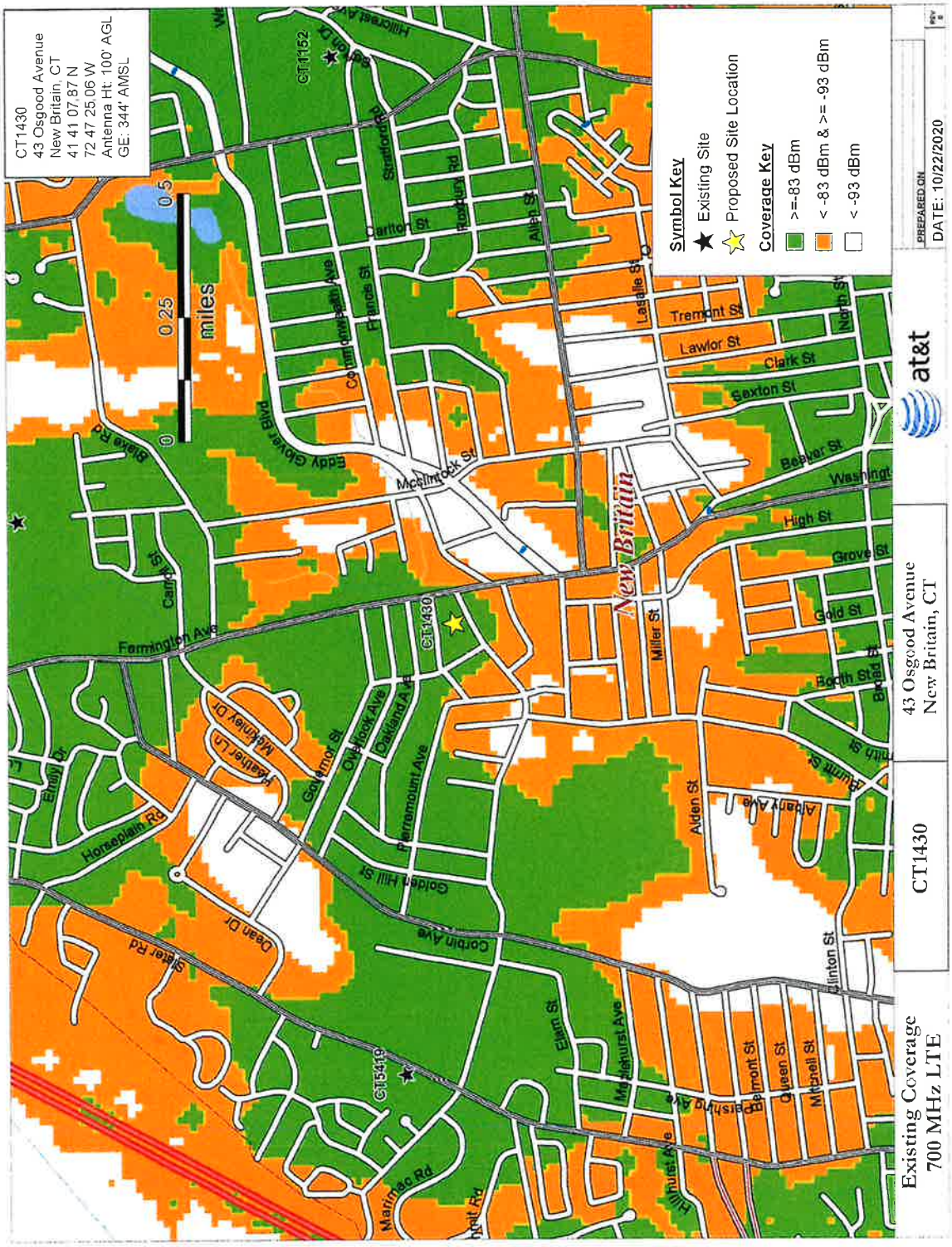


Attachment 1: CT1430 Area Terrain Map

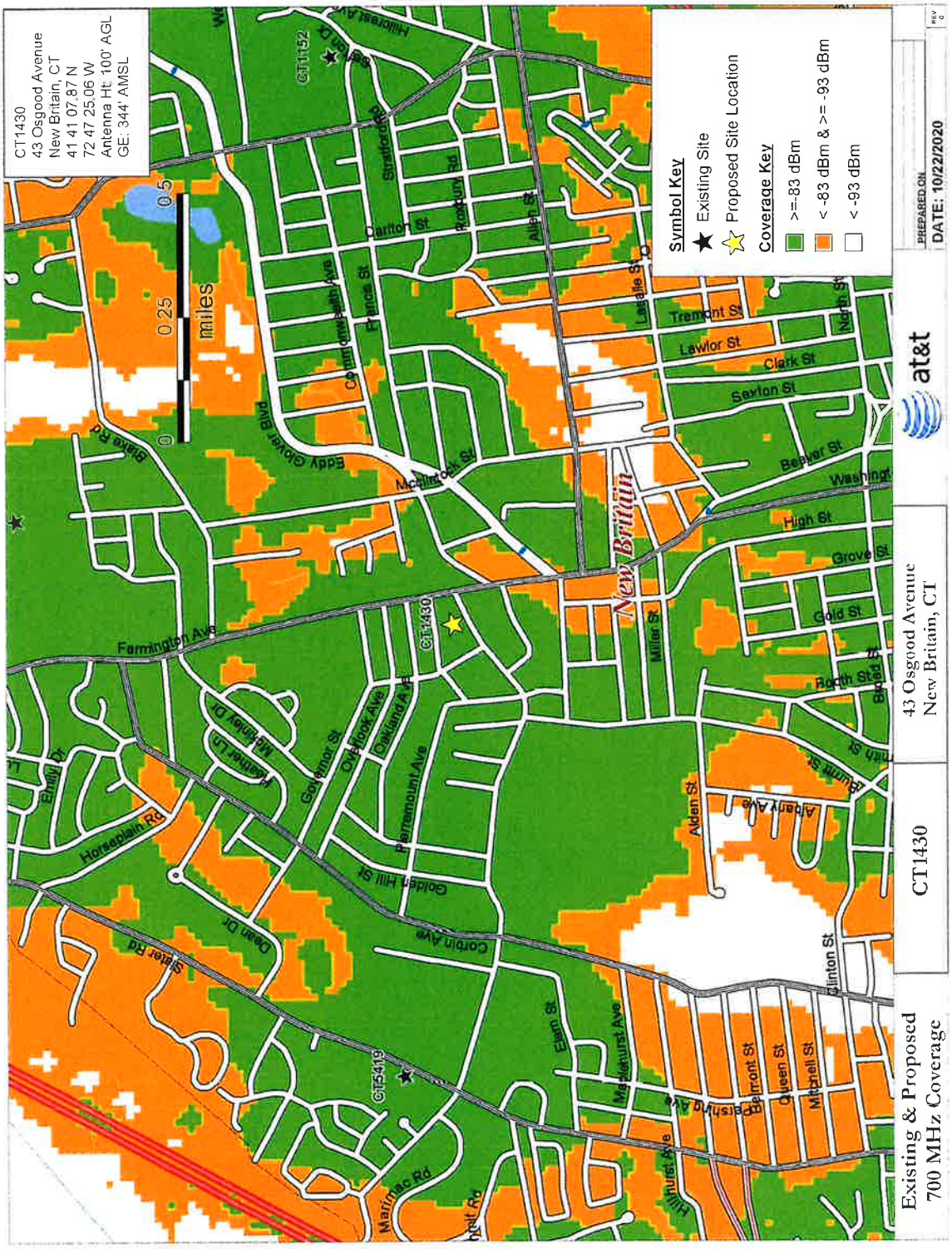
Site Name	Address	City/State	Location		Antenna Height (ft AGL)	Ground Elevation (feet)
			Latitude	Longitude		
CT1024	10 Loon Lake Road	New Britain	41.6766	-72.8214	100	350
CT1028	723 Farmington Avenue	New Britain	41.6983	-72.7862	98	306
CT1072	35 Washington Street (Columbus Boulevard)	New Britain	41.6687	-72.7831	116	180
CT1104	45 Maple Ridge Drive	Farmington	41.7180	-72.7693	88	233
CT1152	60 Paul Manafort Drive	New Britain	41.6889	-72.7685	84	154
CT1160	Belden Street	New Britain	41.6682	-72.7552	114	56
CT2337	263 Farmington Avenue DUP 1	Farmington	41.7299	-72.7904	150	421
CT2585	1500 New Britain Ave	West Hartford	41.7230	-72.7627	52	185
CT5194	200 Stanley Street	New Britain	41.6539	-72.7693	195	104
CT5254	1 Hartford Square	New Britain	41.6664	-72.8128	162	237
CT5255	130 Birdseye Road	Farmington	41.7158	-72.8106	131	413
CT5379	178 Lester Street	New Britain	41.6899	-72.7584	189	86
CT5403	605 Willard Avenue	Newington	41.6994	-72.7366	157	112
CT5419	732 Slater Road	New Britain	41.6862	-72.8086	51	403



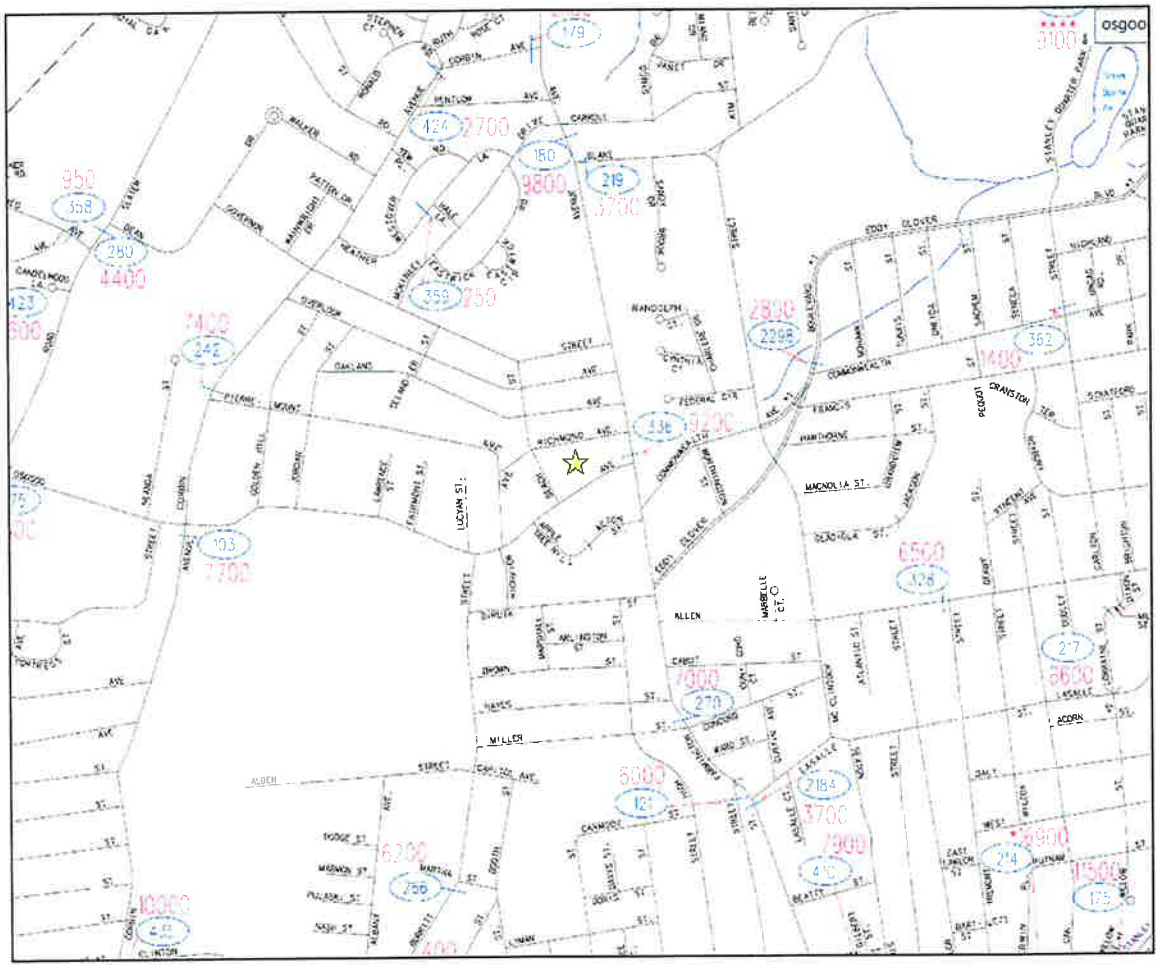
Attachment 2: CT1430 Neighbor Site Data



Attachment 3: CT1430 Existing 700 MHz LTE Coverage for the Current AT&T Network

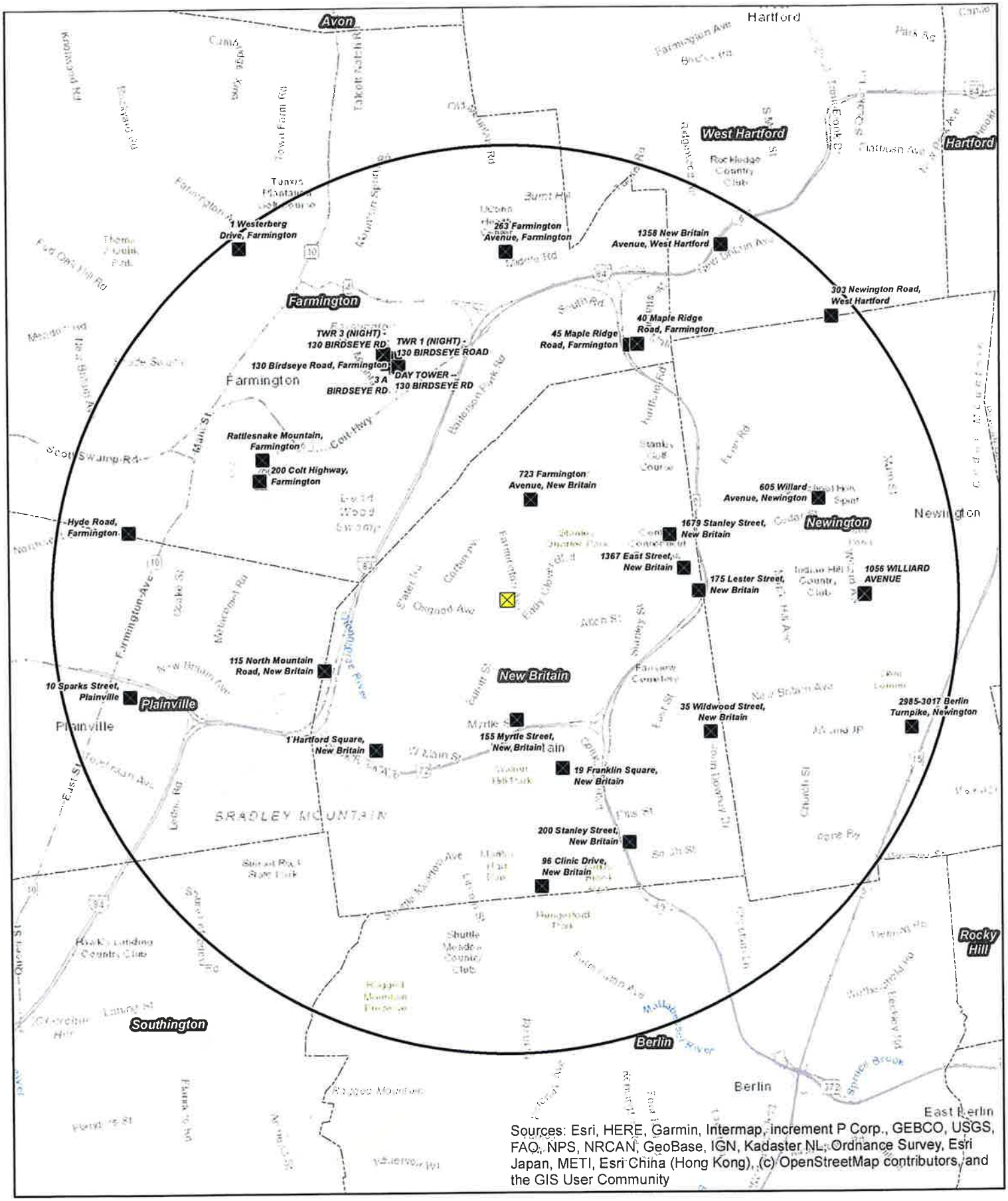


Attachment 4: CT1430 Existing 700 MHz LTE Coverage with Proposed Site for the AT&T Network



Attachment 5: CT1430 Connecticut DOT Average Annual Daily Traffic Data – New Britain

TAB 3



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Proposed Facility
- Existing Towers Within 4 Miles of Proposed Facility
- 4-Mile Radius
- Municipal Boundary

Existing Adjacent Towers

Proposed Wireless
Telecommunications Facility
CT0090-New Britain
43 Osgood Avenue
New Britain, Connecticut

Base Map Source: ESRI World Topographic Map
Data Sources: CSC Tower Database, Updated March 2020; FCC ASR GIS Database, Updated 2012
Map Scale: 1 inch = 6,000 feet
Map Date: September 2020

N W E S

6,000 3,000 0 6,000 Feet

ALL POINTS TECHNOLOGY CORPORATION

TAB 4

PROJECT SUMMARY

SCOPE OF WORK:	ARX WIRELESS IS PROPOSING TO INSTALL THE FOLLOWING IMPROVEMENTS: 104' FOOT TOWER AND FOUNDATION 50'x50' FENCED COMPOUND POWER AND TELCO UTILITIES AT&T EQUIPMENT CABINETS WITH GENERATOR ON 13'x8' CONCRETE PAD, SIX (6) AT&T ANTENNAS, AND TWELVE (12) RRHs WITH ASSOCIATED CABLING AND APPURTENANCES.
SITE ADDRESS:	43 OSGOOD AVENUE NEW BRITAIN, CT 06053
LATITUDE: LONGITUDE:	N41° 41' 07.87" W72° 47' 25.06"
PROPERTY OWNER	OSGOOD AVENUE PROPERTY LLC 119 LIBERTY STREET NEWINGTON, CT 06111
MAP/LOT/BLOCK:	C5B 115
POWER COMPANY: TELEPHONE COMPANY:	EVERSOURCE FRONTIER COMMUNICATIONS
TOWER OWNER/APPLICANT:	ARX WIRELESS INFRASTRUCTURE, LLC KEITH COPPINS (203) 623-3287 110 WASHINGTON AVENUE NORTH HAVEN, CT 06473

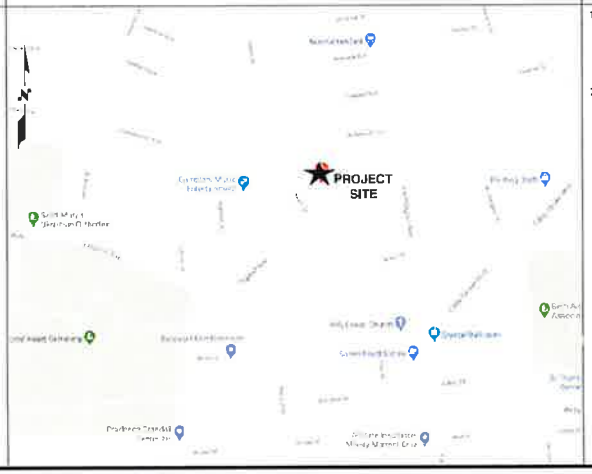
ARX WIRELESS

TECHNICAL REPORT
SITE NUMBER: CT0090
SITE NAME: NEW BRITAIN

TECH REPORT

DRAWING INDEX

VICINITY MAP



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF ARX WIRELESS. 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.
2. 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.

ARX WIRELESS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CHECKED BY: DJR

APPROVED BY: DJR

SUBMITTALS

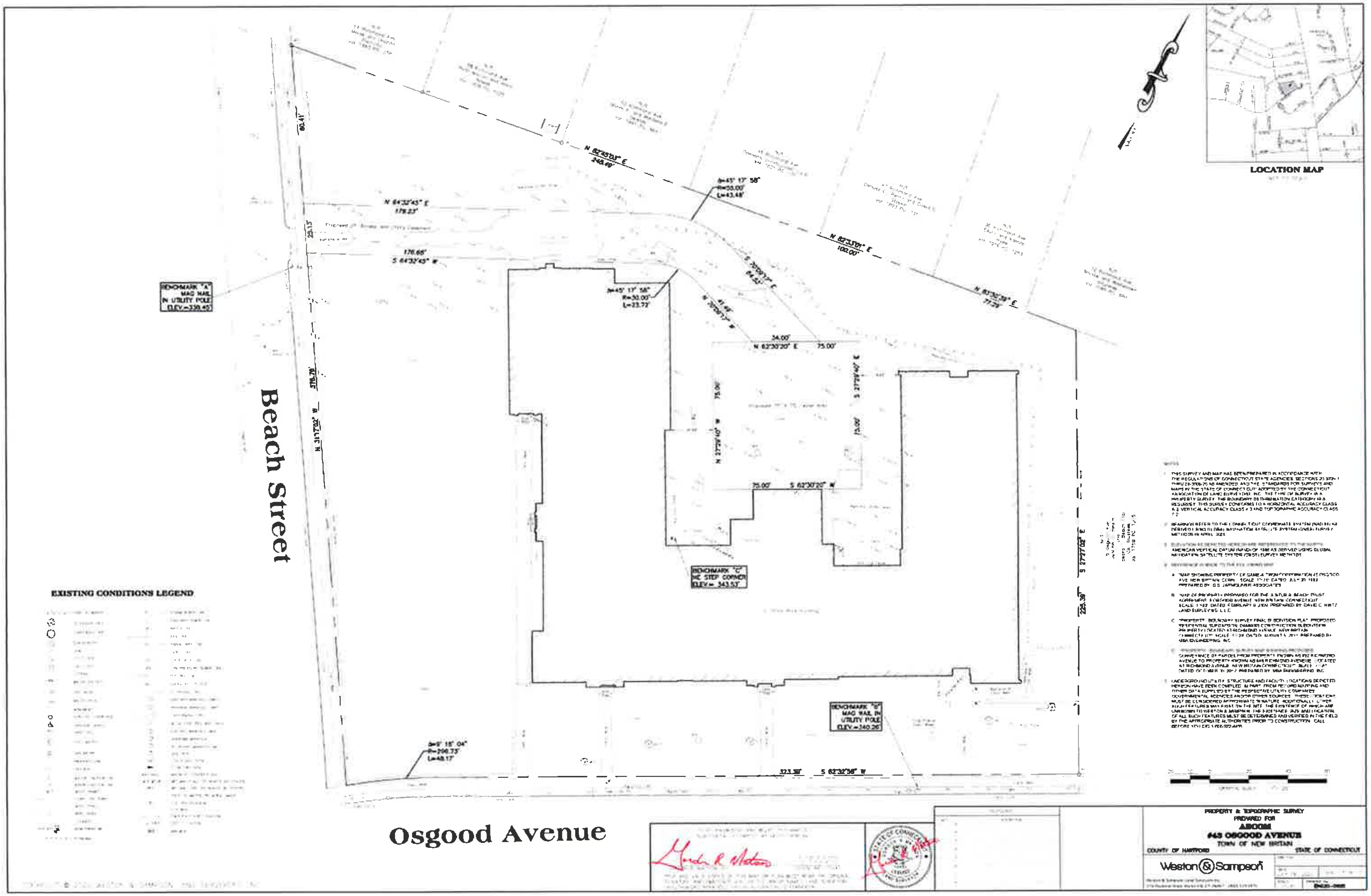
REV	DATE	DESCRIPTION	BY
2	10/1/2020	ISSUED FINAL	
1	09/30/2020	ISSUED FOR REVIEW	MM
0	09/18/2020	ISSUED FOR REVIEW	MM

SITE NAME
CT0090
NEW BRITAIN

SITE ADDRESS
43 OSGOOD AVENUE
NEW BRITAIN, CT 06053

SHEET TITLE
SITE PLAN

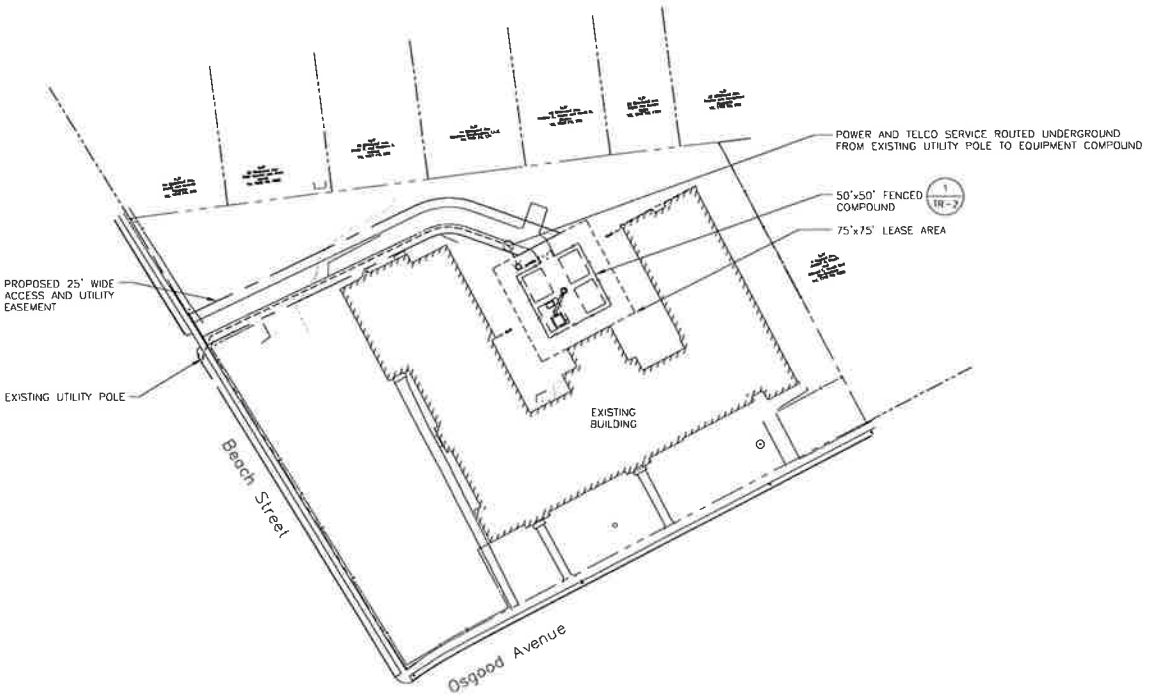
SHEET NUMBER
T-1


LOCATION MAP
N 82°45'03" E
248.49'
Δ=45° 17' 58"
R=55.00'
L=43.48'
N 82°33'01" E
100.00'
N 83°30'39" E
77.29'
N 64°32'45" E
178.23'
176.65'
S 64°32'45" W
80.41'
23.15'
378.78'
N 31°17'02" W
BENCHMARK "A"
MAG NAIL
IN UTILITY POLE
ELEV.=339.45
Δ=45° 17' 58"
R=30.00'
L=23.72'
S 70°09'13" E
64.52'
N 70°09'13" W
41.46'
34.00'
N 62°30'20" E
75.00'
S 27°29'40" E
75.00'
N 27°29'40" W
75.00'
75.00'
S 62°30'20" W
BENCHMARK "C"
NE STEP CORNER
ELEV.= 343.53'
S 27°47'02" E
225.38'
BENCHMARK "B"
MAG NAIL IN
UTILITY POLE
ELEV.=340.26'
Δ=9° 15' 04"
R=298.73'
L=48.17'
323.58'
S 62°32'38" W
Beach Street
Osgood Avenue
EXISTING CONDITIONS LEGEND
PROPERTY & TOPOGRAPHIC SURVEY
PREPARED FOR
ABCOM
#43 OSGOOD AVENUE
TOWN OF NEW BRITAIN
COUNTY OF HARTFORD
STATE OF CONNECTICUT
Weston & Sampson

VICINITY MAP
SCALE: N.T.S

N

CENTER OF STRUCTURE COORDINATES:	LAT:	N41° 41' 07.87"
	LONG:	W72° 47' 25.06"



SITE PLAN 1 TR-1
22x34 SCALE: 1"=40'-0"
11x17 SCALE: 1"=80'-0"

GRAPHIC SCALE
0 20 40 80 120 FEET

TECH REPORT

ARX WIRELESS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CHECKED BY: DJR

APPROVED BY: DJR

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	11/12/2020	ISSUED FINAL	
1	10/23/2020	ISSUED FOR REVIEW	KAH
0	09/18/2020	ISSUED FOR REVIEW	KAH

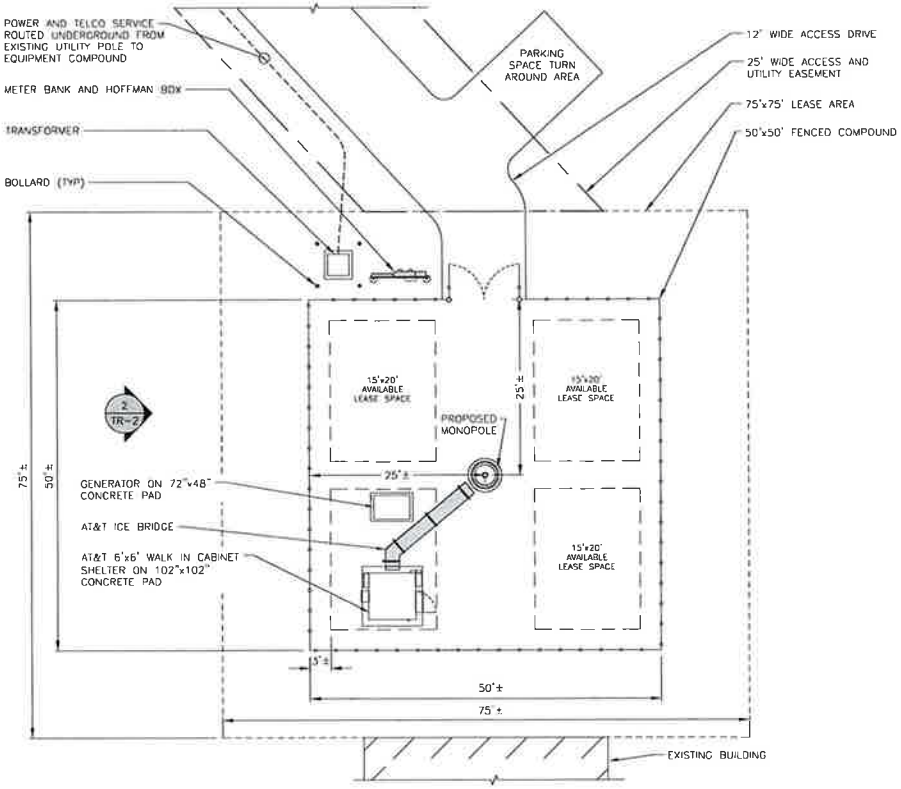
SITE NAME
CT0090
NEW BRITAIN

SITE ADDRESS
43 OSGOOD AVENUE
NEW BRITAIN, CT 06053

SHEET TITLE
SITE PLAN

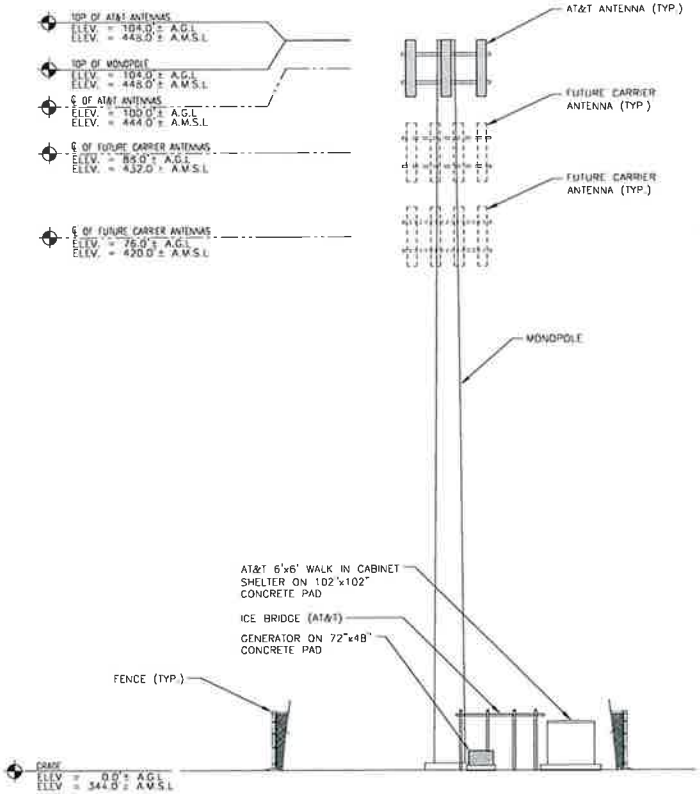
SHEET NUMBER
TR-1

TECH REPORT



COMPOUND PLAN (1 / TR-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

GRAPHIC SCALE
0 4 8 16 24 FEET



NORTH ELEVATION (2 / TR-2)
22x34 SCALE: 1"=10'-0"
11x17 SCALE: 1"=20'-0"

GRAPHIC SCALE
0 5 10 20 30 FEET

ARX WIRELESS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CHECKED BY: DJR

APPROVED BY: DJR

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	11/12/2020	ISSUED FINAL	
1	09/02/2020	ISSUED FOR REVIEW	KAM
0	08/18/2020	ISSUED FOR REVIEW	KAM

SITE NAME
CT0090
NEW BRITAIN

SITE ADDRESS
43 OSCOOD AVENUE
NEW BRITAIN, CT 06053

SHEET TITLE
COMPOUND PLAN AND ELEVATION

SHEET NUMBER
TR-2

TAB 5

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-5815-OE

Issued Date: 11/03/2020

Keith Drucker
Arx Wireless Infrastructure, LLC
110 Washington Avenue
North Haven, CT 06473

**** 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 CT0090 - New Britain
Location:	New Britain, CT
Latitude:	41-41-07.87N NAD 83
Longitude:	72-47-25.06W
Heights:	344 feet site elevation (SE)
	160 feet above ground level (AGL)
	504 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

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)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 .

This determination expires on 05/03/2022 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 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, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, 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 includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

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.

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 our office at (816) 329-2525, or natalie.schmalbeck@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-5815-OE.

Signature Control No: 454002119-455680371 (DNE)
Natalie Schmalbeck
Technician

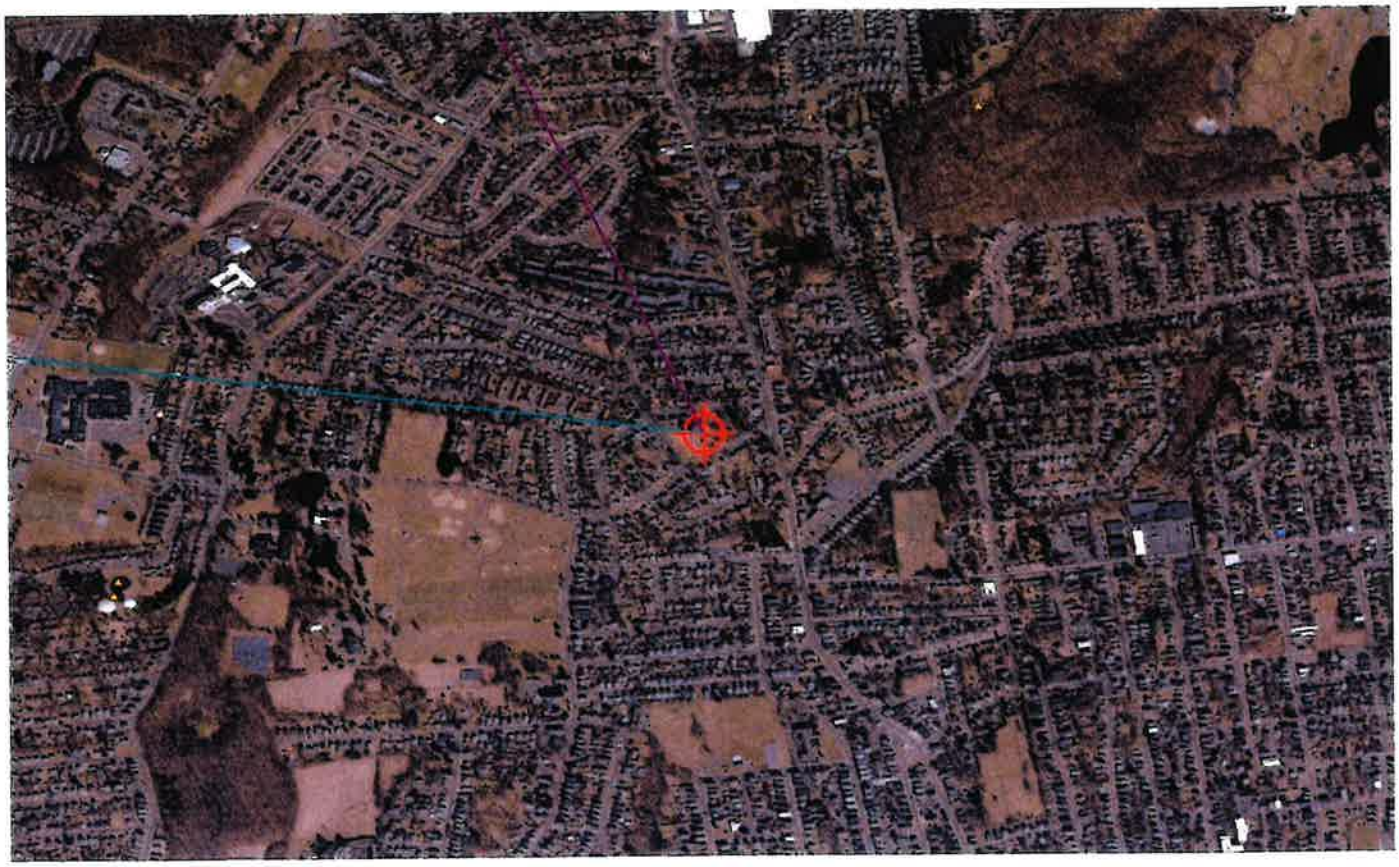
Attachment(s)
Frequency Data
Map(s)

cc: FCC

Frequency Data for ASN 2020-ANE-5815-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
6	7	GHz	42	dBW
10	11.7	GHz	55	dBW
10	11.7	GHz	42	dBW
17.7	19.7	GHz	55	dBW
17.7	19.7	GHz	42	dBW
21.2	23.6	GHz	55	dBW
21.2	23.6	GHz	42	dBW
614	698	MHz	1000	W
614	698	MHz	2000	W
698	806	MHz	1000	W
806	901	MHz	500	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
929	932	MHz	3500	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
1670	1675	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2360	MHz	2000	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W

Verified Map for ASN 2020-ANE-5815-OE



TAB 6

WETLAND INSPECTION

October 21, 2020 **APT Project No.: CT631130**

Prepared For: ARX Wireless
110 Washington Avenue
North Haven, CT 06473
Attn: Keith Coppins

Site Name: CT0090 – New Britain

Site Address: 43 Osgood Avenue, New Britain, Connecticut

Date of Investigation: 9/16/2020

Field Conditions: **Weather:** sunny, low 70's
Soil Moisture: dry

Wetland/Watercourse Delineation Methodology[1]:
☒Connecticut Inland Wetlands and Watercourses

Municipal Upland Review Area:
Wetlands: 100 feet **Watercourses:** 100 feet

The wetlands inspection was performed by[2]:

Matthew Gustafson, Registered Soil Scientist

Enclosures: Wetland Inspection Field Form & Wetland Inspection Map

This report is provided as a brief summary of findings from APT's wetland investigation of the referenced Study Area that consists of proposed development activities and areas generally within 200 feet.[3] If applicable, APT is available to provide a more comprehensive wetland impact analysis upon receipt of site plans depicting the proposed development activities and surveyed location of identified wetland and watercourse resources.

---

1 *Wetlands and watercourses were delineated in accordance with applicable local, state and federal statutes, regulations and guidance.*

2 All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

3 *APT has relied upon the accuracy of information provided by ARX Wireless and its contractors regarding proposed lease area and access road/utility easement locations for identifying wetlands and watercourses within the study area.*

Attachments

- Wetland Inspection Field Form
- Wetland Inspection Map

Wetland Inspection Field Form

Wetlands Identified within Study Area:	Yes ☐ No ☒	
Nearest Wetland Resource:	±0.6 mile to the east	
Identification Method:	Remote sensing ☒ Type: CTDEEP Wetland Mapping	Field identified ☒

SITE CONDITIONS:

DEVELOPED ☒

Paved ☐	Gravel ☐	Maintained Lawn ☒
Agriculture ☐	Cultivated ☐	Hayfield/Pasture ☐
Comments: The site is entirely developed with vacant building, maintained lawn and landscaping. The proposed tower facility would be located in an area of maintained lawn.		

UNDEVELOPED UPLAND HABITAT ☐

Forest ☐	Scrub/Shrub ☐	Field ☐
Other: None		
Comments: None		

SOILS:

Are field identified soils consistent with NRCS mapped soils?	Yes ☒	No ☐
If no, describe field identified soils		

NEAREST WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: None		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: None		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Watercourse Name: None		
Comments: None		

Wetland Inspection Field Form (Cont.)

SPECIAL AQUATIC HABITAT:

Vernal Pool Yes ☐ No ☒ Potential ☐	Other ☐
Vernal Pool Habitat Type: None	
Comments: None	

GENERAL COMMENTS:

All-Points Technology Corp., P.C. ("APT") understands that ARX Wireless is proposing to construct a wireless telecommunications facility on a developed vacant property within an area of existing maintained lawn. Access to the facility would be provided by an existing paved access that serves the property from Beach Street.

No wetlands or watercourses are located within or immediately adjacent to the subject property. The nearest wetland area is ±0.6 mile to the east. As a result of the significant distance from the proposed facility to the nearest wetland resource, the proposed development would not adversely impact wetland or watercourse resources.

Legend

- Proposed Conduit
- Proposed Equipment
- Proposed Site Layout
- Subject Property
- Approximate Parcel Boundary
- Approximate Wetland Area (None Within Map Extent)*
- Delineated Wetland Boundary (None Within Map Extent)*
- Wetlands (CT DEEP) - Inset Map Only

Wetland Inspection Map

Proposed Wireless
Telecommunications Facility
CT0090-New Britain
43 Osgood Avenue
New Britain, Connecticut

Map Notes:
**No wetlands identified on the site or subject property*
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Scale: 1 inch = 100 feet
Map Date: September 2020

ALL-POINTS TECHNOLOGY CORPORATION

TAB 7

ALL-POINTS TECHNOLOGY CORPORATION

PRELIMINARY VISUAL ASSESSMENT

Date: October 20, 2020

To: ARX Wireless
110 Washington Avenue
North Haven, CT 06473

From: Brian Gaudet

Re: Proposed Telecommunications Facility
43 Osgood Avenue
New Britain, Connecticut

ARX Wireless ("ARX") has identified a proposed location for development of a wireless telecommunications facility at 43 Osgood Avenue in New Britain, Connecticut (the "Host Property"). The proposed Facility would include a 104-foot tall steel monopole and supporting equipment within a ±50-foot by ±50-foot fenced compound (the "Facility") located in the northeastern portion of the Host Property.

The Host Property is a single parcel located at the northeast corner of Osgood Avenue and Beach Street. It is developed with a vacant one-story institutional building formerly used as an elementary school. Residential development surrounds the Host Property.

At the request of ARX, All-Points Technology Corporation, P.C. ("APT") has prepared initial viewshed mapping to provide a preliminary evaluation of the visibility associated with the proposed Facility. To conduct this assessment, a predictive computer model was developed specifically for this project using ESRI's ArcMap Geographic Information System ("GIS")[1] software and available GIS data. The predictive model provides an initial estimate of potential visibility throughout a pre-defined "Study Area", in this case a two-mile radius surrounding the proposed Facility location.

The predictive model incorporates project and Study Area-specific data, including the Facility location, its ground elevation and the proposed Facility height, as well as the surrounding topography, existing vegetation, and structures (the primary features that can block direct lines of sight). The Study Area extends into the neighboring municipalities of Farmington to the north and west, Newington to the east, and Plainville to the west. I-84 runs in a generally north-south direction in the western portion of the Study Area; state Routes 72 and 9 extend through the southern and eastern portions, respectively.

A digital surface model ("DSM"), capturing both the natural and built features on the Earth's surface, was generated for the extent of the Study Area utilizing State of Connecticut 2016 LiDAR[2] LAS[3] data points. LiDAR

---

[1] ArcMap is a Geographic Information System desktop application developed by the Environmental Systems Research Institute for creating maps, performing spatial analysis, and managing geographic data.

[2] Light Detection and Ranging.

[3] An LAS file is an industry-standard binary format for storing airborne LiDAR data.

is a remote-sensing technology that develops elevation data by measuring the time it takes for laser light to return from the surface to the instrument's sensors. The varying reflectivity of objects also means that the "returns" can be classified based on the characteristics of the reflected light, normally into categories such as "bare earth," "vegetation," "road," or "building". Derived from the 2016 LiDAR data, the LAS datasets contain the corresponding elevation point data and return classification values. The Study Area DSM incorporates the first return LAS dataset values that are associated with the highest feature in the landscape, typically a treetop, top of a building, and/or the highest point of other tall structures.

Once the DSM was generated, ESRI's Viewshed Tool was utilized to identify locations within the Study Area where the proposed Facility may be visible. ESRI's Viewshed Tool predicts visibility by identifying those cells[4] within the DSM that can be seen from an observer location. Cells where visibility was indicated were extracted and converted from a raster dataset to a polygon feature which was then overlaid onto an aerial photograph and topographic base map. Since the DSM includes the highest relative feature in the landscape, isolated "visible" cells are often indicated within heavily forested areas (e.g., from the top of the highest tree) or on building rooftops during the initial processing. It is recognized that these areas do not represent typical viewer locations and overstate visibility. As such, the resulting polygon feature is further refined by extracting those areas. The viewshed results are also cross-checked against the most current aerial photographs to assess whether significant changes (a new housing development, for example) have occurred since the time the LiDAR-based LAS datasets were captured.

The results of the preliminary analysis are intended to provide a representation of those areas where portions of the Facility may potentially be visible to the human eye without the aid of magnification, based on a viewer eye-height of five (5) feet above the ground and the combination of intervening topography, trees and other vegetation, and structures. However, the Facility may not necessarily be visible from all locations within those areas identified by the predictive model, which has limitations. For instance, it is important to note that the computer model cannot account for mass density, tree diameters and branching variability of trees, or the degradation of views that occurs with distance. As a result, some areas depicted on the viewshed maps as theoretically offering potential visibility of the Facility may be over-predicted because the quality of those views is not sufficient for the human eye to recognize the Facility or discriminate it from other surrounding or intervening objects.

Visibility also varies seasonally with increased, albeit obstructed, views occurring during "leaf-off" conditions. Beyond the density of woodlands found within the given Study Area, each individual tree has its own unique trunk, pole timber and branching pattern characteristics that provide varying degrees of screening in leafless conditions which cannot be adequately modeled. Thus, modeling for seasonal variations of visibility generally over-predicts the viewshed in "leaf-off" conditions, even when incorporating conservative constraints into the model (i.e., assuming each tree is simply a vertical pole of varying width, depending upon species, with no distinct branching pattern). Therefore, seasonal visibility is evaluated in the final visibility assessment once field verification activities are completed.

The preliminary viewshed mapping results indicate that predicted visibility associated with the proposed Facility could include up to approximately 47 acres year-round and 80 acres seasonally, when leaves are off the deciduous trees (cumulatively, approximately 1.6 percent of the 8,042-acre Study Area). The predicted visibility occurs primarily within ±0.5 mile of the Host Property, including the immediately surrounding area and within portions of cemeteries to the southwest and southeast. Limited and intermittent areas of additional

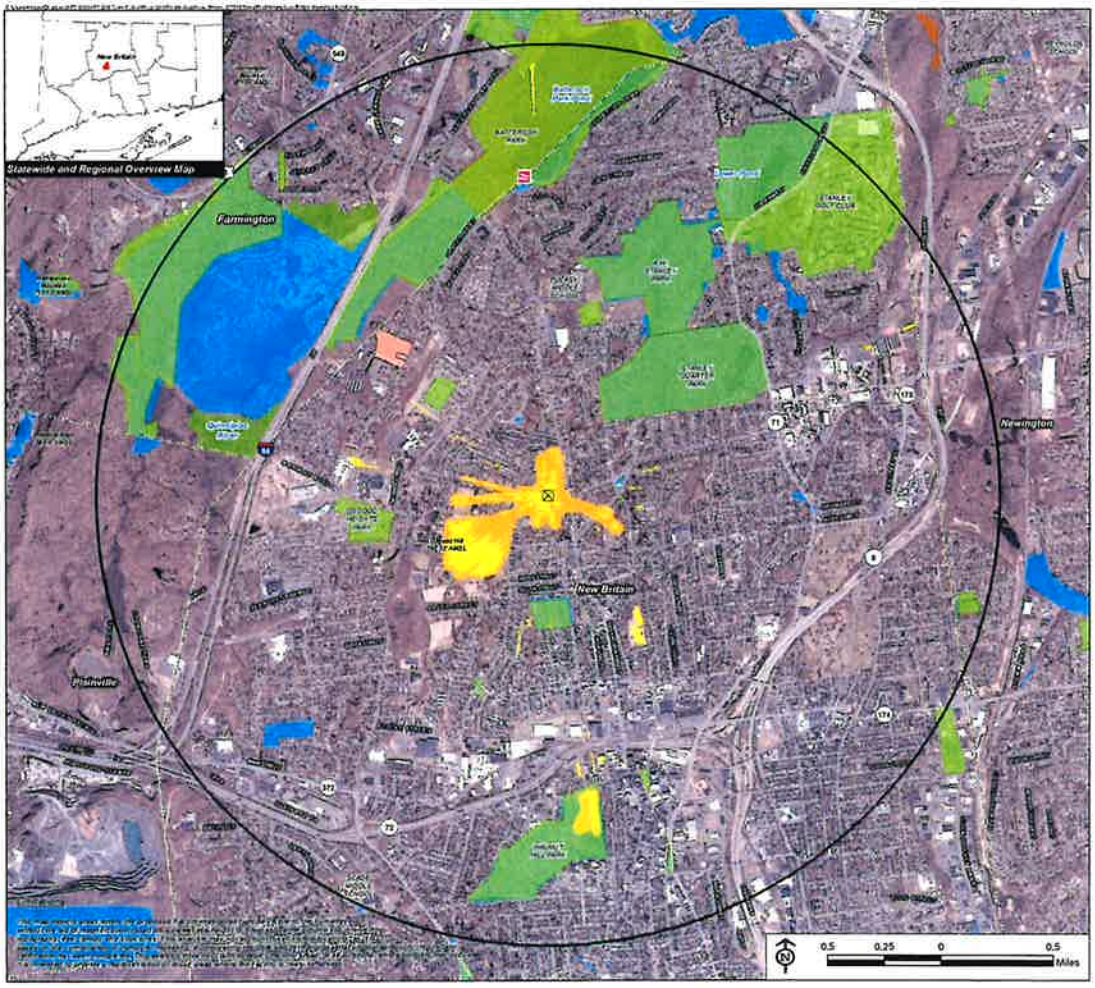
[4] Each DSM cell size is 1 square meter.

year-round visibility are predicted at distances of up to 1.0 mile to the west (over open fields at the E.C. Goodwin Technical High School), 1.5 miles to the south (primarily over open fields in the eastern portion of Walnut Hill Park) and over open areas on the campus of Central Connecticut State University more than 1.75 miles to the north and east.

The maps provided as attachments offer a preliminary basis for understanding the extent of visibility that may occur throughout the Study Area, but they do not address the character of those potential views. Note also that the results of the computer model have not been field verified. Our experience is that the computer model's sensitivity typically results in the initial mapping being over-predictive of the Facility's viewshed.

These initial results will be field-verified via a balloon test to supplement and fine tune the results of the preliminary computer modeling. APT will inventory and photo-document areas where the balloon can be seen (as well as locations where it is not visible) and prepare photographic simulations from several vantage points to depict scaled renderings of the proposed Facility. This information will be presented in ARX's application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need.

Attachments



Preliminary Viewshed Analysis Map

Proposed Wireless Telecommunications Facility
CT0090-New Britain
43 Osgood Avenue
New Britain, Connecticut

Proposed facility height is 104 feet AGL.
Forest canopy height is derived from LiDAR data.
Study area encompasses a two-mile radius and includes 8,042 acres.
Information provided on this map has not been field verified
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Date: October 2020

Legend

- Proposed Site
- Study Area (2-Mile Radius)
- Predicted Year-Round Visibility (47 Acres)
- Areas of Potential Seasonal Visibility (80 Acres)
- Municipal Boundary
- Trail
- Scenic Highway
- DEEP Boat Launches
- Municipal and Private Open Space Property
- State Forest/Park

Protected Open Space Property

- Federal
- Land Trust
- Municipal
- Private
- State

Data Sources:

Physical Geography / Background Data

A digital surface model (DSM) was created from the State of Connecticut 2016 LiDAR LAS data points. The DSM captures the natural and built features on the Earth's surface.

Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP. Scenic Roads: CTDOT State Scenic Highways (2015), Municipal Scenic Roads (compiled by APT)

Dedicated Open Space & Recreation Areas

Connecticut Department of Energy and Environmental Protection (DEEP). DEEP Property (May 2007, Federal Open Space (1137), Municipal and Private Open Space (197), DEEP Boat Launches (1134)

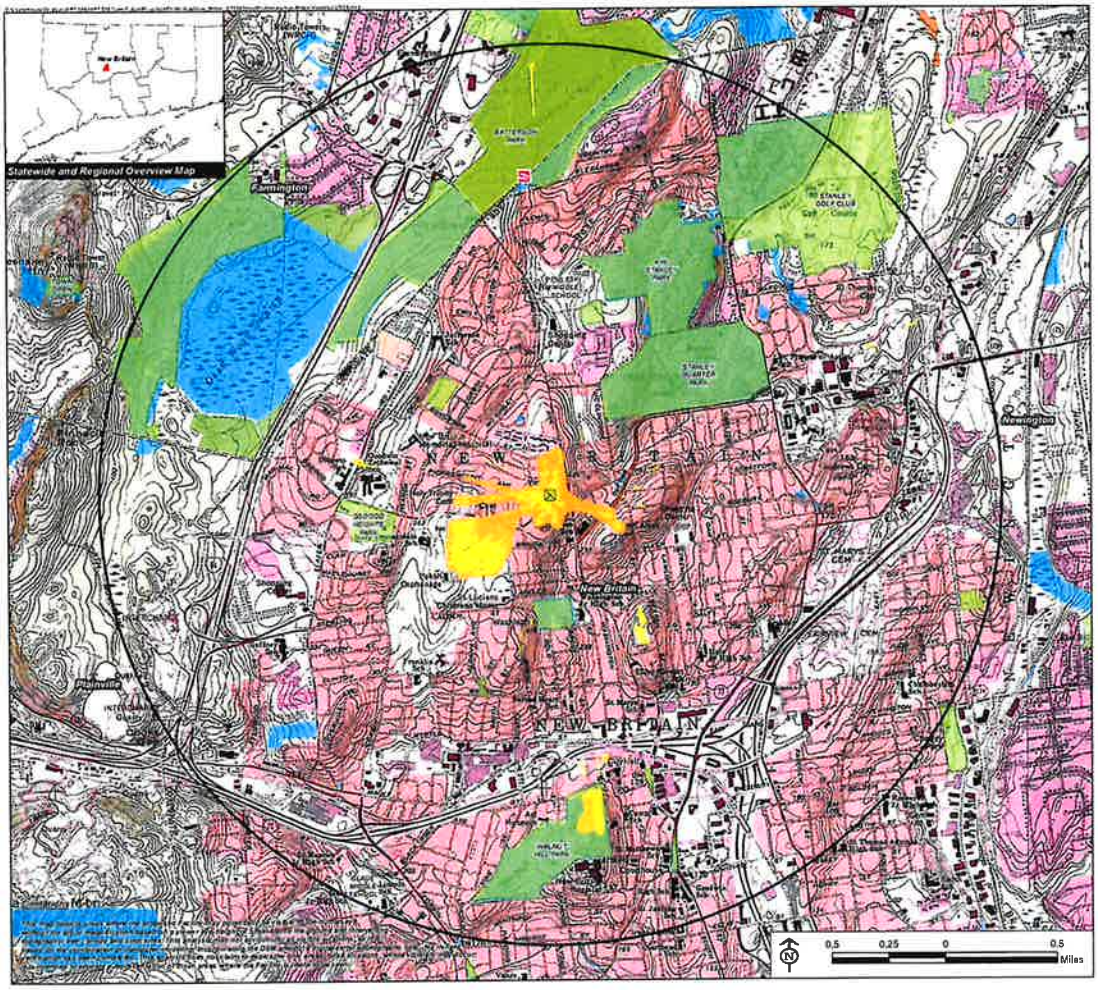
Connecticut Forest & Parks Association, Connecticut Walk Books East & West.

Other

CTDOT Scenic Strips (based on Department of Transportation data)

Notes

***Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown*



Preliminary Viewshed Analysis Map

Proposed Wireless Telecommunications Facility
CT0090-New Britain
43 Osgood Avenue
New Britain, Connecticut

Proposed facility height is 104 feet AGL.
Forest canopy height is derived from LIDAR data.
Study area encompasses a two-mile radius and includes 8,042 acres.
Information provided on this map has not been field verified
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Hartford South, CT (1992) and New Britain, CT (1992)
Map Date: October 2020

Legend

- Proposed Site
- Study Area (2-Mile Radius)
- Predicted Year-Round Visibility (47 Acres)
- Areas of Potential Seasonal Visibility (80 Acres)
- Municipal Boundary
- Trail
- Scenic Highway
- Areas of Potential Seasonal Visibility (80 Acres)
- DEEP Boat Launches
- Municipal and Private Open Space Property
- State Forest/Park

Protected Open Space Property

- Federal
- Land Trust
- Municipal
- Private
- State

Data Sources:

Physical Geography / Background Data

A digital surface model (DSM) was created from the State of Connecticut 2015 LIDAR LAS data points. The DSM captures the natural and built features on the Earth's surface.

Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP. Scenic Roads: CTDOT State Scenic Highways (2015), Municipal Scenic Roads (compiled by AFT)

Protected Open Space & Recreation Areas

Connecticut Department of Energy and Environmental Protection (DEEP): DEEP Property (May 2007), Federal Open Space (1997), Municipal and Private Open Space (1997), DEEP Boat Launches (1994)

Connecticut Forest & Parks Association, Connecticut Walk Books East & West

Other

CTDOT Scenic Strips (based on Department of Transportation data)

Notes

**Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown*

TAB 8

HERITAGE
CONSULTANTS

September 22, 2020

Mr. Brian Gaudet
All-Points Technology Corporation
567 Vauxhall Street Extension – Suite 311
Waterford, CT 06385

RE: Preliminary Archaeological Assessment of a Proposed Telecommunications Facility Located at 43 Osgood Avenue in New Britain, Connecticut

Mr. Gaudet:

Heritage Consultants, LLC (Heritage), is pleased to have this opportunity to provide All-Points Technology Corporation (All-Points) with the following preliminary archaeological assessment of a proposed telecommunications facility (the proposed Facility) located at 43 Osgood Avenue in New Britain, Connecticut (Figure 1). The current project entailed completion of a cultural resources summary based on the examination of data obtained from the Connecticut State Historic Preservation Office (CT-SHPO), as well as GIS data, including historical mapping, aerial photographs, and topographic quadrangles, maintained by Heritage. This investigation is based upon project location information provided to Heritage by All-Points. The objectives of this study were to gather and present data regarding previously identified cultural resources situated within 1.6 km (1 mi) of the proposed project area and to investigate the proposed project area in terms of its natural and historical characteristics so that the need for completing additional cultural resources investigations could be evaluated.

The proposed Facility is situated on a developed parcel located at 43 Osgood Avenue in New Britain, Connecticut that is linked to Farmington Avenue (Figure 1). The proposed Facility will be located inside the courtyard of the former Israel Putnam Elementary School Building, which has been vacant for approximately 20 years. The surrounding area is mainly residential, but also contains the Sacred Heart Cemetery to the southwest, as well as the Beth Alom Cemetery to the southeast. The Holy Cross Church is located to the south of the project aera. A review of historic maps depicting the proposed project area show that the road network in the region was well developed by the mid to late nineteenth century (Figures 2 and 3). Both the 1851 and 1855 maps of the region containing the Facility depict the project parcel as a vacant area. It is likely that this area was used for agricultural purposes during the historical era.

A review of the earliest available aerial image for this area, which dates from 1934, confirms the interpretation of the historic maps (Figure 4). This image shows that the project area was used for residential and sporadic agricultural purposes during the early twentieth century. This is made evident by the indicated farming parcels to the northwest and south of the proposed cellular facility. The Israel Putnam Elementary School appears on the 1934 aerial image. The subsequent aerial image, which was captured in 1951, shows a similar situation, with distinct farming parcels nearby; however, it appears that farming had been recently abandoned in the area, as evidence of moderate reforestation that appeared in the immediate vicinity of the project area (Figure 5). An ell addition to the Israel Putnam Elementary School is also first observed on the 1951 aerial. The 2004 and 2019 aerial images in Figures 6

P.O. Box 310249 • Newington, Connecticut 06131
Phone (860) 299-6328
Email: dgeorge@heritage-consultants.com

and 7, show the project location in its essentially modern state. The immediate vicinity of the tower location over the last 20 years or so has been integrated into a vital commercial and residential zone within the town of New Britain.

Background research for the current project also included a review of previously identified archaeological sites and National Register of Historic Places properties/districts sites within 1.6 km (1 mi) of the proposed Facility (Figures 8 and 9). This review revealed that while there are no known archaeological sites near the proposed project area, there is one National Register of Historic Places properties that has been identified within 1.6 km (1 mi) of the project location. This property is known as the Washington School. This facility was built in 1922 at the corner of High and Carmody Streets in New Britain, which are located at the eastern end of Washington Park. The three-story, flat-roofed school has walls made of red brick laid in a Flemish bond pattern. Its cast-concrete details are, for the most part, Gothic-inspired. The school building retains a high degree of architectural integrity, and alterations to its historical fabric are limited to the auditorium's balcony and new aluminum rails bolted to the cast-iron staircase balusters; however, these additions have not caused displacement of original material. Washington School is significant because it embodies the distinctive characteristics of school architecture from the first quarter of the twentieth century (Criterion C). It is also significant as the work of a prominent Connecticut architect, Delbert K. Perry, an important figure both in his profession and in school design. The Washington School building also holds significance in the history of New Britain (Criterion A). Due to its distance from the project area, the school will not be impacted by the Facility.

In addition, soils located within the project area were examined as part of this review. They belong to the Wethersfield-Urban Land series. The Wethersfield series consists of very deep, well drained loamy soils formed in dense glacial till on uplands. The soils are moderately deep to dense basal till. They are nearly level to steep soils on till plains, low ridges, and drumlins. The Urban Land series consists of the original soil covered by impervious surfaces such as asphalt, concrete, and buildings. In most places, the underlying soil has been cut away or covered by fill from surrounding areas (Figure 10). A typical profile for Wethersfield-Urban Land Soils is as follows: **A**-- 3 to 8 cm; dark brown (7.5YR 3/2) loam; moderate medium granular structure; friable; many fine and medium roots; 10 percent gravel; strongly acid; clear wavy boundary; **Bw1**--8 to 22 cm; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent gravel; strongly acid; clear wavy boundary; **Bw2**--22 to 69 cm; dark reddish brown (5YR 3/3) gravelly loam; weak medium subangular blocky structure; friable; few medium roots; 15 percent gravel and cobbles; strongly acid; clear wavy boundary; and **Cd**--69 to 165 cm; reddish brown (2.5YR 4/4) gravelly loam; weak thick platy structure; very firm, brittle; few silt films and black coatings on some plates; 20 percent gravel and cobbles; strongly acid.

A pedestrian survey of the project area, which was completed on September 18, 2020, included a walk-down and photo documentation of the lease area and proposed tower location (Photos 1 through 11). The photos shown below support the analysis of the aerial images described above; the area has been severely impacted by modern development. Based on the current condition of the project area, as well as the historic changes to the region noted above, it is the professional opinion of Heritage Consultants, LLC that the proposed project area possesses a low/no probability to contain archaeological resources due to the gradual development of the area beginning in the nineteenth century and continuing through the twentieth century. Thus, no additional archaeological examination of this area is recommended prior to construction. If you have any questions regarding this Technical Memorandum, or if we may be

of additional assistance with this or any other projects you may have, please do not hesitate to call me at 860-299-6328 or email me at dgeorge@heritage-consultants.com. We are at your service.

Sincerely,

David R. George, M.A., R.P.A.

P.O. Box 310249 • Newington, Connecticut 06131
Phone (860) 299-6328
Email: dgeorge@heritage-consultants.com

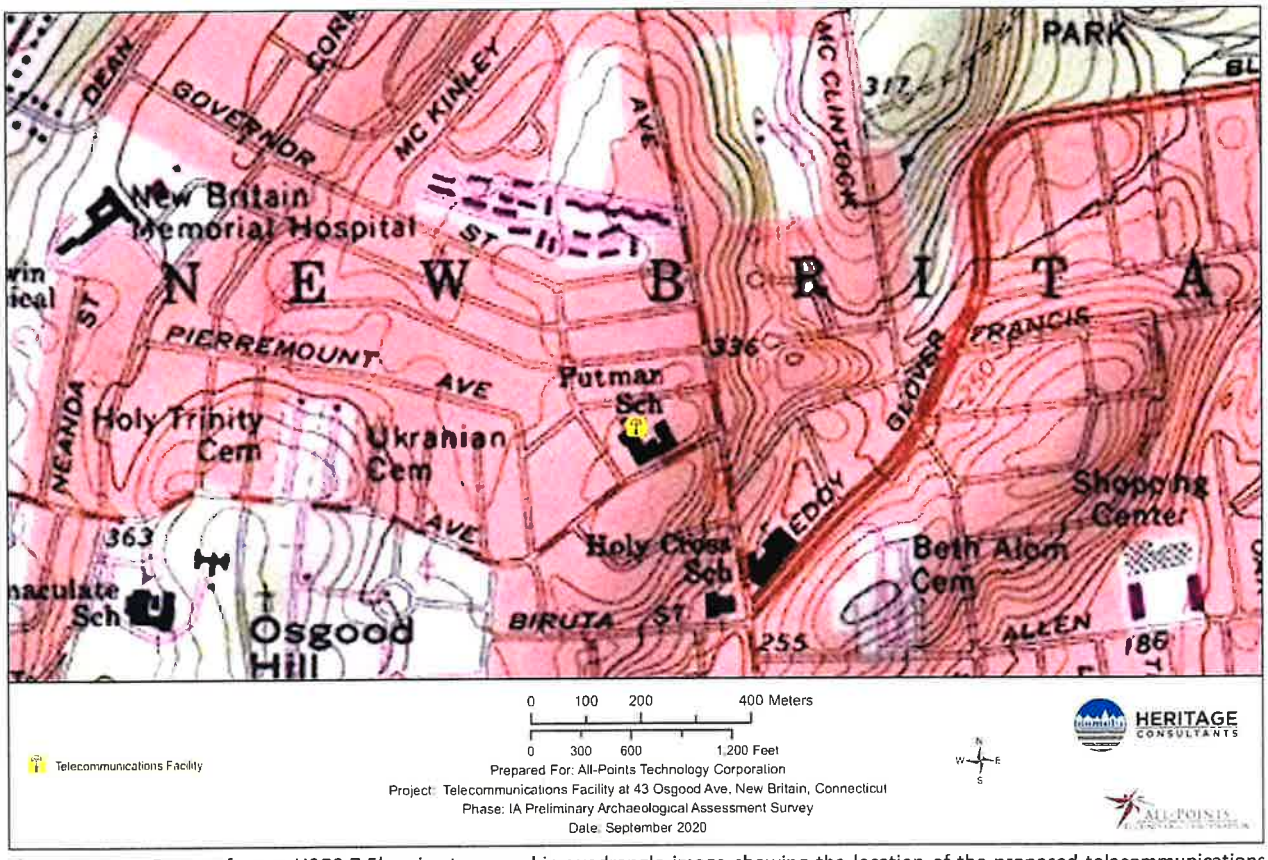


Figure 1. Excerpt from a USGS 7.5' series topographic quadrangle image showing the location of the proposed telecommunications facility in New Britain, Connecticut.

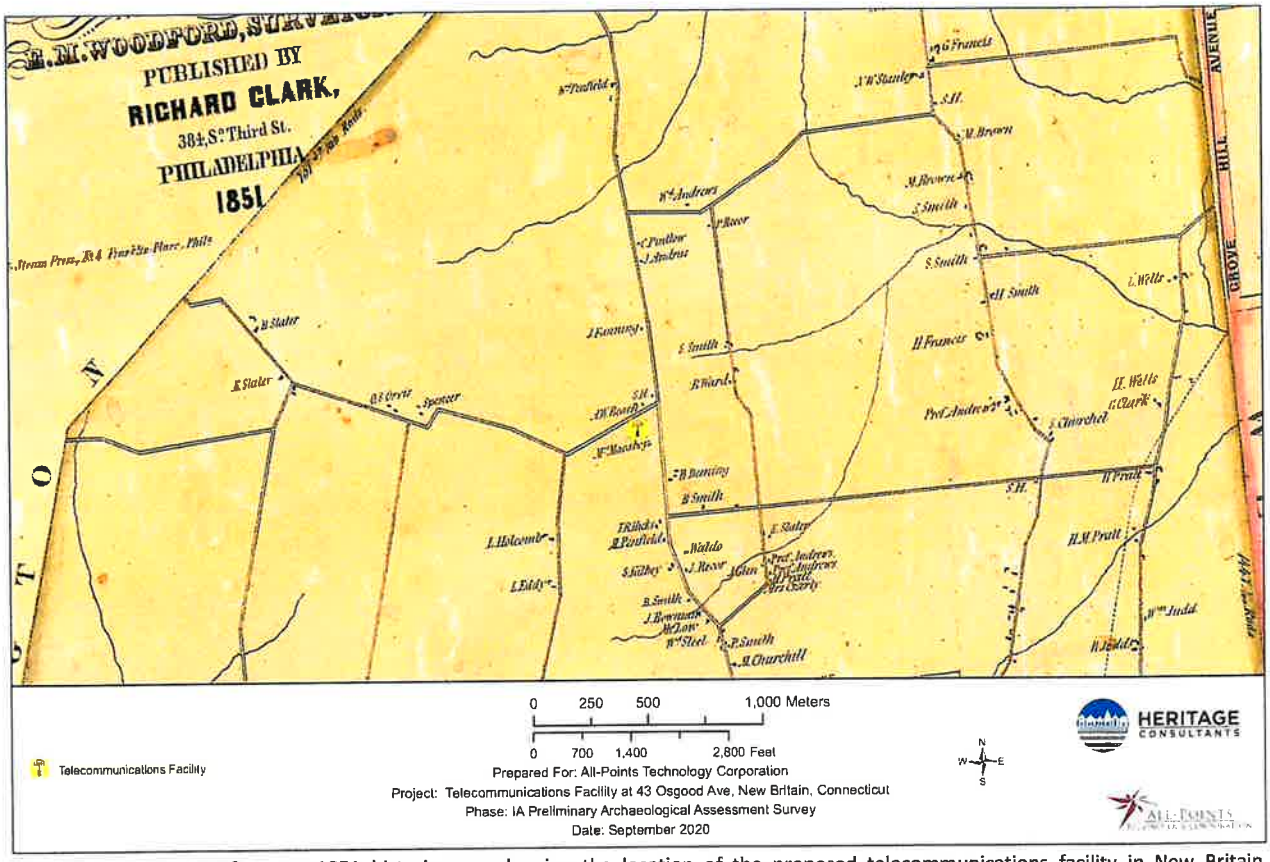


Figure 2. Excerpt from an 1851 historic map showing the location of the proposed telecommunications facility in New Britain, Connecticut.

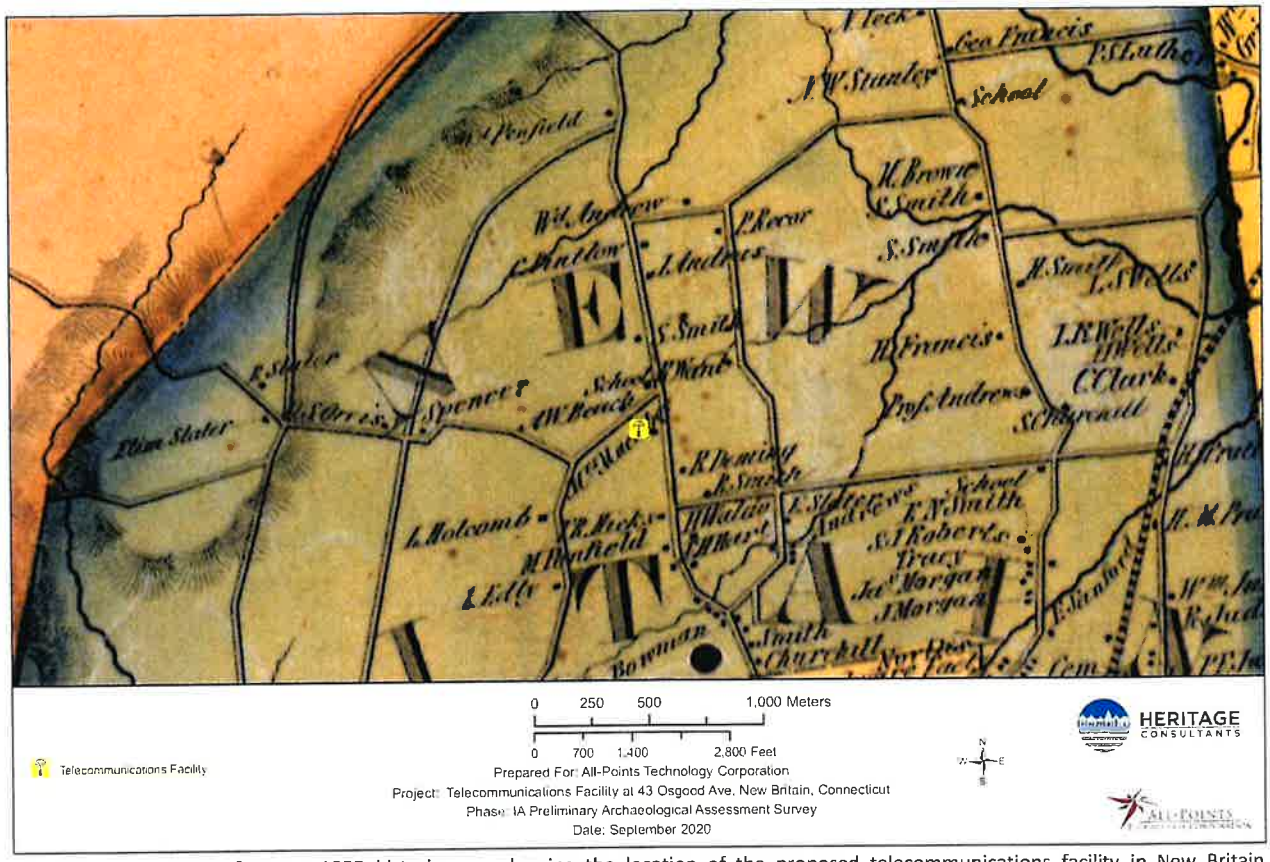


Figure 3. Excerpt from an 1855 historic map showing the location of the proposed telecommunications facility in New Britain, Connecticut.

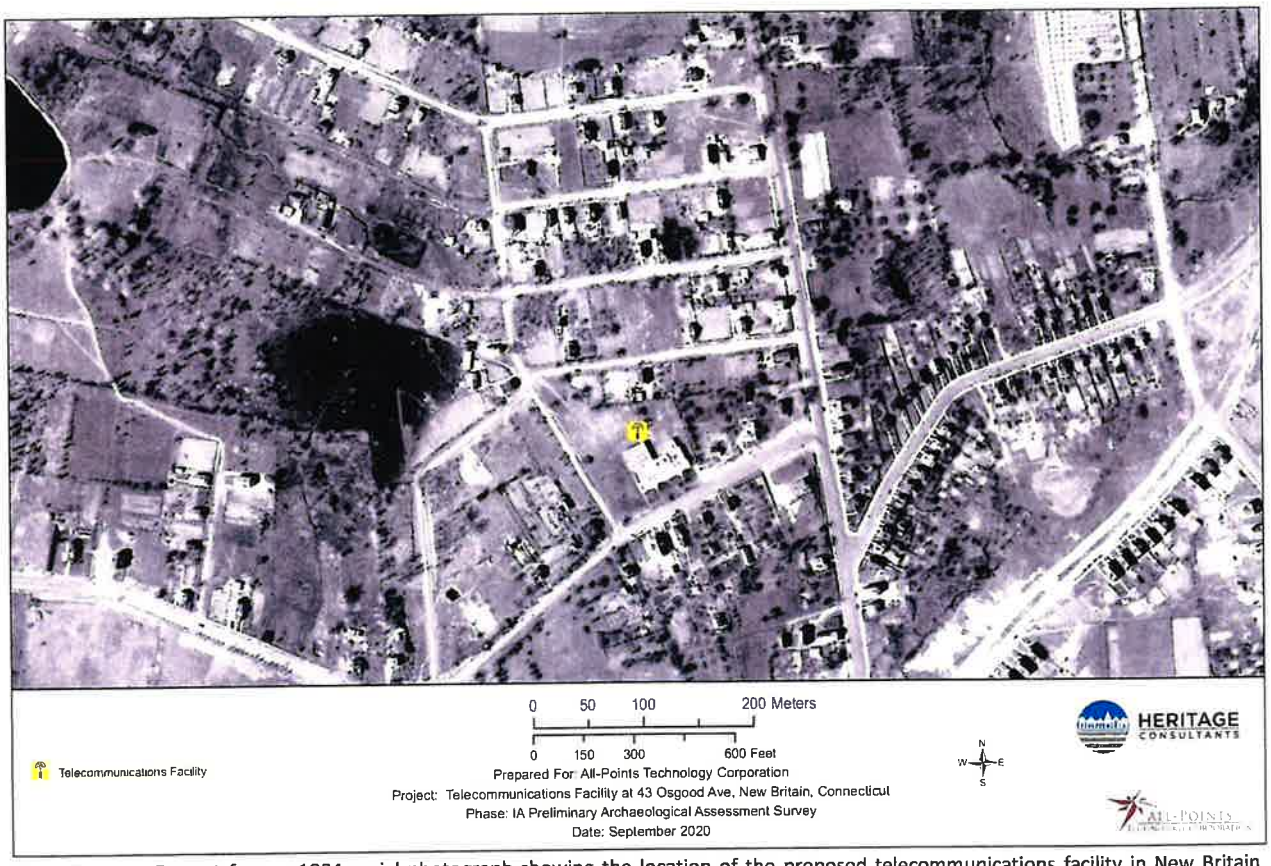


Figure 4. Excerpt from a 1934 aerial photograph showing the location of the proposed telecommunications facility in New Britain, Connecticut.

Figure 5. Excerpt from a 1951 aerial photograph showing the location of the proposed telecommunications facility in New Britain, Connecticut.

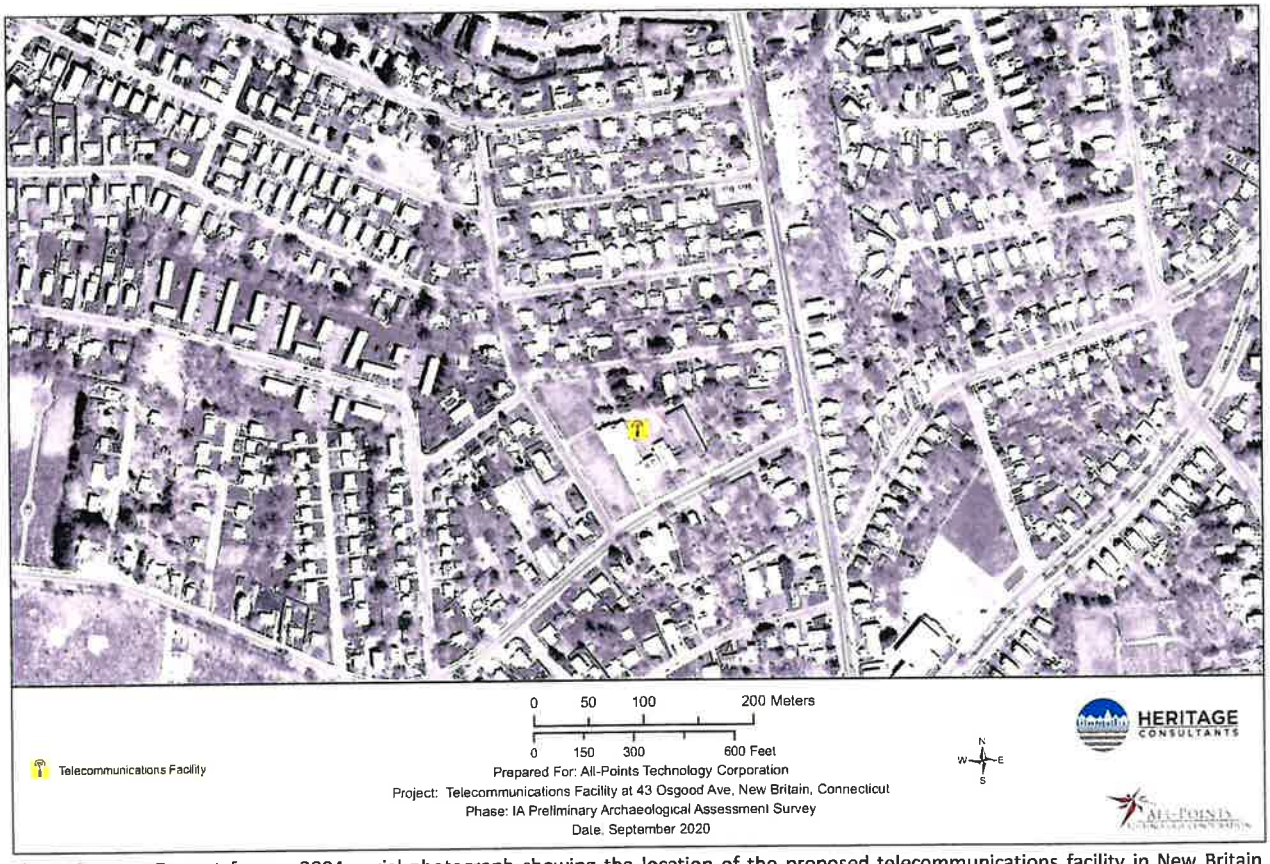


Figure 6. Excerpt from a 2004 aerial photograph showing the location of the proposed telecommunications facility in New Britain, Connecticut.

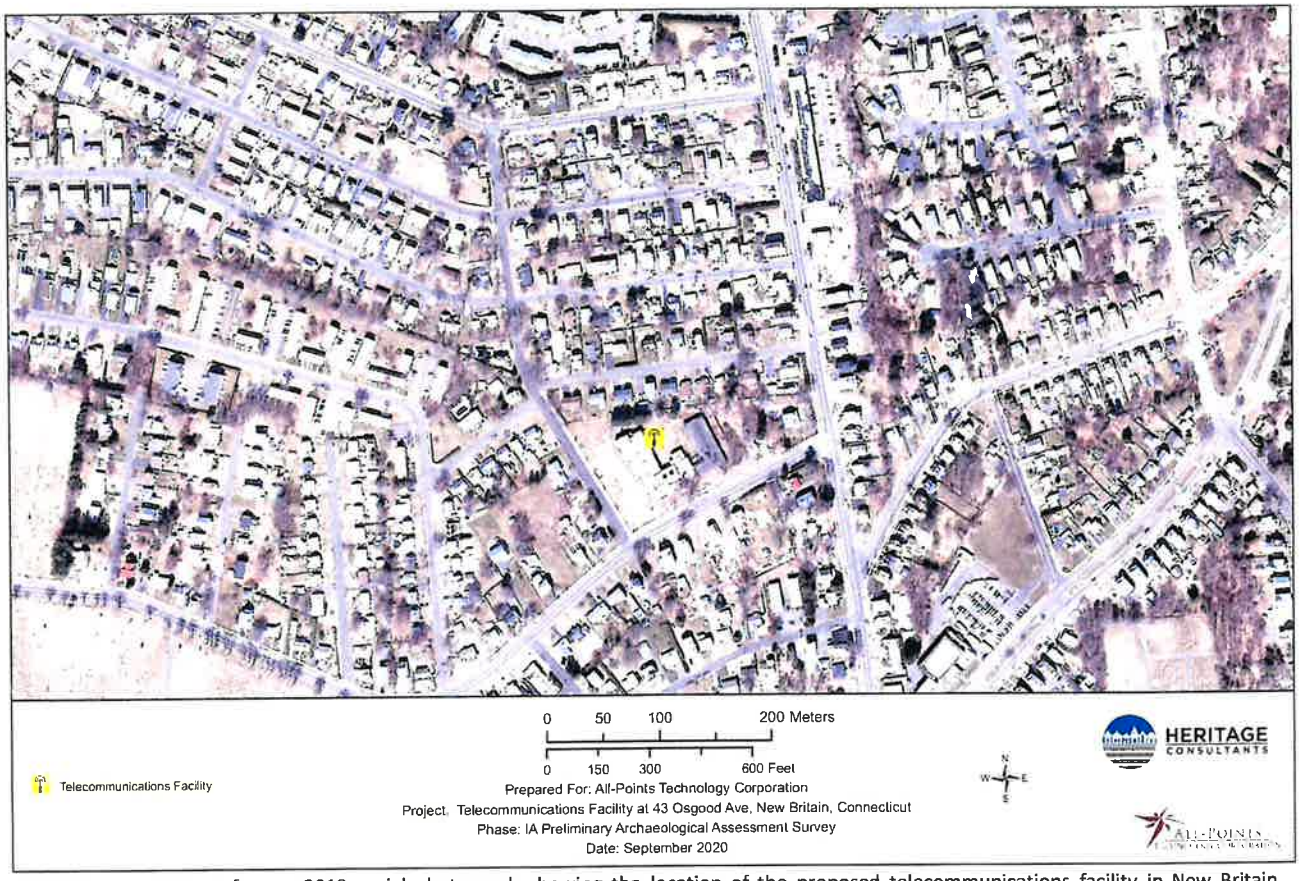


Figure 7. Excerpt from a 2019 aerial photograph showing the location of the proposed telecommunications facility in New Britain, Connecticut.

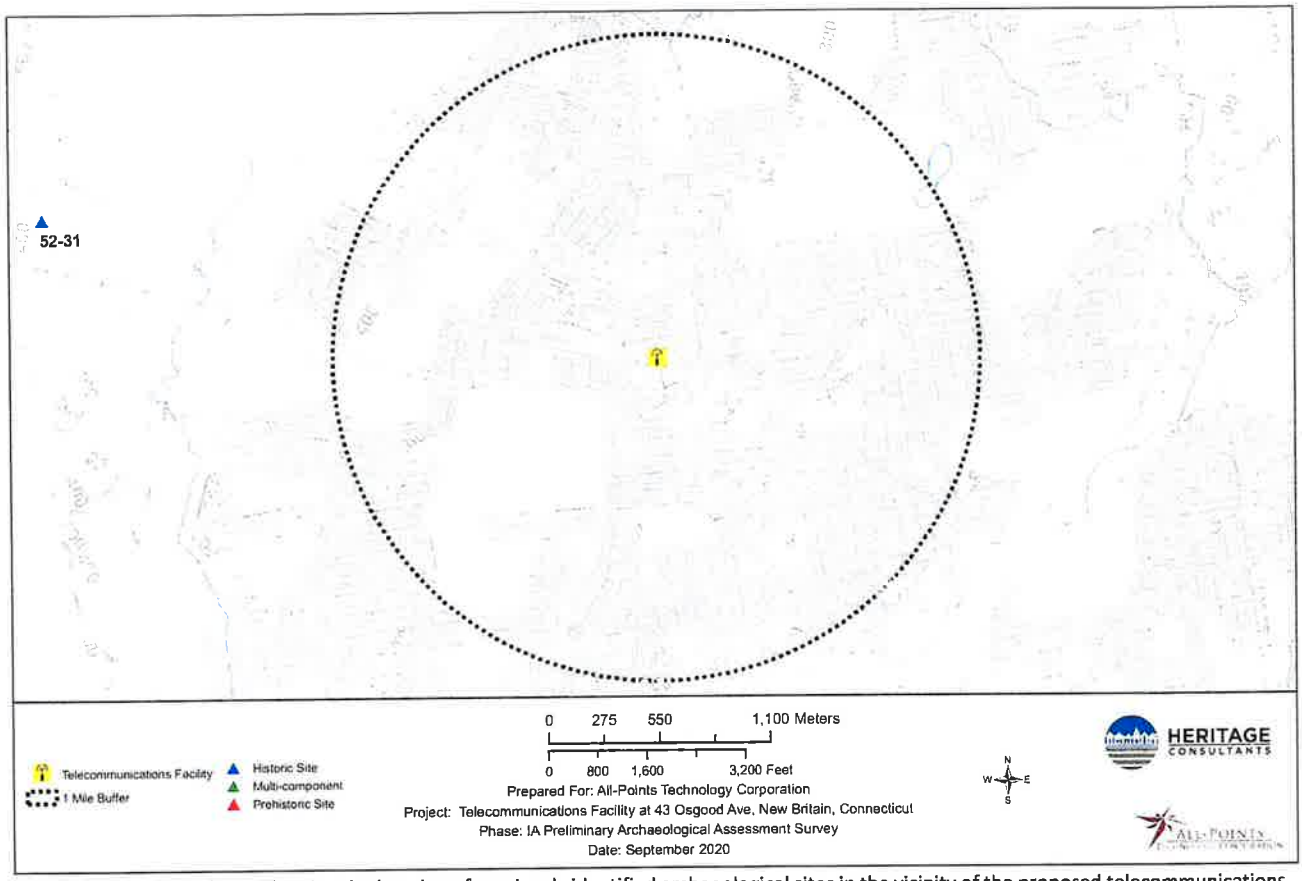


Figure 8. Digital map showing the location of previously identified archaeological sites in the vicinity of the proposed telecommunications facility in New Britain, Connecticut.

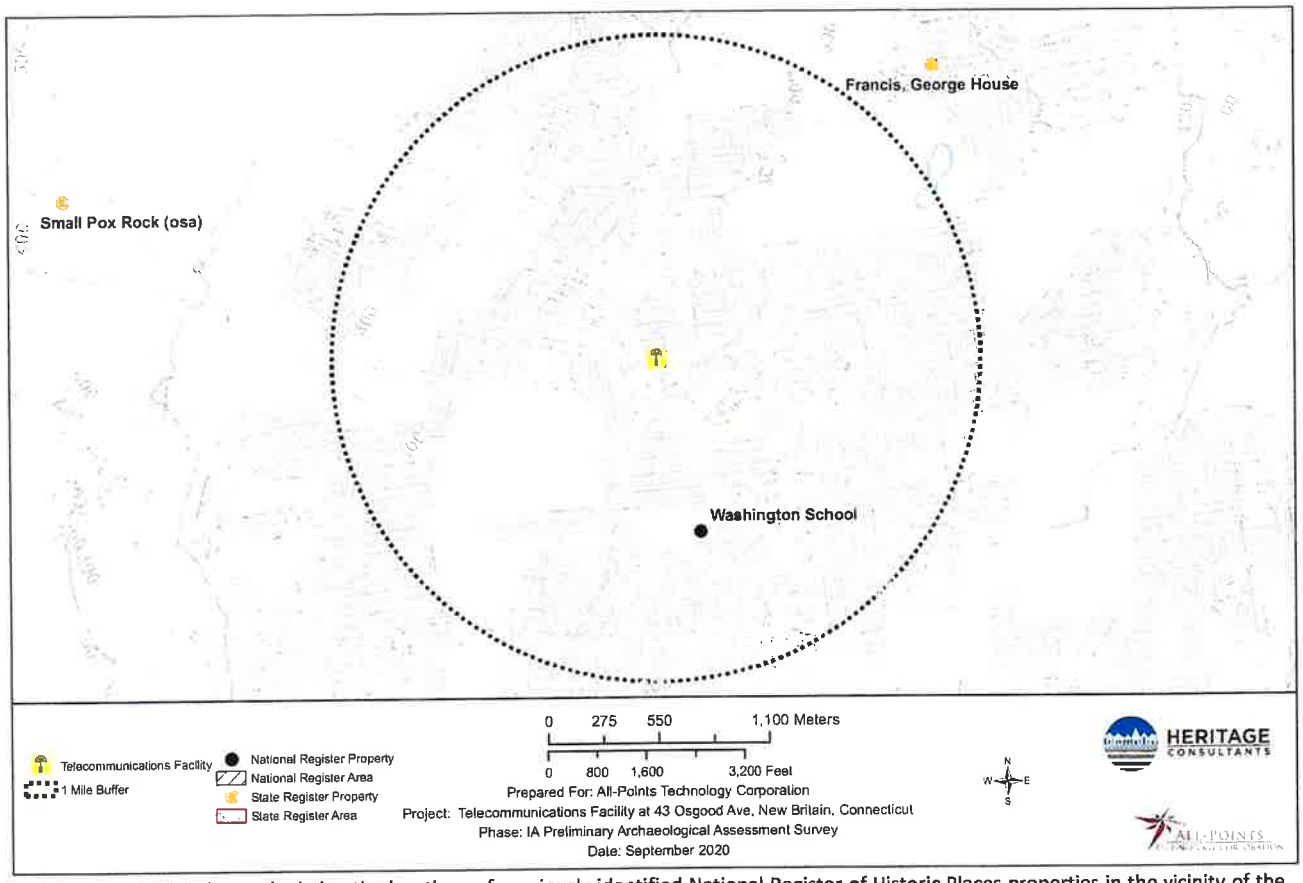


Figure 9. Digital map depicting the locations of previously identified National Register of Historic Places properties in the vicinity of the proposed telecommunications facility in New Britain, Connecticut.

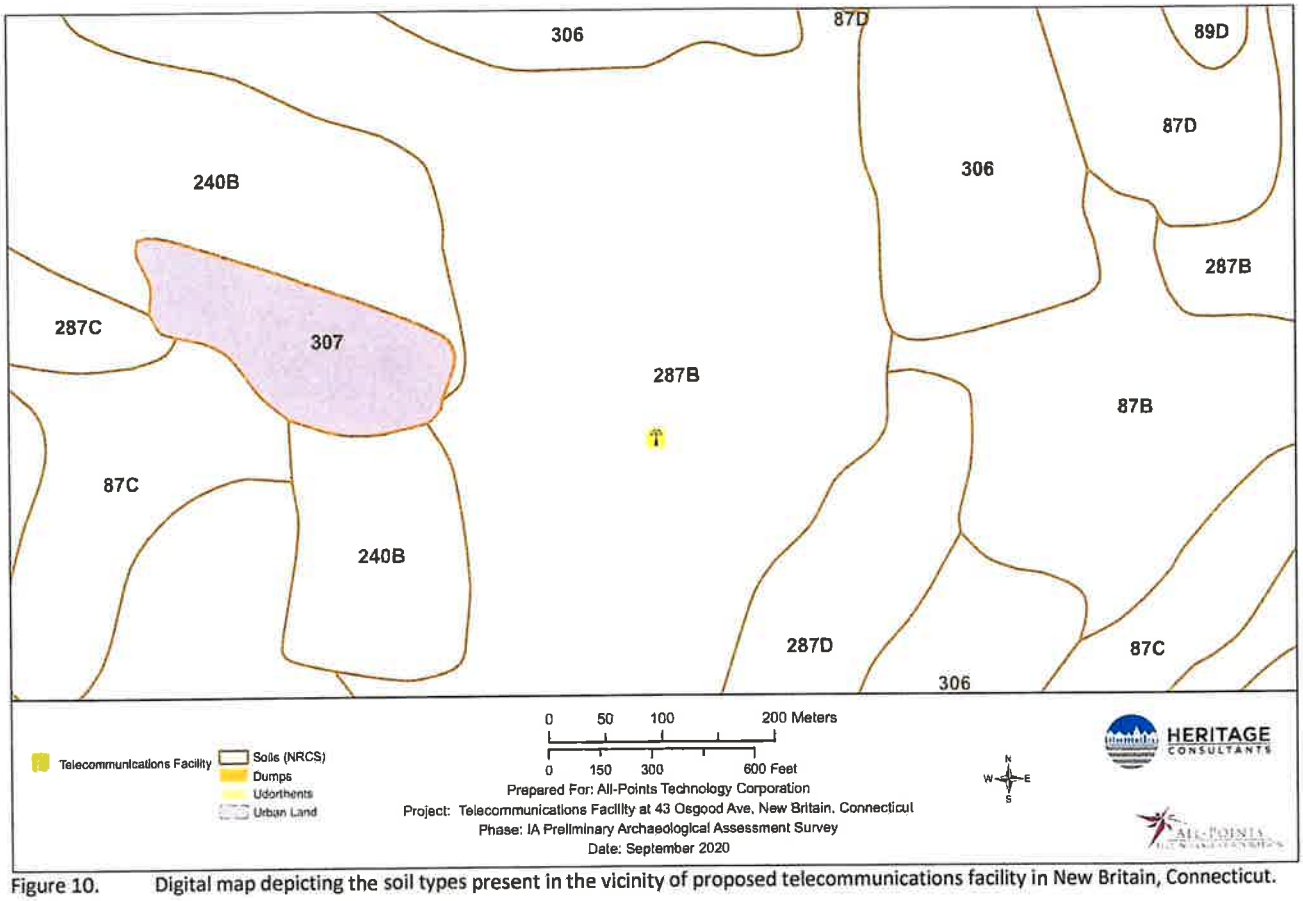


Figure 10. Digital map depicting the soil types present in the vicinity of proposed telecommunications facility in New Britain, Connecticut.

Photo 1. Overview photo looking east along proposed access to telecommunications facility in New Britain, Connecticut.

Photo 2. Overview photo from proposed monopole location looking west toward former Israel Putnam Elementary School in New Britain, Connecticut.

Photo 3. Overview photo from proposed monopole location looking north toward former Israel Putnam Elementary School in New Britain, Connecticut.

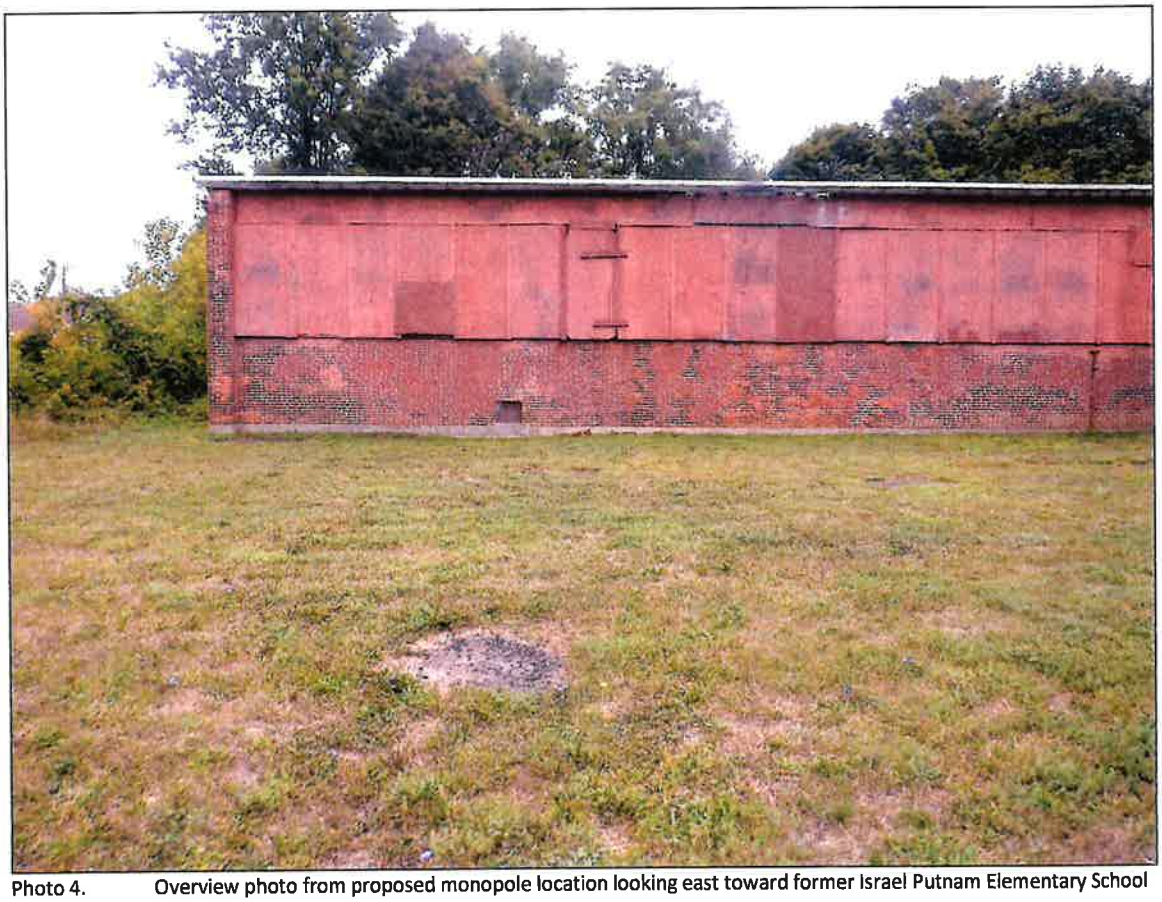


Photo 4. Overview photo from proposed monopole location looking east toward former Israel Putnam Elementary School in New Britain, Connecticut.

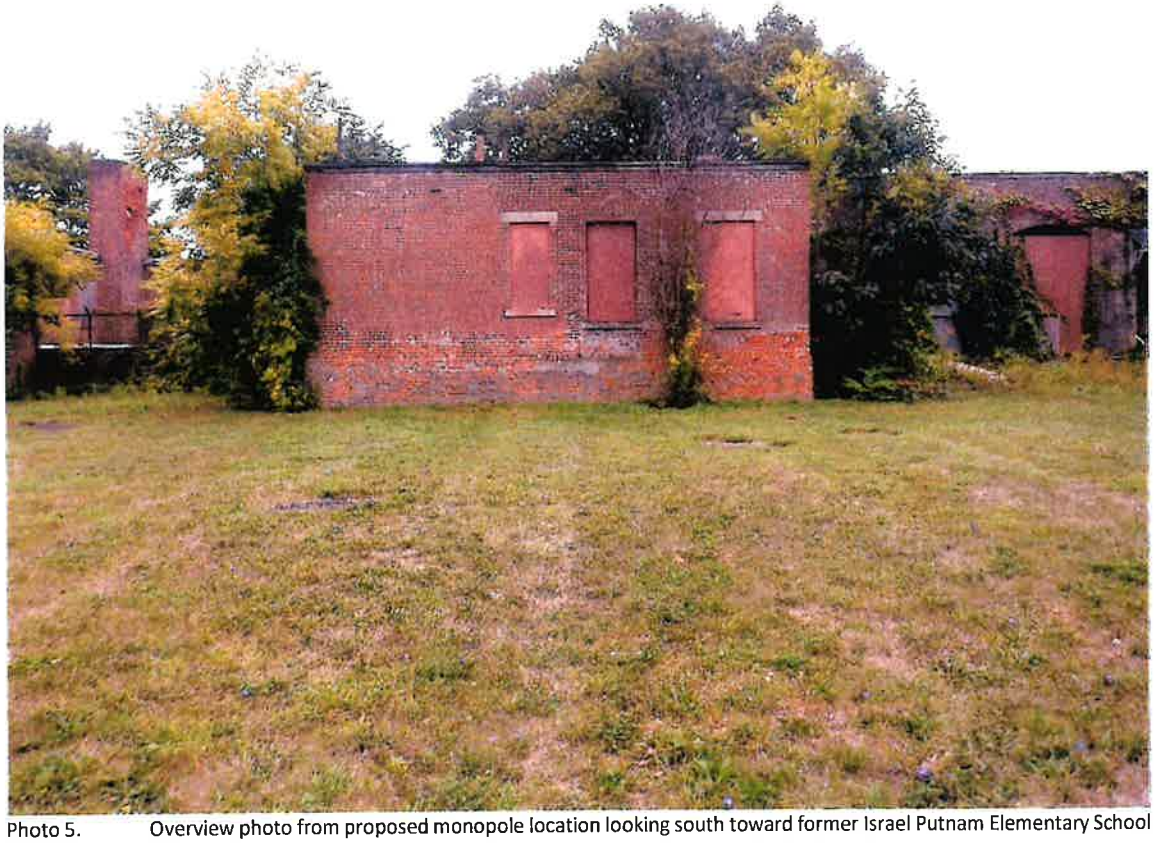


Photo 5. Overview photo from proposed monopole location looking south toward former Israel Putnam Elementary School in New Britain, Connecticut.

Photo 6. Overview photo showing proposed monopole location in New Britain, Connecticut. View is southeast toward former Israel Putnam Elementary School in New Britain, Connecticut.

Photo 7. Overview photo showing proposed monopole location in New Britain, Connecticut. View is southwest toward former Israel Putnam Elementary School in New Britain, Connecticut.

Photo 8. Overview photo showing proposed monopole location in New Britain, Connecticut. View is northwest toward proposed access road and Beach Street.

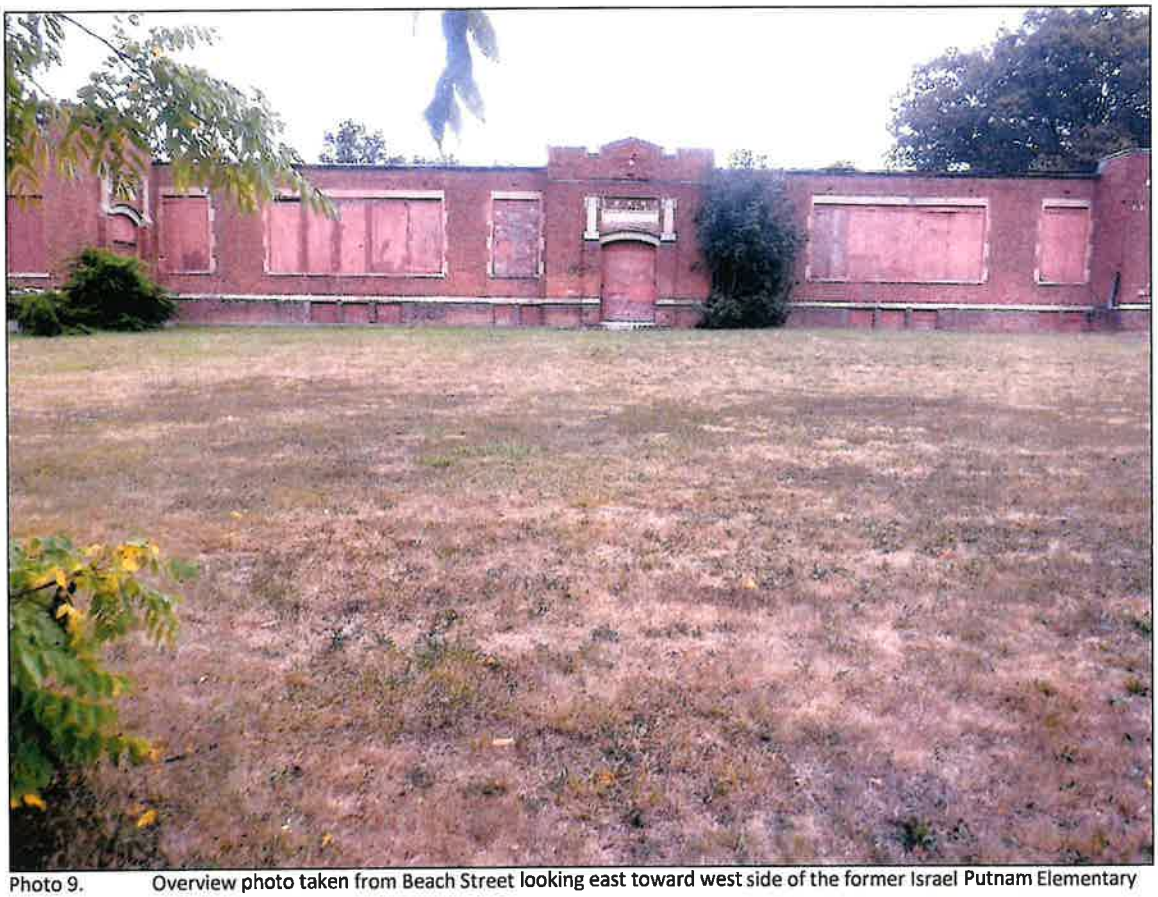


Photo 9. Overview photo taken from Beach Street looking east toward west side of the former Israel Putnam Elementary School in New Britain, Connecticut.

Photo 10. Overview photo taken from the intersection of Osgood Avenue and Beach Street looking northeast toward southwest corner of former Israel Putnam Elementary School in New Britain, Connecticut.

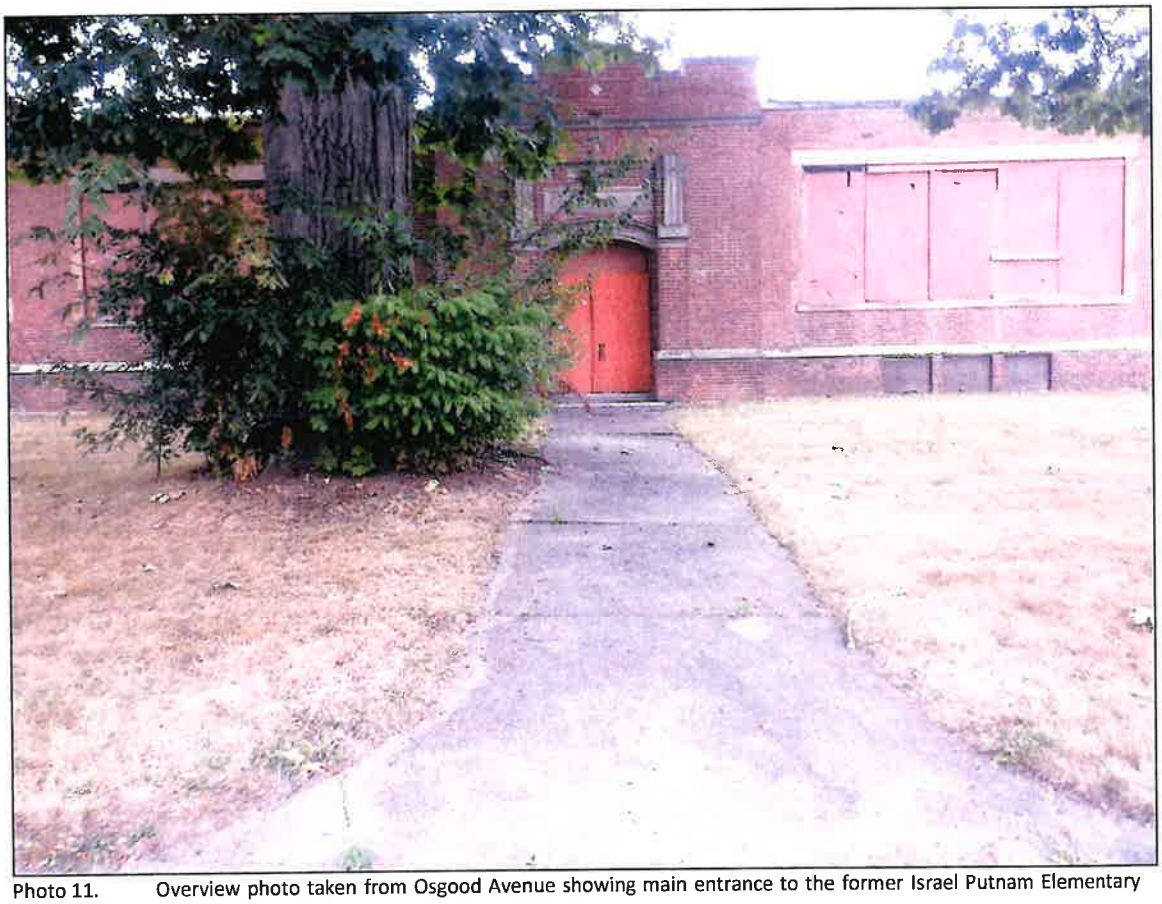


Photo 11. Overview photo taken from Osgood Avenue showing main entrance to the former Israel Putnam Elementary School in New Britain, Connecticut.