
**APPLICATION FOR DEVELOPMENT OF REGIONAL IMPACT REVIEW
APPROVAL AND USE VARIANCE AND DIMENSIONAL VARIANCE
FOR A WIRELESS COMMUNICATION FACILITY**

Eco-Site, Inc.

**c/o Ricardo M. Sousa, Esq.
Prince Lobel Tye LLP
One International Place, Suite 3700
Boston, MA 02110**

Applicant

**Property Location:
145 MA-130
Sandwich, MA 02563**

Parcel ID: 17-009

**Prepared by: Ricardo M. Sousa, Esq.
Prince Lobel Tye LLP
One International Place, Suite 3700
Boston, MA 02110
Telephone: (617) 456-8123
Facsimile: (617) 456-8100**

December 6, 2016

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OF THE TOWN OF SANDWICH**
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Sandwich, MA 02563**

Parcel ID: 17-009

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Town Of Sandwich

THE OLDEST TOWN ON CAPE COD



BOARD OF APPEALS

16 Jan Sebastian Drive, Sandwich, MA 02563
 Phone: 508 833 8001
 Fax: 508 833 8006
 E-mail: planning@townofsandwich.net

Variance Application

To the Board of Appeals of the Town of Sandwich,
 The undersigned herewith submits an application and requests a hearing before the
 Board of Appeals for a variance under Section 3820 of Sandwich Protective Zoning
 By-law for the purpose of constructing a new monopole style wireless telecommunications tower.

Subject Property Map # 17, Parcel # 009. (Found on tax bill) Zoning District: R-2

Registry of Deeds title reference: Book _____, Page _____, or Certificate
 Of Title Number 188826 & Land Court Lot # n/a & Plan # 38251-A.
 (Call Barnstable County Registry at (508) 362-7733).

Property Street Address: 145 MA-130, Sandwich, MA 02563

Lot area of subject property (Found on tax bill): Approximately 17.13 acres

Frontage dimension of subject property (Call Assessor's Office at (508) 888-0157):
Approximately 535'

Date subject lot was created in its present form (Call Barnstable County Registry at
 (508) 362-7733): Unknown

Property Owner (s): PJR Realty Trust, Pasquale J, Russo IV and Pasquale J

Owner's Permanent Address: P.O. Box 1328, Forestdale, MA 02644

Daytime Phone #: 508-989-3793 Email: _____

Signature of Property Owner(s): [Signature]

Applicant: Eco-Site and T-Mobile c/o Ricardo M. Sousa Esq.

Applicant's Address: 240 Leigh Farm Road, Suite 415, Durham, NC 27707

Daytime Phone #: 508-397-1765 Email: Sruzzo@eco-site.com

Signature of Applicant: [Signature]

Signature of Authorized Agent: [Signature] Ricardo M. Sousa Esq.

Daytime Phone #: 617-456-8123 Email: rsousa@princelobel.com



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December 7, 2016

Via Hand Delivery

Town of Sandwich
Zoning Board of Appeals
16 Sebastian Drive
Sandwich, MA 02563

Re: Application for a Use Variance and Dimensional Variance for a
Wireless Telecommunications Tower
Property Address: 145 Route 130
Sandwich, MA 02644 (the "Property")
Assessor Parcel ID: 17-009
Applicant: Eco-Site, Inc. ("Eco-Site") and T-Mobile Northeast LLC ("T-
Mobile" and together with Eco-Site, the "Applicant")

Dear Honorable Members of the Zoning Board of Appeals:

This firm represents the Applicant in connection with an application for a Use Variance and Dimensional Variance from the Sandwich Zoning Board of Appeals (the "Board") for the construction of its proposed Telecommunications Facility¹ on the Property. Eco-Site is proposing to construct a one hundred and thirty-five foot (135') monopole style wireless tower² (the "Monopole") and T-Mobile proposes to install thereupon, six (6) wireless communications antennas at a centerline height of one hundred and thirty feet (130') more or less, together with appurtenant equipment at the base of the Monopole (the "T-Mobile Facility"). The Monopole will have the capacity to co-locate an additional three (3) antenna arrays for other wireless telecommunications carriers and will be surrounded by a eight (8) foot high chain link fence. The proposed Monopole and T-Mobile Facility (together, the proposed Monopole and T-Mobile Facility may also be referred to as the "Facility") are illustrated on the plans attached hereto, and incorporated herein by reference (the "Plans").

The Property is located in the R-2 Residential 2 zoning district for the Town of Sandwich. Pursuant to Article III, Section 3820 of the Town of Sandwich Protective Zoning By-Law (the "By-Law"), the use of the Property for a wireless communications facility in the R-2 zoning district is not permitted. Pursuant to Article II, Section 2600, the maximum building height in the R-2 district is 35'. Accordingly, the proposed Facility will require a Use Variance and a Dimensional Variance (for height) from the Board. The Applicant is entitled to a Use Variance and a Dimensional Variance from the Board, because its proposal satisfies the requirements of the By-Law and Chapter 40A of the Massachusetts General Laws. Furthermore,

Prince Lobel Tye LLP

One International Place

Suite 3700

Boston, MA 02110

TEL: 617 456 8000

FAX: 617 456 8100

¹ Pursuant to Article III, Section 3830 of the By-Law, a Telecommunications Facility is defined as a "Any structure including all buildings and appurtenances solely intended to house and/or support equipment (equipment shelter), used for transmission and/or reception of electromagnetic radiation, including towers, monopoles, antennas, wiring or other devices attached thereto, including guy wires."

² Pursuant to Article III, Section 3830 of the By-Law, a Telecommunications Tower is defined as "Any guyed, monopole, or self-supported tower, constructed as a freestanding structure proposed to mount one or more antennas intended for transmitting and receiving television, AM/FM radio, digital, microwave, cellular, telephone or similar forms of electromagnetic radiation."

in conjunction with its request for a Use Variance and Dimensional Variance from the Board, the Applicant is seeking approval from the Cape Cod Commission (the "Commission"), pursuant to the Wireless Technical Bulletin, last revised on September 30, 2010, (the "Technical Bulletin"), and the Applicant satisfies the requirements thereunder.

Pursuant to the extensive Alternative Site Analysis conducted by the Applicant, a copy of which is attached hereto, the Applicant is unable to find a suitable existing location to co-locate its proposed wireless Facility. Without the proposed Facility, T-Mobile cannot provide seamless wireless service to the Town of Sandwich, pursuant to the mandate of the Telecommunications Act of 1996 and its license issued by the Federal Communications Commission (the "FCC"). Moreover, because the By-Law restricts wireless facilities to the Wireless Telecommunications Overlay District the Town of Sandwich has effectively prohibited wireless facilities from certain areas of Town. It is impossible for T-Mobile to fill its significant gap in coverage and provide seamless and reliable wireless coverage to the Town of Sandwich under the present zoning scheme without obtaining a use and dimensional variance. Therefore, the Applicant respectfully requests that this Board grant the use variance and dimensional variance described herein, pursuant to its authority under Article I, Section 1321 of the By-Law.

A. Background

T-Mobile is licensed by the Federal Communications Commission (the "FCC") to construct and operate a wireless telecommunications network in various markets throughout the country, including the Commonwealth of Massachusetts and in particular in the Town of Sandwich. A copy of the Applicant's FCC license is attached hereto. The Applicant is in the process of designing and constructing a telecommunications system to serve all of the Commonwealth of Massachusetts. One of the key design objectives of its systems is to provide seamless coverage. Such a system requires a grid of radio transmitting and receiving links located approximately .5 to 2 miles apart, depending on the location of existing and proposed installations in the surrounding area, the existing use of the network and the existing topography. The radio transmitting and receiving facilities operate on a line-of-sight basis, requiring a clear path from the facility to the user on the ground. This dynamic requires the antennas to be located in a location where the signal is not obstructed or degraded by other buildings or by topographical features such as hills.

B. RF Coverage Determination

T-Mobile has performed a study of radio frequency coverage for the Town of Sandwich and from the Property, the results of which are shown on the coverage maps submitted herewith. It has determined that a telecommunications facility located on the proposed Monopole on the Property will provide reliable coverage to the targeted sections of the Town of Sandwich and the immediately surrounding area if T-Mobile's proposed antennas are located at the requested height of one hundred and thirty feet (130').

In connection herewith, T-Mobile has submitted a radio frequency propagation map showing its current coverage and the gap in coverage that the proposed site will fill, and a radio propagation map showing the anticipated coverage from the site. Additionally, T-Mobile has submitted a report from its radio frequency engineer stating the necessity of this site to provide

adequate network service to T-Mobile customers within the Town of Sandwich, especially along Route 130, Quaker Meeting House Road and within the surrounding neighborhoods.

C. The Facility

As illustrated on the Plans, the Monopole will be 135' in height and will be located within a 50' x 50' fenced compound, within a 70' X 70' lease area. T-Mobile's Facility will consist of six (6) wireless communications panel antennas and a dish antenna at a centerline height of 130' more or less, together with equipment cabinets on a concrete pad, an ice bridge, a GPS antenna and Remote Radio Heads (RRH) with accessory junction boxes and surge suppressors mounted alongside the antennas. The antennas will be connected via coaxial cable installed within the Monopole to appurtenant radio equipment. The compound will be surrounded by an eight (8) foot high chain link fence.

Pursuant to FCC mandate, enhanced emergency (E911) service is required to meet nationwide standards for wireless telecommunications systems. To comply with this federal standard, T-Mobile will install one (1) E911 Global Positioning System (GPS)/GSM antenna.

After installation, the T-Mobile Facility will be unmanned and will require only biweekly visits by a single vehicle for routine maintenance. The only utilities required to operate this facility are standard 120-volt electrical power as well as telephone service, which are presently installed on the Property. Finally, the Monopole and the T-Mobile Facility will comply with all applicable local, state and federal safety codes, including FCC regulations related to radio frequency emissions.

D. Legal Argument

1. The Applicant is entitled to a Use Variance and Dimensional Variance because the proposed Facility satisfies the requirements for a Wireless Telecommunications Facility set forth in Article III of the By-Law, as follows:

As the Property is not located within the Wireless Telecommunications Overlay District, as defined in Article III, Section 3820 of the By-Law, the Applicant submits that it need not apply for a Special Permit as required under Article III, Section 3850 of the By-Law. To the extent that this Board determines that the provisions set forth in Article III, Section 3800 of the By-Law, apply to the proposed Facility, the Applicant respectfully submits that it meets the requirements for a Special Permit from the Planning Board, without waiving the argument that such a permit is not required.

A. Pursuant to Article III, Section 3852 of the By-Law, the Applicant has submitted the following:

- a. Fully executed application form**
- b. Certified Abutters List**

- c. A Site Plan Prepared by a professional engineer at a scale of 1"=40' which shall show the following:
 - 1. Tower location, including guy wires, if any, and tower height
 - 2. Accessory building or structures for equipment
 - 3. Topography at five foot contour intervals
 - 4. Fencing, landscaping & lighting
 - 5. Access and parking
 - 6. Abutters
 - 7. Areas to be cleared of vegetation
 - 8. Site boundaries
- d. A locus plan at a scale of 1" = 1000' which shall show all streets, bodies of water, landscape features, historic sites, and all buildings within the parcel and within three hundred (300) feet of the property lines, and the exact location of the proposed structure(s). An aerial photograph of a similar scale encompassing the stated requirements is allowed.
- e. Detailed calculations and plans for drainage and drainage structures as described in the most recently revised Sandwich Subdivision Rules & Regulations.
- f. Plans shall satisfy requirements, both transitional and permanent, for the prevention of erosion and excessive surface water runoff during construction and operation of the facility as described in Section 3530 of this by-law.
- g. A color photograph or rendition of the facility with its antennas and/or panels, illustrating the dish or antenna at the proposed location is required. A rendition shall also be prepared illustrating a view of the facility from the nearest street(s).
- h. Drawings and studies that show the ultimate appearance and operation of the personal wireless service facility at full build-out are required.
- i. A description of the facility and the reasons for the proposed location, height and design.
- j. A professional structural engineer's written description of the proposed tower structure including tower superstructure and foundation and their capacity to support the tower superstructure, the proposed antenna(s) and possible additional antenna(s).

- k. A description of available space on the tower providing illustrations and examples of the type and number of wireless telecommunications devices that could be mounted on the proposed tower structure.
- l. A written statement from the applicant that the proposed facility complies with, or is exempt from applicable regulations administered by the Federal, State, and County governments
- m. Output frequency, number of channels, power input and maximum power output per channel; antenna type and orientation; tiled coverage plots for the proposed facility and for any repeaters to be used in conjunction with the proposed facility.

Please see the attached Executed Application Form, Certified Abutters List, Plans, Photo Simulations, Radio Frequency Affidavits and Plots and Stormwater Report and Management Plan.

B. The Applicant complies with the Site Requirements for a Wireless Telecommunications Facility set forth in Article III, Section 3853 of the By-Law as follows:

- a. Telecommunications buildings and other accessory structures housing support equipment shall be screened from adjacent properties to the greatest extent possible.

In an effort to camouflage the proposed Facility to the greatest extent possible, the Applicant has located the Monopole on an undeveloped, but cleared, portion of a 17 acre lot; set the proposed Facility back from the street approximately three hundred and eighty (380) feet; and entered into a Buffer Zone agreement with the landlord to ensure that a critical section of tree coverage stays in place so long as the Monopole is on the property and expanded its originally proposed lease area by 20' to incorporate a landscaped buffer immediately surrounding the fenced-in portion of the Facility.

- b. Signs shall be limited to those needed to identify the property and the owner and warn of any danger. Announcement signage shall be provided that indicates "No Trespassing" and "Danger" and a telephone number which shall provide 24-hour access to the operator of the facility in the event of an emergency; and otherwise comply with the Town's Sign By-law.

The Applicant hereby agrees to comply with this requirement.

- c. All network connections from the telecommunications site shall be via underground landlines except to the extent that underground landlines are not feasible, due to underground conditions, in the reasonable determination of the Planning Board. Clearing of natural

vegetation shall be limited to that which is necessary for the construction, operation, maintenance and access to the facility.

The Applicant hereby agrees to comply with this requirement.

- d. Night lighting shall be the minimum necessary to satisfy the requirements of state and federal laws. Lighting of equipment structures and any other facilities on site shall be shielded from abutting properties. There shall be total cutoff of all light at the property lines of the parcel to be developed, and footcandle measurements at the property line shall be 0.0 initial footcandles when measured at grade.**

The Applicant hereby agrees to comply with this requirement. The proposed Monopole will be an unmanned structure with no offensive lighting, noise, odors, dust, smoke, vibration, sewage, or refuse materials associated with it. There will be no discharge of pollutants or hazardous wastes from the Facility. The Facility will meet all applicable state and federal environmental standards. Moreover, the proposed Tower will enhance the safety, convenience and welfare of the people of Lawrence by providing more reliable and competitive wireless service, thereby fulfilling the mandate of the Applicant's FCC license.

- e. Telecommunications towers shall be set back from each property line a minimum of the distance equal to the height of the tower.**

The proposed 135' Monopole is set back from the property lines a minimum distance of 160' and as such complies with this requirement. Please see the Plans attached hereto.

- f. Telecommunications towers shall not exceed 150 feet in height as measured from the original ground level.**

The current proposal for the Monopole is 135' in height as measured from the original ground level and as such complies with this requirement. Please see the Plans attached hereto.

- g. There shall be a minimum of one parking space for each new facility, to be used in connection with the maintenance of the facility and the site, and not to be used for the permanent storage of vehicles.**

The Applicant is proposing two (2) parking spaces to be used in connection with the maintenance of the Facility. The parking spaces will not be used for storage of vehicles.

Furthermore, the proposed Monopole is a passive use and requires no employees on the premises. Specifically, it will generate only about two vehicle trips per month by a service technician for routine maintenance. As such, the traffic generated by the proposed use of the property for a Wireless Telecommunications Facility will be de minimus.

- h. Towers and facilities shall be a neutral, non-reflective color designed to blend with the surrounding environment.**

The Applicant hereby agrees to comply with this requirement.

- i. Towers and accessory structures shall not be located in wetlands or in wetland buffer zones.**

The Applicant complies with this requirement.

- j. Stormwater run-off shall be contained on-site.**

The Applicant has designed a comprehensive Stormwater Pollution Prevention plan and has designed a comprehensive erosion and sedimentation control plan. Please see the attached Stormwater Pollution Plan and Plans.

C. The Applicant complies with the Criteria For Approval for a Wireless Telecommunications Facility set forth in Article III, Section 3856 of the By-Law as follows:

- a. That the proposed tower or device satisfies the requirements of this By-law and that the size, height, and design is the minimum necessary for that purpose; and**

As discussed herein and further evidenced by the attached Radio Frequency Affidavit and Radio Frequency Plots, T-Mobile has identified a significant gap in wireless coverage and a significant need for capacity relief in this area of Sandwich. T-Mobile was unable to find a suitable location in which it could install or co-locate its proposed facility. Furthermore, as evidenced by the Radio Frequency Affidavit and Radio Frequency Plots, the proposed height is the minimum height necessary for T-Mobile to fill its gap in coverage and provide adequate service to its customers, as required under its license from the FCC.

- b. That the applicant has demonstrated a good faith effort to co-locate with other carriers or to roof-mounted or facade the wireless telecommunication facility including in such good faith effort as:**
 - 1. Submission of a list of alternative candidate sites considered for mounting or co-location and the reasons for rejection; and**
 - 2. Contact, as may be feasible, with other licensed carriers for operating in the contiguous communities and the Special Permit Granting Authority finds no technically or economically equal co-location is available; and**

Please see the attached Alternative Site Analysis, co-location commitment and notice letters prepared by the Applicant.

- c. **That the proposed tower or device is in compliance with federal and state requirements regarding aviation safety; and**

Please see the attached FAA approval.

- d. **That the proposal complies with FCC Reg. 96-386 regarding emissions of electromagnetic radiation.**

The Applicant submits that it will comply with all applicable local, state and federal safety codes, including FCC regulations related to radio frequency emissions.

D. The Applicant has read and agrees to the following requirements:

- a. **Article III, Section 3860 – Maintenance**
- b. **Article III, Section 3870 – Monitoring**
- c. **Article III, Section 3890 – Abandonment or Discontinuation of Use**

2. The Applicant is entitled to a Use and Dimensional Variance because the proposed Facility satisfies the conditions for a Variance pursuant to Article I, Section 1321 of the By-Law as follows:

- a. **A literal enforcement of the provisions of this bylaw would involve a substantial hardship, financial or otherwise, to the petitioner or appellant.**

The intent of the U.S. Congress, when it enacted the Telecommunications Act of 1996 (the “TCA”), was to institute a framework to promote the competition and innovation within the telecommunications industry. Under its license from the FCC, T-Mobile is obligated to provide a reliable “product” (i.e. wireless communications service) to the population of the Town of Sandwich. Likewise, consumer expectations for increasingly robust and reliable service requires competing service providers (including T-Mobile) to identify and remedy existing gaps in reliable network coverage, or gaps that result from increasing subscriber voice and data traffic beyond the limits of existing network infrastructure. A carrier’s failure to remedy network gaps in a timely fashion can result in a significant loss of subscribers to competing telecommunications carriers. As demonstrated in the Radio Frequency Report and Service Coverage maps provided by the Applicant and attached hereto, the proposed Monopole and T-Mobile Facility and corresponding relief requested are necessary to remedy a gap in reliable service coverage within T-Mobile’s existing network infrastructure.

Accordingly, a literal enforcement of the provisions of the By-Law would prevent T-Mobile from eliminating an existing gap in reliable service coverage, resulting in a potential loss of subscribers and the inability to effectively compete for subscribers with FCC licensed

competitors in the market, contrary to the intent of the By-Law and the U.S. Congress in enacting the TCA.

- b. The hardship is owing to circumstances relating to the soil conditions, shape, or topography of such land or structures but not affecting generally the zoning district in which it is located.**

Unlike other land and structures in the zoning district, this site has unique radio frequency characteristics due to the topography of the land and the location of the site within the narrow search area specified by T-Mobile's modeling, which maps coverage regions for the entire wireless network.

As described in more detail in the attached Alternative Site analysis, T-Mobile investigated alternative sites in and around the defined geographic area within which its engineers determined that a facility must be located to fill the gap in service coverage and to function effectively within its network of existing and planned facilities. There is no existing location within the Wireless Telecommunications Overlay District that would provide the necessary coverage to the subject area of the Town of Sandwich. Therefore, the proposed Monopole and T-Mobile Facility are necessary to close the coverage gap that is illustrated on the propagation maps submitted herewith.

The Telecommunications Act of 1996

As noted in *Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland*, 231 F.Supp. 2d 396, 406-407 (D. Mass. 2002), the "need for closing a significant gap in coverage, in order to avoid an effective prohibition of wireless services, constitutes another unique circumstance when a zoning variance is required." T-Mobile requires variances since it cannot close a significant gap in coverage without installing a facility in the R-2 zoning district, that is above 35' in height.

In a growing number of cases, the federal courts have found that variance denials violate the TCA, even if such denials would be valid under state law. For example, in *AT&T Communications v. Town of Lincoln*, 107 F. Supp. 2d 108 (D. Mass. 2000), the court found that denial of a variance for a location outside of the town's wireless overlay district violated the TCA and ordered the variance to issue despite a by-law provision prohibiting use variances. Recently, the Wayland Court reached the same result. In that case, the court stated: "Although the Board's statement [regarding its lack of authority to issue a use variance] may be a correct statement in Massachusetts regarding variances, it is not controlling in the special case of wireless communications facilities . . . Under the Telecommunications Act, the Board cannot deny the variance if in so doing it would have the effect of prohibiting wireless services." *Wayland* at 406-407.

T-Mobile has demonstrated a need for coverage in an area immediately surrounding the Property. The installation proposed by the Applicants is the least intrusive means available to T-Mobile to fill its gap in coverage. Therefore, the need to close this significant gap in coverage constitutes another unique circumstance which is relevant to the grant of the requested variances.

c. Desirable relief may be granted without either;

1. Substantial detriment to the public good; or

The operation of the proposed telecommunications Facility will not adversely impact the health, safety, and the welfare of the residents of the Town of Sandwich or impair the intent or purpose of the By-Law.

Granting the requested relief will benefit the Town and promote the safety and welfare of its residents, businesses and drivers by providing reliable state-of-the-art digital wireless voice and data services. In addition, granting the requested relief will not be contrary to the public interest because:

1. The proposed use complies with the By-Law to the extent reasonably feasible;
2. The proposed location of the proposed Facility is necessary for the effective deployment of the T-Mobile's network;
3. The proposed Facility will comply in all respects with RF emission standards established by the FCC;
4. The proposed Facility will not have any adverse effect on the value of land and buildings in the neighborhood or on the amenities thereof. The use will be passive and require no employees on the premises. Specifically, the proposed Facility will require approximately two vehicle trips per month by a service technician for routine maintenance and will require no water, septic, or other municipal services;
5. The proposed Facility will promote and conserve the convenience and general welfare of the inhabitants of the Town by enhancing telecommunication services;
6. The proposed Facility will involve no overcrowding of land or undue concentration of population because it is an unmanned facility;
7. The proposed Facility will preserve and increase the amenities of the Town by enhancing telecommunications services;
8. The proposed Facility will lessen the danger from fire and natural disasters by providing increased network access for emergency communications in the event of such fires and natural disasters;
9. The proposed Facility will involve no adverse effects on public and private water supplies and indeed will utilize no water at all;

10. The proposed Facility will facilitate the adequate provision of transportation by improving mobile telecommunications for business, personal, commuters and emergency uses;
11. The proposed Facility will involve no adverse effects on drainage, schools, parks, open space, or other public requirements;
12. The proposed Facility will involve no excessive noise or pollution to the environment;
13. The proposed Facility will involve no adverse effects on historic sites;
14. The proposed Facility will be an appropriate use of land in the Town;
15. The proposed Facility will be a benefit to the community by allowing for more competitive wireless telecommunications services to the residents and businesses of the Town.

2. Nullifying or substantially derogating from the intent or purpose of the By-Law.

The purpose of the By-Law, as outlined in Article I, Section 1100, will be observed by the granting of the requested relief because the proposed Facility:

1. will not contribute to traffic congestion because the traffic produced thereby will be limited to a single vehicle for biweekly visits for routine maintenance checks;
2. will conserve health by not producing any pollutants or wastes, while being in compliance with all applicable state and federal safety codes;
3. will contribute to securing safety from fire, flood, panic and other dangers by providing more reliable wireless coverage with E911 enhanced emergency service and Global Positioning System technology;
4. will not inhibit adequate light and air;
5. will not contribute to overcrowding of land or the undue concentration of population;
6. will encourage the most appropriate use of land throughout the Town because the Property is currently used for public utilities;
7. will increase the Town's amenities by providing more reliable and competitive wireless coverage to the residents and businesses of Lawrence; and

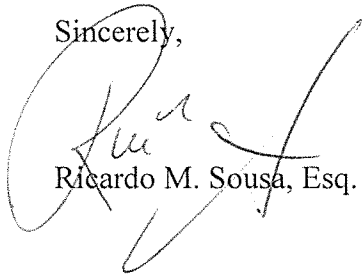
8. will encourage multiple uses of land thereby providing for orderly expansion and development.

E. Conclusion

The Applicants hereby request that the Board determine that the Applicant has satisfied the requirements for the grant of the requested use variance and dimensional variance and to further determine that the proposed Monopole and T-Mobile Facility will not have an adverse impact upon the subject neighborhood and the Town of Sandwich. The Property is an appropriate location for the installation and operation of the proposed Monopole and T-Mobile Facility and the proposal set forth herein represents the least intrusive means through which T-Mobile can close a significant gap in reliable service coverage under the By-Law.

For the foregoing reasons, the Applicants respectfully request the Board to grant the foregoing zoning relief in the form of a use variance and a dimensional variance, and such other relief as the Board deems necessary in order to allow the installation and operation of the proposed Monopole and T-Mobile Facility on the Property.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Ricardo M. Sousa', is written over a circular embossed seal. The signature is fluid and cursive.

Ricardo M. Sousa, Esq.

Enclosures

3



Application Cover Sheet

Cape Cod Commission
3225 Main Street, PO Box 226
Barnstable, MA 02630
Tel: (508) 362-3828 • Fax: (508) 362-3136

For Commission Use Only

Date Received:
Fee (\$):
Check No:
File No:

A Type of Application (check all that apply)

- ☒ Development of Regional Impact (DRI) ☐ Hardship Exemption ☐ Limited DRI Review
☐ Jurisdictional Determination ☐ DRI Exemption ☐ Request for Joint MEPA/DRI Review

B Project Information

Project Name: MA-0049 "Russo" Total Site Acreage: 17.13 Acres
Project/Property Location: 145 MA-130, Sandwich, MA 02563 Zoning: R-2

Brief Project Description:

Include total square footage of proposed and existing development, gross floor area, number of lots existing or to be created, specific uses, description of existing conditions, as applicable (attach additional sheets if necessary).

The Applicant proposes to construct a 135' monopole style telecommunications tower located within a fenced and landscaped compound

C Owner(s) of Record

List the following information for all involved parcels. Provide copies of each Deed and Purchase and Sale Agreement and/or evidence of leasehold interest, if applicable, for all involved parcels. Proof of ownership/legal rights for Applicant(s) to proceed with the proposed development must be documented prior to the Commission deeming any application complete (attach additional sheets if necessary).

Map/Parcel	Owner's Name	Lot & Plan	Land Court Certificate of Title #	Registry of Deeds Book/Page #
17-009	PJR Realty Trust			

There **ARE/ARE NOT** (circle one) court claims, pending or completed, involving this property (if yes, please attach relevant information).

D Certification

I hereby certify that all information provided on this application form and in the required attachments is true and accurate to the best of my knowledge. I agree to notify the Cape Cod Commission of any changes on the information provided in this application, in writing, as soon as is practicable. I understand failure to provide the required information and any fees may result in a procedural denial of my project.

NOTE: For wireless communication facilities, a licensed carrier should be either an applicant or a co-applicant.

APPLICANT	Applicant(s) Name:	<u>Eco-Site</u>	Tel:	<u>919-636-6810</u>	Fax:	
	Address:	<u>240 Leigh Farm Road, Suite 415, Durham, NC 27707</u>				
	Signature:	<u>[Signature]</u>	Date:	<u>10-20-16</u>		
CO-APPLICANT	Co-Applicant(s) Name:	<u>T-Mobile Northeast LLC</u>	Tel:	<u>508-286-2700</u>	Fax:	
	Address:	<u>15 Commerce Way, Suite B, Norton, MA 02766</u>				
	Signature:	<u>[Signature]</u>	Date:	<u>3/6/17</u>		
CONTACT	Contact:	<u>Ricardo M. Sousa</u>	Tel:	<u>617-456-8123</u>	Fax:	<u>617-456-8100</u>
	Address:	<u>One International Place, Suite 3700, Boston, MA 02110</u>				
	Signature:	<u>[Signature]</u>	Date:	<u>3/6/17</u>		
PROPERTY OWNER	Property Owner:	<u>PJR Realty Trust</u>	Tel:	<u>508-579-3059</u>	Fax:	
	Address:	<u>P.O. Box 1328, Forestdale, MA 02644</u>				
	Signature:	<u>[Signature]</u>	Date:	<u>11-17-16</u>		
BILLABLE ENTITY	Name:					
	Address:					

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December 7, 2016

Via Hand Delivery

Cape Cod Commission
3225 Main Street
P.O. Box 226
Barnstable, MA 02630

Re: Application for Development of Regional Impact ("DRI") Review
for a Wireless Telecommunications Tower
Property Address: 145 Route 130
Sandwich, MA 02644 (the "Property")
Assessor Parcel ID: 17-009
Applicant: Eco-Site, Inc. ("Eco-Site") and T-Mobile Northeast LLC ("T-
Mobile" and together with Eco-Site, the "Applicant")

Dear Honorable Members of the Zoning Board of Appeals:

This firm represents the Applicant in connection with an application for a Development of Regional Impact Review from the Cape Cod Commission (the "Commission") for the construction of its proposed new Personal Wireless Service Facility¹ on the Property. Eco-Site is proposing to construct a new one hundred and thirty-five foot (135') monopole style wireless tower² (the "Monopole") and T-Mobile proposes to install thereupon, six (6) wireless communications antennas at a centerline height of one hundred and thirty feet (130') more or less, together with appurtenant equipment at the base of the Monopole (the "T-Mobile Facility"). The Monopole will have the capacity to co-locate an additional three (3) antenna arrays for other wireless telecommunications carriers and will be surrounded by an eight (8) foot high chain link fence. The proposed Monopole and T-Mobile Facility (together, the proposed Monopole and T-Mobile Facility may also be referred to as the "Facility") are illustrated on the plans attached hereto, and incorporated herein by reference (the "Plans").

Pursuant to the Wireless Technical Bulletin, set forth by the Cape Cod Commission, last revised on September 30, 2010, (the "Technical Bulletin") and Chapter A, Section 3(i)(l) of the Commission's enabling regulations, any wireless communication tower exceeding thirty-five feet (35') in height is a Development of Regional Impact and requires review and approval by the Commission. The Property is located in the R-2 Residential 2 zoning district for the Town of Sandwich. Pursuant to Article III, Section 3820 of the Town of Sandwich Protective Zoning By-

¹ Pursuant to Section III (R) of the Wireless Technical Bulletin of the Cape Cod Commission, last revised on September 30, 2010, a Personal Wireless Service Facility is defined as a "Facility for the provision of personal wireless services, including the mount, antenna(s), equipment shelter(s) and security barrier."

² Pursuant to Section III (N) of the Wireless Technical Bulletin of the Cape Cod Commission, last revised on September 30, 2010, a Monopole is defined as "The type of mount that is self-supporting with a single shaft of wood, steel or concrete and a platform (or racks) for panel antennas arrayed at the top."

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Law (the “By-Law”), the use of the Property for a wireless communications facility in the R-2 zoning district is forbidden. Pursuant to Article II, Section 2600, the maximum building height in the R-2 district is thirty-five feet (35’). Accordingly, the proposed Facility will require approval from the Commission and a Use Variance and a Dimensional Variance from the Sandwich Zoning Board of Appeals (the “Board”). The Applicants are entitled to approval from the Commission and a Use Variance and a Dimensional Variance from the Board, because their proposal satisfies the requirements of the By-Law, the Technical Bulletin and Chapter 40A of the Massachusetts General Laws.

Pursuant to the extensive Alternative Site Analysis conducted by T-Mobile, a copy of which is attached hereto, T-Mobile is unable to find a suitable existing location to co-locate its proposed wireless Facility. Without the proposed Facility, T-Mobile cannot provide seamless wireless service to the Town of Sandwich, pursuant to the mandate of the Telecommunications Act of 1996 and its license issued by the Federal Communications Commission (the “FCC”). Moreover, because the By-Law restricts wireless facilities to the Wireless Telecommunications Overlay District the Town of Sandwich has effectively prohibited wireless facilities from certain areas of Town. It is impossible for T-Mobile to provide seamless and reliable wireless coverage to the Town of Sandwich under the present zoning scheme without obtaining a use and dimensional variance. Therefore, the Applicants respectfully request that the Commission approve the Facility so that the Applicants may seek the necessary variances from the Board.

A. Background

T-Mobile is licensed by the Federal Communications Commission (the “FCC”) to construct and operate a wireless telecommunications network in various markets throughout the country, including the Commonwealth of Massachusetts and in particular in the Town of Sandwich. A copy of the Applicant’s FCC license is attached hereto. The Applicant is in the process of designing and constructing a telecommunications system to serve all of the Commonwealth of Massachusetts. One of the key design objectives of its systems is to provide seamless coverage. Such a system requires a grid of radio transmitting and receiving links located approximately .5 to 2 miles apart, depending on the location of existing and proposed installations in the surrounding area, the existing use of the network and the existing topography. The radio transmitting and receiving facilities operate on a line-of-sight basis, requiring a clear path from the facility to the user on the ground. This dynamic requires the antennas to be located in a location where the signal is not obstructed or degraded by other buildings or by topographical features such as hills.

B. RF Coverage Determination

T-Mobile has performed a study of radio frequency coverage for the Town of Sandwich and from the Property, the results of which are shown on the coverage maps submitted herewith. It has determined that a telecommunications facility located on the proposed Monopole on the Property will provide adequate coverage to the targeted sections of the Town of Sandwich and

the immediately surrounding area if T-Mobile's proposed antennas are located at the requested height of one hundred and thirty feet (130').

In connection herewith, T-Mobile has submitted a radio frequency propagation map showing its current coverage and the gap in coverage that the proposed site will fill, and a radio propagation map showing the anticipated coverage from the site. Additionally, T-Mobile has submitted a report from its radio frequency engineer stating the necessity of this site to provide adequate network service to T-Mobile customers within the Town of Sandwich, especially along Route 130 and within the surrounding neighborhoods.

C. The Facility

As illustrated on the Plans, the Monopole will be 135' in height and will be located within a 50' x 50' fenced compound, within a 70' X 70' lease area. T-Mobile's Facility will consist of six (6) wireless communications panel antennas and a dish antenna at a centerline height of 130' more or less, together with equipment cabinets on a concrete pad, an ice bridge, a GPS antenna and Remote Radio Heads (RRH) with accessory junction boxes and surge suppressors mounted alongside the antennas. The antennas will be connected via coaxial cable installed within the Monopole to appurtenant radio equipment. The compound will be surrounded by a 8' high chain link fence.

Pursuant to FCC mandate, enhanced emergency (E911) service is required to meet nationwide standards for wireless telecommunications systems. To comply with this federal standard, T-Mobile will install one (1) E911 Global Positioning System (GPS)/GSM antenna. As noted on the submitted Plans, the E911 GPS/GSM antenna will be mounted to the proposed ice bridge tray covering the radio equipment.

After installation, the T-Mobile Facility will be unmanned and will require only biweekly visits by a single vehicle for routine maintenance. The only utilities required to operate this facility are standard 120-volt electrical power as well as telephone service, which are presently installed on the Property. Finally, the Monopole and the T-Mobile Facility will comply with all applicable local, state and federal safety codes, including FCC regulations related to radio frequency emissions.

D. Cape Cod Commission Requirements

1. **The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Location requirements for a Personal Wireless Service Facility set forth in Section IV of the Technical Bulletin, as follows:**

Section IV – Location:

- A. **If feasible, personal wireless service facilities should be located on existing structures, including but not limited to buildings, water towers, existing**

telecommunications facilities, utility poles and towers, and related facilities, provided that such installation preserves the character and integrity of those structures. In particular, applicants are urged to consider use of existing telephone and electric utility structures as sites for one or more personal wireless service facilities. The applicant shall have the burden of proving that there are no feasible existing structures upon which to locate.

As discussed herein and further evidenced by the attached Radio Frequency Affidavit and Radio Frequency Plots, T-Mobile has identified a significant gap in wireless coverage and a significant need for capacity relief in this area of Sandwich. T-Mobile was unable to find a suitable location in which it could install or co-locate its proposed facility. Please see the attached Alternative Site Analysis and Existing Tower Inventory for a more detailed analysis of the exhaustive search conducted by T-Mobile and its Site Acquisition team.

- B. If the applicant demonstrates that it is not feasible to locate on an existing structure, personal wireless service facilities should be designed so as to be camouflaged to the greatest extent possible, including but not limited to use of compatible building materials and colors, screening, landscaping and placement within trees.**

The Applicant has designed the Monopole to minimize any visual impact on the surrounding area and will paint the Monopole to blend in with the surrounding area and as required by the Commission.

Furthermore, in an effort to camouflage the proposed Facility to the greatest extent possible, the Applicant has located the Monopole on an undeveloped, but cleared, portion of a 17 acre lot; set the proposed Facility back from the street approximately 380'; entered into a Buffer Zone agreement with the landlord to ensure that a critical section of tree coverage stays in place so long as the Monopole is on the property and expanded its originally proposed lease area by 20' so as to incorporate a landscaped buffer zone for the Facility.

- C. The applicant shall submit documentation of the legal right to install and use the proposed facility mount at the time of application for a Development of Regional Impact approval.**

Please see the attached redacted lease as evidence of the applicant's legal right to install and use the proposed Facility.

- 2. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Dimensional requirements for a Personal Wireless Service Facility set forth in Section V of the Technical Bulletin, as follows:**

- A. Height, General.** Personal wireless service facilities should be no higher than ten feet above the average height of buildings within 300 feet of the proposed facility. However, the height of a personal wireless service facility should not exceed the height limits of the zoning district in which the facility is proposed to be located, unless the facility is completely camouflaged such as within a flagpole, steeple, chimney, or similar structure.

In order to balance the need for wireless telecommunications services, together with the articulated desire to minimize the impact of wireless facilities, the Applicant is proposing a 135' monopole style telecommunications tower. As demonstrated in the attached plans and Radio Frequency materials, the proposed height of 130' for the T-Mobile facility is necessary to fill the existing gap in coverage. However, the proposed height also allows for the construction of a telecommunications tower that can accommodate three (3) additional carriers.

The applicant respectfully submits that the proposed height allows for the maximum number of additional carriers and will ultimately result in less tower structures in the area. As such, the applicant respectfully requests a waiver from this provision as the proposed Monopole is 135' in height in an R-2 district with a height limitation of 35'.

- B. Height, Ground-Mounted Facilities.** Ground-mounted personal wireless service facilities (i.e. wireless communication towers) should not project higher than ten feet above the average building height or, if there are no buildings within 300 feet, these facilities should not project higher than ten feet above the average tree canopy height, measured from ground level (AGL). If there are no buildings within 300 feet of the proposed site of the facility, all ground-mounted personal wireless service facilities should be surrounded by dense tree growth to screen views of the facility in all directions. These trees may be existing on the subject property or proposed to be planted as part of the application.

As stated above, in order to balance the need for wireless telecommunications services, together with the articulated desire to minimize the impact of wireless facilities, the Applicant is proposing a 135' monopole style telecommunications tower. The proposed Facility will be set back from the street approximately 380' and will be buffered by dense tree growth. Furthermore, the Applicant has entered into a buffer agreement with the Landlord to ensure that the trees buffering the tower from the street will not be removed.

Again, the applicant respectfully submits that the proposed height allows for the maximum number of additional carriers and will ultimately result in less tower structures in the area. As such, the applicant respectfully requests a waiver from this provision as the proposed Monopole is 135' in height.

- C. Height, Wireless Facility Overlay Districts.** If a town has established a wireless facility overlay district (as designated on the town zoning map) where taller facilities are permitted, personal wireless service facilities of up to 150 feet in height may be allowed. Monopoles are the preferred type of mount for such taller structures.

This provision is not applicable as the proposed Facility is not located within the Town of Sandwich's Wireless Facility Overlay District.

As discussed herein and further evidenced by the attached Radio Frequency Affidavit and Radio Frequency Plots, T-Mobile has identified a significant gap in wireless coverage and a significant need for capacity relief in this area of Sandwich. T-Mobile was unable to find a suitable location in which it could install or co-locate its proposed facility. Please see the attached Alternative Site Analysis and Existing Tower Inventory for a more detailed analysis of the exhaustive search conducted by T-Mobile and its Site Acquisition team.

Furthermore, although the Wireless Facility Overlay District By-Law for the Town of Sandwich does not apply, the Applicant respectfully submits that it meets all of the requirements under said By-Law. As such, the Applicant respectfully suggests that the intent of this provision is applicable to the current situation and would allow the Commission to allow the proposed Monopole at 135' in height.

- D. Setbacks.** All personal wireless service facilities and their equipment shelters should comply with the building setback provisions of the zoning district in which the facility is located. In addition, the following setbacks should be observed:
- 1. In order to ensure public safety, the minimum distance from the base of any ground-mounted personal wireless service facility to any property line, road, habitable dwelling, business or institutional use, or public recreational area should be the height of the facility/mount, including any antennas or other appurtenances. This setback is considered a "fall zone." The applicant shall provide proof of a legal interest in the fall zone, including but not limited to proof of fee ownership, an easement, or a leasehold sufficient to meet the requirements of this section.**
 - 2. In reviewing an application for a personal wireless service facility, the Commission may reduce the required fall zone by as much as 50% of the recommended distance, if it finds that a substantially better design will result from such reduction. In making such a finding, the Commission should consider both the visual and safety impacts of the proposed facility.**

The 135' Monopole is set back from any property line, road, habitable dwelling, business or institutional use, or public recreational area by a minimum of 160' and as such complies with the fall zone setback. Please see the attached Plans.

Furthermore, as the property on which the Monopole is located is approximately 17 acres in size and utilized as a garden center near the street and storage for contractors in the remainder, the Applicant respectfully requests a waiver from the requirement that it hold a legal interest in the fall zone area.

3. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Special Regulations for a Personal Wireless Service Facility set forth in Section VI of the Technical Bulletin, as follows:

A. Design Standards

- 1. Camouflage. Personal wireless service facilities should be camouflaged or hidden from public view wherever possible by incorporating them into an existing or proposed structure, by using fiberglass to replace building elements, and/or through careful selection of construction materials and/or color.**

The Applicant has designed the Monopole to minimize any visual impact on the surrounding area and will paint the Monopole to blend in with the surrounding area and as required by the Commission. Furthermore, the proposed Facility will be set back approximately 380' from route 130 on a large industrial and commercial lot, and buffered by significant tree cover. As such, the Applicant respectfully submits that the proposed Monopole will have a minimal impact on the surrounding view shed.

- 2. Buffers. If personal wireless service facilities are not camouflaged from public viewing areas by existing buildings or structures, they should be surrounded by buffers of dense tree growth and understory vegetation in all directions to create an effective year-round visual buffer. Ground-mounted personal wireless service facilities should provide a vegetated buffer of sufficient height and depth to effectively screen the facility. Trees and vegetation may be existing on the subject property or installed as part of the proposed facility or a combination of both. The Commission will work with the applicant to determine the types and sizes of trees and plant materials and depth of the needed buffer based on site conditions.**

The Applicant has worked with Commission staff to identify tree buffer zones of particular importance. After identifying a section of tree cover that was particularly important

for buffering purposes, the Applicant has entered into a buffer zone agreement with the Landlord, limiting the landlord ability to remove such a buffer.

Furthermore, the Applicant has expanded its leased area by 20' X 20' and proposed additional landscaping around the proposed fenced enclosure.

Please see the attached Buffer Zone agreement and Plans.

3. **Color. To the extent that any personal wireless service facility extends above the height of the vegetation immediately surrounding it, it should be painted in a light grey or light blue hue which blends with sky and clouds.**

The Applicant hereby agrees to comply with this requirement.

4. **Equipment Shelters. Equipment shelters for personal wireless service facilities should be designed consistent with one of the following design standards:**
 - a. **Equipment shelters should be located in underground vaults; or**
 - b. **Equipment shelters should be designed consistent with traditional Cape Cod architectural styles and materials, with a roof pitch of at least 10/12 and wood clapboard or shingle siding; or**
 - c. **All ground-mounted personal wireless service facilities should be surrounded by a security barrier. Equipment shelters should be camouflaged behind an effective year-round landscape buffer, equal to the height of the proposed building, and/or wooden fence. The Commission, in consultation with local officials will determine the style of fencing and/or landscape buffer that is compatible with the neighborhood.**

The Applicant complies with design standard C above, in that its facility is enclosed in a 50' X 50' fenced in area and further surrounded by a 20' X 20' landscaped area. The proposed Facility is also located on commercial and industrial lot utilized for a garden center and storage.

5. Lighting and Signage

- a. **Personal wireless service facility mounts should be lighted only if required by the Federal Aviation Administration (FAA).**

Lighting of equipment shelters and any other facilities on the ground should be designed in accordance with Technical Bulletin #95-001, Development of Regional Impact Guidelines for Exterior Lighting.

The Applicant hereby agrees to comply with this requirement. Please also see the attached FAA approval.

- b. All signs should comply with the FCC and applicable requirements of the town's sign regulations.**

The Applicant hereby agrees to comply with this requirement. Please also see the attached FCC license for T-Mobile.

- 6. Historic Districts Personal wireless service facilities should not be located within an historic district unless they are completely camouflaged.**

The proposed Facility is not located within a Historic District.

- 7. Scenic Landscapes and Vistas**

- a. Personal wireless service facilities should not be located within open areas that are visible from public roads, recreational areas or residential development. All ground-mounted personal wireless service facilities which are not camouflaged by existing buildings or structures should be surrounded by a buffer of dense tree growth.**

The Applicants proposed Facility is located on a large 17 acre lot which has been partially cleared for use as a garden center and storage. The Property provides ample tree cover to camouflage the proposed Monopole and the Applicant has entered into a Buffer Zone agreement with the landlord to protect a specific section of tree cover that is critical to buffering the proposed Monopole.

The Applicant has also provided photo simulations, based on a balloon test, depicting the minimal impact the proposed Facility will have on the surrounding view shed. Please see the attached photo simulations.

- b. Any personal wireless service facility that is located within the viewshed of a scenic vista, scenic landscape or scenic road as designated by a town should not exceed the height of vegetation at the proposed location.**

The Applicant has worked closely with the Commissions historic preservationist and has provided photo simulations of the proposed Monopole from various locations on Peters Pond and major intersections.

- B. Noise Standards. Ground-mounted personal wireless service facilities should not generate noise from equipment and/or wind in excess of 50 db at the property line.**

Please see the attached Noise Affidavit prepared by Krupakaran Kolandaivelu, P.E. of Network Building and Consulting, dated October 19, 2016.

- C. Radiofrequency Radiation (RFR) Standards: All equipment proposed for a personal wireless service facility should be authorized per the FCC Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (FCC Guidelines).**

The Applicant hereby agrees to comply with this requirement. Please also see the attached Radio Frequency Affidavit, prepared by Ryan Monte de Ramos, a T-Mobile Radio Frequency Engineer.

- D. Hazardous Materials Standards: Under the Regional Policy Plan, a wireless facility in a Wellhead Protection District is limited to household quantities of hazardous materials/waste. The Commission may require provisions for full containment of any hazardous materials used on-site, including an enclosed containment area with a sealed floor, designed to contain 110% of the total volume of all hazardous materials used, handled or stored on the site and a prohibition on floor drains. No hazardous waste should be discharged on the site of any personal wireless service facility.**

There will be no hazardous materials or waste, generated, used or stored at the proposed personal wireless service facility.

- 4. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Co-location requirements for a Personal Wireless Service Facility set forth in Section VII of the Technical Bulletin, as follows:**

- A. Licensed carriers should share personal wireless service facilities and sites where feasible and appropriate, thereby reducing the number of personal**

wireless service facilities that are stand-alone facilities. All applicants for a personal wireless service facility should demonstrate a good faith effort to co-locate with other carriers. Such good faith effort includes:

1. A survey of all existing structures that may be feasible sites for co-locating personal wireless service facilities;
2. Contact with all the other licensed carriers for commercial mobile radio services operating in the County; and
3. Sharing information necessary to determine if co-location is feasible under the design configuration most accommodating to co-location.

T-Mobile has conducted an extensive alternative site analysis and determined that there are no existing structures upon which to install or co-locate its proposed Facility. Please see the attached Alternative Site Analysis and Existing Tower Inventory.

Eco-Site is in the business of developing telecommunications towers and has every intention of providing additional space for all other licensed carriers for commercial mobile radio services operating in the County. As evidenced by its co-applicant's interest in the site, this is an area of Sandwich that is in need of additional coverage and capacity for commercial mobile radio service providers.

The Applicant has also provided the Commission with a Co-Location Commitment stating its intention to allow additional carriers to utilize its site. Please see the attached Co-Location Commitment.

- B. In the event that co-location is found to be not feasible, a written statement of the reasons for the infeasibility should be submitted to the Commission. The Commission may retain a technical expert in the field of RF engineering to verify if co-location at the site is not feasible or is feasible given the design configuration most accommodating to co-location. If the Executive Director of the Commission or his/her designee determines it will require the services of an outside consultant / technical expert to assist in the project evaluation, the project Applicant will deposit with the Commission an amount of money estimated to cover 100% of these services. If this initial estimate is insufficient to adequately review the project proposal, the Applicant will provide the additional funds necessary. Any funds not expended at the conclusion of the review will be returned to the Applicant. The Commission may deny a permit to an applicant that has not demonstrated a good faith effort to provide for co-location.**

The Applicant has specifically designed the Proposed Monopole at a specific height and structural standard to enable it to accommodate additional licensed carriers. The proposed Monopole can accommodate a total of four (4) antenna arrays, including T-Mobile's. Please see the attached Plans and Co-Location Commitment.

- C. If the applicant does intend to co-locate or to permit co-location, the Commission may request drawings and studies which show the ultimate appearance and operation of the personal wireless service facility at full build-out.**

Please see the attached Plans.

- D. If the Commission approves co-location for a personal wireless service facility site, the permit should indicate how many facilities of what type shall be permitted on that site, including the type, size and location of storage cabinets or buildings. Facilities specified in the Development of Regional Impact (DRI) approval should require no further Commission review. Estimates of RFR emissions will be required for all facilities, including proposed and future facilities.**

The Applicant has shown a total of four (4) antenna arrays on the Plans for its proposed Facility and respectfully requests that DRI approval not be required for those additional facilities.

- 5. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Monitoring and Maintenance requirements for a Personal Wireless Service Facility set forth in Section IX of the Technical Bulletin, as follows:**

- A. After the personal wireless service facility is operational, the applicant should submit, within 90 days of beginning operations, and at annual intervals from the date of issuance of the DRI Certificate of Compliance, existing measurements of RFR from the personal wireless service facility. Such measurements should be signed and certified by a RF engineer, stating that RFR measurements are accurate and meet FCC Guidelines as specified in the Radiofrequency Standards (sub-section VI C) of these Guidelines.**

The Applicant hereby agrees to comply with this requirement.

- B. After the personal wireless service facility is operational, the applicant should submit, within 90 days of the issuance of the DRI Certificate of Compliance, and at annual intervals from the date of issuance of the DRI Certificate of Compliance, existing measurements of noise from the personal wireless service facility. Such measurements should be signed by an**

acoustical engineer, stating that noise measurements are accurate and meet the Noise Standards (sub-section VI.B.) of these Guidelines.

The Applicant hereby agrees to comply with this requirement.

- C. The applicant and co-applicant should maintain the personal wireless service facility in good condition. Such maintenance includes, but is not be limited to, painting, structural integrity of the mount and security barrier, and maintenance of the buffer areas and landscaping.

The Applicant hereby agrees to comply with this requirement.

- 6. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the Abandonment requirements for a Personal Wireless Service Facility set forth in Section X of the Technical Bulletin, as follows:

- A. At such time that the owner plans to abandon a personal wireless service facility, such owner should notify the Commission and the Town by certified U.S. mail of the proposed date of abandonment. Such notice should be given no less than 30 days prior to abandonment. In the event that an owner fails to give such notice, the personal wireless service facility shall be considered abandoned if it is not used for a period of six (6) months.

The Applicant hereby agrees to comply with this requirement.

- B. Upon abandonment of the facility, the owner should physically remove the personal wireless service facility within 90 days from the date of abandonment. "Physically remove" includes, but is not limited to:
 - 1. Removal of antennas, mount, equipment shelters and security barriers from the subject property.
 - 2. Proper disposal of the waste materials from the site in accordance with local and state solid waste disposal regulations.
 - 3. Restoring the location of the personal wireless service facility to its natural condition, except that any landscaping and grading should remain after removal of the personal wireless service facility.

The Applicant hereby agrees to comply with this requirement.

- C. If a carrier fails to remove a personal wireless service facility in accordance with this section of these Guidelines, the town shall have the authority to

enter the subject property and physically remove the facility. The Commission should consider requiring the applicant to post a bond at the time of construction to cover costs for the removal of the personal wireless service facility in the event the town must remove the facility.

Should the Commission so require, the Applicant will post a bond at the time of construction to cover costs for the removal of the proposed Facility.

7. The Applicant is entitled to Approval from the Commission because the proposed Facility satisfies the General Criteria for Documenting Need for a Proposed Wireless Facility set forth in Section XI of the Technical Bulletin, as follows:

- A. Introduction:** The Cape Cod Commission has an established hierarchy of preference with regard to locating personal wireless service facilities. Regional Policy Plan Minimum Performance Standard 4.3.2.1 states that “Whenever feasible, new telecommunications facilities shall be required to co-locate with existing facilities in order to minimize their visual impacts.” The Commission’s policy thus encourages locating on existing buildings and structures rather than permitting the construction of new towers or monopoles. Commission review is not required for facilities located on existing buildings or structures. In addition, Commission review is not required for the reinforcement, reconstruction or replacement of an existing wireless communication tower on the same site with an addition of up to 20 feet in height.

The Commission’s DRI review for wireless facilities first focuses on alternatives to proposed new towers or monopoles and looks very closely at existing buildings and structures in the vicinity of the proposed tower as possible alternative locations. Applicants are expected to have pursued these locations prior to application to the Commission and the Town, and must adequately document why these sites have proven to be unsatisfactory to the carrier(s). The Commission’s engineering consultants will assist in reviewing technical data provided by the primary carrier and all co-locating carriers to assess the feasibility of alternatives.

For new towers or monopoles, the Commission seeks sites with limited impact on significant scenic and historic resources, and seeks proposals with siting and design features which successfully camouflage the facility. The Commission also seeks proposals with at least three committed carriers. Although the Commission has reviewed facilities with fewer co-locators than three, it requires documentation that the proposing carrier has contacted in writing all other carriers licensed for Cape Cod regarding the proposed facility. Co-location for new towers or monopoles is stressed and single-

carrier facilities are not encouraged. Single-carrier facilities should incorporate creative solutions which are effectively camouflaged.

As discussed herein and further evidenced by the attached Radio Frequency Affidavit and Radio Frequency Plots, T-Mobile has identified a significant gap in wireless coverage and a significant need for capacity relief in this area of Sandwich. T-Mobile was unable to find a suitable location in which it could install or co-locate its proposed facility. Please see the attached Alternative Site Analysis and Existing Tower Inventory for a more detailed analysis of the exhaustive search conducted by T-Mobile and its Site Acquisition team.

As noted in *Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland*, 231 F.Supp. 2d 396, 406-407 (D. Mass. 2002), the “need for closing a significant gap in coverage, in order to avoid an effective prohibition of wireless services, constitutes another unique circumstance when a zoning variance is required.” Although outside the purview of the Commission, T-Mobile will require variances since it cannot close a significant gap in coverage without installing the Facility in an area that prohibits wireless telecommunications facilities and structures at a height above 35’.

T-Mobile has demonstrated a need for coverage in an area immediately surrounding the Property. The installation proposed by the Applicants is the least intrusive means available to T-Mobile to fill its gap in coverage. Therefore, the need to close this significant gap in coverage constitutes another unique circumstance which is relevant to the grant of the requested DRI approval and variances.

Furthermore, in an effort to increase the amount of available co-location space, the Applicant has designed the Facility to be able to accommodate up to four (4) wireless service providers.

Please see the attached Plans, Photo Simulations, Alternative Site Analysis and Co-Location Commitment.

B. Application Requirements: The following documentation is required to justify need and must be submitted as part of the DRI application. If the need for a new facility is justified, the applicant must also demonstrate that the proposed location will have the least possible impact on surrounding scenic and historic resources, and that the proposed facility design will have the least possible impact on community character. Other information may be requested during the DRI review process.

- 1. Demonstration of a coverage and/or capacity problem requiring a solution.**
 - a. Drive test data showing clear failure points in critical locations.**

- b. **Dropped call statistics and/or capacity statistics (if RF coverage appears sufficient)**
- c. **Zoning or assessors or USGS map (11" x 17" or smaller) showing the location of all existing and proposed personal wireless service facilities for that carrier in the town and in adjacent towns, and showing the area of the coverage or capacity problem.**

Please see the attached Radio Frequency Report, Radio Frequency Affidavit and Drive Test Data prepared by T-Mobile, demonstrating that there is a significant gap in this area of Sandwich.

- 2. **Demonstration that all existing structures have been identified and fairly rejected.**
 - a. **Provide results from tower databases, town records, Cape Cod Commission maps, and other reasonably available resources to identify potential sites on existing structures.**
 - b. **Provide aerial photographs of sufficient resolution and coverage to identify significant features such as utility rights of way, towers, steeples, tanks, and other existing tall structures.**
 - c. **For a) and b), consider area greater than the typical "search ring." Extend search for existing structures to the acceptable coverage contours of adjacent sites.**
 - d. **Provide propagation plots to demonstrate anticipated coverage from rejected sites or structures.**
 - e. **Identify whether a combination of the existing structures considered in a. and b. could address the coverage and/or capacity problem defined in item 1).**
 - f. **Provide documentation that demonstrates that sites with potentially good coverage are not available or otherwise unusable.**

As discussed herein and further evidenced by the attached Radio Frequency Affidavit and Radio Frequency Plots, T-Mobile has identified a significant gap in wireless coverage and a significant need for capacity relief in this area of Sandwich. T-Mobile was unable to find a

suitable location in which it could install or co-locate its proposed facility. Please see the attached Alternative Site Analysis and Existing Tower Inventory for a more detailed analysis of the exhaustive search conducted by T-Mobile and its Site Acquisition team.

- 3. Demonstration that proposed location and height will solve problem**
 - a. Drive test data showing**
 - i. Performance of proposed facility**
 - ii. Composite performance of proposed facility and intersecting facilities**

Please see the attached CW Test prepared by T-Mobile.

- b. Propagation plots in sufficiently enlarged scale to show local terrain effects:**
 - i. Propagation plot of proposed facility alone**
 - ii. Propagation of each adjacent facility, separately (Identify whether each facility is complete, under construction or proposed)**
 - iii. Composite propagation plot (See Presentation Guidelines below for details)**

Please see the attached Radio Frequency Affidavit and Radio Frequency Plots.

- 4. Demonstration that proposed height is minimum necessary to achieve coverage of target area.**
 - a. Provide propagation plots at incrementally lower elevations until reaching an elevation that clearly is not sufficient. Use increments of ten percent of proposed antenna elevation above ground, or ten feet, whichever is greater.**
 - b. Measure and provide data on height of surrounding tree, vegetation, and/or building cover. Supply photographs to corroborate. In complex environments, a plan view is recommended.**

- c. Provide a propagation plot with top of antenna placed ten feet above average surrounding cover line.

Please see the attached Radio Frequency Affidavit and Radio Frequency Plots.

- 5. Demonstration of visual impact of proposed new structure. A balloon test or, preferably and where appropriate, a crane at the proposed site is required. The date, time and location of the test must be advertised in a newspaper of general circulation in the town at least 14 days, but not more than 21 days, prior to the test, and the Commission and the town must be notified in writing at least 14 days prior to the test.
 - a. During crane/balloon test, map locations along local public ways where facility is visible above visual horizon. In addition to mapping local visibility, anticipate roads where distant views are possible. Use of line-of-sight (also called terrain shadowing) mapping software is encouraged to identify areas to send mapping personnel. However, final map must be the result of personal observation.
 - b. Map visibility of a lower tower height for comparison. Select height in coordination with Commission staff. Height could be half of the proposed structure's height or 10 feet above the height of local tree, vegetation or building cover. Mark balloon or crane in visible fashion at the alternate height. Visibility of lower elevation can be mapped at the same time by mapping personnel.
 - c. Field verify actual elevations above ground of test crane or balloon.
 - d. Provide map that indicates visibility of both elevations from public ways. See Presentation Guidelines below for details.
 - e. Confer with Commission and town staff to identify points of view of particular interest or concern to be documented at the time of the crane/balloon test.
 - f. Provide photographs of the proposed site during the crane/balloon test from all representative visibility locations identified in 5.a) and 5.d) and from all points identified in 5.e).

The Applicant conducted its crane / balloon test on September 30, 2016 from approximately 10:00am until 2:30pm. The Applicant published notice of the test in the Cape Cod Times and the Sandwich Enterprise on September 16, 2016 and September 24, 2016 and notified both the Cape Cod Commission and the Town of Sandwich of the test via E-mail on September 14, 2016. As such, the Applicant has complied with the notice provisions of this section.

The balloon test was done at 130', the proposed height of T-Mobile's facility, and 120' feet.

Furthermore, the Applicant has prepared an extensive set of photo simulations, consistent with the request of the Commission's historical preservationist.

Please see the attached Photo Simulations.

6. Demonstration of Camouflaged Siting and Design Features

- a. 1"= 40' vicinity plan to demonstrate how the proposed siting will limit visibility of the personal wireless service facility, showing the following:
 - i. Property lines for the subject property and adjacent properties within 300 feet of the project property.
 - ii. Existing tree cover on the subject property and adjacent properties within 300 feet, by dominant species and average height, as measured by or available from a verifiable source.
 - iii. Outline of all existing buildings, including purpose, on subject property and adjacent properties within 300 feet.
 - iv. Location of all roads, public and private, on the subject property and adjacent properties within 300 feet including driveways proposed to serve the personal wireless service facility.
 - v. Proposed location of antenna, mount, equipment shelter(s), and security barrier.

- vi. Distances, at grade, from the proposed personal wireless service facility to each building on the vicinity plan.
- vii. Contours at each two feet AMSL for the subject property and adjacent properties within 300 feet.
- viii. All proposed changes to the existing property, including grading, vegetation removal, parking and temporary or permanent roads and driveways.

Please see the attached Plans.

- b. Cross-sections of the proposed antennas, mounts, equipment shelter(s) and security barrier, showing dimensions of all features, to demonstrate how the design of the facility will be streamlined to limit visibility. The Commission seeks a clean architectural appearance that limits visually cluttered equipment such as mounting hardware, pipes, bolts, and cables.
- c. Color and materials of the proposed personal wireless service facility, represented by a color board showing actual colors proposed for antennas, mounts, equipment shelters, cable runs and security barrier, if any.
- d. Existing vegetation and proposed landscaping, identified by size and species, shown both in plan and cross- section to demonstrate how vegetation will limit the visibility of the proposed facility.
- e. If lighting of the site is proposed, a manufacturer's computer-generated point-to-point printout, indicating the horizontal footcandle levels at grade within the site and 25 feet beyond the property lines. Any FAA lighting requirements and information on the types of luminaires proposed.

Please see the attached Plans and Photo Simulations.

7. Demonstration of Co-Location Capability

- a. Documentation in writing that the proposing carrier has contacted all other carriers licensed for Cape Cod regarding the proposed facility.
- b. Information showing the proposed structure fully populated with wireless facilities, showing all positions and types of facilities which can be accommodated on the proposed facility.

Please see the attached Plans and Co-Location Commitment.

- 8. **Radiofrequency Radiation (RFR) Filing Requirements:** The applicant should provide a statement listing the existing and maximum future projected measurements of RFR from the proposed personal wireless service facility, for the following situations:
 - a. Existing, or ambient: the measurements of existing RFR.
 - b. Existing plus proposed personal wireless service facilities: maximum estimate of RFR from the proposed personal wireless service facility plus the existing RFR environment.
 - c. Certification, signed by a RF engineer, stating that RFR measurements are accurate and meet FCC Guidelines as specified in the Radiofrequency Radiation Standards (sub-section VI.C.) of these Guidelines.

Please see the attached Radio Frequency Affidavit.

- 9. **Hazardous Materials Filing Requirements:** The applicant should provide a written description of the type(s) and quantities of any hazardous waste and/or hazardous materials to be used, stored or generated for each wireless carrier proposed to be located on the project site, as well as provide a written description and plans for containment of any hazardous materials/waste.

There will be no hazardous materials, or waste, generated, stored, or used at the proposed Facility.

- 10. **Noise Filing Requirements:** The applicant should provide a statement listing the existing and maximum future projected measurements of noise from the proposed personal wireless service facilities, measured in decibels Ldn (logarithmic scale, accounting for greater sensitivity at night), for the following:

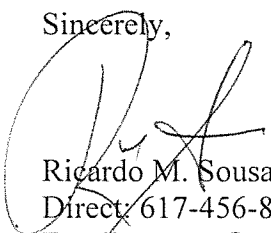
- a. Existing, or ambient: the measurements of existing noise.
- b. Existing plus proposed personal wireless service facilities: maximum estimate of noise from the proposed personal wireless service facility plus the existing noise environment. Such statement should be certified and signed by an acoustical engineer, stating that noise measurements are accurate and meet the Noise Standards (subsection VI.B.) of these Guidelines.
- c. The Commission may waive one or more of the application filing requirements of this section if it finds that such information is not needed for a thorough review of a proposed personal wireless service facility.

Please see the attached Noise Affidavit.

E. Conclusion

The Applicants hereby request that the Commission determine that the Applicant has satisfied the requirements for the grant of the requested relief and to further determine that the proposed Monopole and T-Mobile Facility will not have an adverse impact upon the subject neighborhood and the Town of Sandwich. The Property is an appropriate location for the installation and operation of the proposed Monopole and T-Mobile Facility and the proposal set forth herein represents the least intrusive means through which T-Mobile can close a significant gap in reliable service coverage under the By-Law.

Sincerely,



Ricardo M. Sousa, Esq.
Direct: 617-456-8123
Email: rsousa@princelobel.com

5

Town Of Sandwich

THE OLDEST TOWN ON CAPE COD

OFFICE OF THE BOARD OF ASSESSORS
ASSESSING DEPARTMENT



16 Jan Sebastian Drive
Sandwich, MA 02563-2319
TEL: 508-888-0157
FAX: 508-833-8098
E-mail: assessing@townofsandwich.net

TO: BOARD OF APPEALS

SUBJECT: CERTIFIED LIST OF ABUTTERS AS REQUESTED BY:
KEENAN BRINN FOR PJR REALTY TRUST
MAP 17 PARCEL 9
145 ROUTE 130, FORESTDALE, MA 02644


DATE: SEPTEMBER 30, 2016

THE ATTACHED LIST OF ABUTTERS REQUESTED BY PJR REALTY TRUST
(MAP 17 PARCEL 9) HAS BEEN CERTIFIED BY THE BOARD OF ASSESSORS AS
PER RECORDS IN THE TOWN OF SANDWICH ASSESSOR'S OFFICE AS OF
FISCAL 2017.

BOARD OF ASSESSORS


Nicholas E. Fernandes, Jr.


Lawrence B. Harrington


Robert G. James

Certified list is good for 6 months from the above certification date.

Town Of Sandwich

THE OLDEST TOWN ON CAPE COD

OFFICE OF THE BOARD OF ASSESSORS
ASSESSING DEPARTMENT



SEP 30 '16 AM 8:39

16 Jan Sebastian Drive
Sandwich, MA 02563-2319

TEL: 508-888-0157

FAX: 508-833-8098

E-mail: assessing@townofsandwich.net

LIST OF ABUTTERS REQUEST FOR CERTIFICATION

NOTE: PLEASE ALLOW TEN BUSINESS DAYS FOR A LIST TO BE CERTIFIED BY ASSESSORS, PER M.G.L. 66, S.10 LISTS ARE CERTIFIED ON A "FIRST COME, FIRST SERVE" BASIS, PLEASE PLAN YOUR TIME FRAME ACCORDINGLY

DATE OF REQUEST 9/30 Person requesting certification KEENAN BRINN

Contact Phone Number and/or Email 617-680-5464 kbrinn@nbelle.com

Signature [Signature]

Name of Property Owner/Applicant PJR REALTY TRUST / ECO-SITE

Street Location of Property 145 ROUTE 130 (Russo's Cape Cod Bark)

Map Number 17 Parcel Number 9

Number of Abutters on list 21 + Owner of Record + 4 Towns

The application is for:

- ☒ Board of Appeals (Variance, Special Permit, Comprehensive Permit)
- ☐ Planning Board (Special Permit)
- ☐ Planning Board (Definitive Plan)
- ☐ Selectmen (Road Taking)
- ☐ Selectmen (Utility/pole location)
- ☐ Selectmen (Gasoline/Oil storage tank)
- ☐ Selectmen (Liquor License)
- ☐ Conservation Commission (Notice of Intent)
- ☐ Historic District (Certification of Appropriateness)
- ☐ Board of Health (Site Assignment)
- ☐ Other (Specify) _____

**ABUTTERS' LISTS MUST BE
PAID IN ADVANCE
THANK YOU**

For Use by Assessors

☐ The attached list has more than three errors. Please submit a corrected list.

☒ The attached list is certified to be a correct listing of abutters for the described application, based on the most recent tax list.

Fee \$410.00 Date Paid/Method of Payment 9/30/16 Employee's initials [Signature]

Certified by [Signature]

CK # 227

Parcel ID	Name:	RASHID, ZAHID & SARWAT (TE)		
16-025-	Name 2:			
	Address:	28 PLEASANTWOOD DRIVE		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	28 PLEASANTWOOD DRIVE		

Parcel ID	Name:	STEIDING, DONNA L		
17-003-	Name 2:			
	Address:	7 PRINCESS PINE PATH		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	7 PRINCESS PINE PATH		

Parcel ID	Name:	POTHIER, STEVEN J & STEPHANIE J (TE)		
17-004-	Name 2:			
	Address:	3 PRINCESS PINE PATH		
	Address2:			
	Town:	FORESTDALE	MA	02644-1009
	Property Loc:	3 PRINCESS PINE PATH		

Parcel ID	Name:	DENESHA, JILL M		
17-005-	Name 2:	LOUISE A JOHNSON (JTWROS)		
	Address:	1 PRINCESS PINE PATH		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	1 PRINCESS PINE PATH		

Parcel ID	Name:	MCMULLIN, JOSEPH E & KERRY A (TE)		
17-006-	Name 2:			
	Address:	133 ROUTE 130		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	133 ROUTE 130		

Parcel ID	Name:	JUDSON, TODD A		
17-007-	Name 2:			
	Address:	PO BOX 30		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	137 ROUTE 130		

Parcel ID	Name:	BUCKLAND, STEPHEN & LISA-LEE (TE)		
17-008-	Name 2:			
	Address:	PO BOX 414		
	Address2:			
	Town:	FORESTDALE	MA	02644
	Property Loc:	143 ROUTE 130		

Parcel ID	Name:	SANDWICH TOWN OF - TAX TAKING		
17-010-	Name 2:			
	Address:	130 MAIN ST		
	Address2:			
	Town:	SANDWICH	MA	02563-2208
	Property Loc:	151 ROUTE 130		

Parcel ID	Name:	SULLIVAN, RICHARD J & KATHLEEN A (TE)
17-012-	Name 2:	
	Address:	84 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	84 GREENVILLE DRIVE

Parcel ID	Name:	DOVALO, ENRIQUE JR & JENNIFER ANN (TE)
17-013-	Name 2:	
	Address:	82 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	82 GREENVILLE DRIVE

Parcel ID	Name:	LANG TRUST
17-014-	Name 2:	
	Address:	80 GREENVILLE DRIVE
	Address2:	
	Town:	FORESTDALE MA 02644
	Property Loc:	80 GREENVILLE DRIVE

Parcel ID	Name:	TIERNEY, RUSSELL E & CHERYL A (TE)
17-015-	Name 2:	
	Address:	78 GREENVILLE DRIVE
	Address2:	
	Town:	FORESTDALE MA 02644
	Property Loc:	78 GREENVILLE DRIVE

Parcel ID	Name:	NESS, PHYLLIS M & PETER R NESS (JT)
17-016-	Name 2:	
	Address:	76 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	76 GREENVILLE DRIVE

Parcel ID	Name:	PEPE FAMILY REVOCABLE TRUST
17-017-	Name 2:	LESLIE L & KEVIN A PEPE
	Address:	74 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	74 GREENVILLE DRIVE

Parcel ID	Name:	MURPHY, KENDRA M
17-018-	Name 2:	
	Address:	72 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	72 GREENVILLE DRIVE

Parcel ID	Name:	DEANE, KENNETH P & LAUREL J (TE)
17-019-	Name 2:	
	Address:	70 GREENVILLE DR
	Address2:	
	Town:	FORESTDALE MA 02644-1006
	Property Loc:	70 GREENVILLE DRIVE

Parcel ID	Name: MORETTI FAMILY TRUST
17-210-	Name 2: PEARL & PETER MORETTI
	Address: 3 PETERS POND DR
	Address2:
	Town: FORESTDALE MA 02644-1111
	Property Loc: 3 PETERS POND DRIVE

Parcel ID	Name: THOMAS, BENJAMIN W & HAYLEY V (TE)
17-213-	Name 2:
	Address: 8 QUAKER MEETINGHOUSE ROAD
	Address2:
	Town: FORESTDALE MA 02644
	Property Loc: 8 QUAKER MEETINGHOUSE ROAD

Parcel ID	Name: P A LANDERS, INC
17-214-	Name 2:
	Address: 351 WINTER STREET
	Address2:
	Town: HANOVER MA 02339
	Property Loc: 152 ROUTE 130

Parcel ID	Name: P.A. LANDERS INC.
17-215-	Name 2:
	Address: P O BOX FF
	Address2:
	Town: HANOVER MA 02339
	Property Loc: 142 ROUTE 130

Parcel ID	Name: P.A. LANDERS, INC.
17-216-	Name 2:
	Address: P O BOX FF
	Address2:
	Town: HANOVER MA 02339
	Property Loc: 132 ROUTE 130

Parcel ID	Name: PJR REALTY TRUST
17-009-	Name 2: PASQUALE J RUSSO IV & PASQUALE J
	Address: P O BOX 1328
	Address2:
	Town: FORESTDALE MA 02644
	Property Loc: 145 ROUTE 130

Parcel ID	Name:
0	Name 2:
	Address:
	Address2:
	Town:
	Property Loc:

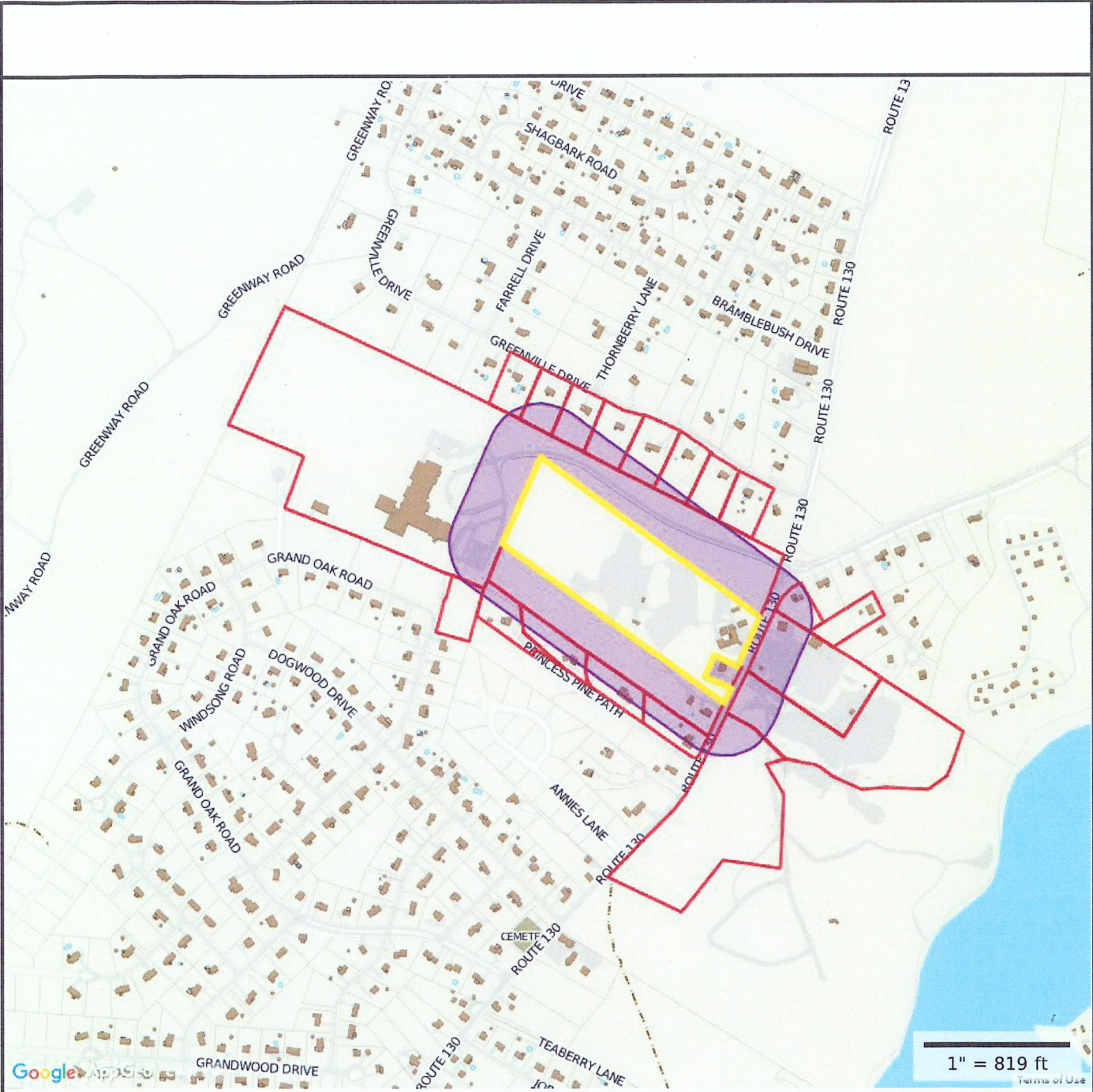
Parcel ID	Name:
0	Name 2:
	Address:
	Address2:
	Town:
	Property Loc:

TOWN OF BARNSTABLE
PLANNING BOARD
200 MAIN STREET
HYANNIS, MA 02601

TOWN OF BOURNE
PLANNING BOARD
24 PERRY AVENUE
BUZZARDS BAY, MA 02532

TOWN OF FALMOUTH
PLANNING BOARD
59 TOWN HALL SQUARE
FALMOUTH, MA 02540

TOWN OF MASHPEE
PLANNING BOARD
16 GREAT NECK ROAD NORTH
MASHPEE, MA 02649



Property Information

Property ID 17-009-
Location 145 ROUTE 130
Owner PJR REALTY TRUST, PASQUALE J
RUSSO IV & PASQUALE J



**MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT**

Town of Sandwich, MA makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

6

Eco-Site

240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707

SITE NAME: RUSSO
SITE #: MA-0049
T-MOBILE SITE #: 4HY0602B



SITE INFORMATION

SITE NAME: RUSSO
SITE ID #: MA-0049

911 SITE ADDRESS: 145 ROUTE 130
SANDWICH, MA 02644

LATITUDE (NAD 83): 41° 41' 41.77" (41.694936) N
LONGITUDE (NAD 83): -70° 29' 57.72" (70.499367) W

JURISDICTION: BARNSTABLE COUNTY
ZONING: R2 (RESIDENTIAL 2)

CONSTRUCTION TYPE: IIB

PARCEL ID NUMBER: 17-009

PARCEL AREA: 17.13± ACRES
PARCEL OWNER: PJR REALTY TRUST,
PASQUALE J RUSSO IV & PASQUALE J
ADDRESS: P.O. BOX 1328
FORESTDALE, MA 2644

GROUND ELEVATION: 150.1' (AMSL)

STRUCTURE TYPE: RAWLAND - MONOPOLE
STRUCTURE HEIGHT: 135'-0" (AGL)
(135'-0" TO HIGHEST APPURTENANCE)

CARRIERS: 0 EXISTING, 1 PROPOSED, 3 FUTURE

USE: PROPOSED TELECOMMUNICATIONS TOWER
AND UNMANNED EQUIPMENT

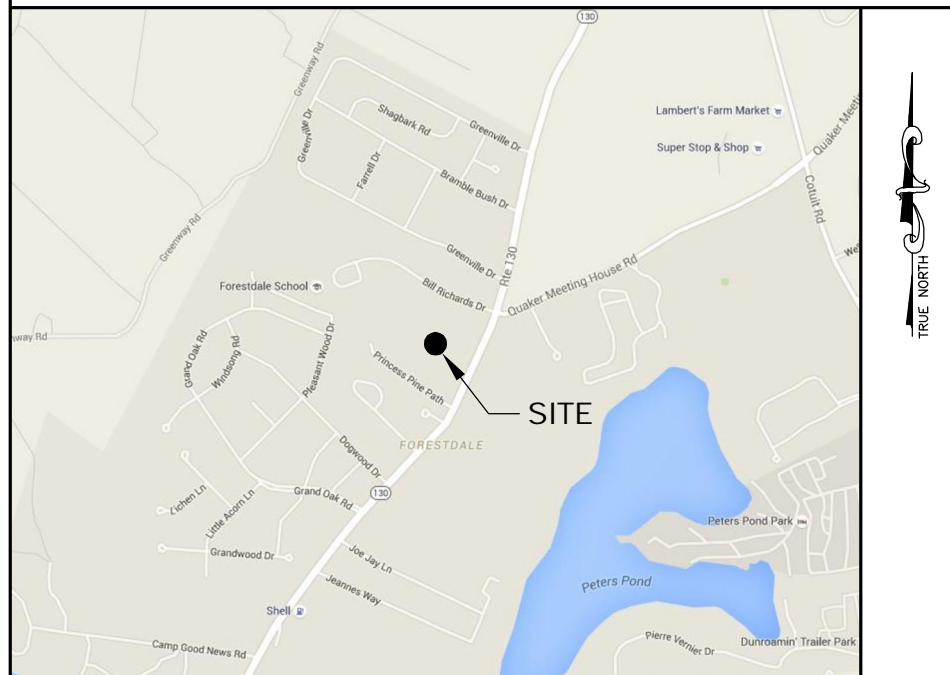
PROJECT TEAM

APPLICANT: ECO-SITE
240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
OFFICE: (919) 636-6810

PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

VICINITY MAP



CODE COMPLIANCE

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

- 2009 INTERNATIONAL BUILDING CODE (MASSACHUSETTS AMENDED 8TH EDITION)
- 2014 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC - REFERENCE 527 CMR
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECORDIA GR-1275
- ANSI/T 311

DRAWING INDEX

T-1	TITLE SHEET
C-1	OVERALL SITE PLAN
C-2	DETAILED OVERALL SITE PLAN
C-3	SITE PLAN
C-4	ELEVATION
C-5	DETAILS
C-6	EROSION & SEDIMENTATION CONTROL PLAN & NOTES
C-7	EROSION & SEDIMENTATION CONTROL DETAILS
C-8	INFILTRATION TRENCH DETAILS & LAND MANAGEMENT NOTES

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	DISAPPROVED/REVISE
PROPERTY OWNER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SITE ACQUISITION	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONSTRUCTION MANAGER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ZONING	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF ENGINEER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ENGINEER



APPLICANT



SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

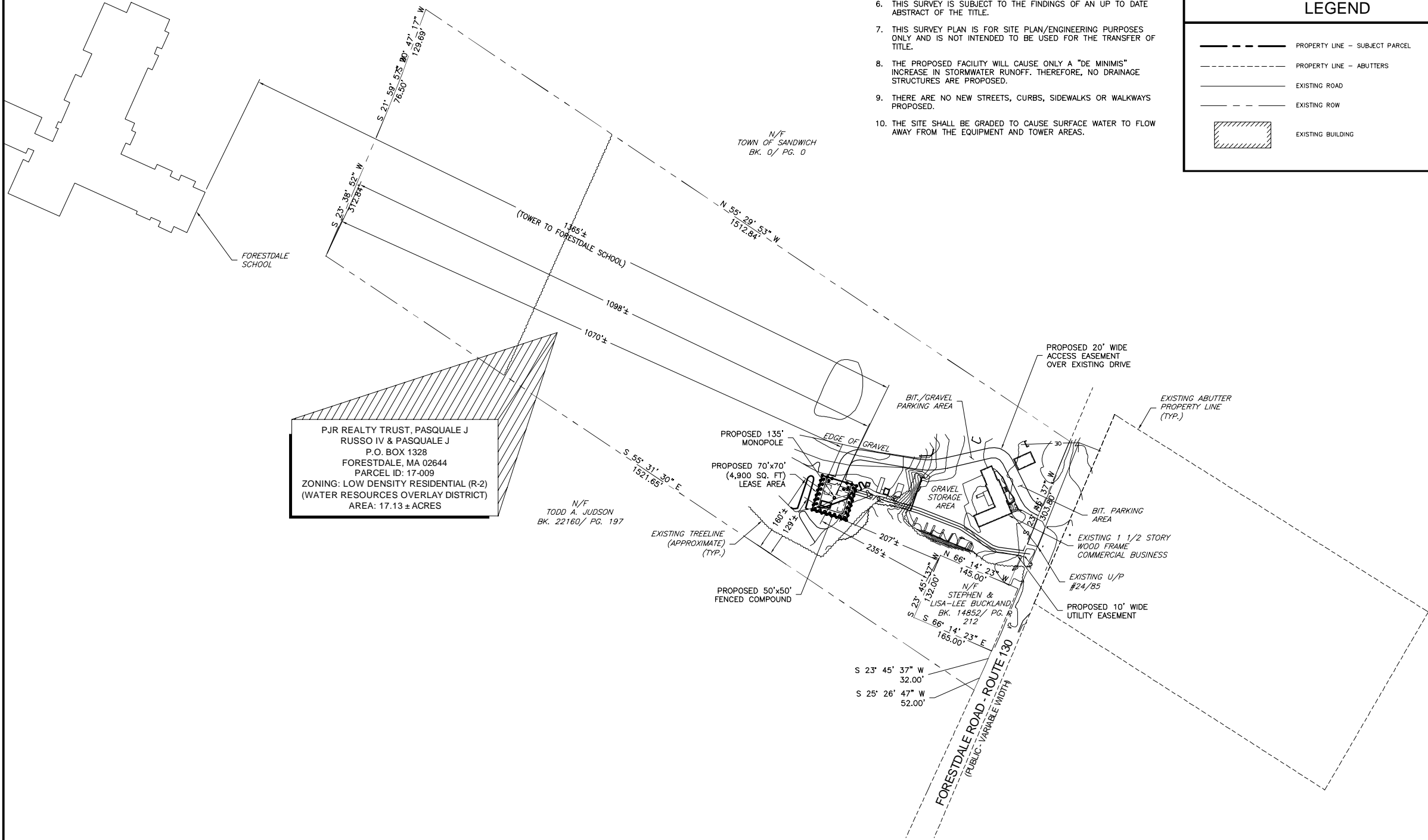
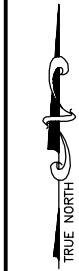
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



SITE NOTES

1. PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, PLANS OF RECORD AND PLANS ENTITLED EXISTING CONDITIONS PLAN OF LAND, BY PFS LAND SURVEYING, INC. DATED 07/03/16 AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
2. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
3. ACCORDING TO FEMA FLOOD INSURANCE RATE MAP FOR THE TOWN OF SANDWICH, MASSACHUSETTS, COMMUNITY PANEL NUMBER 25001C 0528 J, EFFECTIVE DATE JULY 16, 2014, THE PROPOSED FACILITY IS WITHIN ZONE X (AREA OF MINIMAL FLOODING).
4. ALL BEARINGS SHOWN HEREON ARE ROTATED TO TRUE NORTH.
5. UNDERGROUND UTILITIES OR IMPROVEMENTS, IF ANY AND NOT VISIBLE AT TIME OF SURVEY ARE NOT SHOWN.
6. THIS SURVEY IS SUBJECT TO THE FINDINGS OF AN UP TO DATE ABSTRACT OF THE TITLE.
7. THIS SURVEY PLAN IS FOR SITE PLAN/ENGINEERING PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR THE TRANSFER OF TITLE.
8. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
9. THERE ARE NO NEW STREETS, CURBS, SIDEWALKS OR WALKWAYS PROPOSED.
10. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.

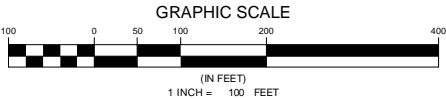
ZONING DATA

ZONING DISTRICT:	LOW DENSITY RESIDENTIAL (R-2) (WATER RESOURCES OVERLAY DISTRICT)	
	REQUIRED	PROPOSED
MINIMUM FRONT YARD:	50'	207'± (COMPOUND)
MINIMUM SIDE YARD:	45'	129'± (COMPOUND)
MINIMUM REAR YARD:	45'	1070'± (COMPOUND)
MAXIMUM TOWER HEIGHT:	150'	135'
TOWER SETBACK:	1 x HEIGHT	234'± / 160'± / 1098'±

LEGEND

	PROPERTY LINE - SUBJECT PARCEL
	PROPERTY LINE - ABUTTERS
	EXISTING ROAD
	EXISTING ROW
	EXISTING BUILDING

1 OVERALL SITE PLAN
C-1 SCALE: 1" = 100'



ENGINEER



NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELSEA, MA 02154
(978) 856-8308

APPLICANT



240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
(919) 636-6810

SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS			
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC
REV	DATE	DESCRIPTION	BY

PROFESSIONAL STAMP



ENGINEER

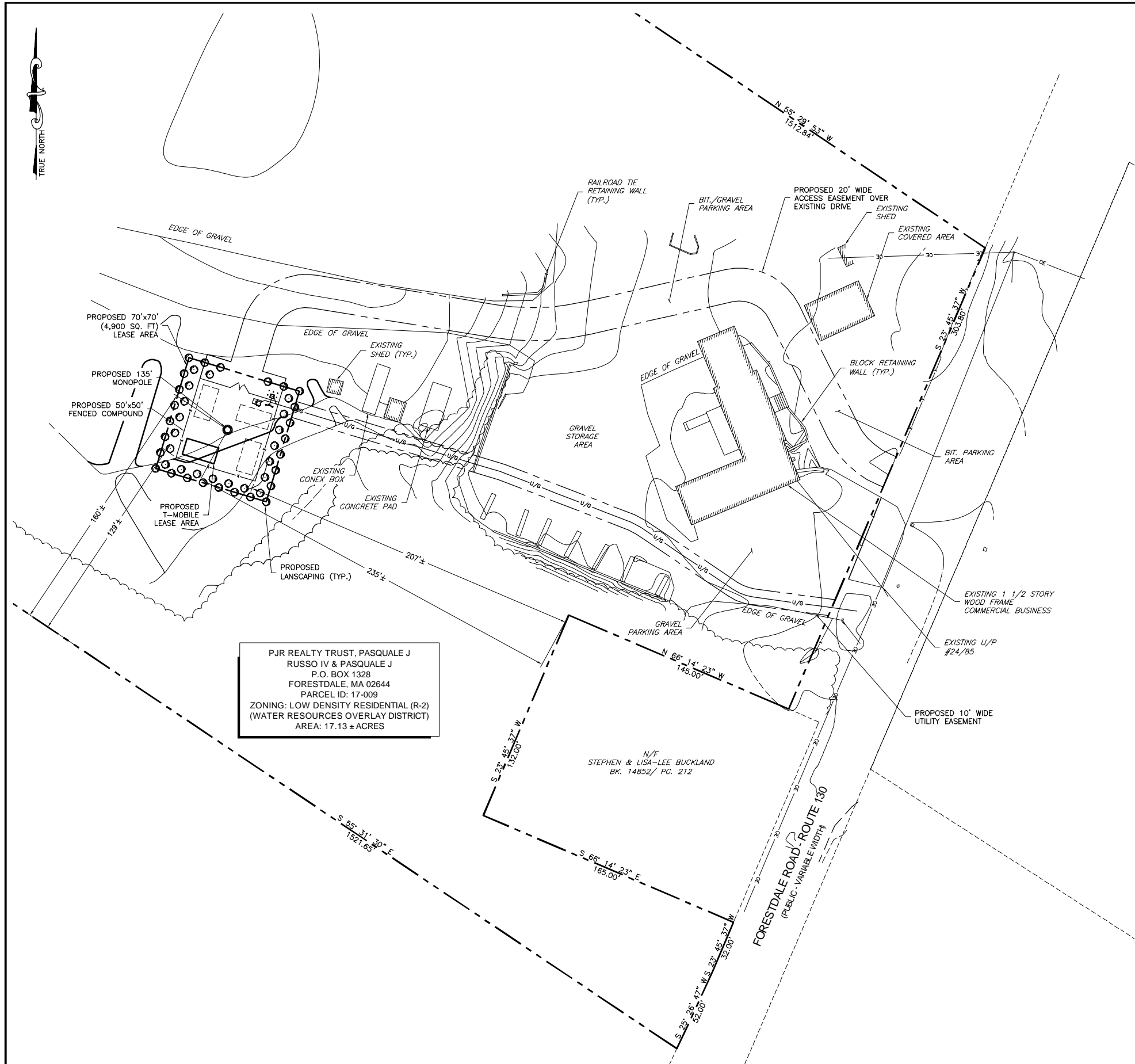
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

OVERALL
SITE PLAN

SHEET NUMBER

C-1



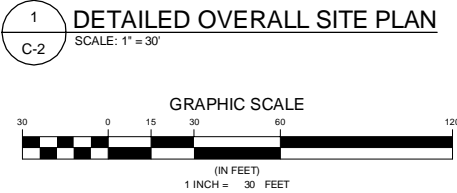
PJR REALTY TRUST, PASQUALE J
RUSSO IV & PASQUALE J
P.O. BOX 1328
FORESTDALE, MA 02644
PARCEL ID: 17-009
ZONING: LOW DENSITY RESIDENTIAL (R-2)
(WATER RESOURCES OVERLAY DISTRICT)
AREA: 17.13 ± ACRES

ZONING DATA		
ZONING DISTRICT:	LOW DENSITY RESIDENTIAL (R-2) (WATER RESOURCES OVERLAY DISTRICT)	
	REQUIRED	PROPOSED
MINIMUM FRONT YARD:	50'	207'± (COMPOUND)
MINIMUM SIDE YARD:	45'	129'± (COMPOUND)
MINIMUM REAR YARD:	45'	1070'± (COMPOUND)
MAXIMUM TOWER HEIGHT:	150'	135'
TOWER SETBACK:	1 x HEIGHT	235'± / 160'± / 1098'±

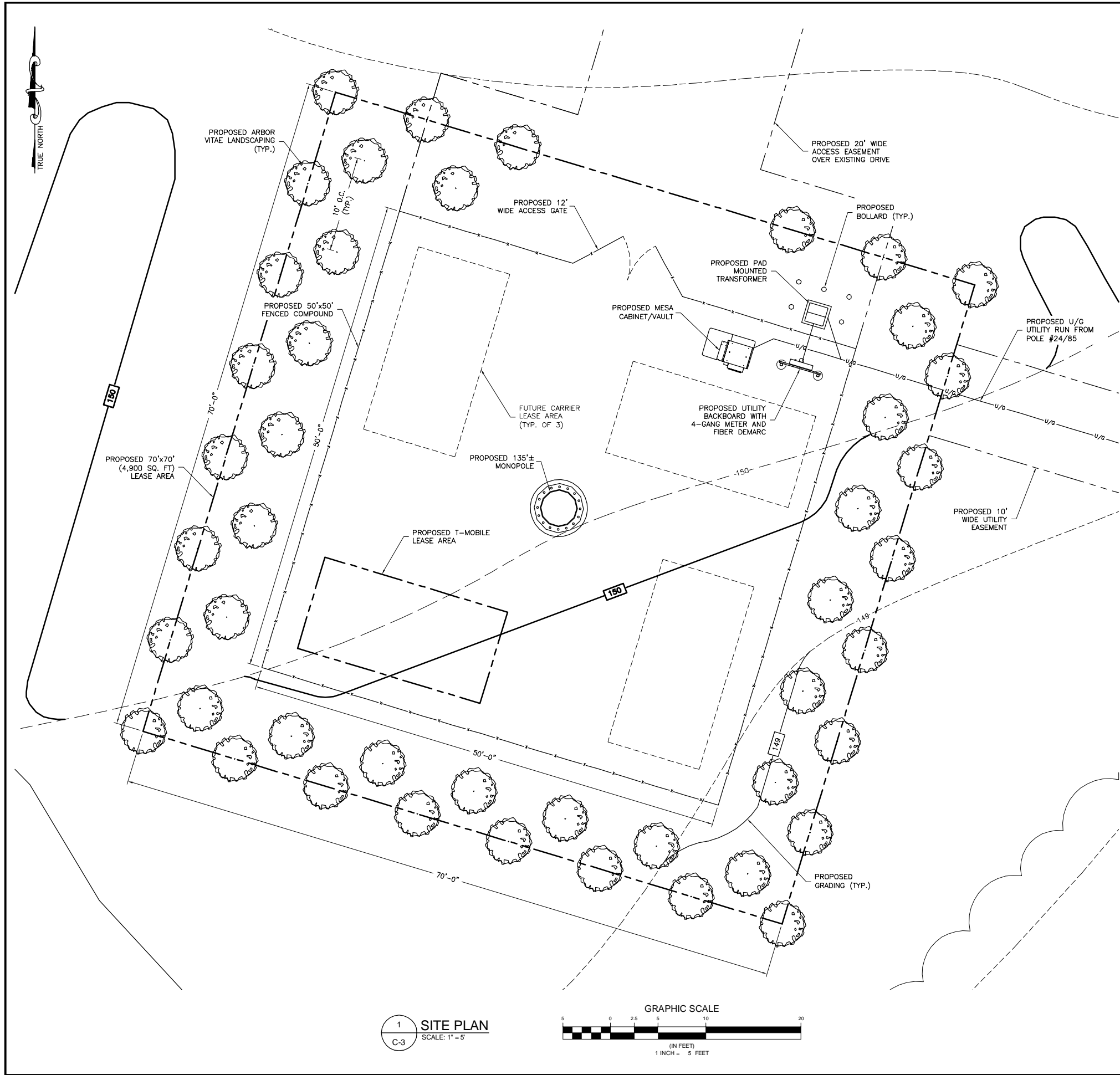
LEGEND	
	PROPERTY LINE - SUBJECT PARCEL
	PROPERTY LINE - ABUTTERS
	EXISTING ROAD
	EXISTING ROW
	EXISTING BUILDING

SITE NOTES

1. PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, PLANS OF RECORD AND PLANS ENTITLED EXISTING CONDITIONS PLAN OF LAND, BY PFS LAND SURVEYING, INC. DATED 07/03/16 AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
2. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
3. ACCORDING TO FEMA FLOOD INSURANCE RATE MAP FOR THE TOWN OF SANDWICH, MASSACHUSETTS, COMMUNITY PANEL NUMBER 25001C 0528 J, EFFECTIVE DATE JULY 16, 2014, THE PROPOSED FACILITY IS WITHIN ZONE X (AREA OF MINIMAL FLOODING).
4. ALL BEARINGS SHOWN HEREON ARE ROTATED TO TRUE NORTH.
5. UNDERGROUND UTILITIES OR IMPROVEMENTS, IF ANY AND NOT VISIBLE AT TIME OF SURVEY ARE NOT SHOWN.
6. THIS SURVEY IS SUBJECT TO THE FINDINGS OF AN UP TO DATE ABSTRACT OF THE TITLE.
7. THIS SURVEY PLAN IS FOR SITE PLAN/ENGINEERING PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR THE TRANSFER OF TITLE.
8. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
9. THERE ARE NO NEW STREETS, CURBS, SIDEWALKS OR WALKWAYS PROPOSED.
10. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.



ENGINEER	 NB+C ENGINEERING SERVICES, LLC. 100 APOLLO DRIVE, SUITE 303 CHELSEA, MA 02154 (978) 856-8308																																				
APPLICANT	 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 636-6810																																				
SITE INFORMATION	RUSSO MA-0049 145 ROUTE 130 SANDWICH, MA 02644 BARNSTABLE COUNTY																																				
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ENGINEER	KRUPAKARAN KOLANDAIVELU, P.E. MA PROFESSIONAL ENGINEER LIC. #50019																																				
SHEET TITLE	DETAILED OVERALL SITE PLAN																																				
SHEET NUMBER	C-2																																				



GENERAL NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES COMPANY OR OTHER PUBLIC AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
8. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES AND NOTIFY UNDERGROUND FACILITIES PROTECTIVE ORGANIZATION AT 1 (800) 962-7962 PRIOR TO EXCAVATION AT SITE.
9. ANY UNDERGROUND UTILITIES OR STRUCTURES THAT EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE IT AND CONTACT THE APPLICANT & THE OWNER'S REPRESENTATIVE.
10. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY 2 TIMES PER MONTH.
11. ALL EXCAVATION WITHIN 36" OF EITHER SIDE OF UNDERGROUND UTILITIES MUST BE COMPLETED BY HAND EXCAVATION METHODS.
12. NO SIGNIFICANT NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
13. THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS REQUIRED).
14. THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
15. POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.
16. THERE ARE NO COMMERCIAL SIGNS PROPOSED FOR THIS INSTALLATION.
17. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
18. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
19. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
20. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
21. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING.
22. THE AREAS DISTURBED DUE TO CONSTRUCTION ACTIVITY SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEED,ED, AND COVERED WITH MULCH.
23. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE NEW YORK STATE GUIDELINES FOR EROSION AND SEDIMENT CONTROL, AND COORDINATED WITH THE TOWN.

ENGINEER

NB+C
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

APPLICANT

Eco-Site

240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
(919) 636-6810

SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
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0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

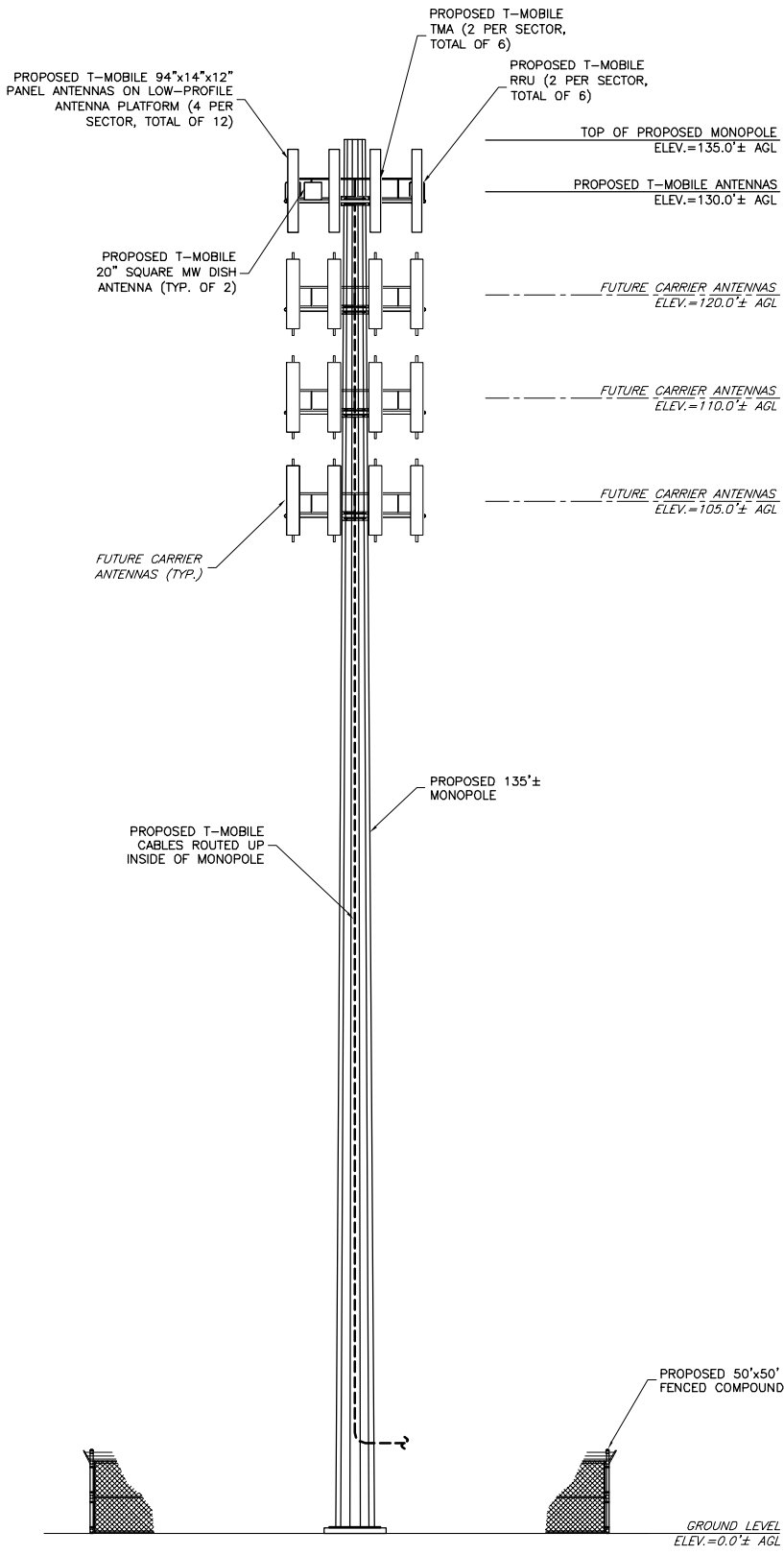
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

SITE PLAN

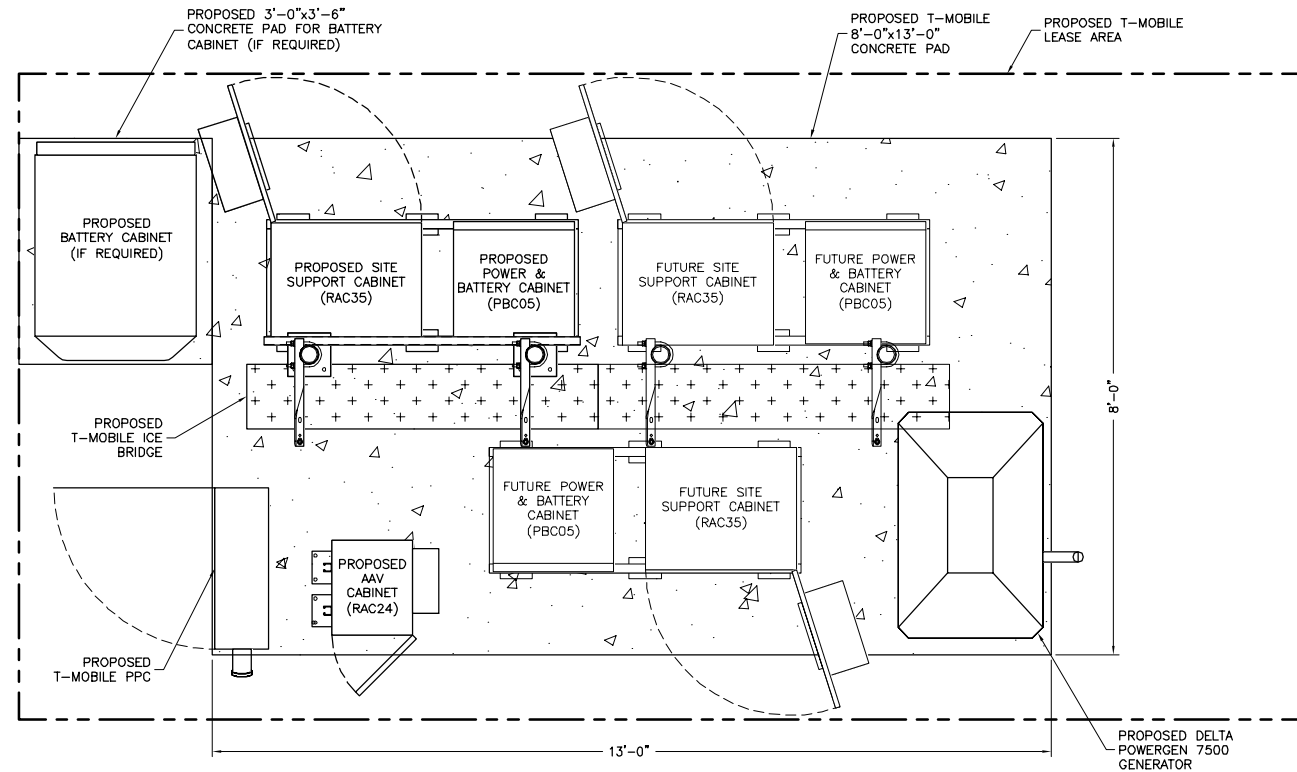
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C-3

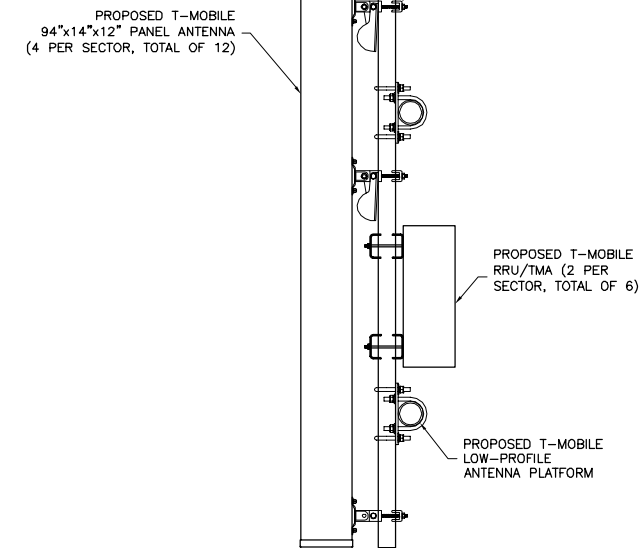


STRUCTURAL NOTE:
CONTRACTOR TO VERIFY ALL PROPOSED AND EXISTING ANTENNAS AND CABLES WERE CONSIDERED AND PASSED A STRUCTURAL ANALYSIS PERFORMED BY A LICENSED ENGINEER PRIOR TO INSTALLATION.

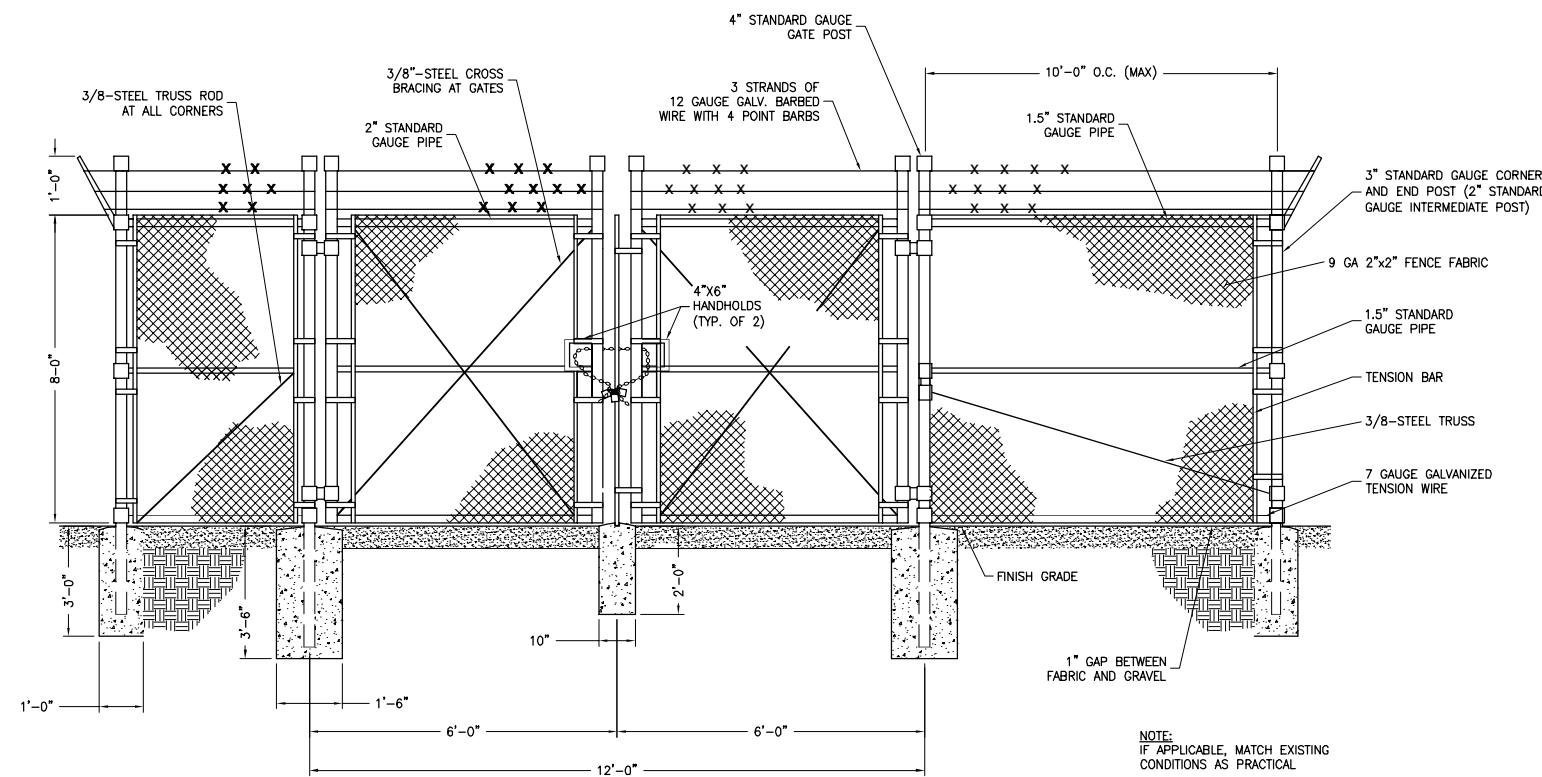
ENGINEER	<div><div>NB+C</div><div>TOTALLY COMMITTED.</div><div>NB+C ENGINEERING SERVICES, LLC. 100 APOLLO DRIVE, SUITE 303 CHELSEA, MA 01824 (978) 856-8308</div></div>																																
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SHEET TITLE	<div>ELEVATION</div>																																
SHEET NUMBER	<div>C-4</div>																																



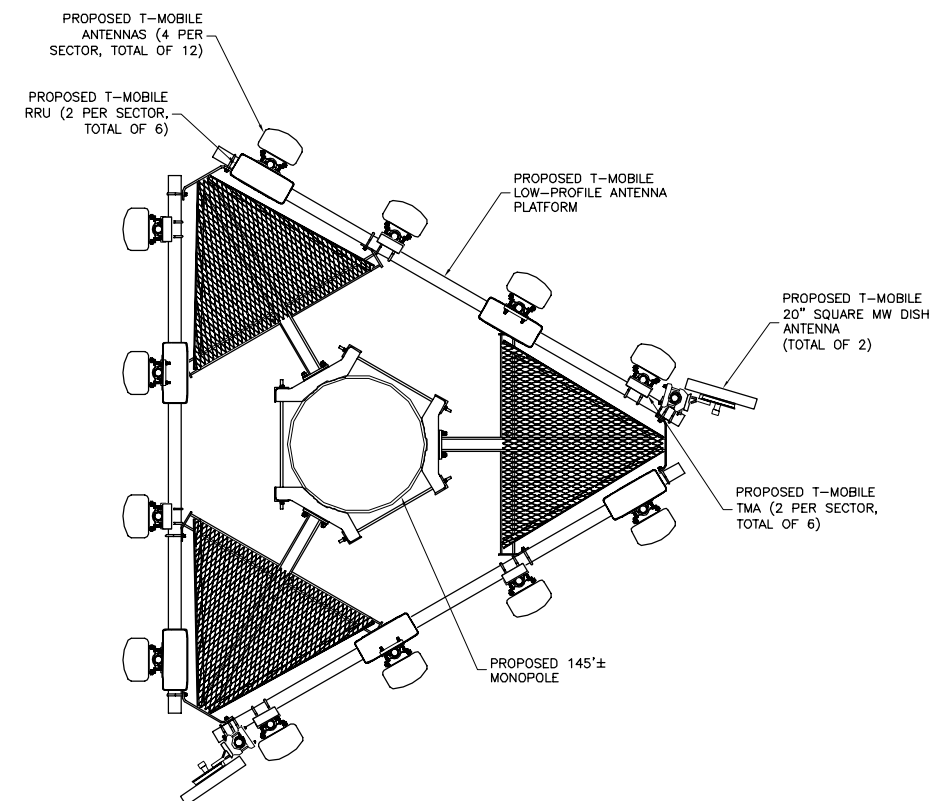
1 PLAN AT EQUIPMENT PAD
C-5 NTS




2 ANTENNA & RRU MOUNTING DETAIL
C-5 NTS

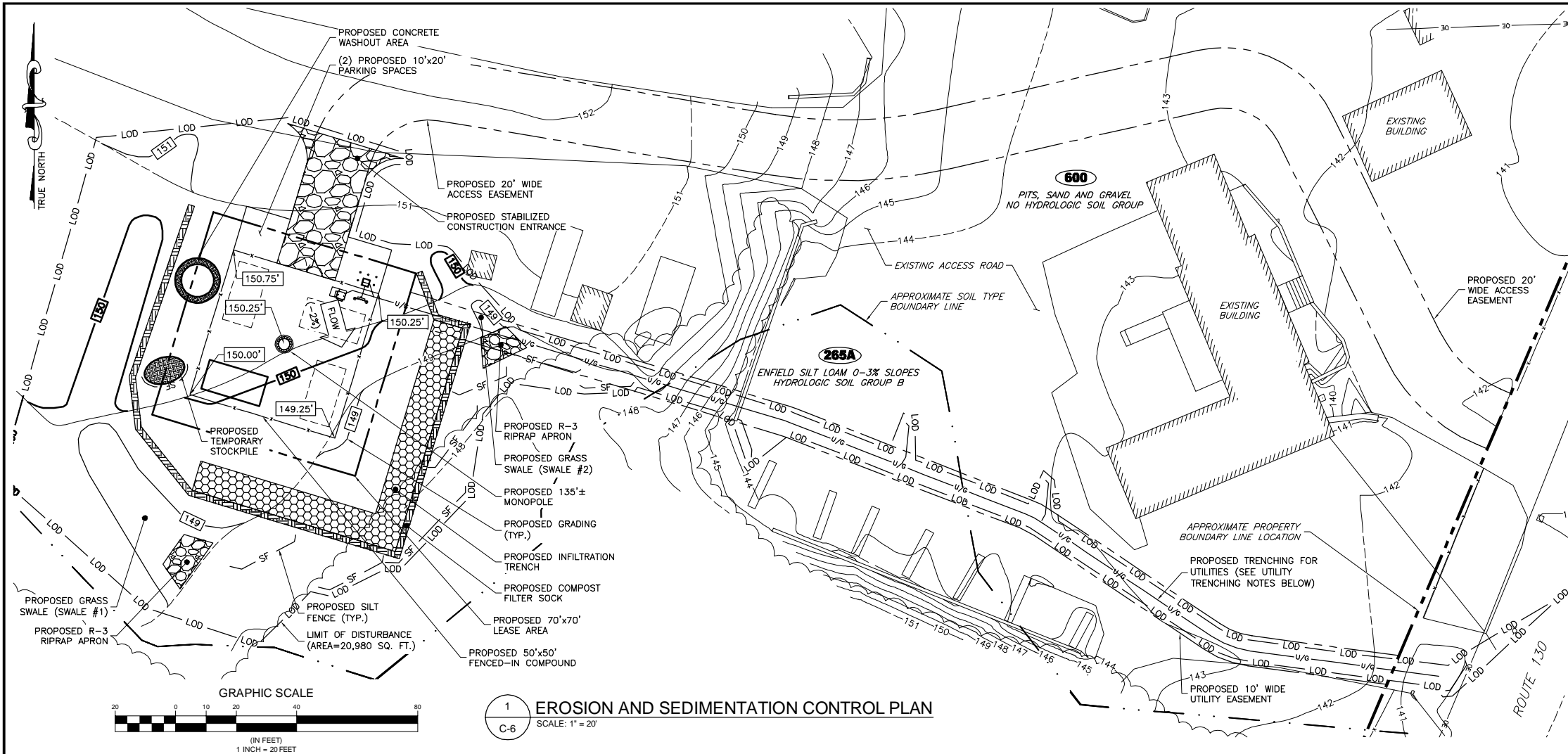


3 TYPICAL FENCE AND GATE DETAIL
C-5 NTS



4 ANTENNA PLAN
C-5 NTS

ENGINEER	<div><div><div>NB+CTM</div><div>TOTALLY COMMITTED.</div></div><div><div>NB+C ENGINEERING SERVICES, LLC.</div><div>100 APOLLO DRIVE, SUITE 303</div><div>CHELSEAFORD, MA 01824</div><div>(978) 856-8308</div></div></div>																																
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SHEET NUMBER	<div><div>C-5</div></div>																																



1 EROSION AND SEDIMENTATION CONTROL PLAN
C-6
SCALE: 1" = 20'

GENERAL EROSION & SEDIMENT CONTROL PROCEDURES

1. THE OPERATOR/RESPONSIBLE PERSON (O/RP) SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
2. THE EROSION AND SEDIMENT CONTROL PLAN IS TO BE USED FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY. IT SHALL NOT BE USED FOR ANY OTHER CONSTRUCTION RELATED ITEMS.
3. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
4. UNTIL A SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. INSPECTIONS SHALL BE LOGGED ONTO NYDEC FORM FROM APPENDIX H OF "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL", AND KEPT ONSITE AT ALL TIMES. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEANOUT, REPAIR, REPLACEMENT, RE-GRADING, RE-SEEDING, RE-MULCHING AND RE-NETTING MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED, WILL BE REQUIRED.
5. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
6. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE CONSERVATION DISTRICT.
7. THE O/RP SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE MUNICIPALITY CONSERVATION DISTRICT, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.
8. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH STATE OF NEW YORK'S "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".
9. THE MUNICIPALITY OR ITS DESIGNEE MAY INSPECT ALL PHASES OF THE CONSTRUCTION, OPERATIONS, MAINTENANCE AND ANY OTHER IMPLEMENTATION OF STORMWATER BMPS.
10. DURING ANY STAGE OF THE REGULATED EARTH DISTURBANCE ACTIVITIES, IF THE MUNICIPALITY OR ITS DESIGNEE DETERMINES THAT ANY BMPS ARE NOT BEING IMPLEMENTED IN ACCORDANCE WITH THIS ORDINANCE, THE MUNICIPALITY MAY SUSPEND OR REVOKE ANY EXISTING PERMITS OR OTHER APPROVALS UNTIL THE DEFICIENCIES ARE CORRECTED.
11. WHEN REQUIRED, ADEQUATE PROVISIONS SHALL BE MADE FOR DUST CONTROL MEASURES AS ARE DEEMED ACCEPTABLE BY THE MUNICIPAL ENGINEER.
12. ALL PUMPING OF SEDIMENT-LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER UNDISTURBED AREAS. NO SEDIMENT OR SEDIMENT LADEN WATER IS ALLOWED TO LEAVE THE SITE WITHOUT FIRST BEING PROPERLY FILTERED.
13. DISTURBED AREAS ON WHICH EARTH MOVING ACTIVITIES HAVE CEASED AND WHICH WILL REMAIN EXPOSED SHALL BE STABILIZED IMMEDIATELY, EITHER TEMPORARILY OR PERMANENTLY, INCLUDING THE RESTORATION OF DRIVEWAYS, STOCKPILES, OFF-SITE UNDERGROUND UTILITY LINES AND GRADED PERIMETER AREAS. DISTURBED AREAS THAT ARE AT FINISHED GRADE OR WHICH WILL NOT BE RE-DISTURBED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS. DURING NON-GERMINATION PERIODS, MULCH MUST BE APPLIED AT RECOMMENDED RATES. CRUSHED STONE ON PAVEMENT SUBGRADES IS CONSIDERED ADEQUATE PROTECTION.

14. WHERE DISTURBED AREAS ARE DIFFICULT TO STABILIZE, NETTING SHOULD BE USED TO HOLD SEED AND MULCH IN PLACE; THIS IS ESPECIALLY IMPORTANT AROUND WATERCOURSES, IN SWALES AND AREAS OF CONCENTRATED FLOWS AND STEEP SLOPES.
15. CONTRACTOR SHALL NOTIFY THE MUNICIPALITY CONSERVATION DISTRICT OF DISPOSAL METHOD AND LOCATION OF MATERIALS (IF ANY) TO BE REMOVED FROM SITE.
16. ALL BUILDING MATERIAL AND WASTES MUST BE REMOVED FROM THE SITE AND RECYCLED IN ACCORDANCE WITH NYDEC'S SOLID WASTE REGULATIONS (REGULATIONS CHAPTER IV, SUPPORT 360-1), AND/OR ANY ADDITIONAL LOCAL, STATE OR FEDERAL REGULATIONS. NO BUILDING MATERIALS (USED OR UNUSED) OR WASTE MATERIALS SHALL BE BURNED, BURIED, DUMPED OR DISCHARGED AT THE SITE.
17. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED OR PLACED IN SOIL STOCKPILES AND STABILIZED.
18. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET; STOCKPILE SLOPES MUST NOT EXCEED 2:1.
19. REFER TO THE SITE / RECORD PLAN FOR ADDITIONAL NOTES.

UTILITY TRENCH EXCAVATION/DISTURBANCE GUIDELINES

1. LIMIT ADVANCED CLEARING AND GRUBBING OPERATIONS TO A DISTANCE EQUAL TO TWO TIMES THE LENGTH OF PIPE INSTALLATION THAT CAN BE COMPLETED IN ONE DAY.
2. WORK CREWS AND EQUIPMENT FOR TRENCHING, PLACEMENT OF PIPE, PLUG CONSTRUCTION AND BACKFILLING SHALL BE SELF CONTAINED AND SEPARATE FROM CLEARING AND GRUBBING AND SITE RESTORATION AND STABILIZATION OPERATIONS.
3. ALL SOIL EXCAVATED FROM THE TRENCH SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
4. LIMIT DAILY TRENCH EXCAVATION TO THE LENGTH OF PIPE PLACEMENT, PLUG INSTALLATION AND BACKFILLING THAT CAN BE COMPLETED THE SAME DAY.
5. WATER WHICH ACCUMULATES IN THE OPEN TRENCH SHALL BE COMPLETELY REMOVED BY PUMPING BEFORE PIPE PLACEMENT AND / OR BACKFILLING BEGINS. WATER REMOVED FROM THE TRENCH SHALL BE PUMPED THROUGH A FILTRATION DEVICE.
6. ON THE DAY FOLLOWING PIPE PLACEMENT AND TRENCH BACKFILLING, THE DISTURBED AREA SHALL BE GRADED TO FINAL CONTOURS AND IMMEDIATELY STABILIZED.
7. SEE SPECIFICATIONS AND DETAILS FOR BACKFILLING AND COMPACTION REQUIREMENTS IN UTILITY TRENCH. ALL FILL COMPACTION AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION SHALL BE AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND SHALL BE COORDINATED WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS.
8. THE CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
9. REFER TO SITE PLAN FOR ADDITIONAL NOTES.

NOTE:

CONSTRUCTION OF SITE WILL TAKE BETWEEN 30 AND 60 DAYS. SILT FENCE WILL BE INSPECTED DAILY AND IF ANY REPAIR OR REPLACEMENT IS REQUIRED IT WILL BE DONE IMMEDIATELY.

PROPOSED IMPERVIOUS COVERAGE

GRAVEL PARKING SPACES	750 SQFT / 0.017 ACRES
GRAVEL COMPOUND	2,500 SQFT / 0.057 ACRES
PROPOSED IMPERVIOUS COVERAGE	3,250 SQFT / 0.075 ACRES
TOTAL AREA OF DISTURBANCE	12,580 SQFT / 0.293 ACRES

LEGEND	
	IRON BAR/PIPE
	CONCRETE MONUMENT
	UTILITY POLE
	FIRE HYDRANT
	TREES/LANDSCAPING
	MANHOLES
	PROPERTY LINE
	ADJACENT PROPERTY LINE
	PROPERTY SETBACK LINE
	RIGHT OF WAY
	LIMIT OF DISTURBANCE
	SOIL TYPE
	SOIL TYPE BOUNDARY
	FEMA FLOODPLAIN BOUNDARY
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	PROPOSED MAJOR CONTOURS
	PROPOSED MINOR CONTOURS
	PROPOSED ELECTRIC
	PROPOSED TELCO
	PROPOSED FENCE
	SILT FENCE
	CHAIN LINK FENCE
	TREELINE

CONSTRUCTION SEQUENCE

AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE O/RP SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE CONSERVATION DISTRICT TO AN ON-SITE MEETING. ALSO, AT LEAST 3 WORKING DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE MASSACHUSETTS ONE CALL SYSTEM INCORPORATED AT 1-888-344-7233 FOR BURIED UTILITIES LOCATIONS.

EROSION AND SEDIMENT BMPS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMPS.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.

1. MOBILIZATION
2. CONSTRUCT TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES
3. ROUGH GRADE SITE
4. INSTALL INFILTRATION TRENCH (SEE NOTES ON ES-3)
5. CONSTRUCT AND MAINTAIN TEMPORARY COVER TO STABILIZE DISTURBED AREAS
6. INSTALL UTILITIES
7. STABILIZE PROPOSED ACCESS ROAD W/ STONE SUB-BASE & PLACE STONE WITHIN COMPOUND AREA
8. COLLECT SILT AND SEDIMENT AND PLACE BACK ON SITE
9. ESTABLISH PERMANENT COVER
10. REMOVE EROSION AND CONTROL MEASURES

IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE O/RP SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

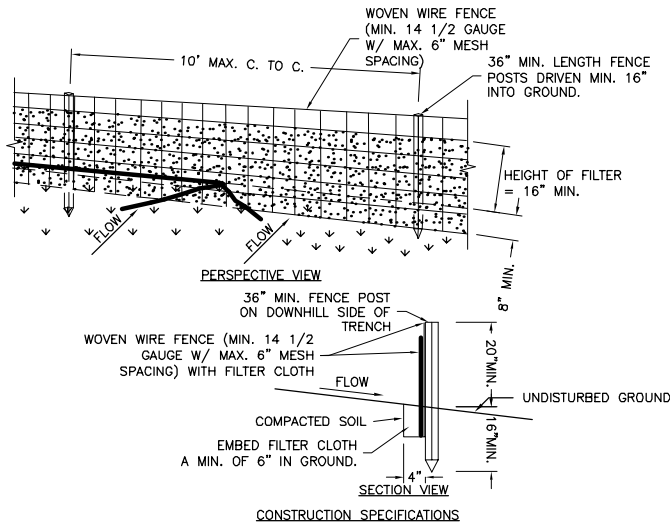
AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.



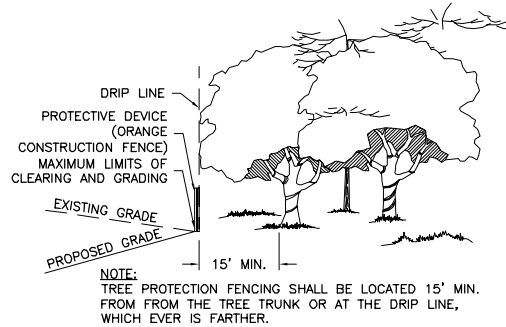
Know what's below.
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ENGINEER	 NB+C ENGINEERING SERVICES, LLC. 100 APOLLO DRIVE, SUITE 303 CHELSEA, MA 01924 (978) 856-8308																																																				
APPLICANT	 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 636-6810																																																				
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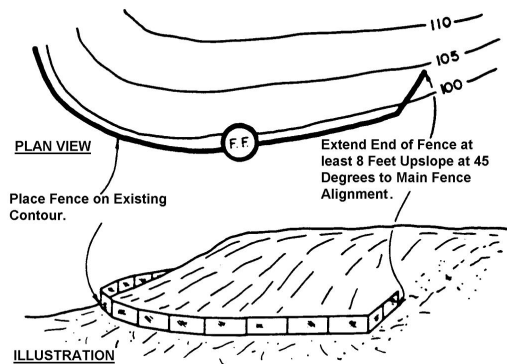


- WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
- FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
- PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
- REMOVE ACCUMALATED DEIMENT BEFORE IT IS HALFWAY UP THE FENCE.
- ENSURE THAT SILT FENCE IS TRENCHED IN GROUND AND THRE ARE NO GAPS

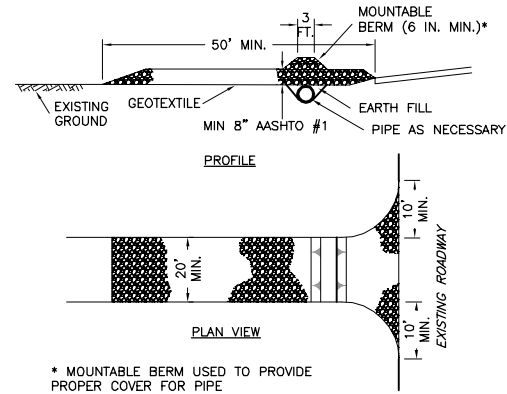
1 STANDARD FILTER FABRIC FENCE
C-7 NTS



4 TREE PROTECTION
C-7 NTS

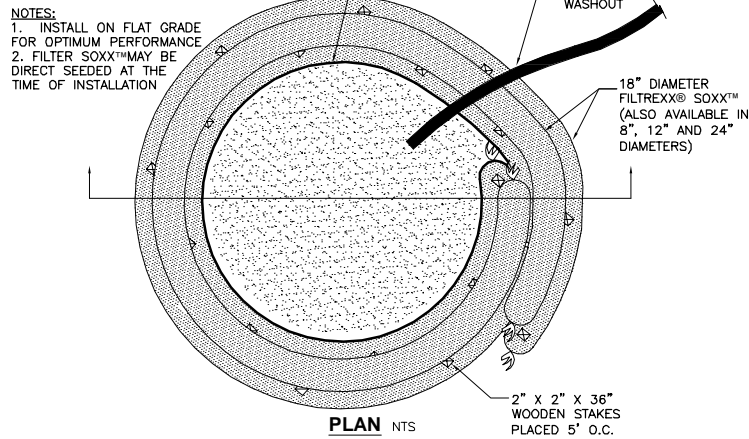
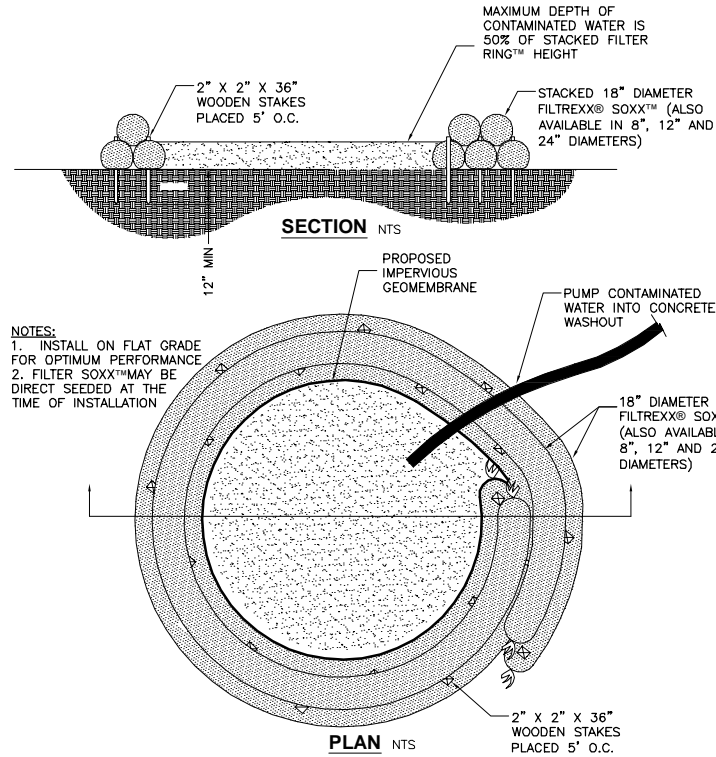


5 SEDIMENT BARRIER ALIGNMENT
C-7 NTS

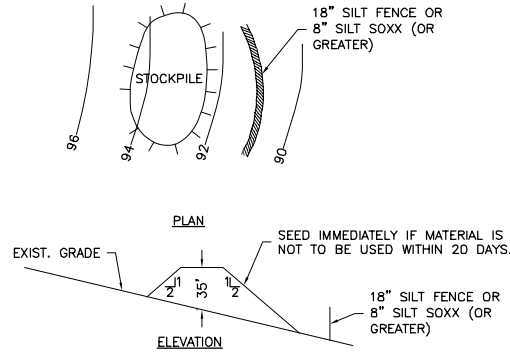


- NOTES:
- REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
- RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
- MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
- MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK, WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

2 ROCK CONSTRUCTION ENTRANCE
C-7 NTS

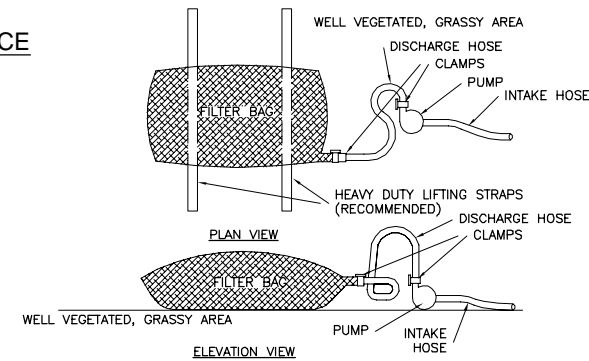


6 FILTREXX CONCRETE WASHOUT DETAIL
C-7 NTS



- NOTES:
- INSTALL SILT FENCE DOWNSLOPE OF AREA OF STOCKPILE.
 - PLACE STOCKPILE IN AREAS SHOWN ON EROSION CONTROL PLAN WITHOUT BLOCKING NATURAL DRAINAGE PATTERNS.
 - FOLLOW DIMENSIONS SHOWN ABOVE. HEIGHT SHOULD NOT EXCEED 35 FT. SIDE SLOPES SHOULD NOT BE STEEPER THAN 2(H):1(V).
 - SEED IMMEDIATELY IF MATERIAL IS NOT TO BE USED WITHIN 20 DAYS. FOLLOW "SEEDING, FERTILIZATION SCHEDULE & SPECIFICATIONS."
 - LOCATION(S) AND SIZE(S) OF SOIL STOCKPILES ARE APPROXIMATE AND SHALL BE ADJUSTED PER FIELD AND CONSTRUCTION SEQUENCE CONDITIONS. CONTRACTOR SHALL VERIFY REQUIRED SIZE(S). REQUIREMENTS FROM THE STANDARDS DETAIL MUST BE FOLLOWED FOR STOCKPILES.

3 TOPSOIL STOCKPILE AND MAINTENANCE
C-7 NTS



- NOTES:
- LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:
- | PROPERTY | TEST METHOD | MINIMUM STANDARD |
|--------------------------|-------------|------------------|
| AVG. WIDE WIDTH STRENGTH | ASTM D-4884 | 60 LB/IN |
| GRAB TENSILE | ASTM D-4632 | 205 LB |
| PUNCTURE | ASTM D-4833 | 110 LB |
| MULLEN BURST | ASTM D-3786 | 350 PSI |
| UV RESISTANCE | ASTM D-4355 | 70% |
| AOS % RETAINED | ASTM D-4751 | 80 SIEVE |

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HO OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

7 PUMPED WATER FILTER BAG
C-7 N.T.S.

ENGINEER

APPLICANT

SITE INFORMATION

DESIGN RECORD

PROFESSIONAL STAMP

ENGINEER

SHEET TITLE

SHEET NUMBER

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CHELMSFORD, MA 01824
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DURHAM, NC 27707
(919) 636-6810

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC



KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

EROSION & SEDIMENTATION CONTROL DETAILS

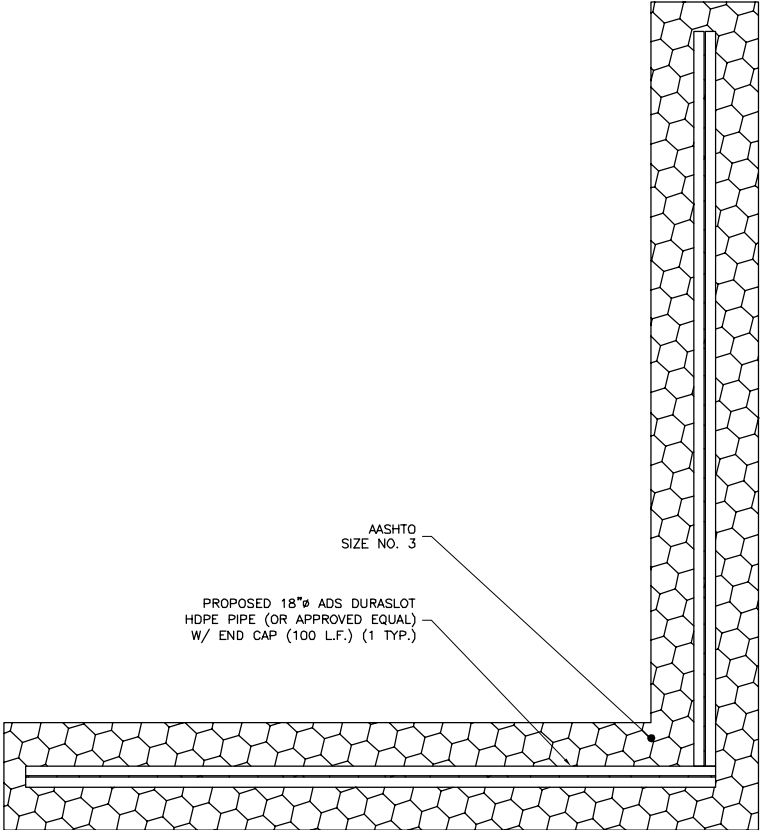
C-7

INFILTRATION TRENCH CONSTRUCTION SEQUENCE

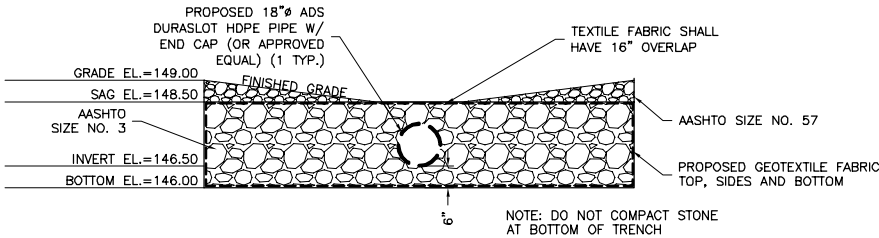
1. MINIMIZE COMPACTION IN AREA OF PROPOSED INFILTRATION TRENCH.
2. IF POSSIBLE, INSTALL TRENCH DURING LAST PHASE OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND /OR DAMAGE FROM CONSTRUCTION ACTIVITY.
3. EXCAVATE INFILTRATION TRENCH BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE. TILL 6 TO 12 INCHES BELOW FINISHED TRENCH BOTTOM TO ENSURE THAT SOIL CONDUCTIVITY IS MAINTAINED. (SCHEDULE INSPECTION WITH CONSERVATION DISTRICT 48 HOURS PRIOR TO EXCAVATION)
4. PLACE NONWOVEN GEOTEXTILE ALONG BOTTOM AND SIDES OF TRENCH. NONWOVEN GEOTEXTILE ROLLS SHOULD OVERLAP BY A MINIMUM OF 16 INCHES WITHIN TRENCH. FOLD BACK AND SECURE EXCESS GEOTEXTILE DURING STONE PLACEMENT.
5. PLACE UNIFORMLY GRADED. CLEAN WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS.
6. INSTALL PERFORATED SLOTTED PIPE AND OBSERVATION WELLS AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED CLEAN WASHED AGGREGATE IN 8 INCH LIFTS.
7. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER INFILTRATION TRENCH, WITH MINIMUM OVERLAP OF 16 INCHES. ALLOW PROPOSED 6 INCH SLOT WITH GRATE TO DAYLIGHT AT TOP OF TRENCH, DO NOT COVER WITH GEOTEXTILE.
8. PLACE 6 INCHES OF AASHTO #57 STONE INDICATED ON PLANS.

INFILTRATION TRENCH CONSTRUCTION NOTES

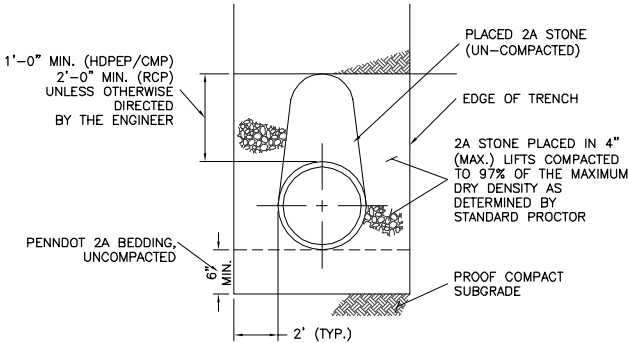
1. DURING CONSTRUCTION OF INFILTRATION TRENCHES, A QUALIFIED DESIGNER MUST OBSERVE AND EVALUATE THE SOIL HORIZONS OF EACH TRENCH EXCAVATION (A PORTION EXTENDING AT LEAST 3 FEET BELOW EACH TRENCH BOTTOM), MUST DETERMINE THE SOIL'S SUITABILITY FOR EACH INFILTRATION TRENCH, AND MUST SUBMIT A SIGNED REPORT OF HIS/HER OBSERVATIONS, EVALUATIONS AND DETERMINATIONS TO YORK TOWNSHIP PRIOR TO CONTINUING CONSTRUCTION OF EACH TRENCH.
2. ORANGE FENCING MUST BE INSTALLED/MAINTAINED TO DELINEATE ALL INFILTRATION AREAS BEFORE/DURING EARTH DISTURBANCE ACTIVITIES.
3. DURING EARTH DISTURBANCE ACTIVITIES, INFILTRATION AREAS MUST BE PROTECTED FROM COMPACTION AND SEDIMENT.
4. NON-WOVEN GEOTEXTILE FOR INFILTRATION TRENCHES SHALL CONSIST OF NEEDED NONWOVEN POLYPROPYLENE FIBERS AND MEET THE FOLLOWING PROPERTIES:
A. GRAB TENSILE STRENGTH (ASTM D4632) ≥ 120 LBS
B. MULLEN BURST STRENGTH (ASTM D3786) ≥ 225 PSI
C. FLOW RATE (ASTM D4491) ≥ 95 GAL/MIN/SFT
D. US RESISTANCE AFTER 500 HRS (ASTM D4355) ≥ 70%
E. HEAT-SET OR HEAT-CALENDARED FABRICS ARE NOT PERMITTED. ACCEPTABLE TYPES INCLUDE MIRAFI 140N, AMOCO 4547, GEOTEX 451, OR APPROVED OTHERS.
5. STONE FOR INFILTRATION TRENCHES SHALL BE 2 INCH TO 1 INCH UNIFORMLY GRADED COARSE AGGREGATE, WITH A WASH LOSS OF NO MORE THAN 0.5%, AASHTO SIZE NUMBER 3 PER AASHTO SPECIFICATIONS, PART 1, 19TH ED., 1998, OR LATER AND SHALL HAVE VOIDS 40% AS MEASURED BY ASTM C29.
6. NON-WOVEN GEOTEXTILE MUST ENVELOP STONE FOR INFULTRATION TRENCHES.
7. GRATES FOR PVC CLEANOUTS SHALL BE AASHTO H10 OR H20 LOAD RATED DEPENDING ON THEIR PLACEMENT (H20 FOR VEHICULAR LOADING).



1 INFILTRATION TRENCH DETAIL
C-8 NTS



2 INFILTRATION TRENCH SECTION
C-8 NTS



- NOTES:
1. IF TRENCH IS EXTREMELY WET DUE TO HIGH GROUNDWATER, USE AASHTO #57 STONE UP TO THE HAUNCHES OF THE PIPE. REMAINDER OF BEDDING TO BE PENNDOT 2A.
 2. FOLLOW 'PIPE INSTALLATION PROCEDURES' PER PENNDOT PUBLICATION 72M - RC-30M.

3 PIPE BEDDING - INFILTRATION TRENCH
C-8 NTS

SEEDING/ STABILIZATION SPECIFICATIONS

1. TOPSOIL STOCKPILE PROTECTION
A. APPLY GROUND LIMESTONE AT A RATE OF 90LBS. PER 1000 SQ.FT.
B. APPLY FERTILIZER (10-20-10) AT A RATE 11LBS. PER 1000 SQ.FT.
C. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ.FT. AND ANNUAL RYEGRASS AT 1 LB. PER 1000 SQ.FT.
D. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
E. PROPERLY ENTRENCH A SILT FENCE AT THE BOTTOM OF THE STOCKPILE.
18. TEMPORARY STABILIZATION SPECIFICATIONS
A. APPLY GROUND LIMESTONE AT A RATE OF 184 LBS. PER 1000 SQ.FT.
B. APPLY FERTILIZER (10-20-10) AT A RATE 11 LBS. PER 1000 SQ.FT.
C. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ.FT. AND ANNUAL RYEGRASS AT 1LB. PER 1000 SQ.FT.
D. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
E. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.
19. PERMANENT STABILIZATION SPECIFICATIONS
A. APPLY TOPSOIL TO A DEPTH OF 5 INCHES (UNSETTLED)
B. APPLY GROUND LIMESTONE AT A RATE OF 184 LBS. PER 1000 SQ.FT. AND WORK FOUR INCHES INTO SOIL.
C. APPLY FERTILIZER (10-20-10) AT A RATE 11 LBS. PER 1000 SQ.FT.
D. APPLY HARD FESCUE SEED AT 2.7 LBS. PER 1000 SQ.FT. AND CREEPING RED FESCUE SEED AT 0.7 LBS. PER 1000 SQ.FT. AND PERENNIAL RYEGRASS SEED AT 0.25 LBS. PER 1000 SQ.FT.
E. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
F. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.

STORMWATER MAINTENANCE PROCEDURES

STRUCTURAL STORMWATER MANAGEMENT AND TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND PRACTICES WILL NEED TO BE MAINTAINED FREQUENTLY. IT IS THE RESPONSIBILITY OF THE OPERATOR TO INSPECT AND MAINTAIN THE CONTROLS SO THAT THEY ARE WORKING EFFICIENTLY. THE OPERATOR NEEDS TO PAY CLOSE ATTENTION TO INSPECTION REPORTS THAT WILL ADVISE OF NEEDED MAINTENANCE. CAPTURED SEDIMENT WILL HAVE TO BE REMOVED PERIODICALLY FROM EACH PRACTICE IN ORDER FOR THE CONTROL TO FUNCTION PROPERLY. IT IS LIKELY THAT IF TEMPORARY CONTROLS ARE NOT MAINTAINED PROPERLY, CONTROLS WILL FAIL CREATING A MASS DISCHARGE OF SEDIMENTATION TO THE WATER BODY PREVIOUSLY PROTECTED. PERIODICALLY REMOVE SEDIMENT FROM THE INFILTRATION TRENCH, CONVEYANCE SWALES, SILT FENCES, CHECK DAMS, SILT SACKS, INLET PROTECTIONS, AND SEDIMENT TRAPS. REPLACE TOP-SOIL, MULCH AND SEED WHERE SEEDING HAS BEEN DISTURBED.

POST-CONSTRUCTION MAINTENANCE FOR THIS PROJECT WILL CONSIST OF ANNUAL INSPECTIONS OF PERMANENT STORMWATER MANAGEMENT FACILITIES. INSPECT AND PERFORM MAINTENANCE TWICE ANNUALLY ON THE CONVEYANCE SWALES AND INFILTRATION TRENCH. THESE MAINTENANCE PROCEDURES ARE ESSENTIAL TO ASSURE CONTINUAL PERFORMANCE OF THE STORMWATER MANAGEMENT PRACTICES ON YOUR SITE. A LICENSED PROFESSIONAL ENGINEER SHALL INSPECT THE SYSTEM ONE YEAR AFTER THE COMPLETION OF THE SYSTEM AND SUBMIT A LETTER CERTIFYING THAT THE SYSTEM WAS INSTALLED AND FUNCTIONS AS DESIGNED. THIS LETTER AND THE MAINTENANCE, INSPECTION, AND OPERATION OF THE CONTROLS ARE THE RESPONSIBILITY OF THE TELECOMMUNICATIONS COMPOUND OWNER.

TEMPORARY STABILIZATION FOR FROZEN CONDITIONS

THE FOLLOWING TEMPORARY STABILIZATION MEASURES MUST BE PERFORMED WHEN CONSTRUCTION IS OCCURRING DURING WINTER/FROZEN GROUND CONDITIONS. THE FOLLOWING REQUIREMENTS DO NOT SUPERCEDE ANY OTHER REQUIREMENTS OF THIS SWPPP AS THEY APPLY TO NON-FROZEN GROUND CONDITIONS.

- PERIMETER EROSION CONTROL MUST STILL BE INSTALLED PRIOR TO EARTHWORK DISTURBANCE AS PER THIS SWPPP.
- ANY AREAS THAT CANNOT BE SEEDED TO TURF BY OCTOBER 1 OR EARLIER WILL RECEIVE A TEMPORARY SEEDING. THE TEMPORARY SEEDING WILL CONSIST OF WINTER RYE SEEDED AT THE RATE OF 120 POUNDS PER ACRE (2.5 POUNDS PER 1,000 SQUARE FEET) OR STABILIZED AS PER THE TEMPORARY STABILIZATION FOR WINTER CONSTRUCTION/FROZEN CONDITIONS.
- ANY AREA OF DISTURBANCE THAT WILL REMAIN INACTIVE FOR A PERIOD OF 14 CONSECUTIVE DAYS MUST BE MULCHED. THIS INCLUDES ANY PREVIOUSLY DISTURBED AREAS THAT ARE COVERED WITH SNOW.
- MULCH MUST CONSIST OF LOOSE STRAW APPLIED AT THE RATE OF 2 TO 3 BALES (90 TO 100 POUNDS) PER THOUSAND SQUARE FEET.
- MULCH MUST BE APPLIED UNIFORMLY OVER THE AREA OF BARE SOIL OR BARE SOIL THAT IS COVERED WITH SNOW. FOR THE LATTER CONDITION, MULCH MUST BE APPLIED ON TOP OF SNOW.
- USING A TRACKED VEHICLE, MULCH MUST BE CRIMPED INTO THE BARE SOIL/SNOW. THE TRACKED VEHICLE MUST BE DRIVEN ACROSS THE MULCHED AREAS IN AT LEAST TWO DIRECTIONS TO MAXIMIZE CRIMPING OF MULCH INTO THE SOIL/SNOW.
- IF MULCH GETS BLOWN OFF AN AREA TO A SIGNIFICANT DEGREE, THE SITE INSPECTOR WILL REQUIRE THAT AN AREA BE RE-MULCHED IN ACCORDANCE WITH ITEMS 2 THROUGH 5 ABOVE, AND THIS AREA WILL BE INCLUDED ON THE INSPECTION CHECKLIST FOR THE NEXT INSPECTION.
- IF A PARTICULAR AREA REPEATEDLY EXPERIENCES LOSS OF MULCH DUE TO WIND, THEN THE INSPECTOR WILL REQUIRE THAT AN ALTERNATIVE METHOD BE USED TO SECURE THE MULCH IN PLACE. SUCH ALTERNATIVES MAY INCLUDE THE USE OF NETTING, TACKIFIER OR OTHER METHODS DEEMED APPROPRIATE BY THE INSPECTOR.
- DURING PERIODS WHEN SNOW IS MELTING AND/OR SURFACE SOILS ARE THAWING DURING DAYTIME HOURS, MULCHED AREAS MUST BE RE-TRACKED (CRIMPED) AS PER ITEM 5 ABOVE AT LEAST ONCE EVERY SEVEN DAYS, MORE FREQUENTLY IF DIRECTED BY THE INSPECTOR. ADDITIONAL MULCH MAY BE REQUIRED TO OBTAIN COMPLETE COVERAGE OF AN AREA. BIODEGRADABLE EROSION CONTROL MATTING MAY BE REQUIRED ON STEEPER SLOPES.
- ADDITIONAL STABILIZATION MEASURES FOR NON-FROZEN GROUND CONDITIONS DESCRIBED IN THE SWPPP WILL BE IMPLEMENTED AT THE TIME DEEMED APPROPRIATE BY THE INSPECTOR.
- DURING THE WINTER SEASON, IF A SITE HAS BEEN STABILIZED AND SOIL DISTURBING ACTIVITIES HAVE BEEN SUSPENDED FOR THE WINTER, WEEKLY INSPECTIONS CAN BE SUSPENDED. HOWEVER, MONTHLY INSPECTIONS MUST STILL BE CONDUCTED. ALL NORMAL WEEKLY INSPECTIONS MUST RESUME WHEN SOIL DISTURBING ACTIVITIES RESUME.

LANDSCAPE MANAGEMENT PLAN

THE LANDSCAPE PLAN DESIGNED FOR THE PROPOSED TELECOMMUNICATION FACILITY IS DESIGNED TO PROVIDE PROPER CONVEYANCE OF STORMWATER RUNOFF, AND A VISUAL BUFFER FOR THE ABUTTERS. THE SEEDING AND STABILIZATION SPECIFICATIONS ARE TO BE FOLLOWED AS LAID OUT WITHIN THE CONSTRUCTION DRAWINGS. UPON COMPLETION OF THE PROJECT AND FINAL STABILIZATION OF THE PROPOSED GRADING, TYPICAL MAINTENANCE AND INSPECTIONS SHALL TAKE PLACE. THE PARTY RESPONSIBLE FOR THE OPERATIONS AND MAINTENANCE OF THE TELECOMMUNICATIONS COMPOUND, OR THEIR REPRESENTATIVE, IS RESPONSIBLE FOR LANDSCAPE MANAGEMENT OF THE PROPOSED INSTALLATION.

GRASS AREAS: PROPOSED GRASS AREAS, INCLUDING THE CONVEYANCE SWALES, ARE TO BE MOWED TWICE A MONTH IN THE SPRING AND FALL MONTHS, AND WEEKLY DURING THE SUMMER MONTHS. LEAF REMOVAL IS TO TAKE PLACE AS NECESSARY DURING THE FALL MONTHS. LEAVES MUST BE REMOVED FROM SWALES AND TRENCH IN ORDER FOR PROPER FUNCTIONALITY OF THE STORMWATER STRUCTURES.

TREE BUFFER: THE PROPOSED TREES SHALL BE PRUNED ONCE YEARLY AS NEEDED TO REMOVE DEAD BRANCHES AND TO ENCOURAGE UPWARD GROWTH. IF AN UNHEALTHY OR DEAD TREE IS FOUND DURING INSPECTION, AN IDENTICAL SPECIES MUST REPLACE THE LOST TREE. TREE STAKES SHALL BE REMOVED FROM TREES AT A TIME SUGGESTED BY THE PROVIDING NURSERY.

LANDSCAPE WASTE: ANY AND ALL WASTE FROM THE INSTALLATION AND MAINTENANCE OF THE PROPOSED LANDSCAPING SHALL BE REMOVED AND DISPOSED OF OFF-SITE.

ENGINEER



NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

APPLICANT



240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
(919) 636-6810

SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

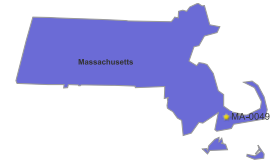
INFILTRATION
TRENCH DETAILS
& LAND
MANAGEMENT
NOTES

SHEET NUMBER

C-8

7

Photographic Simulation Package



Proposed Wireless Telecommunications Facility:

MA-0049 - 4HY0602B Russo
145 Route 130
Sandwich, MA02644

- Proposed new 135 ft AGL monopole type telecommunications facility
- Balloon Test was done utilizing a crane during RF Drive Test and at two different heights as per CCC request:-
 - Red Balloon 145 Ft AGL
 - Yellow Balloon & Crane Basket @ proposed tower height 135 Ft AGL
- Balloon Test completed 9/30/16
- Documentation photographs taken 9/30/16
- Revised 10/19/16 to include potential 4 carrier site

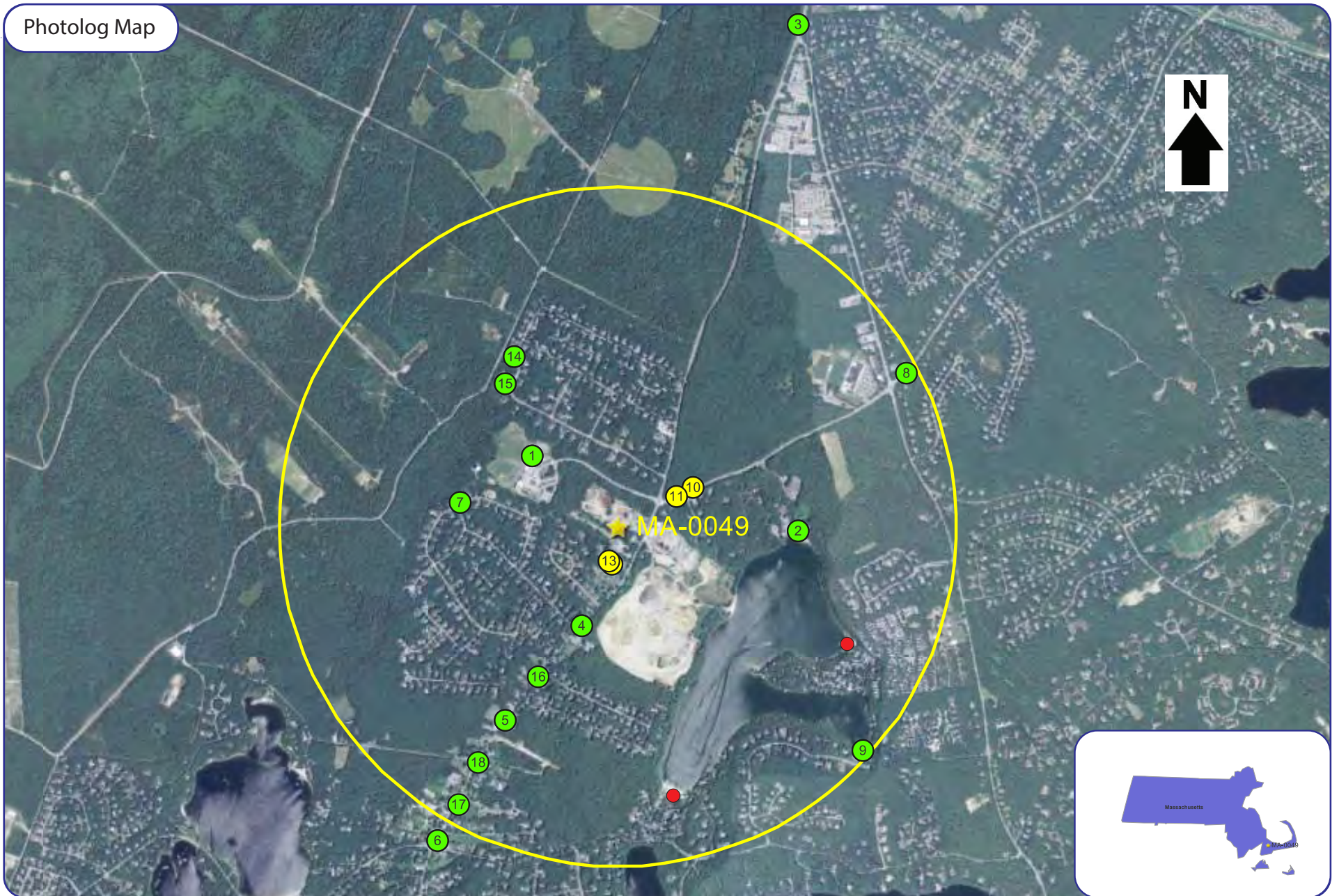
Package prepared by:

Virtual Site Simulations, LLC
9 Walts Way
Narragansett, Rhode Island 02882

www.VirtualSiteSimulations.com

Viewshed analysis maps and representations contained herein depict where proposed facility may potentially be visible based on the best data available and site conditions at the time data was collected. This study does not claim to depict all locations from where the facility may be potentially visible.





Proposed Upgrade to Existing Wireless Telecommunications Facility:
MA-0049 - 4HY0602B Russo
 145 Route 130
 Sandwich, MA02644

- Legend:
- ☆ Facility Location
 - ⊗ Photo location - Balloon not visible
 - ⊙ Photo location - Balloon visible
 - Requested area not accessible
 - 1 Mile Radius

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



Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
1	Bill Richards Dr.	41.69791	-70.50429	+/- 0.33 Miles	North East	133.12	Not Visible

Site: MA-0049 - 4HY0602B Russo

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



Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
2	257 Cotuit Road	41.69467	-70.48913	+/- 0.53 Miles	North West	232.92	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
3	Forestdale Rd. and Cotuit Rd.	41.71626	-70.48910	+/- 1.57 Miles	North	199.4	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
4	Forestdale Rd. North	41.69064	-70.50150	+/- 0.31 Miles	South East	23.62	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location

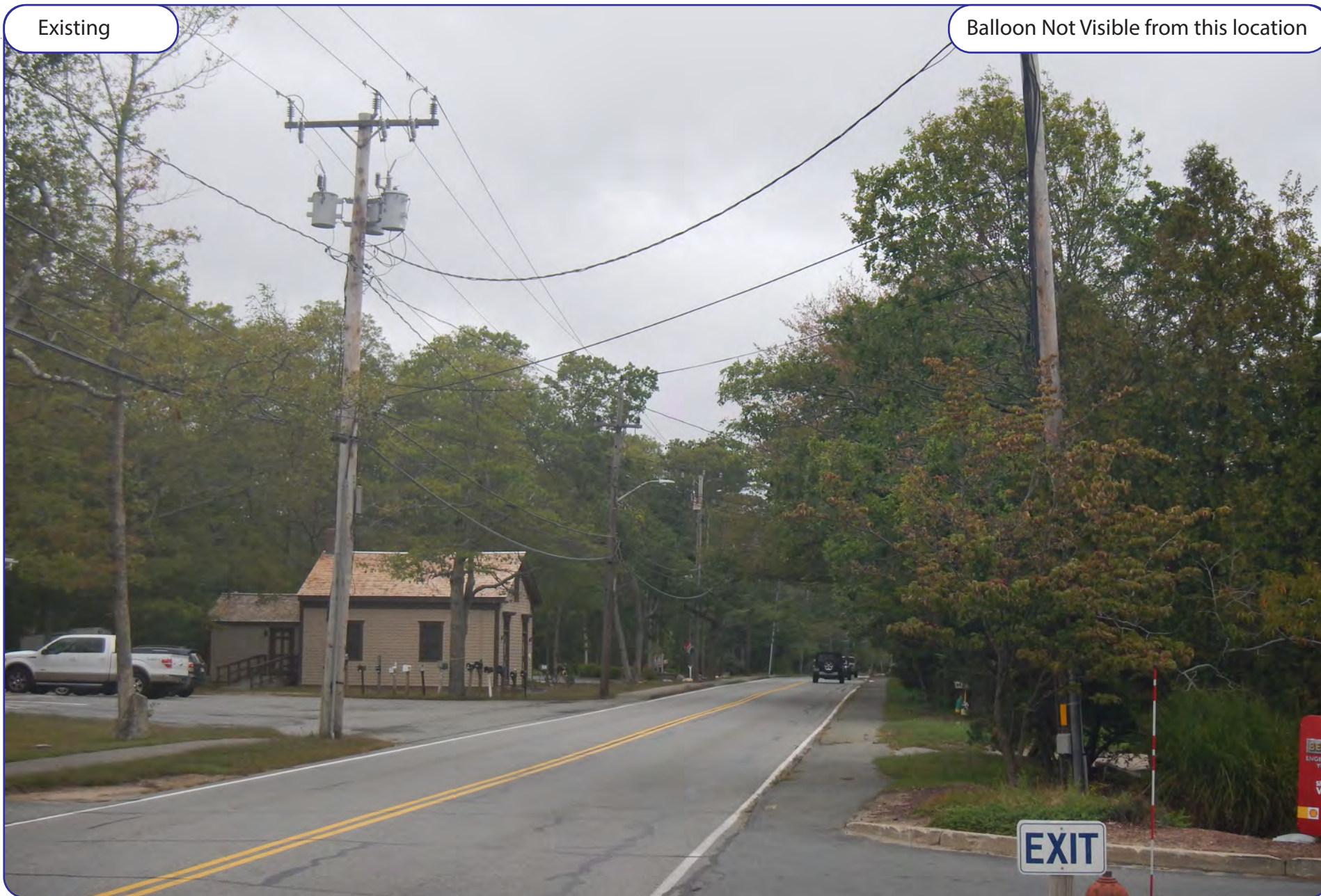


Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
5	Foresdale Rd. Middle	41.68663	-70.50588	+/- 0.66 Miles	South East	28.46	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
6	Forestdale Rd. South	41.68148	-70.50973	+/- 1.07 Miles	South East	30.45	Not Visible

Site: MA-0049 - 4HY0602B Russo

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



Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
7	Grand Oak Rd	41.69593	-70.50846	+/- 0.47 Miles	East	94.73	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
8	Quaker Meeting House & Contuit Rd.	41.70139	-70.48295	+/- 0.96 Miles	North West	240.51	Not Visible

Site: MA-0049 - 4HY0602B Russo

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



Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
9	John Ewer Rd	41.68532	-70.48541	+/- 0.98 Miles	South West	310.55	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
10	Quaker Meeting House Rd. East	41.69658	-70.49509	+/- 0.25 Miles	North West	245.36	Year Round

Site: MA-0049 - 4HY0602B Russo

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

Simulation at proposed tower height



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
10	Quaker Meeting House Rd. East	41.69658	-70.49509	+/- 0.25 Miles	North West	245.36	Year Round

Site: MA-0049 - 4HY0602B Russo

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Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
10	Quaker Meeting House Rd. East	41.69658	-70.49509	+/- 0.25 Miles	North West	245.36	Year Round

Site: MA-0049 - 4HY0602B Russo

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Existing



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
11	Quaker Meeting House Rd. West	41.69620	-70.49607	+/- 0.20 Miles	North West	245.2	Year Round

Site: **MA-0049 - 4HY0602B Russo**

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Simulation

Simulation at proposed tower height



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
11	Quaker Meeting House Rd. West	41.69620	-70.49607	+/- 0.20 Miles	North West	245.2	Year Round

Site: MA-0049 - 4HY0602B Russo

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Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
11	Quaker Meeting House Rd. West	41.69620	-70.49607	+/- 0.20 Miles	North West	245.2	Year Round

Site: **MA-0049 - 4HY0602B Russo**

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Existing



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
12	Princess Pine Path East	41.69329	-70.49976	+/- 0.11 Miles	South	358.62	Year Round

Site: MA-0049 - 4HY0602B Russo

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Simulation

Simulation at proposed tower height



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
12	Princess Pine Path East	41.69329	-70.49976	+/- 0.11 Miles	South	358.62	Year Round

Site: MA-0049 - 4HY0602B Russo

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Simulation

Simulation at 145 FT AGL



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
12	Princess Pine Path East	41.69329	-70.49976	+/- 0.11 Miles	South	358.62	Year Round

Site: MA-0049 - 4HY0602B Russo

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



Existing



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
13	Princess Pine Path West	41.69339	-70.49996	+/- 0.11 Miles	South	4.22	Seasonal

Site: MA-0049 - 4HY0602B Russo

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





Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
13	Princess Pine Path West	41.69339 -70.49996	+/- 0.11 Miles	South	4.22	Seasonal

Site: MA-0049 - 4HY0602B Russo

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Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
13	Princess Pine Path West	41.69339	-70.49996	+/- 0.11 Miles	South	4.22	Seasonal

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
14	GreenVille Dr. North	41.70212	-70.50538	+/- 0.59 Miles	North East	146.26	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
15	Greenville Dr. South	41.70095	-70.50583	+/- 0.53 Miles	North East	157.1	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
16	Forestdale @ Joe Jay	41.68844	-70.50398	+/- 0.50 Miles	South	21.84	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
17	Forestdale @ Brightside	41.68305	-70.50855	+/- 0.94 Miles	South	21.51	Not Visible

Site: MA-0049 - 4HY0602B Russo

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Existing

Balloon Not Visible from this location



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
18	Forestdale @ Camp Good News	41.68483	-70.50741	+/- 0.81 Miles	South	13.59	Not Visible

Site: MA-0049 - 4HY0602B Russo

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8

AFFIDAVIT
OF
SITE ACQUISITION SPECIALIST

The undersigned hereby states the following in support of the application by Eco-Site Inc. a Delaware corporation, located at 240 Leigh Farm Rd., Suite 415, Durham, NC 27707 and T-Mobile Northeast LLC a wholly owned subsidiary of T-Mobile USA, Inc. ("T-Mobile") to construct and operate a wireless communications facility at 145 Rt. 130, Sandwich MA 02644 (the "Site").

1. My name is Keenan Brinn and I am a Site Acquisition Specialist for Network Building and Consulting, LLC. I have been retained by Eco-Site, to provide services for the purpose of obtaining approvals, leases, and licenses as well as performing other site acquisition and development tasks involved in building and installing wireless communication facilities. I have performed, and am performing, such services in connection with Eco-Site's proposed wireless communications facility located at the Site.
2. I have participated directly or through my present and past employment in the development of such facilities, including wireless communication towers such as the facility proposed for the Site. I have personally visited the Site and the area surrounding the Site on numerous occasions. I submit this affidavit based on my personal knowledge of the Site and the surrounding area and based on my professional experience in the development of wireless communication facilities.
3. When T-Mobile's radio frequency experts identify an area within which a wireless communications installation is required to provide coverage to a significant gap in its coverage network, the area is illustrated on a map and issued to the Site Acquisition Specialist. In this instance, the illustrated area is centered upon latitude 41.684369°, longitude -70.486810°, in the vicinity of Pierre Vernier

Drive Sandwich MA. The radius of the coverage area is approximately half a mile.

4. Part of my site acquisition and development duties include identifying potential candidates within the area identified by T-Mobile's radio frequency experts. The candidate identification process includes reviewing the applicable zoning ordinance to identify areas within which the proposed use is allowed. Viable candidates consist of existing structures of sufficient height from which an antenna installation can provide sufficient coverage, or lacking such a structure, parcels located within the narrowly defined search area upon which a tower may be constructed to a sufficient height. In order to be viable, a candidate must provide adequate coverage to the significant gap in T-Mobile's network. In addition, all viable candidates must have a willing landowner with whom commercially reasonable lease terms may be negotiated. Preference is given to locations that closely comply with local zoning ordinances, or in the event no viable candidates are determined to be located within such areas, to identify other potentially suitable candidates beyond the targeted area, with preference given to existing structures in accordance with both the Cape Cod Commission and Sandwich Zoning regulations.
5. In connection with this site, I have provided site acquisition services, including researching the area, identifying potential alternative candidates, and lease negotiations for the Site.
6. The geographic area defined by T-Mobile's radio frequency experts consists of mostly single family homes, an industrial area, single story retail stores with accompanying parking areas, a school, fresh water ponds, and conservation land.

There are no existing structures in the area with the height necessary to provide the needed coverage.

7. In searching the area defined by the radio frequency expert, the following potential locations were identified, considered, and rejected for the reasons stated below:

a. P.A Landers Inc. – Raw Land

Proposed new 120' Monopole. The property is located at 152 Rt. 130 Sandwich. This candidate is a 20 acre commercial property. The site is an operating sand and gravel business with substantial truck traffic.

Rejected – Owner had no interest in hosting a tower on this property.

b. Russo's Cape Cod Bark and Mulch Inc. – Raw Land

Proposed new 120' Monopole. This property is located at 145 Rt. 130 Sandwich MA. The site is a 16 acre commercially zoned parcel, with a retail and wholesale landscape supply business operating on site. The property has a substantial portion that is not developed.

Accepted

- c. Town of Sandwich – Raw land.

Proposed new 120' Monopole. This property is located at 34 Quaker Meeting House Rd. The site is 84 acres and contains an open field, woodland and a beach area.

Rejected- The property is part of a public conservation area.

- d. Town of Sandwich – Raw land.

Proposed new 120' Monopole. This property is located at 71 Quaker Meeting House Rd. The site is 71 acres and contains an open fields, athletic fields and woodland.

Rejected- The property is part of a public conservation area.

- e. Camp Good News – Raw Land.

Proposed new 120' Monopole. This property is located at 71 Rt. 130 Sandwich MA. The parcel is 210 acres used as a seasonal camp. It lies just outside the targeted area. The property is largely wooded.

Rejected – Owners were not interested in hosting a tower on the property.

f. Jeffery Hauck - Raw Land

The property address is 20 Jan Sebastian Dr. This property is 1.5 acres and is commercially zoned in an industrial park. Currently the parcel is vacant.

Rejected – T-Mobile team. Property deemed too far from service area.

g. Philip Doherty – Raw Land

The property address is 8 Victory Dr. Sandwich MA. This property is 2.4 acres and is commercially zoned in an industrial park. Currently the parcel is vacant.

Rejected – T-Mobile team. Property deemed too far from service area.

h. Town of Sandwich Water Tower – Collocation

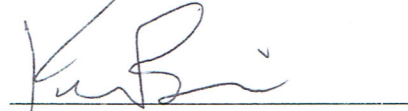
The address for the water tower is Georgia Rd. Sandwich. Tower is approximately 120 ft. high.

Rejected – T-Mobile team. Property deemed too far from service area.

8. Based on my review of the zoning ordinance, my personal knowledge of the area, the location of T-Mobile's existing facilities, and analysis provided by T-Mobile's radio frequency expert, none of the potential alternative candidates located within allowed zoning districts are reasonably feasible alternatives to the proposed Site. In addition, based on my experience, in my professional opinion, the Site is the

least intrusive solution to provide adequate coverage to this significant gap in T-Mobile's network coverage.

Executed this 17th day of October 2016.

A handwritten signature in dark ink, appearing to read 'K. Brinn', is written over a horizontal line.

Keenan Brinn
Site Acquisition Specialist

9

EXISTING T-MOBILE ON-AIR SITE

Site Code	Site Class	Latitude	Longitude	Height (Feet)	Address	County	City	State	Zip Code	Structure Owner
4HY1561A	Monopole	41.67108889	-70.5164278	132	23 Falmouth Sandwich Road	Barnstable	Sandwich	MA	*02644	Global Tower Partners
4HY0562B	Monopole	41.656389	-70.496937	117	54 Echo Road	Barnstable	Mashpee	MA	*02649	<undefined>
4HY0514A	Monopole	41.709167	-70.426667	138	43 Chase Road	Barnstable	Sandwich	MA	*02537	Seacoast Tower
4DR1044A	Self Support Tower	41.730278	-70.490828	135	441 Route 130	Barnstable	Sandwich	MA	*02537	American Tower
4HY0546A	Watertank	41.72219	-70.45887	85	290 Quaker Meetinghouse Rd	Barnstable	Sandwich	MA	*02537	Sandwich Water District

10

New Site Design – 4HY0602A
RF Affidavit
Statement of Need

The undersigned hereby states the following in support of the application by T-Mobile, hereafter referred to as "Applicant", to install wireless communications broadcast/receive equipment at 145 Route 130, Sandwich, MA hereinafter referred to as the "Site".

Currently, T-Mobile provides insufficient wireless communication service to the Town of Sandwich particularly along Route 130 and surrounding areas and the proposed site will enable it to fulfill its objective of providing such service pursuant to its Federal Communications Commission ("FCC") license.

The wireless communications service that T-Mobile proposes to provide is part of an existing nationally based network and will include enhanced voice and data capabilities through the use of new Long Term Evolution technologies that is focused on high capacity and speed. The service will also provide an enhanced 911 capability so that emergency responders can pinpoint the location of callers within the service area.

Route 130 and Quaker Meeting House Road through Sandwich and the surrounding areas is critical to T-Mobile's network because it is the main transportation route in the area connecting the town of Mashpee and road leading to MA Route 6, it is an area where the bulk of residences are, and it is an area that T-Mobile provides insufficient wireless communication service. Accordingly, T-Mobile requires the proposed site at the height of 130 feet on the proposed location to effectively provide wireless communication service to the Town of Sandwich and surrounding areas pursuant to its FCC license.

Other Benefits

Wireless communication technology provides vital communications in "911" and other emergency situations and is used to promote efficient and effective personal, business, governmental and agricultural communications. These services have become established and accepted as an integral part of the nation's communications infrastructure and promote the public health, safety, morals, comfort and general welfare.

- The number of 911 calls placed by people using wireless phones has significantly increased in recent years. It is estimated that about 70 percent of 911 calls are placed from wireless phones, and that percentage is growing. For many Americans, the ability to call 911 for help in an emergency is one of the main reasons they own a wireless phone. (source: FCC webpage)
- Each day more than 350,000 9-11 calls are made on cell phones, which is over one half of all emergency calls that are placed.
- More than 60,000 9-1-1 calls are made on the Applicant's network every day

Regulatory Compliance and Safety

The Telecommunication Facility will continue to meet all applicable health and safety standards, as noted above. The Applicant is licensed and regulated by the Federal Communications Commission (FCC), which imposes strict health and safety standards governing construction requirements, technical standards, interference protection, power and height limitations, and radio frequency standards.

These standards are set by independent safety and standard groups such as the American National Standards Institute (ANSI) and the Institute of Electrical Electronics (IEEE). The Applicant will comply with these standards. T-Mobile also intends to comply with applicable FAA guidelines.

Ryan Monte de Ramos,
T-Mobile Radio Frequency Engineer



Signature

10/12/2016

24 Iris Lane
North Providence, RI
02911, USA
(401) 499 5543
Ryan@Monte-Tech.com

Ryan C. Monte De Ramos
RF Engineering Consultant

Education

Bachelor of Science in Electronics and Communications Engineering, Mapua Institute of Technology, Intramuros, Manila, 1999

Experiences

Monte Technologies, Inc. **RF Engineering Consultant**

June 2008 – Present

Monte Technologies, Inc. provides Consulting Services in the areas of RF Engineering, Fixed Network Engineering and Deployment Services for Cellular Network, Microwave Transmission, Broadband WiMAX and LTE radio networks

Project: T-Mobile New England (Current)
Norton, Massachusetts, USA

- Perform RF Design for T-Mobile "Greenfield" project and L700 Overlay in New England Market
- Coordinate and provide direction to Site Acquisition, Architecture & Engineering, and Construction Manager during Site Design phase.
- Evaluate and Approve candidates submitted by Site Acquisition and Development
- Perform Scoping and Site Configuration Recommendation for L700 Overlay Design
- Attends and Represent T-Mobile during Zoning Hearings as Radio Frequency Engineer Expert Witness
- Generate LTE CIQ for T-Mobile's LTE 1900 and LTE 2100

Project: Alcatel-Lucent Networks (February 2011 - February 2015)
Massachusetts, USA

- Lead and Perform RF Design for ALU Sprint Network Vision Project for Boston Market, Central New Jersey and Northern New Jersey from start to finish
- Part of core team responsible in providing optimized RF Design for 3G and LTE using **Planet Ev and Capesso** (Expert in Planet Ev)
- RF Design Lead Engineer for Boston Massachusetts Sprint Network Vision Project
- Responsible for coordinating with Alcatel-Lucent SIOP Team (Site Acquisition, Construction and Architectural and Engineering) in achieving RF Design objectives
- Responsible for Cluster Optimization before and after site integration including but not limited to achieving Key Performance Indicators and Launch-Market Acceptance.

Project: AT&T New England (January 2013 - April 2014)
Southern Massachusetts and Rhode Island, USA

- Design AT&T LTE Network Expansion for Southern MA and Rhode Island which include Macro Sites, Outdoor DAS, Indoor DAS and Small Cells
- Evaluate areas where AT&T coverage are poor to non, engage with Site Acquisition, Architecture & Engineering, and Construction Manager to provide direction and guidance during the design phase.
- Responsible in providing optimized RF Design both for UMTS and LTE using Atoll Planning tool
- Responsible for design, evaluation and approval of areas requiring DAS solutions (Indoor and Outdoor) and Small Cells
- Approves and Evaluates candidates submitted by AT&T ASG Group
- Attends and Represent AT&T during Zoning Hearing as Radio Frequency Engineer Expert Witness

**24 Iris Lane
North Providence, RI
02911, USA
(401) 499 5543
Ryan@Monte-Tech.com**

**Ryan C. Monte De Ramos
RF Engineering Consultant**

Project: Nokia-Siemens LTE Project for Lightsquared (December 2010 - February 2011)

Southern Massachusetts, Rhode Island, Worcester and New Hampshire, USA

- Lead and Perform RF Design for Lightsquared LTE network.
- Designed LTE network in Southern Massachusetts (including Cape Cod), Worcester MA, Rhode Island and New Hampshire.
- Provide Nominal Design using **Planet EV**.
- Responsible for issuing search rings, identify primary candidates and evaluate site survey reports from vendors.
- Responsible for providing subscriber forecast based on Census data.

Project: Clearwire New England Market (December 2008 - December 2010)

Southern Massachusetts, Rhode Island and Connecticut, USA

- Lead and Perform RF Design and RF Optimization for Clearwire WiMAX network.
- Designed Clearwire's 4G WiMAX network in Southern Massachusetts and Rhode Island.
- Represented Clearwire as an RF Expert/resource person for all zoning hearings.
- Perform Indoor Design and Testing for Clearwire Corporate accounts
- Responsible for issuing search rings, identify primary candidates and evaluate site survey reports from vendors.
- Provided parameter planning such as frequency, preamble, FAID, BSID and neighbours.
- Responsible for providing presales support including capacity forecast and augments.
- Responsible for evaluating microwave survey report and LOS verification, Microwave Backhaul.
- Provided Site Integration support to field technicians and general contractors during build Phase for Rhode Island, Massachusetts and Connecticut.
- In-charge of post launch optimization for Rhode Island market

Project: T-Mobile Los Angeles/Orange County (June 2008 - December 2008)

Southern California, USA

- Responsible for the engineering system performance of GSM Radio Network. Applies engineering principles to optimize network coverage, performance and capacity.
- Perform Indoor Design and Testing using IPBTS and RF Distributed Antenna System for T-Mobile corporate accounts.
- Uses solid RF Engineering principles and planning tools to maximize coverage, capacity, and performance of assigned clusters of GSM radio network.
- Daily monitoring and review of radio network Key Performance Indicators (KPI). Works with other engineers and operations to address discovered issues.
- Gather, monitor, analyze statistical and call test data to improve system performance indicators such as dropped calls, blocked calls, origination failures, link balance, handoff features to meet departmental goals.
- Troubleshoot worst performing sites; detailed one-by-one analysis of sites for down tilts, neighbor optimization, new site recommendations, etc.
- Optimize existing network by adjusting radio network parameters, adding/deleting of neighbors and recommending possible solutions to hardware problems.
- Integrate new sites to ensure they meet expected performance.
- Performing field evaluation performance and identifying opportunities for performance improvement.
- Provide Engineering Support to Sales / Customers

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Ryan C. Monte De Ramos
RF Engineering Consultant

RF Engineer (CDMA2000)
MetroPCS Boston

Sept. 2007 – June 2008

Massachusetts, USA

- Investigate and provide solutions for RF problem areas identified after keen examination of switch and drive test data using available RF software and hardware tools.
- Design and evaluate Outdoor DAS system (RF over Fiber) of Providence, Cambridge, Boston downtown, Backbay, Newton and Fall River together with NextG and Extenet.
- Design and provide necessary data such as propagation plots with recommended equipment, which includes BTS and Antenna type, to support additional growth sites.
- Design of all new cells in given market.
- Create and maintain databases and maps of tower vendors' site locations to aid in system design.
- Work with Lucent contractors and Director of Radio Engineering on system design to research and determine locations to place sites.
- Initiate and guide troubleshooting agenda for sudden "critical" problem areas. This will mean communication with other departments for switch and cell site technical support.

Senior RF Engineer (GSM)
Celcite Management Solutions

July 2005 – Sept. 2007

Project: T-Mobile RF Engineer
Massachusetts, USA

- Responsible for optimizing, analyzing and improving performance of T-Mobile network on a per cluster system. T-Mobile Northeast uses Ericsson GSM network.
- Responsible for DAS design evaluation and testing for Hull, MA (together with National Grid Wireless), South Shore Plaza Mall (together with ATC), Emerald Square Mall Attleboro MA, and Providence Place Mall.
- Monitor, analyze statistical and drive test data to improve system performance indicators such as dropped calls, blocked calls, originating failures and handoff failures
- Help define and develop processes used for radio network optimization.
- Provides capacity planning and growth strategies.
- Assist T-Mobile Senior RF Engineer to define implementing guidelines for approved new features and technologies.
- Mentors T-Mobile engineering employees and technical staff.

RF Engineer (GSM/UMTS)
LCC International, Inc.

March 2004 – July 2005

Project: Cingular UMTS
Ohio, USA

- Plan and design UMTS network for Cingular market in Cleveland and Columbus Ohio
- Perform UMTS design using Aircom Enterprise, Asset3G tool.
- Coordinate with customers and vendor regarding UMTS site preparation and integration.

**24 Iris Lane
North Providence, RI
02911, USA
(401) 499 5543
Ryan@Monte-Tech.com**

**Ryan C. Monte De Ramos
RF Engineering Consultant**

- Generate RFDS with integrated GSM and UMTS hardware configuration for all candidate sites.
- Generate UMTS cell parameter based on the design requirements (Bearers, services, voice and data traffic distributions).
- Present different UMTS design scenarios including an optimized UMTS design using ACP, Optimi tool.

Project: LCC UMTS RFD (Request For Design), Cingular
Virginia, USA

- Perform trial UMTS design used in evaluating LCC's expertise and ability to design a UMTS network for Cingular.
- Perform UMTS design using Aircom Enterprise, Asset3G tool.

Project: Pre-Launch and Post-launch Optimization (GSM 850 and PCS1900)
Alabama, USA

- Responsible for pre-launch optimization of Cingular GSM 850 and PCS 1900 network, Mobile, AL and Biloxi, MS market.
- Responsible for all optimization solutions for the assigned clusters by changing network parameters (output power settings, neighbor adds/removes, HO Margin Level, HO Margin Quality and so on)
- Analyzing TEMS drivetest field data and resolving network drop calls, set up failures, access failures and handover failures
- Responsible for verifying neighbor relation within and between clusters.
- Responsible for achieving the KPIs for Mobile and Biloxi cluster.
- Responsible for optimization of the implemented 3/9 frequency plan. Resolving adjacent and co-channel interference.
- Familiar with Nokia's NDW, network doctor and OSS.

Project: Pre-Launch and Post-launch Optimization (GSM 850 and PCS1900)
Mississippi, USA

- Responsible for pre-launch optimization of Cingular GSM 850 network, Mississippi market.
- Provide GSM parameter optimization and site audit for newly integrated sites
- Achieved KPI (handover success rate, call set-up success rate, drop call rate and FER) for both BCCH and TCH drivetest, Jackson and Tupelo, MS market.
- Analyzing TEMS drivetest field data and resolving network drop calls, set up failures, access failures and handover failures.
- Provided optimization support for Cingular post launch.
- Familiar in Nokia GSM parameters, NDW, network doctor, and OSS.

**RF Engineer/Consultant
Comms Resources/Aircom International
Manila, Philippines**

Aug. 2003 – Jan. 2004

- Expert in Radio Network Design and Performance Improvement
- Provide network performance improvement and system optimization
- Provide technical recommendations for the improvement of GSM Network
- Achieve the Key Performance Indicators for radio network.

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**Ryan C. Monte De Ramos
RF Engineering Consultant**

Project: Globe Telecom Network Performance Improvement Project
Manila, Philippines

- Perform network performance improvement and system optimization for Globe Telecom Ericsson GSM system.
- Perform network feature testing/trial and provide study, analysis and recommendations.
- Provide traffic capacity enhancement and growth strategies.
- Achieve Key Performance Indicators for Globe's GSM network.

**Design and Network Performance Engineer
Ericsson Telecommunications, Inc.
Manila, Philippines**

Apr. 2000- Aug. 2003

- In charge of system optimization for newly integrated sites.
- Assigned as a Radio Network Planning and Optimization Engineer for Ericsson GSM Systems.
- In charge of the Radio Network Planning and Engineering for Visayas and Mindanao region.
- Familiar in OSS RNO tools, Parameter changes using Ericsson's OSS commands.

Project: Globe Phase 9 GSM Expansion Project

- Involved in radio network optimization for newly integrated site, Globe Phase 9 GSM expansion project.
- Involved in RF system planning/design and capacity planning for Globe Telecom's GSM Expansion Project.

Project: Globe Phase 8B GSM Expansion Project

- Involved in initial tuning and network optimization for newly nominated sites.
- Involved in Radio Frequency Planning for newly integrated sites.

Project: Ericsson-Globe Viking 4 Network Improvement Project, CME 20

- Optimization Engineer for Network Performance Improvement Project of VisMin area.
- Full responsibility to achieve the Key Performance Indicators, network optimization of Globe's GSM Network for Mindanao area, (as agreed upon the contract).

Project: Globe Phase 8 GSM Expansion Project

- Involved in Radio Network Planning for Globe Phase 8 expansion sites.

Project: Ericsson Malaysia Network Change-Out and Initial Tuning

- Assigned on a short-term assignment in Ericsson Malaysia for TM Touch Mobile Network Change-out. TM Touch Mobile is the cellular subsidiary of Telekom Malaysia, the biggest telecom operator in Malaysia. It holds the biggest number of local landline subscribers and GSM cellular subscribers.
- Involved in network change-out of Malaysia's Northern Region.
- Involved in frequency planning, and initial network tuning.
- Responsible for conducting technical training of TM Touch engineering staff regarding Ericsson system.

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***Ryan C. Monte De Ramos
RF Engineering Consultant***

Project: Digital Radio Network Planning Tender

- Involved as RF Design Engineer for Digital GSM Network
- Involved in Radio Network planning of Digital Cellular Network Expansion Project.

**Part-Time Professor
Technological University of the Philippines
City of Manila**

Jun. 2002– Nov. 2002

- Teaches as a part time professor for ECE student of Technological University of the Philippines.
- Handles Digital Signal Analysis and Processing, and Advance Communication subjects.

**Technical Instructor
Philippine Science & Technology Center
Kalookan City**

Nov. 1999– Mar. 2000

- Handles Data Communication and Digital Electronic subjects.
- Part of the reviewing committee for PSTC graduating class.

Training:

Alcatel Lucent LTE Fundamentals
Alcatel Lucent LTE Planning and Optimization
Planet EV Planning and ACP Training
Assett Planning Tool/Enterprise
Fundamentals of WiMAX, Clearwire, MA
Powerwave University, Distributed Antenna System Overview
MetroPCS Boston, Chelmsford Massachusetts, Introduction to CDMA
MetroPCS Boston, Chelmsford Massachusetts, CDMA Traffic Engineering
T-Mobile USA, Norton Massachusetts, Ericsson 06A/R12 Standard and Optional Feature
T-Mobile USA, East Providence RI, EDGE Dimensioning Guidelines
LCC Wireless Institute, VA USA, UMTS/WCDMA Basic to Advance
LCC Wireless Institute, VA USA, Ev_DO and CDMA 2000
LCC Wireless Institute, VA USA, GPRS and EDGE
Ericsson Academy, Sweden, TEMS Cell Planner Workshop
Ericsson Training Center Philippines, OSS-NWS Statistics Handling
Ericsson Training Center Philippines, Ericsson RNO Tools
Ericsson Training Center Philippines, STS Statistics Handling
Aircom International Training Program, AIRCOM Enterprise Suite (ASSET, Optima, Neptune and ILSA)
Ericsson Training Centre Philippines, Outside Plant Engineering and Implementation
PSTC, Kalookan City, Data Communication
Ericsson Global Competence Development, Sweden, I.T./Data Communication Certified
Ericsson Training Centre, Philippines, Advance Data Communication
Ericsson Training Centre, Philippines, Frame Relay
Ericsson Training Centre, Philippines, Wireless Application Protocol Basic and Advance Training
Ericsson Training Centre, Philippines, SS7 Protocol Overview

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***Ryan C. Monte De Ramos
RF Engineering Consultant***

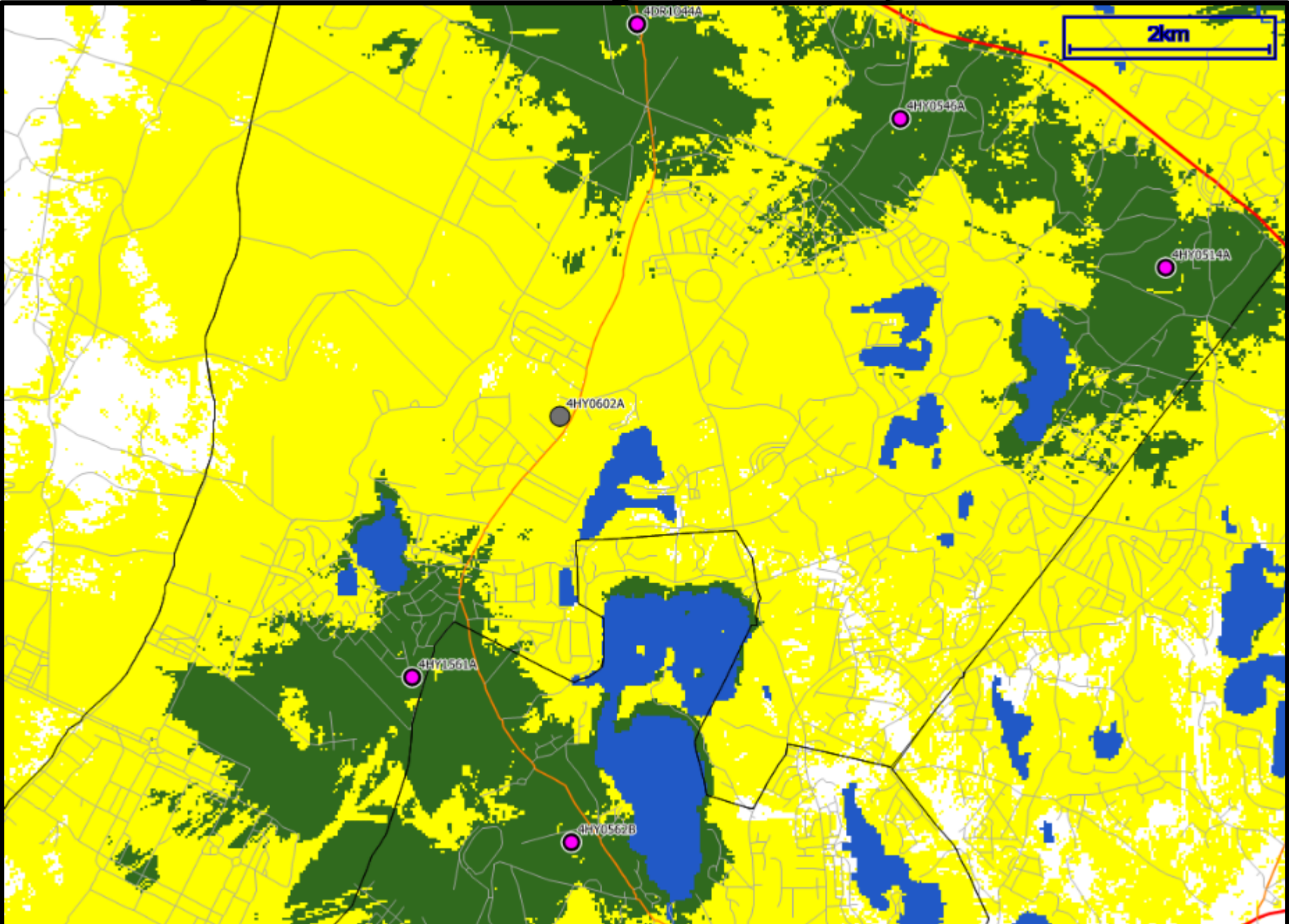
Ericsson Training Centre, Philippines, Wireless LAN and Bluetooth Technology
Ericsson Training Centre, Philippines, GSM Essentials
Ericsson Training Centre, Philippines, GSM System Survey
Ericsson Training Centre, Philippines, GSM Advance System Technique
Ericsson Training Centre, Philippines, GSM Network Planning
Ericsson Academy, Malaysia, SDH Basics
Ericsson Training Centre Philippines, GPRS Overview
Ericsson Academy, Malaysia, GPRS System Survey
Ericsson Academy, Malaysia, GPRS Advance System Technique
Ericsson Academy, Malaysia, GPRS Advance System Technique
Ericsson Training Centre Philippines, CDMA Technology Overview
Ericsson Training Centre Philippines, UMTS Core Network Overview
Ericsson Training Centre Philippines, UMTS Transmission
Ericsson Training Centre Philippines, RBS 2000 Basic
Ericsson Training Centre Philippines, RBS 2202/2206 Operations and Maintenance
Ericsson Telecoms Inc., Hong Kong, Essentials for Management and Marketing

Tools:

Planet EV Planning and ACP Training
Alcatel-Lucent eDAT Tool
Assett Planning Tool/Enterprise
Atoll Planning Tool
WindCatcher WiMAX
XCAL -X
Capesso
Planet EV
T-Mobile – Insite and AIMS
IBwave
OptPCS, TTS Wireless
Aircom Enterprise, Asset3G
TEMS Cell Planer
Optimi
HTML 4
Microsoft Office XP
MapInfo
NDW (Nokia Data Warehouse)
TEMS
Q-VOICE

11

Existing LTE 2100 MHz Coverage in Sandwich, MA

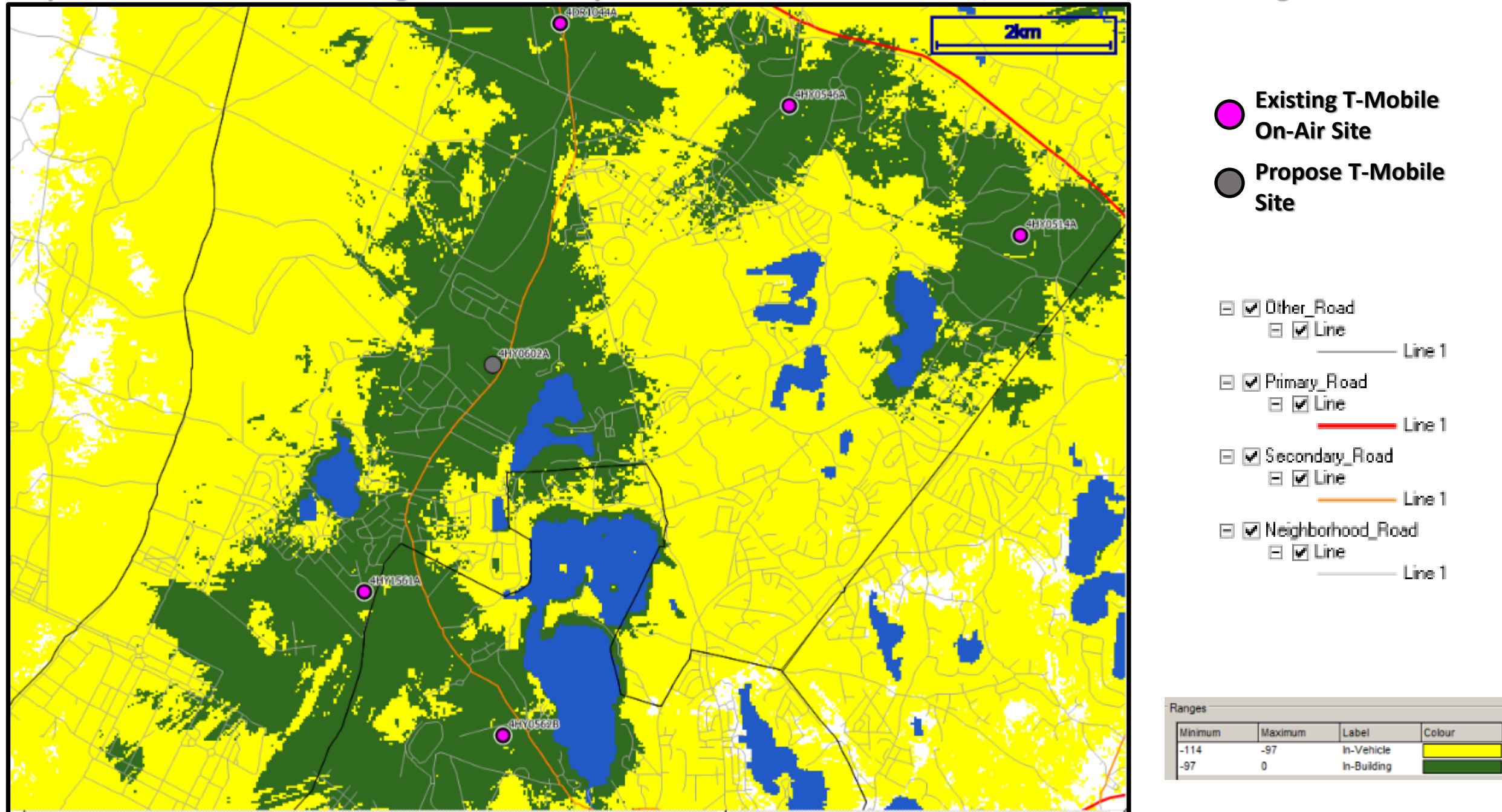


- Existing T-Mobile On-Air Site
- Propose T-Mobile Site

- ☒ Other_Road
 - ☒ Line
 - Line 1
- ☒ Primary_Road
 - ☒ Line
 - Line 1
- ☒ Secondary_Road
 - ☒ Line
 - Line 1
- ☒ Neighborhood_Road
 - ☒ Line
 - Line 1

Ranges			
Minimum	Maximum	Label	Colour
-114	-97	In-Vehicle	Yellow
-97	0	In-Building	Green

Propose LTE 2100MHz Coverage with Primary Candidate at 145 Route 130, Sandwich, MA at Height of 130 Feet

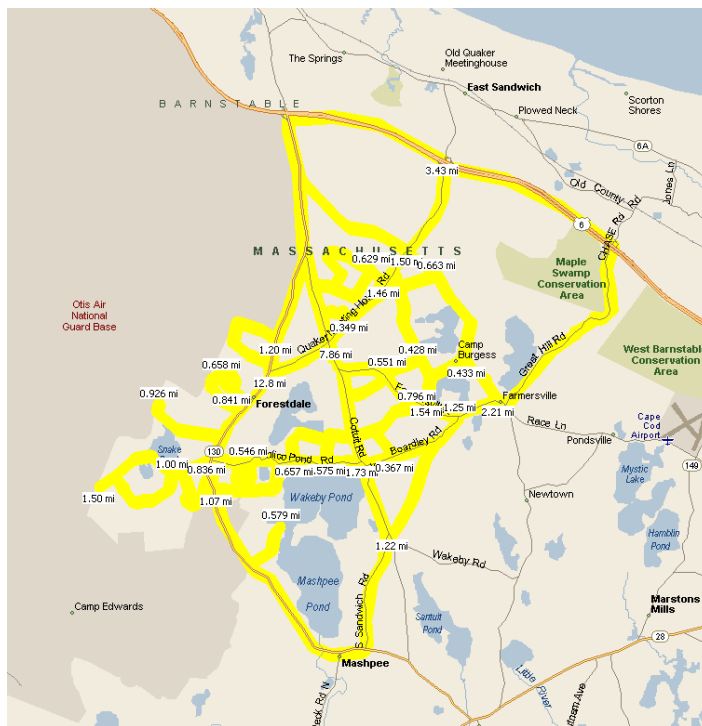


12

 T-Mobile®

Site ID : 4HY0602A – CW Report

CW Test Overview



Drive Test : September 30th , 2016

❑ Test Equipment:
JDSU Multiband Receiver 1314B

❑ Test Measurements:
CW Test 2100 MHz/ 700MHz

❑ Transmitter – Praxsym,Gator

❑ Antenna type – Andrew(Omni),
PowerLogic

CW Testing Overview

EIRP Calculation	
Reference	Power dBm
Transmitter	40
Total Losses(cable & connector)	0.7
Antenna Gain(Andrew ASPP2936)	8.1 dBi
EIRP	47.4

Correction Factor Calculation	
Reference	Power dBm
CW Test BTS EIRP	47.4
Typical BTS EIRP	65
Correction Factor	17 (Approx)

700 Frequency_130FT_ 700 MHz

CW Test

Pa : 40dbm

Losses: 0.7 dbm

Att Gain: 8.1 dbi

EiRP: 47.4

Actual BTS

Pa : 46 dbm

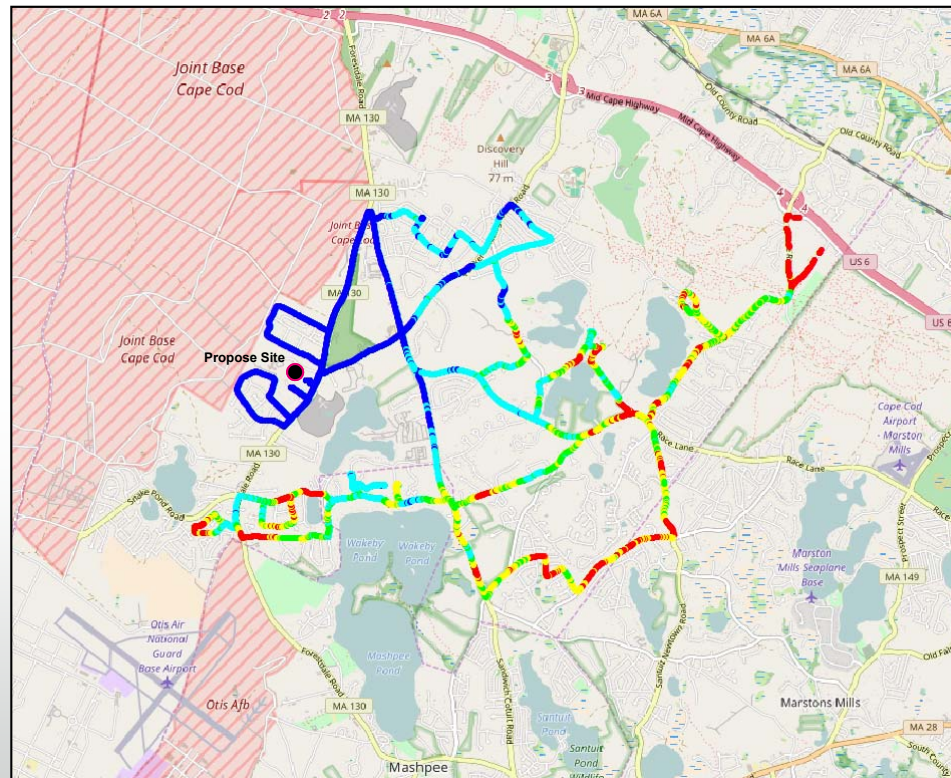
Losses: 1.339 dbm

Att Gain: 20.9 dbi

EiRP: 65.56

Correction Factor

: 17 (Approx)



CW Coverage Ranges in RSSI (dBm)

● -82 to 0	(2116)
● -92 to -82	(1473)
● -97 to -92	(803)
● -102 to -97	(989)
● -110 to -102	(689)
● all others	(130)

2100 Frequency_130FT_2100 MHz

CW Test

Pa : 40dbm

Losses: 0.7 dbm

Att Gain: 8.1 dbi

EiRP: 47.4

Actual BTS

Pa : 46 dbm

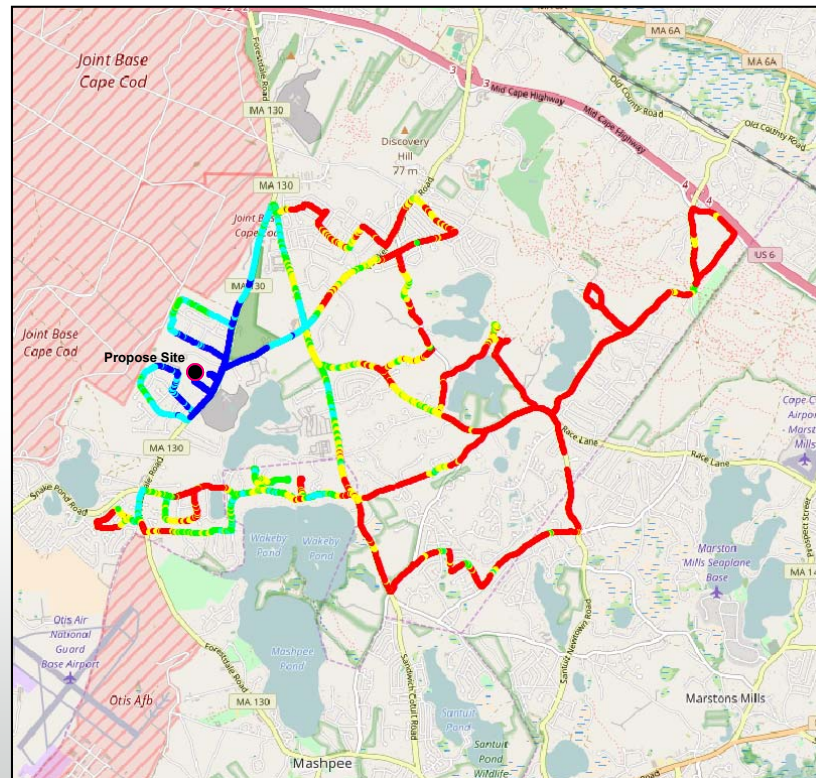
Losses: 2.7 dbm

Att Gain: 20.9 dbi

EiRP: 64.55

Correction Factor

: 17 (Approx)



CW Coverage Ranges in RSSI (dBm)

●	-82 to 0	(1215)
●	-92 to -82	(658)
●	-97 to -92	(762)
●	-102 to -97	(991)
●	-110 to -102	(2440)
	all others	(128)

13

ULS License

PCS Broadband License - KNLH310 - T-Mobile License LLC

Call Sign	KNLH310	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Market

Market	BTA051 - Boston, MA	Channel Block	E
Submarket	0	Associated Frequencies (MHz)	001885.00000000- 001890.00000000 001965.00000000- 001970.00000000

Dates

Grant	06/05/2007	Expiration	06/27/2017
Effective	11/22/2011	Cancellation	

Buildout Deadlines

1st	06/27/2002	2nd	
-----	------------	-----	--

Notification Dates

1st	04/01/1999	2nd	
-----	------------	-----	--

Licensee

FRN	0001565449	Type	Limited Liability Company
-----	------------	------	---------------------------

Licensee

T-Mobile License LLC 12920 SE 38th St. Bellevue, WA 98006 ATTN Dan Menser	P:(425)383-4000 E:FCCRegulatoryComplianceContact@t-mobile.com
--	--

Contact

T-Mobile License LLC 12920 SE 38th St. Bellevue, WA 98006 ATTN Dan Menser	P:(425)383-4000 E:FCCRegulatoryComplianceContact@t-mobile.com
--	--

Ownership and Qualifications

Radio Service Type	Fixed, Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership

Is the applicant a foreign government or the representative of any foreign government?	No
Is the applicant an alien or the representative of an alien?	No
Is the applicant a corporation organized under the laws of any foreign government?	No
Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	No

Is the applicant directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country?

Yes

If the answer to the above question is 'Yes', has the applicant received a ruling(s) under Section 310(b)(4) of the Communications Act with respect to the same radio service involved in this application?

Yes

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

ULS License

PCS Broadband License - WPZY689 - T-Mobile License LLC

Call Sign	WPZY689	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Market

Market	BTA051 - Boston, MA	Channel Block	C
Submarket	2	Associated Frequencies (MHz)	001895.00000000-001910.00000000-001975.00000000-001990.00000000

Dates

Grant	02/28/2007	Expiration	01/03/2017
Effective	02/04/2016	Cancellation	

Buildout Deadlines

1st	12/07/2003	2nd	01/03/2007
-----	------------	-----	------------

Notification Dates

1st	01/30/2002	2nd	12/22/2006
-----	------------	-----	------------

Licensee

FRN	0001565449	Type	Limited Liability Company
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Licensee

T-Mobile License LLC 12920 SE 38th Street Bellevue, WA 98006 ATTN FCC Regulatory Compliance	P:(425)383-8401 F:(425)383-4840 E:FCCregulatorycompliancecontact@t-mobile.com
--	---

Contact

Kiechel Law 8300 Greensboro Drive, Suite 1200 McLean, VA 22102 ATTN Doane F. Kiechel	P:(202)487-6770 F:(703)584-8696 E:doane@kiechellaw.com
---	--

Ownership and Qualifications

Radio Service Type	Mobile
Regulatory Status	Common Carrier Interconnected Yes

Alien Ownership

Is the applicant a foreign government or the representative of any foreign government?	No
Is the applicant an alien or the representative of an alien?	No
Is the applicant a corporation organized under the laws of any foreign government?	No
Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	No

Is the applicant directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country?

Yes

The Applicant has received a declaratory ruling(s) approving its foreign ownership, and the application involves only the acquisition of additional spectrum for the provision of a wireless service in a geographic coverage area for which the Applicant has been previously authorized.

**Basic Qualifications**

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

ULS License

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGB373 - T-Mobile License LLC

Call Sign	WQGB373	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Status	Active	Auth Type	Regular
Market			
Market	REA001 - Northeast	Channel Block	E
Submarket	1	Associated Frequencies (MHz)	001740.00000000- 001745.00000000 002140.00000000- 002145.00000000

Dates

Grant	11/29/2006	Expiration	11/29/2021
Effective	06/26/2012	Cancellation	

Buildout Deadlines

1st	2nd
-----	-----

Notification Dates

1st	2nd
-----	-----

Licensee

FRN	0001565449	Type	Limited Liability Company
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Licensee

T-Mobile License LLC 12920 SE 38th St. Bellevue, WA 98006 ATTN Dan Menser	P:(425)383-4000 F:(425)378-4040 E:FCCRegulatoryComplianceContact@t-mobile.com
--	---

Contact

T-Mobile License LLC Kathleen O Ham 12920 SE 38th St. Bellevue, WA 98006 ATTN Dan Menser	P:(425)383-4000 F:(202)654-5963 E:FCCRegulatoryComplianceContact@t-mobile.com
--	---

Ownership and Qualifications

Radio Service Type	Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership

Is the applicant a foreign government or the representative of any foreign government?	No
Is the applicant an alien or the representative of an alien?	No
Is the applicant a corporation organized under the laws of any foreign government?	No
Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their	No

representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?

Is the applicant directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country?

Yes

The Alien Ruling question is not answered.

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

ULS License

700 MHz Lower Band (Blocks A, B & E) License - WQIZ578 - T-Mobile License LLC

Call Sign	WQIZ578	Radio Service	WY - 700 MHz Lower Band (Blocks A, B & E)
Status	Active	Auth Type	Regular
Market			
Market	BEA003 - Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-RI-VT	Channel Block	A
Submarket	0	Associated Frequencies (MHz)	000698.00000000-000704.00000000-000728.00000000-000734.00000000

Dates

Grant	06/26/2008	Expiration	06/13/2019
Effective	12/02/2013	Cancellation	

Buildout Deadlines

1st	2nd	06/13/2019
-----	-----	------------

Notification Dates

1st	2nd
-----	-----

Licensee

FRN	0001565449	Type	Limited Liability Company
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Licensee

T-Mobile License LLC 12920 SE 38th Street Bellevue, WA 98006 ATTN FCC Regulatory Compliance	P:(425)383-8401 F:(425)383-4840 E:FCCregulatorycompliancecontact@t-mobile.com
--	---

Contact

T-Mobile License LLC Shannon Kraus 12920 SE 38th Street Bellevue, WA 98006 ATTN Shannon Kraus	P:(425)383-5178 F:(425)383-4840 E:shannon.reilly@t-mobile.com
---	---

Ownership and Qualifications

Radio Service Type	Fixed, Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership

Is the applicant a foreign government or the representative of any foreign government?	No
Is the applicant an alien or the representative of an alien?	No
Is the applicant a corporation organized under the laws of any foreign government?	No

Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country? **Yes**

Is the applicant directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country? **Yes**

If the answer to the above question is 'Yes', has the applicant received a ruling(s) under Section 310(b)(4) of the Communications Act with respect to the same radio service involved in this application? **Yes**

Basic Qualifications

The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits

This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

14



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

Aeronautical Study No.
2016-ANE-3110-OE

Issued Date: 08/18/2016

Ingrid Thomas
Eco-Site Inc. (IT)
240 Leigh Farm Rd
Suite 415
Durham, NC 27707

**** 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:	Antenna Tower Russo MA-0049
Location:	New Bedford, MA
Latitude:	41-41-41.77N NAD 83
Longitude:	70-29-57.72W
Heights:	151 feet site elevation (SE) 135 feet above ground level (AGL) 286 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)
☒ 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 and maintained in accordance with FAA Advisory circular 70/7460-1 L.

This determination expires on 02/18/2018 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.
- 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 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.

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 (817) 222-5922. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2016-ANE-3110-OE.

Signature Control No: 300118927-302259109

(DNE)

Debbie Cardenas
Technician

Attachment(s)
Frequency Data

cc: FCC

Frequency Data for ASN 2016-ANE-3110-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
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

15



October 17, 2016

Cape Cod Commission
3225 Main Street
Barnstable, MA 02630

RE: Written Commitment to Allow for Future Co-Location for the proposed telecommunications facility located at 145 MA-130, Sandwich, MA 02563

To Whom It May Concern,

Eco-Site, Inc., is a tower company incorporated in Delaware and is headquartered at 240 Leigh Farm Rd., Suite 415, Durham, NC 27707. Eco-Site's core business is leasing tower space to FCC Licensed Wireless Carriers such as T-Mobile. The proposed Eco-Site tower located at 145 MA-130, Sandwich, MA is a four carrier tower which if permitted will be designed and constructed to a capacity to allow for three additional FCC Licensed Wireless co-locators after T-Mobile is installed at the site

Please accept this letter as a written commitment to allow for co-location in the future from Eco-Site.

I would be happy to answer any questions that you or members of the board may have concerning this proposal. Please feel free to contact me at (508) 397-1765 or SRuzzo@eco-site.com.

Sincerely,

Steve Ruzzo
Project Manager New England
Eco-Site
64 Nathaniel Drive
Whitinsville, MA 01588 Mobile:
(508) 397-1765
www.eco-site.com



October 17, 2016

Town of Sandwich
Zoning Board of Appeals
130 Main Street
Sandwich, MA 02563

RE: Written Commitment to Allow for Future Co-Location for the proposed telecommunications facility located at 145 MA-130, Sandwich, MA 02563

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Sincerely,

Steve Ruzzo
Project Manager New England
Eco-Site
64 Nathaniel Drive
Whitinsville, MA 01588 Mobile:
(508) 397-1765
www.eco-site.com



November 22, 2016

Via Certified Mail

Ms. Ellen Dalmus
Real Estate Manager
Verizon Wireless
118 Flanders Road 3rd Floor
Westborough, MA 01581

Re: Opportunity to lease space on a proposed telecommunications tower to be constructed at 145 Rt. 130, Sandwich MA 02644.

Dear Ms. Dalmus,

Eco-Site is in the development stages for a telecommunications tower in Sandwich Mass. We are contacting you to see if Verizon Wireless has interest in locating on this proposed tower.

The proposed tower details include:

- Tower height 125 ft.
- Tower coordinates are; 41.69492°, -70.49946°
- RAD Centers are available at 110 ft., 100 ft. and 90ft.

Please contact me directly to discuss this tower opportunity.

Regards,

A handwritten signature in blue ink, appearing to read "Steve Ruzzo".

Steve Ruzzo
Project Manager
(508) 397-1765
sruzzo@eco-site.com



November 22, 2016

Via Certified Mail

Mr. Ron Hibbard
Sprint Market Manager Site Development
Sprint New England
800 South Main Street
Mansfield, MA 02048

Re: Opportunity to lease space on a proposed telecommunications tower to be constructed at 145 Rt. 130, Sandwich MA 02644.

Dear Mr. Hibbard,
Eco-Site is in the development stages for a telecommunications tower in Sandwich Mass. We are contacting you to see if Sprint New England has interest in locating on this proposed tower.

The proposed tower details include:

- Tower height 125 ft.
- Tower coordinates are; 41.69492°, -70.49946°
- RAD Centers are available at 110 ft., 100 ft. and 90ft.

Please contact me directly to discuss this tower opportunity.

Regards,

A handwritten signature in blue ink, appearing to read "Steve Ruzzo", is written over a light blue circular stamp.

Steve Ruzzo
Project Manager
(508) 397-1765
sruzzo@eco-site.com



November 22, 2016

Via Certified Mail

Ms. Jessica Rincon
Sr. Real Estate and Construction Manager
AT&T Mobility New England
550 Cochituate Rd. Suite 13 and 14
Framingham, MA 01701

Re: Opportunity to lease space on a proposed telecommunications tower to be constructed at 145 Rt. 130, Sandwich MA 02644.

Dear Ms. Rincon,

Eco-Site is in the development stages for a telecommunications tower in Sandwich Mass. We are contacting you to see if AT&T Mobility New England has interest in locating on this proposed tower.

The proposed tower details include:

- Tower height 125 ft.
- Tower coordinates are; 41.69492°, -70.49946°
- RAD Centers are available at 110 ft., 100 ft. and 90ft.

Please contact me directly to discuss this tower opportunity.

Regards,

A handwritten signature in blue ink, appearing to read "Steve Ruzzo".

Steve Ruzzo
Project Manager
(508) 397-1765
sruzzo@eco-site.com

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BUFFER ZONE AGREEMENT

This Buffer Zone Agreement ("Agreement") is made as of the date last written below by and between Pasquale J. Russo, IV and Pasquale J. Russo, III, Trustees of the PJR Realty Trust ("Russo") and Eco-Site, Inc., a foreign corporation (the "Eco-Site").

RECITALS

1. Russo owns in fee simple that certain parcel of land located at 145 Route 30 in Sandwich, Massachusetts, evidenced by Transfer Certificate of Title No. 188826 dated June 18, 2009, registered land in the Barnstable County Registry of Deeds (the "Property");
2. Russo has entered into an agreement with Eco-Site under which Eco-Site will design, permit, construct and operate a wireless communications tower upon a portion of the Property;
3. Eco-Site has submitted a zoning application to the Town of Sandwich Board of Appeals (the "Board") for its proposed wireless communications tower;
4. Under Section 3(i)(1): *Developments Presumed to be Developments of Regional Impact (DRI Review Thresholds)*, *Construction of any Wireless Communications Tower exceeding 35 feet in overall height* of the Cape Cod Commission's ("CCC") regulations, the Town of Sandwich Board of Appeals referred Eco-Site's zoning application to the CCC for its review;
5. The CCC, as part of its review, has requested Russo to ensure that certain existing tree cover on the Property be preserved as a visual buffer to the proposed wireless communications tower; and
6. Russo is willing to enter into this Agreement in furtherance of the CCC's objective.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is acknowledged, Russo and Eco-Site agree as follows:

AGREEMENT

1. Russo agrees to preserve the trees now existing within the area designated as the "Buffer Zone" as depicted on the attached Exhibit A attached hereto and incorporated herein. Russo shall not, and shall not permit any person to remove trees within the Buffer Zone.
2. Notwithstanding the foregoing, upon prior authorization by the CCC, Russo may, and may authorize other persons to selectively trim or remove in the Buffer Zone (i) dead or dying trees; and (ii) trees that pose a hindrance to the operation of the wireless communications tower in the sole, but reasonable opinion of Eco-Site or any successor to Eco-Site. Russo shall replace any trees removed without CCC approval. Removal or

trimming of trees under applicable law by a public service corporation providing service in the area shall not be subject to the foregoing restriction.

3. CCC agrees to accept the conditions of this Agreement as a public benefit and to give weight to the same in its *Findings for Approval* as set forth in Section 7(c)(viii) of its regulations.
4. This Agreement shall only be effective upon (i) issuance of the CCC's approval; (ii) issuance of all other unappealable local, regional, state and federal permits and approvals necessary and desirable to construct and operate the proposed wireless communications tower; and (iii) construction of the wireless communications tower and ready for installation of communications equipment by at least one (1) wireless communications carrier. This Agreement shall be null and void upon written notice to the CCC by Russo that any one or more of the foregoing conditions has not been satisfied or it clearly appears such condition(s) shall not be satisfied.
5. This Agreement shall automatically terminate without any action being required by Russo at such time that the wireless communications tower shall no longer be present on the Property.
6. Written notice pursuant to this Agreement shall be effective three (3) business days after deposit in the U.S. mail, certified and postage paid, or upon receipt if personally delivered or sent by next business day delivery via a nationally recognized overnight courier to the addresses set forth below. Russo and Eco-Site may from time to time designate any other address for this purpose by providing written notice to the other.

If to Russo:

PJR Realty Trust
145 Route 30
Sandwich, MA 02644
Attention: Pasquale J. Russo IV

If to Eco-Site:

Attn: Asset Management
Eco-Site Site Number: MA-0049
240 Leigh Farm Road
Suite 415
Durham, NC 27707

With a copy to:

Eco-Site, Inc.
Attn: General Counsel
240 Leigh Farm Road
Suite 415
Durham, NC 27707

Pasquale J. Russo IV, Trustee
PJR Realty Trust

Date

Eco-Site, Inc.

By:_____

Its:_____

Name:_____

Date:_____

LANDLORD:

PJR Realty Trust
Pasquale J. Russo IV & Pasquale J. Russo III
145 Rt. 130 / PO Box 1328
Forestdale MA 02644

TENANT:

Eco-Site, Inc.
240 Leigh Farm Road
Suite 415
Durham, NC 27707
Site # & Name: MA-0049 Pierre Vernier Dr.

FIRST AMENDMENT TO LEASE AGREEMENT

THIS FIRST AMENDMENT TO LEASE AGREEMENT ("Amendment") has been made and entered into as of the _____ day of _____, 2016 ("Commencement Date") by and between Eco-Site, Inc., a Delaware corporation (the "Tenant") and PJR Realty Trust, a _____ (the "Landlord"), whose address is 145 Rt. 130 / PO Box 1328 Forestdale MA 02644.

BACKGROUND

WHEREAS, Landlord and Tenant are parties to that certain Lease Agreement dated June 21, 2016 ("Lease") for property located at 145 Rt. 130 Forestdale Massachusetts; and,

WHEREAS, Landlord and Tenant desire to amend Section 1 (a) of the Lease with respect to the Premises.

NOW THEREFORE, the parties intending to be legally bound hereby and in consideration of the terms, provisions and covenants herein contained agree as follows:

AMENDMENTS

1. All capitalized terms unless specifically defined herein, shall have the meaning ascribed to it in the Lease.
2. Paragraph 1(a) shall be deleted in its entirety and replaced with the following:

(a) Landlord grants to Tenant right to lease a portion of the Property measuring approximately 70' x 70' (4900 SF) square feet as described on attached Exhibit 2A, together with unrestricted access for Tenant's uses from the nearest public right-of-way along the Property to the Premises as described on the attached Exhibit 2A (collectively, the "Premises").

3. Except as modified by this Amendment, the Lease and all the covenants, agreements, terms, provisions and conditions thereof shall remain in full force and effect and are hereby ratified and affirmed. The covenants, agreements, terms, provisions and conditions contained in this Amendment shall bind and inure to the benefit of the parties hereto and their respective successors and except as otherwise provided in the Lease as modified by this Amendment, their respective assigns. In the event of any conflict between the terms contained in this Amendment and the Lease, the terms herein contained shall supersede and control the obligations and liabilities of the parties.

[SIGNATURES APPEAR ON NEXT PAGE]

IN WITNESS WHEREOF, the parties have duly executed this FIRST AMENDMENT TO LEASE AGREEMENT as of the above written date.

Tenant: **ECO-SITE, INC.,**
 a Delaware corporation

By:_____

Name: _____

Title: _____

Date:_____

Landlord: PJR Realty Trust, a _____

By:_____

Name:_____

Title:_____

Date:_____

EXHIBIT 2A

**The Premises is depicted/described as follows and will be replaced by a surveyed legal description
when available**

LANDLORD:

PJR Realty Trust
Pasquale J. Russo IV & Pasquale J. Russo III
145 Rt. 130 / PO Box 1328
Forestdale MA 02644

TENANT:

Eco-Site, Inc.
240 Leigh Farm Road
Suite 415
Durham, NC 27707
Site # & Name: MA-0049 Pierre Vernier Dr.

LEASE AGREEMENT

THIS LEASE AGREEMENT ("Lease") is made this 21st day of June, 2016 by and between, PJR Realty Trust (the "Landlord"), whose address is 145 Rt. 130 / PO Box 1328 Forestdale MA 02644, and Eco-Site, Inc., a Delaware corporation (the "Tenant"), whose address is 240 Leigh Farm Road, Suite 415, Durham, NC 27707.

WHEREAS, the Landlord owns certain real property located the County of Barnstable, in the State of Massachusetts, that is more particularly described or depicted in attached **Exhibit 1** (the "Property"); and,

WHEREAS, the Tenant desires to lease from Landlord a certain portion of the Property, more particularly described or depicted in attached **Exhibit 2** (the "Premises").

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree:

1. RIGHT TO LEASE.

(a) Landlord grants to Tenant right to lease a portion of the Property measuring approximately 50'x50' (2500 SF) square feet as described on attached **Exhibit 2**, together with unrestricted access for Tenant's uses from the nearest public right-of-way along the Property to the Premises as described on the attached **Exhibit 2** (collectively, the "Premises").

(b) From and after the date of this Agreement as set forth above for the time period set forth below (the "Testing Period"), in exchange for Tenant paying Landlord a one-time payment of [REDACTED] Tenant and its agents, engineers, surveyors and other representatives will have the right to enter upon the Property to inspect, examine, conduct soil borings, drainage testing, material sampling, and other geological or engineering tests or studies of the Property (collectively, the "Tests"), to apply for and obtain licenses, permits, approvals, or other relief required of or deemed necessary or appropriate at Tenant's sole discretion for its use of the Premises and include, without limitation, applications for zoning variances, zoning ordinances, amendments, special use permits, and construction permits (collectively, the "Government Approvals"), initiate the ordering and/or scheduling of necessary utilities, and otherwise to do those things on or off the Property that, in the opinion of Tenant, are necessary in Tenant's sole discretion to determine the physical condition of the Property, the environmental history of the Property, Landlord's title to the Property and the feasibility or suitability of the Property for Tenant's Permitted Use, all at Tenant's expense. Tenant will not be liable to Landlord or any third party on account of any pre-existing defect or condition on or with respect to the Property, whether or not such defect or condition is disclosed by Tenant's inspection. Tenant will restore the Property to its condition as it existed at the commencement of the Testing Period (as defined below), reasonable wear and tear and casualty not caused by Tenant excepted. In addition, Tenant shall indemnify, defend and hold Landlord harmless from and against any and all injury, loss, damage or claims arising directly out of Tenant's Tests.

(c) The initial term of the Testing Period will be one (1) year (the "Initial Testing Period") and may be renewed by Tenant for an additional one (1) year upon written notification to Landlord.

(d) During the Initial Testing Period and any extension thereof, Tenant may commence the Initial Term of this Lease by notifying Landlord in writing. If Tenant commences the Initial Term, then Landlord leases the Premises to the Tenant subject to the terms and conditions of this Lease. If Tenant does not commence the Lease during the Initial Testing Period or any extension thereof, this Lease will terminate and the parties will have no further liability to each other.

2. TERM.

(a) This Lease shall commence on the date Tenant begins construction at the site, which shall be confirmed in writing from Tenant to Landlord. In the event the date Tenant commences construction falls between the 1st and the 15th of the month, the Lease shall commence on the 1st day of that month and if such date falls between the 16th and the 31st of the month, then the Lease will commence on the 1st day of the following month ("Commencement

Date"). Unless extended or sooner terminated as herein provided, the term shall be for a period of one hundred twenty (120) months following the Commencement Date ("Initial Term").

(b) Tenant shall have the option to extend the term of this Lease for four (4) successive additional periods of 60 months each (each a "Renewal Term"). Each Renewal Term shall commence automatically, unless Tenant delivers notice to Landlord of its intent not to renew, such notice to be delivered not less than thirty (30) days prior to the end of the then-current term.

3. RENT. Tenant shall pay rent to Landlord beginning at Commencement Date a monthly rental payment of [REDACTED] ("Rent"), on or before the fifth (5th) day of each calendar month in advance. Payments will be made via electronic funds transfer ("EFT") directly to Landlord's bank account unless otherwise directed. Rent will be prorated for any partial month. The initial Rent payment will be forwarded by Tenant to Landlord within thirty (30) days from Commencement Date.

4. TAXES. Tenant shall pay any personal property taxes assessed on, or any portion of such taxes attributable to, the Communication Facility. Landlord shall pay when due all real property taxes and all other fees and assessments attributable to the Property and Premises. Tenant shall pay as additional Rent any increase in real property taxes levied against Premises, which are directly attributable to Tenant's use of the Premises (but not, however, taxes attributable to periods prior to the Commencement Date such as roll-back or greenbelt assessments) if Landlord furnishes proof of such increase to Tenant. In the event that Landlord fails to pay when due any taxes affecting the Premises or the Easement, Tenant shall have the right but not the obligation to pay such taxes and deduct the full amount of the taxes paid by Tenant on Landlord's behalf from future installments of Rent.

5. USE.

(a) The Premises are being leased for the purpose of erecting, installing, operating and maintaining radio and communications towers, transmitting and receiving equipment, antennas, dishes, mounting structures, buildings, and related equipment, including but not limited to the installation of a backup generator powered by natural gas which shall be sufficient to service the equipment at the site in the event of a power outage. Tenant may make any improvement, alteration or modification to the Premises as are deemed appropriate by Tenant ("Communications Facility"). Tenant shall have the right to clear the Premises of any trees, vegetation, or undergrowth which, in Tenant's sole opinion, interferes with Tenant's use of the Premises for the intended purposes. Tenant shall have the exclusive right to install upon the Premises communications towers, buildings, equipment, antennas, dishes, fencing, and other accessories related thereto, and to alter, supplement, and/or modify same as may be necessary.

(b) Landlord grants Tenant the right to clear all trees, undergrowth, or other obstructions and to trim, cut and keep trimmed and cut all tree limbs, which may interfere with or fall upon the Communications Facility or Premises. Landlord grants Tenant a non-exclusive easement in, over, across and through other real property owned by Landlord as reasonably required for construction, installation, maintenance, and operation of the Communication Facilities. Tenant shall be entitled to sublease and/or sublicense the Premises, including any communications tower located thereon. At all times during the term of this Lease, Tenant, and its guests, agents, customers, lessees, and assigns shall have the unrestricted, exclusive right to use, and shall have free access to, the Premises seven (7) days a week, twenty-four (24) hours a day. Tenant shall have the exclusive right to sublease or grant licenses to use the radio tower or any structure or equipment on the Premises, but no such sublease or license shall relieve or release Tenant from its obligations under this Lease. If at any time during the term of this Lease, the Federal Aviation Administration, Federal Communications Commission, or other governmental agency changes its regulations and requirements, or otherwise takes any action, the result of which inhibits Tenant's use the Premises, or any communications tower located thereon, for the purposes originally intended by Tenant, or if technological changes render Tenant's intended use of the Premises obsolete or impractical, or if Tenant otherwise determines, in its sole and absolute discretion, with or without cause, that the Premises is no longer suitable or desirable for Tenant's intended use and/or purposes, Tenant shall have the right to terminate this Lease Agreement upon written notice to Landlord.

6. ACCESS AND UTILITIES. Landlord for itself, its successors and assigns, hereby grants and conveys unto Tenant, its customers, employees, agents, invitees, successors and assigns a nonexclusive easement for ingress and egress, as well as for the construction, installation, operation and maintenance of overhead and underground electric, gas and other utility facilities (including wires, poles, guys, cables, conduits and appurtenant equipment), with the right to reconstruct, improve, add to, enlarge, change and remove such facilities, over, across and through any easement for the benefit of and access to the Premises, subject to the terms and conditions herein set forth. The rights granted to Tenant herein shall also include the right to partially assign its rights hereunder to any public or private

utility company or authority to facilitate the uses contemplated herein, and all other rights and privileges reasonably necessary for Tenant's safe and efficient use and enjoyment of the easement for the purposes described above.

7. EQUIPMENT, FIXTURES AND SIGNS. All improvements, equipment or other property attached to or otherwise brought onto the Premises shall at all times be the personal property of Tenant and/or its subtenants and licensees. Tenant or its customers shall have the right to erect, install, maintain, and operate on the Premises such equipment, structures, fixtures, signs, and personal property as Tenant may deem necessary or appropriate, and such property, including the equipment, structures, fixtures, signs, and personal property currently on the Premises, shall not be deemed to be part of the Premises, but shall remain the property of Tenant or its customers. At any time during the term of this Lease Agreement and within a reasonable time after termination hereof, Tenant or its customers shall have the right, but not the obligation, to remove their equipment, structures, fixtures, signs, and personal property from the Premises.

8. ASSIGNMENT. Tenant may assign this Lease to any person or entity at any time without the prior written consent of Landlord. After delivery by Tenant to Landlord of an instrument of assumption by an assignee that assumes all of the obligations of Tenant under this Lease, Tenant will be relieved of all liability hereunder. Landlord may assign this Lease, in whole or in part, to any person or entity (a) who or which acquires fee title to the Premises and/or (b) who or which agrees to be subject to and bound by all provisions of this Lease. Except for the foregoing, assignment of this Lease by Landlord must be approved by Tenant, in Tenant's sole discretion.

9. WARRANTIES AND REPRESENTATIONS.

(a) Landlord warrants and represents that it is the owner in fee simple of the Premises, free and clear of all liens and encumbrances except as to those which may have been disclosed to Tenant, in writing prior to the execution hereof, and that it alone has full right to Lease the Premises for the term set out herein. Landlord further represents and warrants that Tenant, on paying the rent and performing its obligations hereunder, shall peaceably and quietly hold and enjoy the Premises for the term of this Lease.

(b) Landlord shall promptly pay all real estate taxes and assessments against the Premises when due and shall avoid any delinquencies with respect thereto. Landlord shall also pay promptly, when due, any other amounts or sums due and owing with respect to its ownership and operation of the Premises, including, without limitation, judgments, liens, mortgage payments and other similar encumbrances. If Landlord fails to make any payments required under this Lease, such as the payment of real estate taxes and assessments, or breaches any other obligation or covenant under this Lease, Tenant may (without obligation), after providing ten (10) days written notice to Landlord, make such payment or perform such obligation on behalf of Landlord. The full amount of any costs so incurred by Tenant (including any attorneys' fees incurred in connection with Tenant performing such obligation) shall be paid by Landlord to Tenant with interest at the statutory rate thereon, or at Tenant's election may be offset against the rent due hereunder.

(c) Landlord does hereby authorize Tenant and its employees, representatives, agents and consultants to prepare, execute, submit, file and present on behalf of Landlord building, permitting, zoning or land-use applications with the appropriate local, state and/or federal agencies necessary to obtain land use changes, special exceptions, zoning variances, conditional use permits, special use permits, administrative permits, construction permits, operation permits and/or building permits. Landlord understands that any such applications and/or the satisfaction of any requirements thereof may require Landlord's cooperation, which Landlord hereby agrees to provide at no additional cost to Tenant.

(d) Landlord shall not do or permit anything that will interfere with or negate any special use permit or approval pertaining to the Premises or cause any tower on the Premises to be in nonconformance with applicable local, state, or federal laws. Landlord shall cooperate with Tenant in any effort by Tenant to obtain certificates, permits, licenses and other approvals that may be required by any governmental authorities. Landlord agrees to execute any necessary applications, consents or other documents as may be reasonably necessary for Tenant to apply for and obtain the proper zoning approvals required to use and maintain the Premises and the tower site.

(e) Landlord has complied with all, and will continue to comply with environmental, health, and safety laws with respect to the Premises, and no action, suit, proceeding, hearing, investigation, charge, complaint, claim, demand, or notice has been filed or commenced against Landlord or regarding the Premises alleging any failure to so comply. Without limiting the generality of the preceding sentence, Landlord and the Premises are in compliance with all environmental, health, and safety laws. No asbestos-containing thermal insulation or products containing PCB, formaldehyde, chlordane, or heptachlor or other hazardous materials have been placed on or in the Premises by Landlord or, to the knowledge of Landlord, by any prior owner or user of the Premises. To the knowledge of Landlord, there has been no release of or contamination by hazardous materials on the Premises.

(f) All utilities required for the operation of the Tenant's improvements enter the Premises through adjoining public streets or, if they pass through an adjoining private tract, do so in accordance with valid public easements. All utilities are installed and operating and all installation and connection charges have been paid in full.

(g) Landlord has no knowledge of any fact or condition that could result in the termination or reduction of the current access from the Premises to existing highways and roads, or to sewer or other utility services serving the Premises.

(h) The Premises abuts on and has direct vehicular access to a public road, or has access to a public road via a permanent, irrevocable, appurtenant easement benefiting the parcel of real property, and access to the property is provided by paved public right-of-way with adequate curb cuts available.

(i) With respect to the Premises, except as disclosed in writing to Tenant prior to the execution hereof: there currently exist no licenses, sublicenses, or other agreements, written or oral, granting to any party or parties the right of use or occupancy of any portion of the Premises; there are no outstanding options or rights of first refusal to purchase the Premises or any portion thereof or interest therein; and there are no parties (other than Landlord) in possession of the Premises.

(j) Landlord acknowledges that Tenant is in the business of subleasing all or portions of the Premises to subtenants pursuant to separately negotiated subleases entered into between Tenant and subtenant. Tenant may enter into any sublease without the consent of Landlord provided that notwithstanding the terms of that certain sublease, Tenant shall remain liable for all of the terms and conditions of this Lease and Tenant shall fulfill each covenant contained herein. Tenant shall remain liable for and hereby indemnifies and shall protect and defend Landlord from and against all costs, damages or liability (including reasonable attorney fees) resulting from any act or omission of such subtenant to the extent such act or omission is permitted by such subtenant and such permission is contrary to or inconsistent with the terms of this Lease.

(k) It is intended that the legal description of the Premises accurately reflect an "as-built" survey of any existing communications tower and accordingly the parties agree that, if any part of such tower, buildings, roadways, utilities, guy wires or anchors related to the communications tower located on the Premises is located beyond the legal description of the Premises or any easements specified in the Lease, the Lease is hereby amended to provide that the Premises includes the existing location of any such improvements as part of the Premises demised in the Lease, to the extent that such improvements are located on real property owned by Landlord.

10. HOLD OVER TENANCY. Should Tenant or any assignee, sublessee or licensee of Tenant hold over the Premises or any part thereof after the expiration of the term set forth herein, such holdover shall constitute and be construed as a tenancy from month-to-month only, but otherwise upon the same terms and conditions.

11. INDEMNITIES. The parties agree to indemnify, defend and hold harmless the other party, its parent company or other affiliates, successors, assigns, officers, directors, shareholders, agents and employees (collectively, "Indemnified Persons"), from and against all claims and liabilities (including reasonable attorneys' and fees court costs) caused by or arising out of (i) such party's breach of any of its obligations, covenants, or warranties contained herein, or (ii) such party's acts or omissions with regard to the Lease. However, in the event of an Indemnified Person's contributory negligence or other fault, the Indemnified Person shall not be indemnified hereunder to the extent that the Indemnified Person's negligence or other fault caused such claim or liability.

12. WAIVERS

(a) Landlord hereby waives any and all lien rights it may have, statutory or otherwise, in and to the tower facilities or any portion thereof, regardless of whether or not such is deemed real or personal property under applicable laws. Landlord will not assert any claim whatsoever against Tenant for loss of anticipatory profits or any other indirect, special, incidental or consequential damages incurred by Landlord as a result of the construction, maintenance, operation or use of the Premises by Tenant.

(b) EACH PARTY HERETO WAIVES ANY AND ALL CLAIMS AGAINST THE OTHER FOR ANY LOSS, COST, DAMAGE, EXPENSE, INJURY OR OTHER LIABILITY WHICH IS IN THE NATURE OF INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES WHICH ARE SUFFERED OR INCURRED AS THE RESULT OF, ARISE OUT OF, OR ARE IN ANY WAY CONNECTED TO THE PERFORMANCE OF THE OBLIGATIONS UNDER THIS LEASE.

13. INSURANCE.

(a) Tenant shall insure against property damage and bodily injury arising by reason of occurrences on or about the Premises in the amount of not less than \$1,000,000. The insurance coverage provided for herein may be maintained pursuant to master policies of insurance covering other tower locations of Tenant and its corporate affiliates. All insurance policies required to be maintained by Tenant hereunder shall be with responsible insurance

companies, authorized to do business in the state where the Premises are located if required by law, and shall provide for cancellation only upon 10 days' prior written notice to Landlord. Tenant shall evidence such insurance coverage by delivering to Landlord, if requested, a copy of all such policies or, at Tenant's option, certificates in lieu thereof issued by the insurance companies underwriting such risks.

(b) Landlord shall carry, at no cost to Tenant, general property fire, hazard and casualty insurance appropriate for Landlord's improvements on Landlord's Property, and in such amounts to cause the replacement/restoration of the Property (excluding Tenant's improvements and personal property) in the event of casualty.

14. INTERFERENCE. During the term of this Lease, Landlord, its successors and assigns, will not grant any ground lease, license, or easement with respect to any property adjacent to the Premises: (a) for any of the uses contemplated in paragraph 5 herein; or (b) if such lease, license, or easement would detrimentally impact Tenant's communications facilities, or the use thereof. Landlord shall not cause or permit the construction of radio or communications towers on the Premises or on any other property of Landlord adjacent or contiguous to or in the immediate vicinity of the Premises, except for towers constructed by Tenant.

15. RIGHT OF FIRST REFUSAL. If during the term of this Lease, as might be renewed or extended the Landlord shall have received a bona fide arm's length offer to purchase the Premises, or grant any other superior right in the Premises to this Lease from any third party (the "Transferee"), the Landlord shall serve a notice (the "Transfer Notice") upon the Tenant. The Transfer Notice shall set forth the exact terms of the offer so received (including but not limited to the state of title being conveyed to the prospective purchaser), together with a copy of such offer, and shall state the desire of the Landlord to sell or convey the Premises on such terms and conditions. Thereafter, the Tenant shall have the right and option to purchase the Premises at the price and upon the terms and conditions specified in the offer (the "Offer"). If the Tenant desires to exercise its option, it shall give notice (the "Counternotice") to that effect to the Landlord within thirty (30) days after receipt of the Transfer Notice. The closing of the purchase and sale or conveyance of the Premises pursuant to this option shall occur at the time set forth in the Offer, provided that Tenant shall not be required to close before the 15th day following the date of the Counternotice. The Tenant's failure to give a timely Counternotice (or its notice of refusal to purchase) shall be deemed a waiver of its rights to exercise its right of first refusal to accept the Offer but shall not be deemed a waiver of its right of first refusal with respect to any modification to the Offer or any future Offers.

16. SECURITY. The parties recognize and agree that Tenant shall have the right to safeguard and protect its improvements located upon or within the Premises. Consequently, Tenant may elect, at its expense, to construct such enclosures and/or fences as Tenant reasonably determines to be necessary to secure its improvements, including the tower(s), building(s), guy anchors, and related improvements situated upon the Premises. Tenant may also undertake any other appropriate means to restrict access to its communications towers, buildings, guy anchors, guy wires, and related improvements.

17. FORCE MAJEURE. The time for performance by Landlord or Tenant of any term, provision, or covenant of this Lease shall be deemed extended by time lost due to delays resulting from acts of God, strikes, civil riots, floods, material or labor restrictions by governmental authority, and any other cause not within the control of Landlord or Tenant, as the case may be.

18. CONDEMNATION. Notwithstanding any provision of the Lease to the contrary, in the event of condemnation of the Premises, the Landlord and Tenant shall be entitled to separate awards with respect to the Premises, in the amount determined by the court conducting such condemnation proceedings based upon the Landlord's and Tenant's respective interests in the Premises. If a separate condemnation award is not determined by such court, Landlord shall permit Tenant to participate in the allocation and distribution of the award. In no event shall the condemnation award to Landlord exceed the unimproved value of the Premises, without taking into account the improvements located thereon, and in no event shall the Lease be terminated or modified (other than an abatement of rent) due to a casualty or condemnation without the prior written consent of Tenant.

19. DEFAULT. The failure of Tenant or Landlord to perform any of the covenants of this Lease shall constitute a default. The non-defaulting party shall give the other written notice of such default, and the defaulting party shall cure such default within thirty (30) days after receipt of such notice. In the event any such default cannot reasonably be cured within such thirty (30) day period, if the defaulting party shall proceed promptly after the receipt of such notice to cure such default, and shall pursue curing such default with due diligence, the time for curing shall be

extended for such period of time as may be necessary to complete such curing, however, in no event shall this extension of time be in excess of sixty (60) days, unless agreed upon by the non-defaulting party.

20. REMEDIES. Should the defaulting party fail to cure a default under this Lease, the other party shall have all remedies available either at law or in equity, including the right to terminate this Lease. In the event Landlord elects to terminate this Lease due to a default by Tenant, it shall continue to honor all sublicense commitments made by Tenant through the expiration of the term of any such commitment, it being intended hereby that each such commitment shall survive the early termination of this Lease.

21. ATTORNEY'S FEES. If there is any legal proceeding between Landlord or Tenant arising from or based on this Lease, the unsuccessful party to such action or proceeding shall pay to the prevailing party all costs and expenses, including reasonable attorney's fees and disbursements, incurred by such prevailing party in such action or proceeding and in any appeal in connection therewith. If such prevailing party recovers a judgment in any such action, proceeding or appeal, such costs, expenses and attorney's fees and disbursements shall be included in and as a part of such judgment.

22. PRIOR AGREEMENTS. The parties hereby covenant, recognize and agree that the terms and provisions of this Lease shall constitute the sole embodiment of the arrangement between the parties with regard to the Premises, and that all other written or unwritten agreements, contracts, or leases by and between the parties with regard to the Premises are hereby terminated, superceded and replaced by the terms hereof.

23. LENDER'S CONTINUATION RIGHTS.

(a) Landlord agrees to recognize the leases/licenses of all subtenants and sublicensees and will permit each of them to remain in occupancy of its premises notwithstanding any default hereunder by Tenant so long as each such respective subtenant or sublicensee is not in default under the lease/license covering its premises. Landlord agrees to execute such documents as any such subtenant and/or sublicensee might reasonably require, including customary subordination, non-disturbance and attornment agreements and/or Landlord recognition agreements, to further memorialize the foregoing, and further agrees to use reasonable efforts to also cause its lenders to similarly acknowledge, in writing, subtenant/sublicensee's right to continue to occupy its premises as provided above.

(b) Landlord consents to the granting by Tenant of a lien and security interest in Tenant's interest in the Lease and all of Tenant's personal property and fixtures attached to the real property described herein, and furthermore consents to the exercise by Tenant's lender ("Tenant's Lender") of its rights of foreclosure with respect to its lien and security interest. Landlord agrees to recognize Tenant's Lender as Tenant hereunder upon any such exercise by Tenant's Lender of its rights of foreclosure.

(c) Landlord hereby agrees to give Tenant's Lender written notice of any breach or default of the terms of the Lease, within fifteen days after the occurrence thereof, at such address as is specified by Tenant's Lender. Landlord further agrees that no default under the Lease shall be deemed to have occurred unless such notice to Tenant's Lender is also given and that, in the event of any such breach or default under the terms of the Lease, Tenant's Lender shall have the right, to the same extent, for the same period and with the same effect, as the Tenant, plus an additional ninety days after any applicable grace period to cure or correct any such default whether the same shall consist of the failure to pay rent or the failure to perform, and Landlord agrees to accept such payment or performance on the part of Tenant's Lender as though the same had been made or performed by the Tenant. Landlord agrees that it shall not exercise its right to terminate the Lease or any of its other rights under the Lease upon breach or default of the terms of the Lease without so affording Tenant's Lender the foregoing notice and periods to cure any default or breach under the Lease.

(d) Landlord hereby (i) agrees to subordinate any lien or security interest which it may have which arises by law or pursuant to the Lease to the lien and security interest of Tenant's Lender in the collateral securing all indebtedness at any time owed by Tenant to Tenant's Lender (the "Collateral"), and (ii) furthermore agrees that upon an event of default under the loan documents between Tenant and Tenant's Lender or the Lease, Tenant's Lender shall be fully entitled to exercise its rights against the Collateral prior to the exercise by the Landlord of any rights which it may have therein, including, but not limited to, entry upon the Premises and removal of the Collateral free and clear of the Landlord's lien and security interest.

(e) Landlord acknowledges that nothing contained herein shall be deemed or construed to obligate the Tenant's Lender to take any action hereunder, or to perform or discharge any obligation, duty or liability of Tenant under the Lease.

(f) This Lease is subordinate to all deeds of trust, mortgages and ground leases now or hereafter encumbering the Premises, provided Landlord, its' tenants and lenders (1) be bound by the terms of the Lease; (2) not to disturb Tenant's use or possession of the Premises in the event of a foreclosure of such lien or encumbrance so long as Tenant

is not in default hereunder; and 3) not to join Tenant as party defendant in any such foreclosure proceeding taken by it. With regard to any existing encumbrance, Landlord covenants and agrees that, upon the request of Tenant, it shall use its best efforts to cause the holder thereof to execute a customary *Subordination, Non-Disturbance and Attornment Agreement*. In addition, the Parties will, within ten (10) days after the request, execute and deliver to the other party, an estoppel letter as to such matters relating to the Lease as are reasonably requested by either party.

24. INTENTIONALLY DELETED.

25. RIGHT TO NEW LEASE.

(a) In the case of termination of this Lease for any reason, or in the event this Lease is rejected or disaffirmed pursuant to any bankruptcy, insolvency or other law affecting creditor's rights, the Landlord shall give prompt notice thereof to Tenant's Lender, provided Tenant's Lender's name and address have been previously provided. The Landlord, on written request of Tenant's Lender made any time within thirty (30) days after the giving of such notice by the Landlord, shall promptly execute and deliver a new lease of the Premises to Tenant's Lender or its designee or nominee, for the remainder of the term upon all the covenants, conditions, limitations and agreements contained herein (including, without limitation, options to extend the term of this Lease) except for such provisions which must be modified to reflect such termination, rejection or disaffirmance and the passage of time, provided that Tenant's Lender (i) shall pay to the Landlord, simultaneously with the delivery of such new lease, all unpaid rent due under this Lease up to and including the date of the commencement of the term of such new lease and all reasonable expenses, including, without limitation, reasonable attorneys' fees and disbursements and court costs, incurred by the Landlord in connection with the default by the Tenant, the termination of this Lease and the preparation of the new lease, and (ii) shall cure all defaults existing under this Lease which are susceptible to being cured by Tenant's Lender promptly and with due diligence after the delivery of such new lease. Notwithstanding anything to the contrary contained herein, provided Tenant's Lender shall have otherwise complied with the provisions of this Section 25, Tenant's Lender shall have no obligation to cure any defaults which are not susceptible to being cured by such Lender (for example, the bankruptcy of the Tenant).

(b) Between the date of termination of this Lease and the date of execution of the new lease, if a Lender shall have requested such new lease as provided in Section 25(a), the Landlord shall not cancel any subleases or accept any cancellation, termination or surrender thereof (unless such termination shall be effected as a matter of law on the termination of this Lease) or enter into new subleases without the consent of Tenant's Lender.

(c) For so long as Tenant's Lender shall have the right to enter into a new lease with the Landlord pursuant to this Section 25, the Landlord shall not enter into a new lease of the Premises with any person or entity other than Lender, without the prior written consent of Tenant's Lender.

26. ADDITIONAL PROVISIONS.

(a) The parties hereto agree that (1) the Tenant is in possession of the Premises notwithstanding the fact that the Tenant has subleased, or may in the future sublease, certain of the improvements thereon to third parties and (2) the requirements of Section 365(h) of Title 11 of the United States Code (the "Bankruptcy Code") with respect to the Tenant's possession of the leasehold under this Lease are satisfied. Accordingly, the right of the Tenant to remain in possession of the leasehold under this Lease shall continue notwithstanding any rejection of this Lease in any bankruptcy proceeding involving the Landlord, or any other actions by any party in such a proceeding. This provision, while included in this Lease, has been separately negotiated and shall constitute a separate contract between the parties as well as a part of this Lease. The provisions of this Section 26(a) are for the benefit of the Tenant and its assigns, including, without limitation, Tenant's Lender. The parties hereto also agree that Tenant's Lender is a party in interest and shall have the right to appear as a party in any proceeding brought under any bankruptcy law or under any other law which may affect this Lease.

(b) The provisions of Sections 25, and 26 hereof shall survive the termination, rejection or disaffirmance of this Lease and shall continue in full force and effect thereafter to the same extent as if Sections 24, 25 and 26 hereof were a separate and independent contract made by the Landlord, the Tenant and Tenant's Lender and, from the effective date of such termination, rejection or disaffirmance of this Lease to the date of execution and delivery of such new lease, Tenant's Lender may use and enjoy the leasehold estate created by this Lease without hindrance by the Landlord. The aforesaid agreement of the Landlord to enter into a new lease with Tenant's Lender shall be deemed a separate agreement between the Landlord and Tenant's Lender, separate and apart from this Lease as well as a part of this Lease, and shall be unaffected by the rejection of this Lease in any bankruptcy proceeding by any party.

(c) The Landlord shall have no right and expressly waives any right arising under applicable law, in and to the rentals payable to the Tenant under any lease of the improvements on the land demised hereunder, if any, which rentals may be assigned by the Tenant to Tenant's Lender.

(d) If a Secured Interest is in effect, (i) this Lease shall not be modified or amended by the parties hereto, or terminated or surrendered by the Tenant, nor shall the Landlord accept any such termination or surrender of this Lease by the Tenant, without the prior written consent of Tenant's Lender and (ii) the Landlord shall not have the right to terminate this Lease in the event of a casualty or condemnation without the prior written consent of Tenant's Lender.

(e) The provisions of Sections 25 and 26 hereof are for the benefit of Tenant's Lender and may be relied upon and shall be enforceable by Tenant's Lender as if Tenant's Lender were a party to this Lease.

27. NOTICES. All notices, requests, claims, demands, and other communications hereunder shall be in writing and may be hand delivered (provided the deliverer provides proof of delivery) or sent by nationally-established overnight courier that provides proof of delivery, or certified or registered mail (postage prepaid, return receipt requested). Notice shall be deemed received on the date of delivery as demonstrated by the receipt of delivery. Notices shall be delivered to a parties at the address below, or to such other address that a party below may provide from time to time:

If to Landlord:

PJR Realty Trust
145 Rt. 130 / PO Box 1328
Forestdale MA 02644
Attn: Pasquale Russo
Phone: 508-539-3059

If to Tenant:

Eco-Site, Inc.
240 Leigh Farm Road
Suite 415
Durham, NC 27707
Attn: Asset Management
Phone: 919-636-6810
Fax: 919-636-6910
Ref: **MA-0049 Pierre Vernier Dr.**

28. MISCELLANEOUS.

(a) Each party hereto warrants and represents that it has the necessary power and authority to enter into and perform its respective obligations under this agreement.

(b) If any term of this Lease is found to be void or invalid, such invalidity shall not affect the remaining terms of this Lease, which shall continue in full force and effect.

(c) All attached exhibits are hereby incorporated by this reference as if fully set forth herein.

(d) Failure of party to insist on strict performance of any of the conditions or provisions of this Lease, or failure to exercise any of a party's rights hereunder, shall not waive such rights.

(e) This Lease shall be governed by and construed in accordance with the laws of the state in which the Leased Premises are located.

(f) This Lease constitutes the entire Lease and understanding of the parties and supersedes all offers, negotiations and other lease agreements with regard to the Leased Premises. There are no representations or understandings of any kind not set forth herein. Any amendment to this Lease must be in writing and executed by both parties.

(g) This agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, legal representatives, successors and assigns.

(h) A short-form memorandum of this Lease may be recorded at Landlord or Tenant's option in the form as depicted in **Exhibit 3** attached hereto.

**[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK,
SIGNATURES BEGIN ON NEXT PAGE]**

IN WITNESS WHEREOF, the parties hereto have executed this Lease as of the date last signed by a party hereto.

LANDLORD:

PJR Realty Trust

By: Pasquale J. Russo IV
Name: Ben J. Russo
Date: 6-16-16

TENANT:

Eco-Site, Inc.

By: [Signature]
Name: Robert G. Goss
Title: President + COO
Date: 6/21/16

EXHIBIT 1
Description of Parent Tract

EXHIBIT "A"

SOUTHEASTERLY	by Forestdale Road, three hundred three and 80/100 (303.80) feet;
SOUTHWESTERLY	one hundred forty-five (145) feet;
SOUTHEASTERLY	one hundred thirty-two (132) feet;
NORTHEASTERLY	one hundred sixty-five (165) feet by land now or formerly of Grace L. King;
SOUTHEASTERLY	by Forestdale Road, eighty-four (84) feet;
SOUTHWESTERLY	by land now or formerly of Mabel-Grace D. Cahoon, fifteen hundred twenty-one and 65/100 (1521.65) feet; and
NORTHWESTERLY	five hundred nineteen and 03/100 (519.03) feet; and
NORTHEASTERLY	fifteen hundred twelve and 84/100 (1512.84) feet by land now or formerly of the Town of Sandwich.

All of the boundaries are determined by the Court to be located as shown on a plan drawn by Newell B. Snow, Surveyor, dated December 17, 1973, as modified and approved by the Court, filed in the Land Registration Office, as Land Court Plan 38251-A.

Street Address: 145 Route 130, Forestdale, MA.

EXHIBIT 2

The Premises is depicted/described as follows and will be replaced by a surveyed legal description when available

Eco-Site

Urban.Renewal.Wireless.

ECO-SITE ID NUMBER: MA-0049

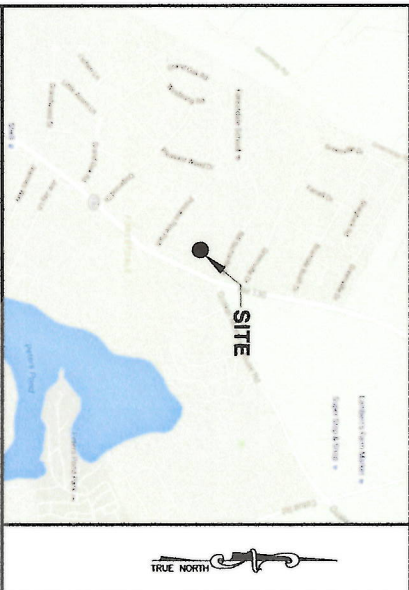
145 ROUTE 130
SANDWICH, MA 02844
BARNSTABLE COUNTY



SITE INFORMATION

ECO SITE ID NUMBER: MA-0049
911 SITE ADDRESS: 145 ROUTE 130
SANDWICH, MA 02844
LATITUDE (NAD 83): 41.69482°
LONGITUDE (NAD 83): -70.49948°
JURISDICTION: BARNSTABLE COUNTY
ZONING: R2 (RESIDENTIAL 2)
USE & OCCUPANCY GROUP: U
CONSTRUCTION TYPE: IIB
PARCEL ID NUMBER: 17-008
PARCEL AREA: 17.13 ACRES
PARCEL OWNER: PASQUALE J. RUSSO IV & PASQUALE J. FORESTATE, MA 2844
ADDRESS: 145 ROUTE 130
FORESTATE, MA 2844
GROUND ELEVATION: 148.0' (AMSLL)
STRUCTURE TYPE: RAWLAND - MONOPOLE
STRUCTURE HEIGHT: 135'-0" (ASL)

VICINITY MAP



CODE COMPLIANCE

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

- 2012 INTERNATIONAL BUILDING CODE
- 2012 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IPC
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 617
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C62 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECOMMA GR-1278
- ANSI/T 311

DRAWING INDEX

LE-1 TITLE SHEET
LE-2 SITE PLAN
LE-3 COMPOUND PLAN
LE-4 ELEVATION



DO NOT SCALE DRAWINGS

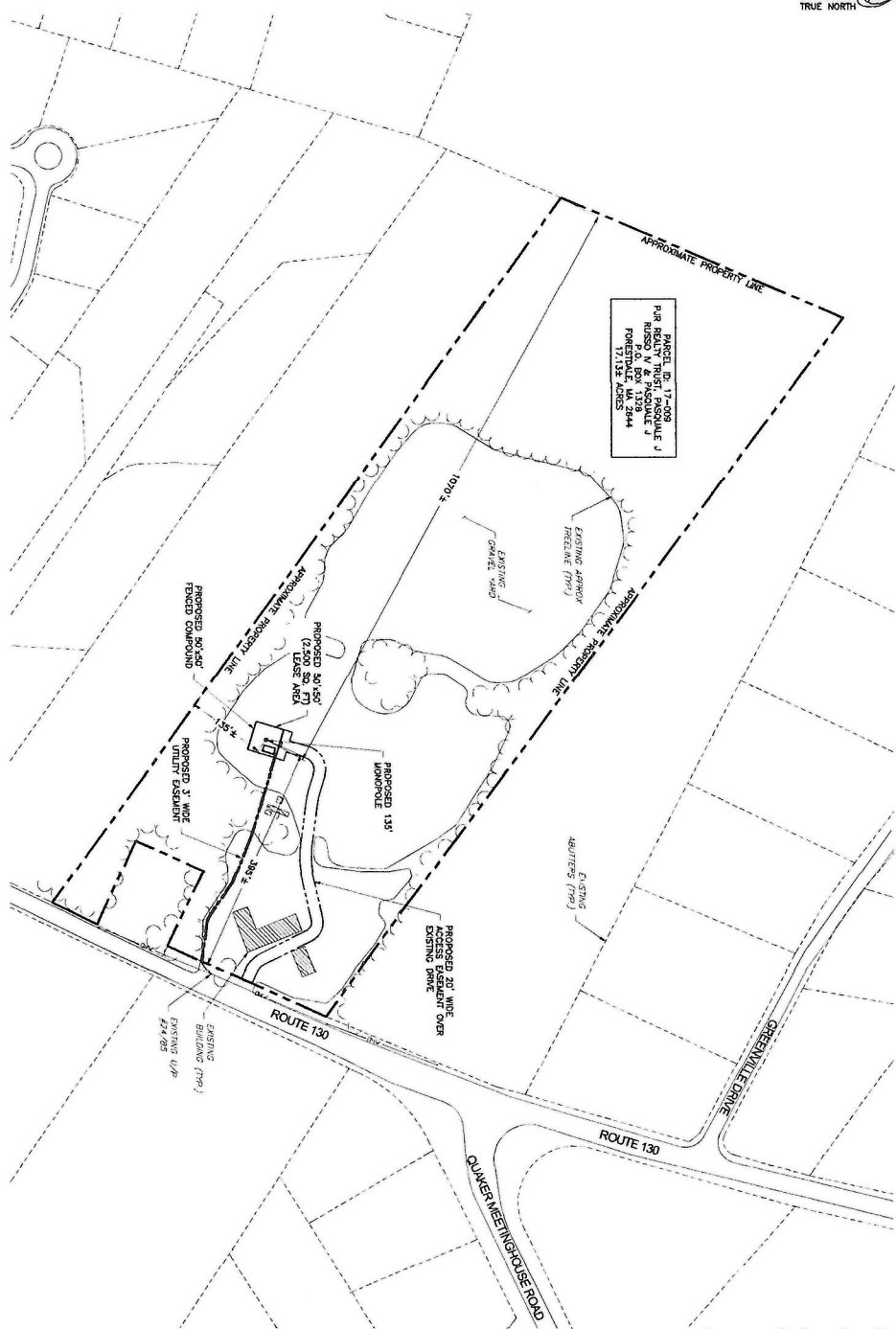
THESE DRAWINGS ARE FORWARDED TO BE FULL SIZE AT 24"X36" CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPROVAL BLOCK

PROPERTY OWNER: _____ DATE: _____
PROJECT MANAGER: _____ DATE: _____
DIRECTOR OF OPERATIONS: _____ DATE: _____

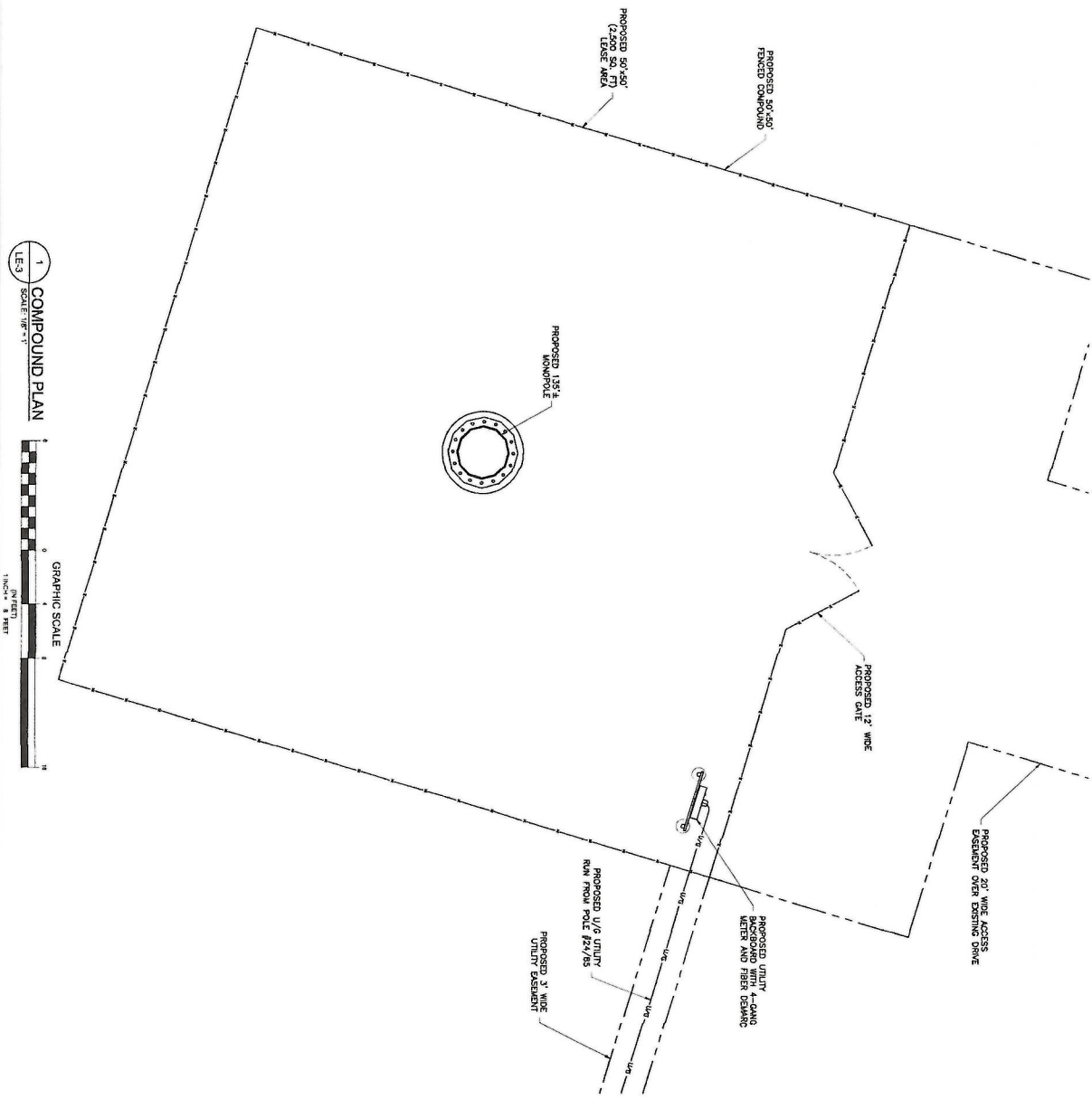
APPROVED: ☐ APPROVED AS NOTED: ☐ DISAPPROVED/REVISE: ☐



ENGINEER		APPLICANT		SITE INFORMATION		DESIGN RECORD		SHEET TITLE		SHEET NUMBER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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NB+C ENGINEERING SERVICES, LLC 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 556-8910</div>		<div>Eco-Site Urban Renewal Wireless. 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 556-8910</div>		MA-0049 145 ROUTE 130 SANDWICH, MA 02844 BARNSTABLE COUNTY		<div>REVISIONS</div> <table><thead><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th></tr></thead><tbody><tr><td>1</td><td>5/6/2013</td><td>PRELIMINARY LE</td><td>JMC</td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> 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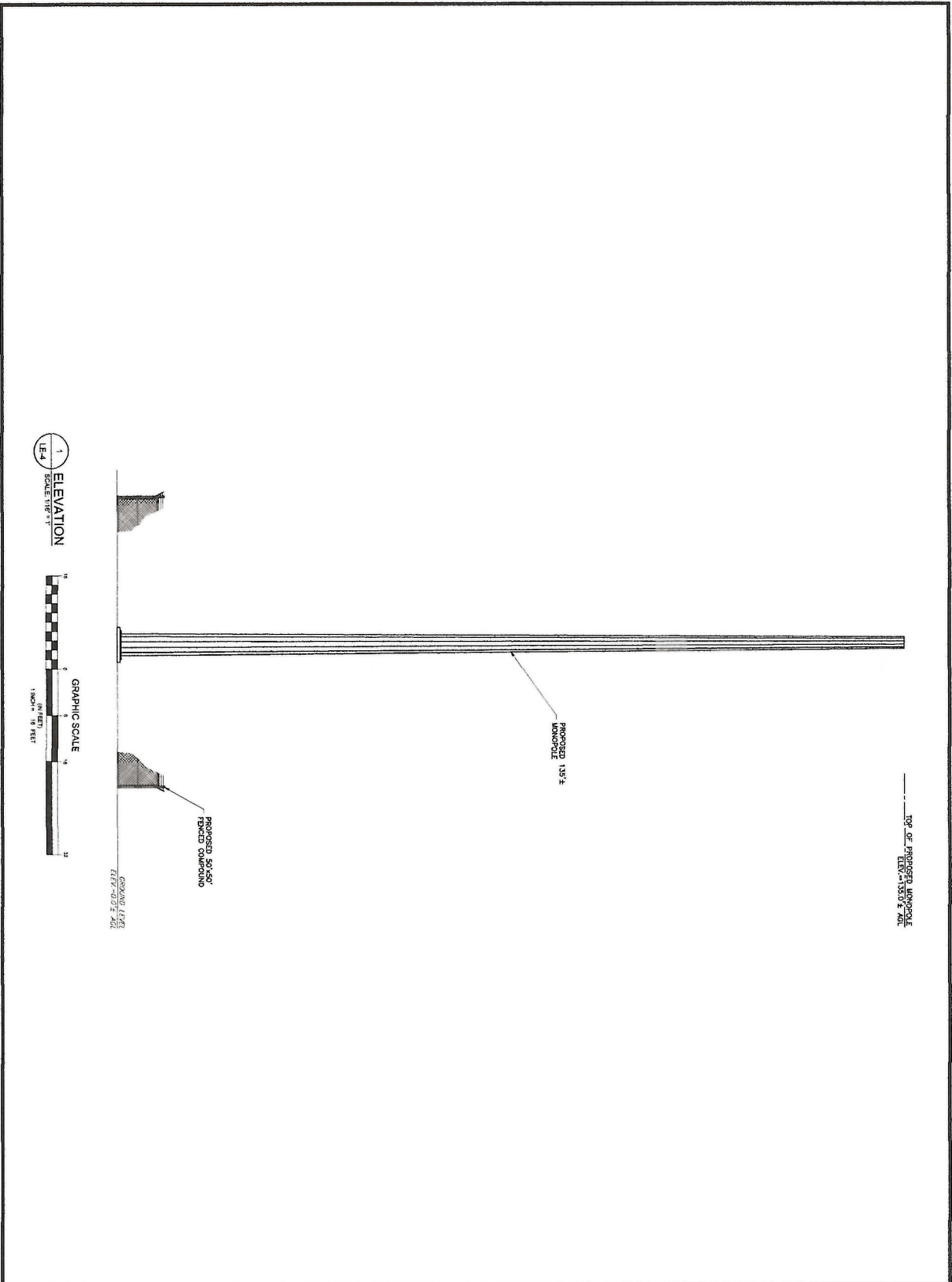


1. **LEASE FIRMITY** IS ASSURED TO BE OF THE HIGHEST QUALITY. YOU WILL HAVE COMPLETE CONTROL OVER YOUR LEASE. YOU WILL BE ABLE TO MAKE ANY CHANGES TO YOUR LEASE AT ANY TIME.
2. **WE ARE EMPLOYING THE LATEST TECHNOLOGY AND MATERIALS TO CONSTRUCT YOUR LEASE.**
3. **WE ARE EMPLOYING THE BEST CONTRACTORS AND SUBCONTRACTORS AVAILABLE TO CONSTRUCT YOUR LEASE.**
4. **THE COST OF THE PROJECTS WILL BE THE LOWEST POSSIBLE. WE WILL BE ABLE TO CONSTRUCT YOUR LEASE IN ANY CLIMATE, DURING ANY SEASON.**
5. **WE WILL BE ABLE TO EXHIBIT THE LEASES TO YOU AT ANY TIME.**
6. **PROGRESS TO THE INSTALLATION OF YOUR LEASE WILL BE MONITORED BY OUR TEAM OF EXPERTS.**
7. **WE WILL BE ABLE TO PROVIDE YOU WITH THE RESULTS OF A MARKET ANALYSIS.**

[illegible]



SHEET NUMBER	SHEET TITLE	DESIGN RECORD	SITE INFORMATION		APPLICANT	ENGINEER		
LE-3	COMPOUND PLAN	REVISIONS		MA-0049 145 ROUTE 130 SANDWICH, MA 02844 BARNSTABLE COUNTY	 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 655-6810	 TOTALLY COMMITTED. N&C ENGINEERING SERVICES, LLC. 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 655-6810		
		REV	DATE				DESCRIPTION	BY
		A	10/07/16				PRELIMINARY LE	PMC





SHEET NUMBER	SHEET TITLE	DESIGN RECORD	SITE INFORMATION		APPLICANT	ENGINEER																																							
LE-4	ELEVATION	<table><tr><th colspan="3">REVISIONS</th></tr><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th></tr><tr><td>A</td><td>06/07/16</td><td>PRELIMINARY I.E.</td><td>PNC</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>	REVISIONS			REV	DATE	DESCRIPTION	BY	A	06/07/16	PRELIMINARY I.E.	PNC																													MA-0049 145 ROUTE 130 SANDWICH, MA 02844 BARNSTABLE COUNTY		<div><p>Urban. Renewal. Wireless.</p><p>240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 688-8910</p></div>	<div><p>TOTALLY COMMITTED.</p><p>N3+C ENGINEERING SERVICES, LLC. 100 LENOX AVENUE, SUITE 200 DURHAM, NC 27707 (919) 688-8910</p></div>
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			REV	DATE	DESCRIPTION	BY																																							
			A	06/07/16	PRELIMINARY I.E.	PNC																																							

EXHIBIT 3

[FORM ONLY – DO NOT EXECUTE]

Return to:
Eco-Site, Inc.
240 Leigh Farm Road
Suite 415
Durham, NC 27707

Site Name: Pierre Vernier Dr.
Site Number: MA-0049

FORM OF MEMORANDUM OF LEASE

This Memorandum of Lease evidences a Lease ("Lease") between PJR Realty Trust ("Landlord"), whose address is 145 Rt. 130 / PO Box 1328, Forestdale MA 02644 and Eco-Site, Inc. a Delaware corporation, whose mailing address is 240 Leigh Farm Rd, Suite 415, Durham, North Carolina 27707 ("Tenant"), commencing on date Tenant begins construction at the site (the "Commencement Date"), which shall be confirmed in writing from Tenant to Landlord, for certain real property (the "Premises"), as described in Exhibit 1 attached hereto.

Landlord ratifies, restates and confirms the Lease and hereby Leases to Tenant the Premises, subject to the terms and conditions of the Lease. The Lease provides for the Lease by the Landlord to Tenant of the Premises for [a/an initial] term of Ten (10) years with four renewal option(s) of an additional five (5) years each, and further provides:

1. Landlord will attorn to any lender of Tenant and will subordinate any Landlord's lien to the liens of Tenant's lender;
2. The Lease restricts Landlord's ability to utilize, or allow the utilization of its adjacent property for the construction, operation and/or maintenance of communications towers and related facilities;
3. The Premises may be used exclusively by Tenant for all legal purposes, including without limitation, erecting, installing, operating and maintaining radio and communications towers, buildings, and equipment;
4. Tenant is entitled to sublease and/or sublicense the Premises, including any communications tower located thereon; and,
5. Under certain circumstances, Tenant has a right of first refusal to acquire the Premises from Landlord.

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK,
SIGNATURES BEGIN ON NEXT PAGE]

IN WITNESS WHEREOF, the parties hereto have executed this MEMORANDUM OF LEASE as of the date last signed by a party hereto.

LANDLORD:

PJR Realty Trust

By: _____

Name: _____

Title: _____

Date: _____

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____ County, State of _____, do hereby certify that _____ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the ____ day of _____, 201__.

(Signature of Notary)
Notary Public

My commission expires: _____

TENANT:

Eco-Site, Inc.,
a Delaware corporation

By: _____

Name: _____

Title: _____

Date: _____

STATE OF NORTH CAROLINA

COUNTY OF _____

I, _____, a Notary Public for _____ County, North Carolina, do hereby
certify that _____ personally appeared before me this day and acknowledged he (or she), as
_____ of Eco-Site, Inc., a Delaware corporation, and that he (or she) as
_____, being authorized to do so, executed the foregoing instrument on behalf of the corporation.

Witness my hand and official seal, this the ____ day of _____, 201__.

(Signature of Notary)

Notary Public

My commission expires: _____

EXHIBIT 1

Premises is depicted as follows and shall be replaced with a surveyed legal description when available

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NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: Whole Site

Date: 9/26/2016
 By: TRD
 Checked by: PB

Drainage Area	1	2	3	4	5	6
Wastewater (Title V Flows)	ft ²	ft ²	ft ²	ft ²	ft ²	ft ²
Title V Flow (Rooftop)	0	0	0	0	4200	1450
Impervious Surfaces	ft ²	ft ²	ft ²	ft ²	ft ²	ft ²
Roof	0	0	0	0	4200	1450
Pavement	0	0	5954	2475	35255	13686
Laydown Areas	272846	24734	3180	14940	72228	4514
Lawn	ft ²	ft ²	ft ²	ft ²	ft ²	ft ²
Lawn/Landscaping	0	2613	6535	451	87	14438
Natural	ft ²	ft ²	ft ²	ft ²	ft ²	ft ²
Woods	235192	0	0	0	3482	48759
Total	ft ²	ft ²	ft ²	ft ²	ft ²	ft ²
PPM Nitrogen Loading	0.96	1.88	4.08	1.59	2.75	3.07

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-1

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

N/A

Impervious

$$272,846 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 70,566.2 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 105,849.3 \frac{mg}{d}$$

Lawn

N/A

Natural

$$235,192 ft^2 \left[\frac{1.583 ft}{yr} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 39,087.3 \frac{L}{d}$$

Summary

$$\frac{105,849.3 mg}{70,566.2 + 39,087.3 L} = \frac{105,849.3 mg}{30,655.5 L} = \mathbf{0.96 ppm}$$

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-2

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

N/A

Impervious

$$24,734 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 6,397.0 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 9,595.4 \frac{mg}{d}$$

Lawn

$$2,613 ft^2 \left[\frac{3 lbs}{1,000 ft^2 * yr} \right] \left[\frac{1 yr}{365 d} \right] \left[\frac{454,000 mg}{lb} \right] [0.25] = 2,437.6 \frac{mg}{d}$$

Natural

N/A

Summary

$$\frac{9,595.4 + 2,437.6 mg}{6,397.0 L} = \frac{84,323.0 mg}{30,655.5 L} = \mathbf{1.88 ppm}$$

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-3

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

N/A

Impervious

$$5,954 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 1,539.9 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 2,309.8 \frac{mg}{d}$$

$$3,180 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 822.4 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 1,233.7 \frac{mg}{d}$$

Lawn

$$6,535 ft^2 \left[\frac{3 lbs}{1,000 ft^2 * yr} \right] \left[\frac{1 yr}{365 d} \right] \left[\frac{454,000 mg}{lb} \right] [0.25] = 6,096.3 \frac{mg}{d}$$

Natural

N/A

Summary

$$\frac{2,309.8 + 1,233.7 + 6,096.3 mg}{1,539.9 + 822.4 L} = \frac{84,323.0 mg}{30,655.5 L} = 4.08 ppm$$

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-4

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

N/A

Impervious

$$2,475 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 640.1 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 960.2 \frac{mg}{d}$$

$$14,940 ft^2 \left[\frac{40 in}{yr} \right] \left[\frac{ft}{12 in} \right] \left[\frac{28.32 L}{ft^3} \right] \left[\frac{1 yr}{365 d} \right] = 3,863.9 \frac{L}{d} \left[\frac{1.5 mg}{L} \right] = 5,795.9 \frac{mg}{d}$$

Lawn

$$451 ft^2 \left[\frac{3 lbs}{1,000 ft^2 * yr} \right] \left[\frac{1 yr}{365 d} \right] \left[\frac{454,000 mg}{lb} \right] [0.25] = 420.7 \frac{mg}{d}$$

Natural

N/A

Summary

$$\frac{960.2 + 5,795.9 + 420.7 mg}{640.1 + 3,863.9 L} = \frac{7,176.8 mg}{4,504.0 L} = 1.59 ppm$$

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-5

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

$$4,200ft^2 \left[\frac{75gpd}{1,000ft^2} \right] \left[\frac{3.785L}{gal} \right] = 1,192.3 \frac{L}{d} \left[\frac{35mg}{L} \right] = 41,729.6 \frac{mg}{d}$$

Impervious

$$4,200ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 1,086.2 \frac{L}{d} \left[\frac{0.75mg}{L} \right] = 814.7 \frac{mg}{d}$$

$$35,255ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 9,118.0 \frac{L}{d} \left[\frac{1.5mg}{L} \right] = 13,677.0 \frac{mg}{d}$$

$$72,228ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 18,680.3 \frac{L}{d} \left[\frac{1.5mg}{L} \right] = 28,020.5 \frac{mg}{d}$$

Lawn

$$87ft^2 \left[\frac{3lbs}{1,000ft^2 * yr} \right] \left[\frac{1yr}{365d} \right] \left[\frac{454,000mg}{lb} \right] [0.25] = 81.2 \frac{mg}{d}$$

Natural

$$3,482ft^2 \left[\frac{1.583ft}{yr} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 578.7 \frac{L}{d}$$

Summary

$$\frac{41,729.6 + 814.7 + 13,677.0 + 28,020.5 + 81.2 \text{ mg}}{1,192.3 + 1,086.2 + 9,118.0 + 18,680.3 + 578.7 \text{ L}} = \frac{84,323.0mg}{30,655.5L} = 2.75ppm$$

NITROGEN LOADING CALCULATIONS



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: DA-6

Date: 9/26/2016
 By: TRD
 Checked by: PB

Wastewater

$$1,450ft^2 \left[\frac{75gpd}{1,000ft^2} \right] \left[\frac{3.785L}{gal} \right] = 411.6 \frac{L}{d} \left[\frac{35mg}{L} \right] = 14,406.7 \frac{mg}{d}$$

Impervious

$$1,450ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 375.0 \frac{L}{d} \left[\frac{0.75mg}{L} \right] = 281.3 \frac{mg}{d}$$

$$13,686ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 3,539.6 \frac{L}{d} \left[\frac{1.5mg}{L} \right] = 5,309.4 \frac{mg}{d}$$

$$4,514ft^2 \left[\frac{40in}{yr} \right] \left[\frac{ft}{12in} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 1,167.5 \frac{L}{d} \left[\frac{1.5mg}{L} \right] = 1,751.2 \frac{mg}{d}$$

Lawn

$$14,438ft^2 \left[\frac{3lbs}{1,000ft^2 * yr} \right] \left[\frac{1yr}{365d} \right] \left[\frac{454,000mg}{lb} \right] [0.25] = 13,468.9 \frac{mg}{d}$$

Natural

$$48,759ft^2 \left[\frac{1.583ft}{yr} \right] \left[\frac{28.32L}{ft^3} \right] \left[\frac{1yr}{365d} \right] = 5,988.7 \frac{L}{d}$$

Summary

$$\frac{14,406.7 + 281.3 + 5,309.4 + 1,751.2 + 13,468.9mg}{411.6 + 375.0 + 3,539.6 + 1,167.5 + 5,988.7L} = \frac{84,323.0mg}{30,655.5L} = 2.76 \frac{mg}{L}$$

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October 19th, 2016

Steve Ruzzo
Eco-Site, Suite 415
240 Leigh Farm Road
Durham, NC 27707

Subject: Proposed Generator Letter for Eco-Site:
4HY0602A/ MA-0049 RUSSO (145 ROUTE 130)

Dear Mr. Ruzzo,

In response to your request, NB+C has provided a noise analysis/comparison letter for the proposed generator as a part of the above project. The analysis revealed the following conditions:

- The noise specifications provided by the manufacturer for the proposed PowerGen 7500 Generator show that the average sound level at a distance of 23.0 feet is 76dBA.
- The property line for this site is located 130.0 feet from the proposed generator location.
- The generator is expected to run once a week, on a weekday, during daytime hours for approximately 45 minutes for routine testing purposes.

The attached calculations show what the sound level will be at the property line. It was determined through these calculations that the sound level at the nearest property line to the generator will be 60.96dBA.

Examples of common sound levels are; 60dBA for a normal conversation, 85dBA for vehicular traffic, and 107dBA for a running lawnmower. Thus, the anticipated sound level at the property line for this proposed generator will be at the sound level of a normal conversation. The calculation is an "ideal" scenario, where no obstructions stand between the source and the receptor of the sound. On the existing site, a 45 foot stand of trees exists between the proposed generator and the nearest property line. A landscaping buffer of trees is proposed alongside the proposed compound. Both vegetated barriers will reduce the sound levels, resulting in nearly inaudible equipment at the nearest property line.

Once a month, T-Mobile has a contractor perform preventative maintenance on each generator. The technician accesses each site in a pickup utility truck with an off-road fuel tank in the bed. During these two visits the generator fuel is topped off to replenish the fuel consumed during the weekly exercise cycle. In the event of an extended power outage and generator usage, the technician is dispatched to refuel the generator in response to the larger than normal fuel usage. Please note, a large delivery vehicle is not utilized in these events.

If you have any questions regarding this matter, please feel free to contact me at 267-460-0122.

Respectfully submitted,
NETWORK BUILDING + CONSULTING



Krupakaran Koldaivelu, P.E.
Engineering Manager - Structural



Noise Level Calculations

Performed by: TRD Date: 10/19/16

Client:

EcoSite

Client Site Info:

Site Name: 4HY0602A/MA-0049 Russo

Site Address: 145 Route 130, Sandwich, MA 02644

Proposed Equipment:

PowerGen 7500 Generator

Max Sound Level=76.0dBA @ 23ft.

Site Data:

l_1 = Sound level at 23 ft. test distance (dBA)

d_1 = 23 ft test distance

l_2 = Sound level at property line (dBA)

d_2 = Distance to property line = 130 ft.

Calculations:

$$l_2 = l_1 - \left| 10 \times \log \left(\frac{d_1}{d_2} \right)^2 \right|$$

$$l_1 = 64.0 dBA$$

(Max Sound Level @ 23ft.)

$$d_1 = 23.0 ft.$$

(Test Distance)

$$d_2 = 130.0 ft.$$

(Distance to Property Line)

$$x = \left(\frac{d_1}{d_2} \right)$$

Sound Level at 130ft.:

$$l_2 = l_1 - |10 \times \log(x^2)|$$

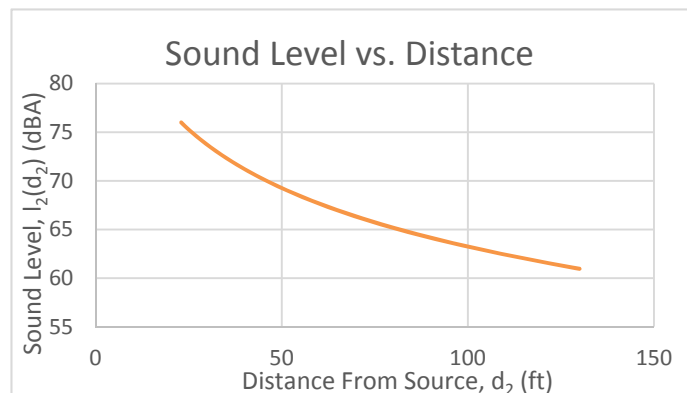
$$l_2 = 60.956 dBA$$

$$l_2 = 60.96 dBA$$

Sound Level Demonstrated:

$$d_2 = 23, 24, \dots, 130 ft.$$

$$l_2 = l_1 - \left| 10 \times \log \left(\frac{d_1}{d_2} \right)^2 \right|$$





PowerGen 7500

DC Generator

Product Feature

- Reliable 52V DC backup solution
- Extremely simple installation
- Extended run times
- Automated exercising routines
- Intelligent control panel monitoring
- Minimal maintenance

Specifications

1. General

Construction	Aluminum enclosure with Pre-galvanized steel base
Dimensions (W x H x D)	27 x 40 x 42 in (686 x 1016 x 1067 mm)
Weight	350 lbs (159 kg) (without optional start batteries)
Mounting options	Pad-mount
Finish	Polyester Powder Paint (Gray)
Fuel options	Propane (LPG) or Natural Gas
Safety	UL2200 Listed

2. Environment

Operating temperature	-20°C to +46°C (-4F to +115F)
Protection class	IP55 electronics enclosure
Altitude	< 4000m above mean sea level
Acoustics	76 dB(A) at 23 feet (7m)

3. Generator Specifications

Output Power (W)	7500W
Output Voltage (V)	52V DC
Output Voltage Regulation	≤ ± 250mV
Engine	570cc Air Cooled Engine
DC Motor	Permanent Magnet Brushed DC Motor
RPM	3450 to 3750
Fuel consumption	1.2 lbs/hr @ 5kW, LPG
Gas inlet pressure	11 in-H2O (0.40 psi)
Output connections	¼"-20, 5/8" C-C threaded stud interface for 1/0 2-hole lugs
Output protection	200A Circuit Breaker

4. Batteries

Site	Start-up from site batteries (50A@49V for <2min)
Start-up (optional)	Start-up with no energy from site batteries

5. Control and Interface

Controls	Auto, Run, Stop
Alarms	Critical, Major, Minor alarm relays (Form-C)
Craft Interface	RJ45 Ethernet
Automated Exercise	Automated periodic exercising with weekend and holiday blackout

6. Ordering information

ESOG150-PCA01	PowerGen 7500 with Large Oil Reservoir
5100266100	2.5 gallon jug of Special Oil for PowerGen 7500 – Required for EPA emissions
3799485900-S	Battery Heater Kit
0999142400	Battery String, 48V, 100Ah

*All specifications are subject to change without prior notice.

Delta Group Website:

www.deltawww.com

Product Website:

www.deltapowersolutions.com

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MA-0049 RUSSO
STORMWATER POLLUTION PREVENTION PLAN

For



RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

Prepared by:

Krupakaran Kolandaivelu, PE

DATE: 09/27/16

Revised: 01/20/17

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1.0 OVERVIEW AND REQUIREMENTS

1.1 Overview

This Stormwater Pollution Prevention Plan (SWPPP) is prepared to inform the landowner and construction personnel of the measures to be implemented for controlling runoff and pollutants from the site during and after construction activities. The objective of this plan is to comply with the Massachusetts Department of Environmental Protection's Stormwater Management Standards' requirements. Any material conflicts between this plan and the site plans, specification or instructions, must be brought to the attention of the design professional. The project may have other permits and it is the responsibility of the owner and contractor to know and understand all permits.

Technical standards are detailed in the "Structural BMP Specifications for the Massachusetts Stormwater Handbook", as well as illustrated on the Erosion and Sediment Control Plan Map included herein. The design of post-construction stormwater control practices follow the guidance provided by "Massachusetts Stormwater Handbook."

2.0 SWPPP REVIEW, UPDATE

2.1 SWPPP Review

Applicable Federal, State, and local regulatory agencies that have jurisdiction may elect to review this SWPPP and notify the permittee in writing that the SWPPP does not meet the requirements of their regulations. If the SWPPP needs to be revised, the permittee and the site contractor will make the required modifications within seven days of such notification and submit written certification to the notifying agency that the changes have been implemented. A copy of the SWPPP will be kept available on site for review by regulatory agencies, engineers, and subcontractors.

2.2 SWPPP Update

The permittee identified in this SWPPP shall amend the SWPPP when there is a change in one or more of the following project components which has an effect on the potential for discharge of pollutants from stormwater runoff associated with construction activities:

- ✓ Design
- ✓ Construction
- ✓ Operation
- ✓ Maintenance

The SWPPP shall also be updated or amended under the following conditions:

- ✓ If measures identified in the SWPPP become ineffective in eliminating or minimizing pollutants from sources identified, or in achieving the general objectives of controlling stormwater pollution from permitted construction activity.
- ✓ To identify a new subcontractor that will implement any part of the SWPPP.

3.0 SITE ASSESSMENT, EVALUATION AND PLANNING

3.1 *Project Description and Location*

Eco-Site is proposing to construct a new telecommunications site on lands of PJR Realty Trust, located at 145 Route 130, Sandwich, MA 02644. The proposed site will consist of a 135' Monopole, a 50'x50' fenced-in gravel compound, and underground utility access connecting the proposed compound to the existing utility lines. Eco-Site plans on using an existing bituminous/gravel access road, and constructing a short section (approximately 50 feet in length) of 12-foot wide gravel access to connect the existing drive with the proposed compound. It shall be noted that the proposed gravel access and compound will both be constructed on existing compacted vehicle and equipment laydown areas. This project will also include the installation of an infiltration trench and vegetated berm downstream of the compound which will be used to capture runoff from the proposed development.

3.2 *Pre-Development Conditions*

The site currently consists of a developed lot with equipment and vehicle laydown areas in the western portion of the property. It shall be noted that the majority of the developed areas on site consist of gravel and dirt parking areas, and a paved bituminous driveway circling the existing building. Stormwater runoff from the existing developed area drains in a southeastern direction. Based on our investigations, the site does not have any existing stormwater management features. The existing drainage pattern will be maintained in the proposed conditions.

3.3 *Receiving Waters*

The closest receiving water for the Project Site is an existing pond, named Peter's Pond, approximately 1,700 feet from the proposed installation. An existing construction yard currently separates the proposed installation from the existing receiving water.

3.4 *Soil Classifications*

Map Unit Symbol/Name	Parent Material	Hydrologic Soil Group	Depth to Water Table	Depth to Restrictive Layer
265A Enfield Silt Loam, 0-3% slopes	Silty, friable loamy eolian deposits over loose, sandy glaciofluvial deposits	B	>80 inches	16-40 inches
600 Pits, sand and gravel	Loose, sandy and gravelly glaciofluvial deposits	N/A	N/A	N/A

4.0 EROSION AND SEDIMENT CONTROL

4.1 *Erosion and Sediment Control Practices*

If any elements of the design are not in conformance with the technical standard, identify them and include the reason for the deviation and provide information, which demonstrates that it is equivalent to the technical standards.

4.1.1 Temporary Structural Practices

- ✓ Silt Fence
- ✓ Stabilized Construction Entrance
- ✓ Temporary Stockpile
- ✓ Concrete Washout Area

4.1.2 Permanent Structural Controls

- ✓ Land Grading
- ✓ Infiltration Trench
- ✓ Vegetated Berm
- ✓ Conveyance Swales

4.1.3 Temporary Stabilization Practices (including vegetative practices)

- ✓ Seed and mulch bare soil areas within 14 days of disturbance unless construction will resume in that area within 21 days.

4.1.4 Permanent Stabilization Practices (including vegetative practices)

- ✓ Seed and mulch all disturbed areas. Slopes that are 3:1 or steeper should receive a Rolled Erosion Control Product (RECP), sodding, and or hydro- seeding a homogenous mixture of wood fiber mulch with tackifying agent.

Refer to Construction Drawings attached in **Appendix A** for detailed information on each practice.

4.2 Erosion and Sediment Control Drawings

Erosion and Sediment Control drawings are included herein

Erosion and Sediment Control drawings must include the following:

- ✓ Total Site Area
 - ✓ All improvements
 - ✓ Areas of disturbance
 - ✓ Areas that will not be disturbed
 - ✓ Existing vegetation
 - ✓ On-site and adjacent off-site surface waters
 - ✓ Wetlands and drainage patterns affected by construction
 - ✓ Existing and final slopes
-
- ✓ Locations of soil types and boundaries
 - ✓ Material, waste, borrow or equipment storage areas located on adjacent properties
 - ✓ Location of stormwater discharges
 - ✓ Specific locations, sizes, and lengths of each erosion and sediment control practice
 - ✓ Details of erosion and sediment control practices shall include dimensions, material specifications, installation details, operation and maintenance requirements. Include location and sizing of any temporary sediment basins and structural practices used to divert flows.

4.3 Construction Plan and Sequence of Operations

The Construction Plan is included in **Appendix A**.

- ✓ Temporary structural erosion controls will be installed prior to earthwork as per the attached plans.
- ✓ Areas to be undisturbed for more than 14 days will be temporarily stabilized by seeding.
- ✓ Disturbed areas will be reseeded and mulched immediately after final contours are re-established and no more than 14 days after the completion of construction at that site.
- ✓ Temporary erosion control devices will not be removed until the area served is stabilized by the growth of vegetation and the area is certified as being stabilized by the Erosion Control Superintendent.

Construction Activities	Reference Sheet Number	Start → Stop
Sequence must include major items such as, but not limited to, clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity resulting in soil disturbance. Include installation of erosion and sediment control practices and timing of installation.		
Install erosion and sediment controls, staging area and construction fencing.		1 Week
Construct Access Road Infiltration Trench, and swales, rough grade site, excavate/construction foundation and install tower		3 Weeks
Construct and maintain temporary cover to stabilize disturbed areas		1 Week
Install Utilities		1-2 weeks
Stabilize proposed access road w/ stone sub-base and places stone within compound		1 week
Collect silt and sediment and place back on site in landscaped areas		1 week
Establish Permanent Cover		2 weeks
Remove Erosion and Control Measures		1 Week

4.4 Erosion and Sediment Control Practice Inspection Schedule

- ✓ Silt fence – maintenance shall be performed as needed and material removed when “bulges” develop in the silt fence.
- ✓ Stabilized construction entrance – entrance shall be maintained in a condition which shall prevent tracking. This may require periodic top dressing with additional aggregate. All sediment tracked onto or spilled on public rights of way shall be removed immediately. When necessary, wheels must be cleaned to remove sediment prior to entrance on public rights of way. When washing is required, it shall be done in an area stabilized with aggregate.
- ✓ Rock outlet protection – once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap. Repair should be immediate.

4.5 Contractor Sequence Form

The operator shall prepare a summary of construction status using the Construction Sequence Form once every month. Significant deviations to the sequence and reasons for those deviations (i.e. weather, subcontractor availability, etc.), shall be noted by the contractor. The schedule shall be used to record the dates for initiation of construction, implementation of erosion control measures, stabilization, etc. A copy of this table will be maintained at the construction site and updated.

5.0 POST CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

5.1 *Stormwater Management Controls*

The Stormwater Management features for the proposed installation were designed to reduce post-development stormwater runoff volume and peak flow. The proposed grading is designed to convey existing offsite flows around the proposed installation, while treating and storing any flow over new impervious surfacing. The analysis below has been completed based on the attached construction drawings and existing site conditions. Drainage area maps are also attached.

If any elements of the design are not in conformance with the technical standard, identify them and include the reason for the deviation and provide information, which demonstrates that it is equivalent to the technical standards.

5.2 *Post Construction Stormwater Management Drawings*

Post construction stormwater management drawings are included in **Appendix A**.

Post construction stormwater management drawings must include the following:

- ✓ Specific locations, sizes, and lengths of each post construction stormwater management practice.
- ✓ Details of post construction stormwater management practices shall include dimensions, material specifications, installation details, operation and maintenance requirements.

5.3 *Hydraulic and Hydrologic Analysis*

The program utilized for quantifying stormwater runoff rates and volumes was **Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2014**. The SCS 24-hour Type II design storms for 2, 10, and 100-year frequency rainfall were analyzed.

- ✓ Hydrologic/hydraulic analysis for all structural components of the stormwater control system for the applicable design storms (see **Appendix B**).
- ✓ Comparison of post-development stormwater runoff conditions with pre- development conditions (see **Appendix B**).
- ✓ Dimensions, material specifications and installation details for each post- construction stormwater control practice (see **Appendix A**).

5.4 Comparison of Pre and Post Construction Stormwater Runoff

Stormwater Quantity. These calculations are based on the HydroCAD analysis.

DA-1	Pre Development	Post Development
2 year, 24 hour storm (Qp)	25.61 CFS	22.41 CFS
10 year, 24 hour storm (Qf)	40.78 CFS	35.62 CFS
DA-2	Pre Development	Post Development
2 year, 24 hour storm (Qp)	9.689 CFS	9.689 CFS
10 year, 24 hour storm (Qf)	15.50 CFS	15.50 CFS

5.4.1 Water Quality Volume Calculations

The following was utilized to determine water quality volume:

$$Volume: V_{WQ} = \frac{D_{WQ}}{12} * A_{IMP}$$

Where:

V_{WQ} = Water Quality Volume (cubic feet)

D_{WQ} = Water Quality Depth (1.0 inches for this area)

A_{IMP} = Impervious Area in square feet

	Required	Provided
Water Quality Volume (WQv)	496.2 ft ³	1612.0 ft ³

5.5 Stormwater Management Analysis

The proposed site improvements are designed to maintain the existing flow direction of stormwater runoff. Along with maintaining the existing flow, proposed structures are designed to convey, store, and treat excess stormwater runoff from the addition of impervious material to the site. Two conveyance swales are proposed to reroute runoff away from the proposed impervious compound. Downslope of the proposed compound, an infiltration trench is proposed to capture and treat the runoff that flows over the proposed installation. As shown in the above calculations, and the attached runoff analysis, the design reduces both the peak runoff flow, and the peak runoff volume for the two- and ten-year 24-hour storms.

The property line serves as the boundary of the analysis. The existing site drainage can be split into two separate drainage areas, based on flow pattern leading to the southeastern property line. These two drainage areas and patterns are maintained in post-development conditions. Drainage Area 1 (DA-1) is broken up in the post-development analysis to analyze the individual sections leading to the two proposed swales and the infiltration trench. Drainage Area 2 (DA-2) is maintained between pre- and post-construction.

5.6 *Stormwater Management Practice Inspection Schedule*

- ✓ Infiltration Trench – maintenance shall be performed as needed and material removed and replaced as sediment accumulation causes ponding or overflow out of the footprint of the trench. Inspection shall take place immediately following major storm events.
- ✓ Conveyance Swales – maintenance shall be performed as needed and material removed when sediment and debris cause ponding within the swale, preventing proper flow. Inspection shall take place immediately following major storm events.

6.0 CONSTRUCTION WASTE

Waste Materials: All waste materials generated during construction will be disposed at a suitable landfill, or transfer station.

Hazardous Waste: The project will not be a generator of hazardous waste and it is not anticipated that any hazardous waste will be generated during construction. If there are any materials generated, a licensed hazardous waste carrier will be contracted to dispose the hazardous material at a suitable disposal site. If hazardous materials are discovered during construction, the work will be stopped until the issue is resolved.

Waste: Portable sanitary facilities will be made available to construction personnel and will be serviced regularly.

7.0 OFFSITE VEHICLE TRACKING

Excavation equipment involved with the construction will remain on the project site and will not regularly egress or ingress the site. Any trucks used to bring in materials or remove materials via municipal paved roads will do so over a stabilized construction entrance. If any off-site vehicle tracking occurs, the contractor will be directed to initiate, street sweeping program in the immediate vicinity of the site.

8.0 EROSION AND SEDIMENT CONTROL INSPECTION

These are the inspection items that will be used to maintain erosion and sediment controls. The practices listed herein shall be implemented in accordance with the attached maintenance schedule.

A maintenance inspection report will be made after each inspection. Reports should be compiled and maintained on-site.

- It is recommended that a rain gage be installed at the site.
- A qualified professional shall conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP and required by GP-0-10-001 have been adequately installed to ensure overall preparedness of the site for commencement of construction.
- **Structural erosion controls and non-stabilized areas shall be inspected at least once every seven (7) days.** The Inspection Form is located at the end of this report (Appendix C) and shall be completed in full for every inspection performed.
- The day-to-day erosion control activities on the site will be monitored by the construction manager. The qualified inspector (as defined by the MassDEP regulations) and his/her crews will make **at least one inspection every seven (7) days** of erosion control devices.
- All measures will be maintained in good working order; if repair is necessary, it will be initiated within 24 hours of report.
- Silt fence will be inspected for depth of sediment, ripped fabric, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in ground.
- All temporary sediment basins should be inspected for stability and integrity **at least once every seven (7) days**. Any structural failure in sediment basins or trenches that serve them will be repaired within 24 hours after detection. All temporary sediment basins or trenches shall be cleaned out when one foot of sediment or half the design depth of the trap has accumulated. All spoils shall be removed to a stabilized upland area.
- Seeded and planted areas will be inspected for bare spots, washouts, and healthy growth. If necessary, spot reseeding or sodding will be implemented.
- Trained Contractor will be responsible for the implementation of the SWPPP. This person will be onsite when any soil disturbing activities are being conducted. This trained contractor cannot conduct the regular SWPPP compliance inspections. This trained contractor must have received 4 hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive 4 hours of training every 3 years. It can also mean an employee from the contracting (construction) company, that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received 4 hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

9.0 TEMPORARY STABILIZATION FOR FROZEN CONDITIONS

The following temporary stabilization measures **MUST** be performed when construction is occurring during winter/frozen ground conditions. The following requirements do not supersede any other requirements of this SWPPP as they apply to non-frozen ground conditions.

- Perimeter erosion control **MUST** still be installed prior to earthwork disturbance as per this SWPPP.
- Any areas that cannot be seeded to turf by October 1 or earlier will receive a temporary seeding. The temporary seeding will consist of winter rye seeded at the rate of 120 pounds per acre (2.5 pounds per 1,000 square feet) or stabilized as per the temporary stabilization for winter construction/frozen conditions.
- Any area of disturbance that will remain inactive for a period of 14 consecutive days **MUST** be mulched. This includes any previously disturbed areas that are covered with snow.
- Mulch **MUST** consist of loose straw applied at the rate of 2 to 3 bales (90 to 100 pounds) per thousand square feet.
- Mulch **MUST** be applied uniformly over the area of bare soil or bare soil that is covered with snow. For the latter condition, mulch **MUST** be applied on top of snow.
- Using a tracked vehicle, mulch **MUST** be crimped into the bare soil/snow. The tracked vehicle **MUST** be driven across the mulched areas in at least two directions to maximize crimping of mulch into the soil/snow.
- If mulch gets blown off an area to a significant degree, the site inspector **WILL** require that an area be re-mulched in accordance with Items 2 through 5 above, and this area **WILL** be included on the inspection checklist for the next inspection.
- If a particular area repeatedly experiences loss of mulch due to wind, then the inspector **WILL** require that an alternative method be used to secure the mulch in place. Such alternatives may include the use of netting, tackifier or other methods deemed appropriate by the inspector.
- During periods when snow is melting and/or surface soils are thawing during daytime hours, mulched areas **MUST** be re-tracked (crimped) as per Item 5 above at least once every seven days, more frequently if directed by the inspector. Additional mulch may be required to obtain complete coverage of an area. Biodegradable erosion control matting may be required on steeper slopes.
- Additional stabilization measures for non-frozen ground conditions described in this SWPPP **WILL** be implemented at the time deemed appropriate by the inspector.
- During the winter season, if a site has been stabilized and soil disturbing activities have been suspended for the winter, weekly inspections can be suspended. However, monthly inspections must still be conducted. All normal weekly inspections must resume when soil disturbing activities resume.

10.0 STORMWATER MAINTENANCE PROCEDURES

Structural stormwater management and temporary erosion and sedimentation controls and practices will need to be maintained frequently. It is the responsibility of the operator to inspect and maintain the controls so that they are working efficiently. The operator needs to pay close attention to Inspection Reports that will advise of needed maintenance. Captured sediment will have to be removed periodically from each practice in order for the control to function properly. It is likely that if temporary controls are not maintained properly, controls will fail creating a mass discharge of sedimentation to the water body previously protected. Periodically remove sediment from the infiltration trench, conveyance swales, silt fences, check dams, silt sacks, inlet protections, and sediment traps. Replace top-soil, mulch and seed where seeding has been disturbed.

Post-construction maintenance for this project will consist of annual inspections of permanent stormwater management facilities. Inspect and perform maintenance twice annually on the conveyance swales and infiltration trench. These maintenance procedures are essential to assure continual performance of the stormwater management practices on your site. A licensed Professional Engineer shall inspect the system one year after the completion of the system and submit a letter certifying that the system was installed and functions as designed. This letter and the maintenance, inspection, and operation of the controls are the responsibility of the telecommunications compound owner.

11.0 LANDSCAPE MANAGEMENT PLAN

The landscape plan designed for the proposed telecommunication facility is designed to provide proper conveyance of stormwater runoff, and a visual buffer for the abutters. The seeding and stabilization specifications are to be followed as laid out within the construction drawings. Upon completion of the project and final stabilization of the proposed grading, typical maintenance and inspections shall take place. The party responsible for the operations and maintenance of the telecommunications compound, or their representative, is responsible for landscape management of the proposed installation.

Grass Areas: Proposed grass areas, including the conveyance swales, are to be mowed twice a month in the spring and fall months, and weekly during the summer months. Leaf removal is to take place as necessary during the fall months. Leaves must be removed from swales and trench in order for proper functionality of the Stormwater structures.

Tree Buffer: The proposed trees shall be pruned once yearly as needed to remove dead branches and to encourage upward growth. If an unhealthy or dead tree is found during inspection, an identical species must replace the lost tree. Tree stakes shall be removed from trees at a time suggested by the providing nursery.

Landscape Waste: Any and all waste from the installation and maintenance of the proposed landscaping shall be removed and disposed of off-site.

12.0 SPILL PREVENTION PRACTICES

12.1 Good Housekeeping and Material Management Practices

The following good housekeeping and material management practices will be followed on site during the construction project to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

- Materials will be brought on site in the minimum quantities required.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposal.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The construction manager or his designee will inspect regularly to ensure proper use and disposal of materials on site.
- The contractor shall prohibit washing of tools, equipment, and machinery in or within 100 feet of any watercourse or wetland.
- All above grade storage tanks are to be protected from vehicle damage by temporary barriers.

12.2 Inventory for Pollution Prevention Plan

The materials and substances listed below are expected to be on-site during construction.

- Petroleum for fueling vehicles will be stored in above ground storage tanks. Tanks will either be steel with an enclosure capable of holding 110% of the storage tank volume or of a Con-Store, concrete encased type typically employed by MassDOT. Hydraulic oil and other oils will be stored in their original containers. Concrete and asphalt will be stored in the original delivery trucks.
- Fertilizer may be stored on site in its original container for a short period of time prior to seeding. Original containers will be safely piled on pallets or similar devices to protect from moisture.

12.3 Hazardous Products

These practices are used to reduce the risks associated with hazardous materials.

- Products will be kept in original containers unless they are not re-sealable.
- Original labels and material safety data sheets will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

12.4 Spill Prevention

The following product specific practices will be followed on site.

12.4.1 Petroleum Products:

- Construction personnel should be made aware that emergency telephone numbers are located in this SWPPP.
- The contractor shall immediately contact MassDEP in the event of a spill, and shall take all appropriate steps to contain the spill, including construction of a dike around the spill and placing absorbent material over this spill.
- The contractor shall instruct personnel that spillage of fuels, oils, and similar chemicals must be avoided and will have arranged with a qualified spill remediation company to serve the site.
- Fuels, oils, and chemicals will be stored in appropriate and tightly capped containers. Containers shall not be disposed of on the project site.
- Fuels, oils, chemicals, material, equipment, and sanitary facilities will be stored/located away from trees and at least 100 feet from streams, wells, wet areas, and other environmentally sensitive sites.
- Dispose of chemical containers and surplus chemicals off the project site in accordance with label directions.
- Use tight connections and hoses with appropriate nozzles in all operations involving fuels, lubricating materials or chemicals.
- Use funnels when pouring fuels, lubricating materials or chemicals.
- All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Any vehicle leaking fuel or hydraulic fuel will be immediately scheduled for repairs and use will be discontinued until repairs are made.

12.4.2 Fertilizers:

- Fertilizer will be stored in its original containers on pallets with water resistant coverings.
- Proper delivery scheduling will minimize storage time.
- Any damaged containers will be repaired immediately upon discovery and any released fertilizer recovered to the fullest extent practicable.

12.4.3 Concrete Trucks:

- Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water only at designated locations on site.

12.4.4 Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup. The construction manager responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the onsite construction office or trailer.

- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies. Any spill in excess or suspected to be in excess of two gallons will be reported to the MassDEP Emergency Response Section. Notification to the MassDEP (1-888-304-1133) must be completed within two hours of the discovery of the spill.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to absorbent pads, brooms, dust pans, mops, rags, gloves, goggles, activated clay, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with spilled substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size

SWPPP
APPENDIX A

Eco-Site

240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707

SITE NAME: RUSSO
SITE #: MA-0049
T-MOBILE SITE #: 4HY0602B



SITE INFORMATION

SITE NAME: RUSSO
SITE ID #: MA-0049

911 SITE ADDRESS: 145 ROUTE 130
SANDWICH, MA 02644

LATITUDE (NAD 83): 41° 41' 41.77" (41.694936) N
LONGITUDE (NAD 83): -70° 29' 57.72" (70.499367) W

JURISDICTION: BARNSTABLE COUNTY
ZONING: R2 (RESIDENTIAL 2)

CONSTRUCTION TYPE: IIB

PARCEL ID NUMBER: 17-009

PARCEL AREA: 17.13± ACRES
PARCEL OWNER: PJR REALTY TRUST,
PASQUALE J RUSSO IV & PASQUALE J
ADDRESS: P.O. BOX 1328
FORESTDALE, MA 2644

GROUND ELEVATION: 150.1' (AMSL)

STRUCTURE TYPE: RAWLAND - MONOPOLE
STRUCTURE HEIGHT: 135'-0" (AGL)
(135'-0" TO HIGHEST APPURTENANCE)

CARRIERS: 0 EXISTING, 1 PROPOSED, 3 FUTURE

USE: PROPOSED TELECOMMUNICATIONS TOWER
AND UNMANNED EQUIPMENT

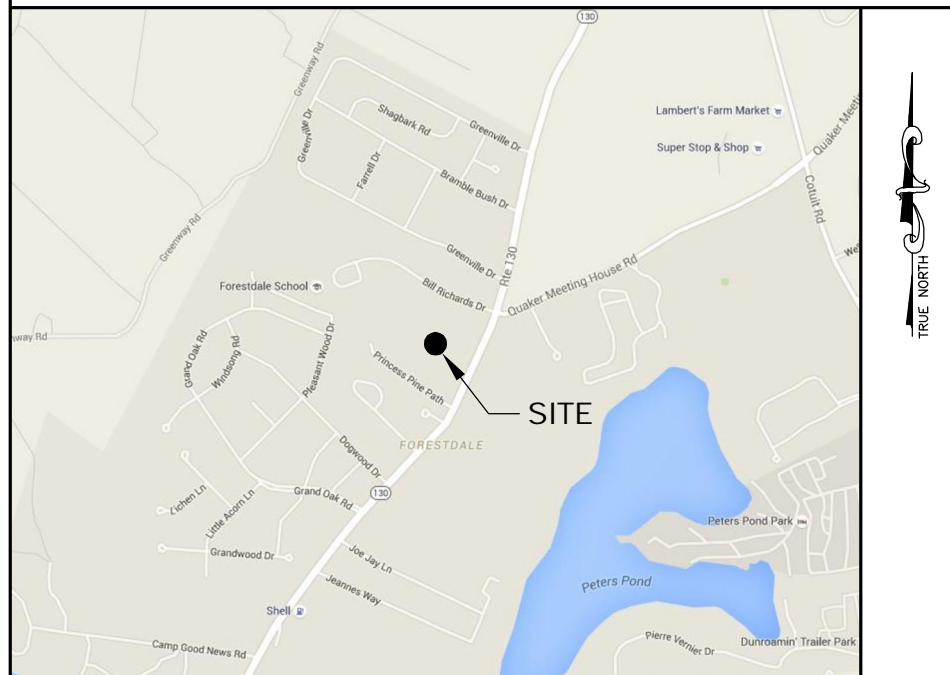
PROJECT TEAM

APPLICANT: ECO-SITE
240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
OFFICE: (919) 636-6810

PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELMSFORD, MA 01824
(978) 856-8308

VICINITY MAP



CODE COMPLIANCE

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

- 2009 INTERNATIONAL BUILDING CODE (MASSACHUSETTS AMENDED 8TH EDITION)
- 2014 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC - REFERENCE 527 CMR
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECordia GR-1275
- ANSI/T 311

DRAWING INDEX

T-1	TITLE SHEET
C-1	OVERALL SITE PLAN
C-2	DETAILED OVERALL SITE PLAN
C-3	SITE PLAN
C-4	ELEVATION
C-5	DETAILS
C-6	EROSION & SEDIMENTATION CONTROL PLAN & NOTES
C-7	EROSION & SEDIMENTATION CONTROL DETAILS
C-8	INFILTRATION TRENCH DETAILS & LAND MANAGEMENT NOTES

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPROVAL BLOCK

		APPROVED	APPROVED AS NOTED	DISAPPROVED/REVISE
PROPERTY OWNER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SITE ACQUISITION	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONSTRUCTION MANAGER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ZONING	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF ENGINEER	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ENGINEER



APPLICANT



SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

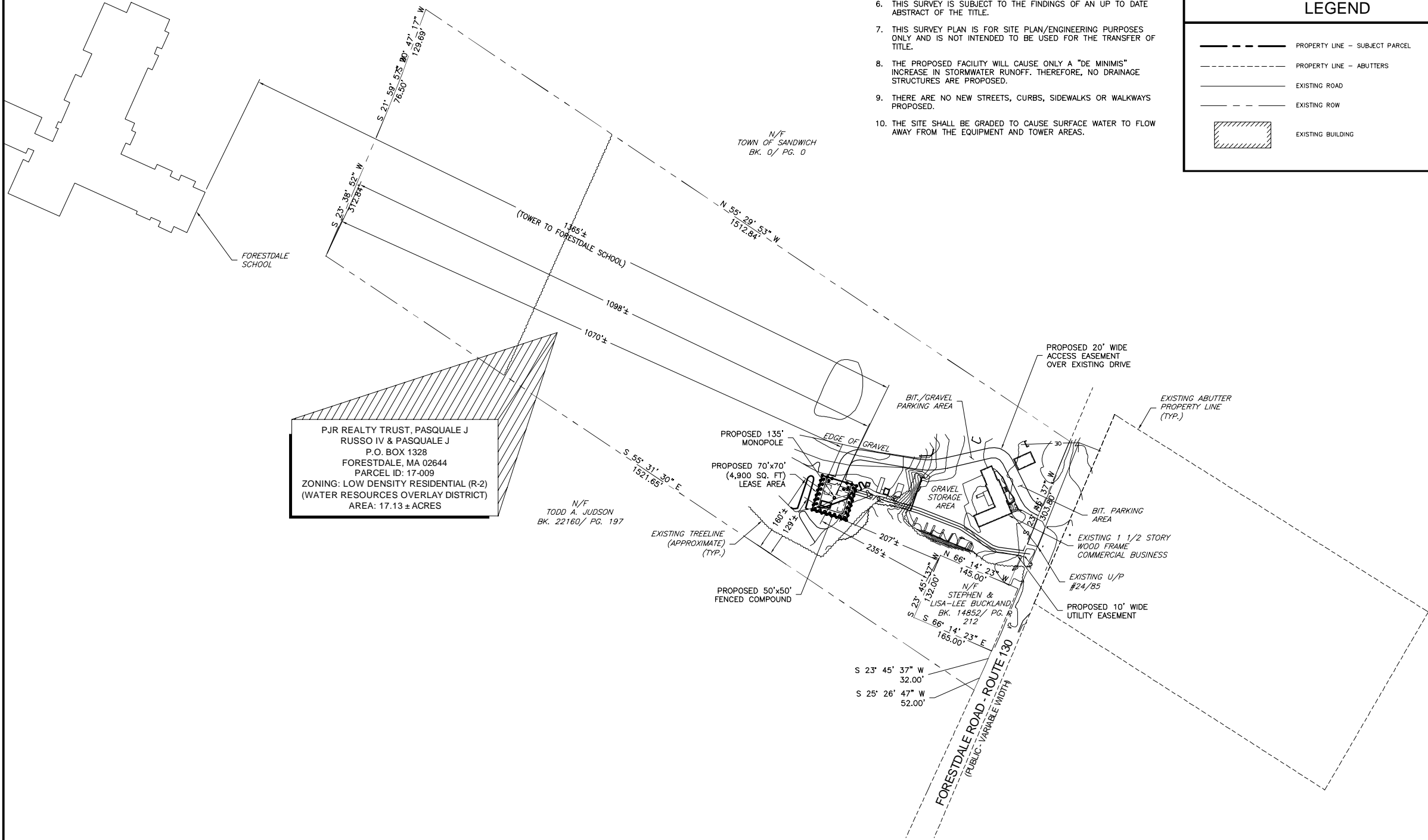
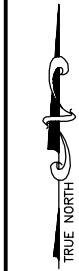
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



SITE NOTES

1. PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, PLANS OF RECORD AND PLANS ENTITLED EXISTING CONDITIONS PLAN OF LAND, BY PFS LAND SURVEYING, INC. DATED 07/03/16 AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
2. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
3. ACCORDING TO FEMA FLOOD INSURANCE RATE MAP FOR THE TOWN OF SANDWICH, MASSACHUSETTS, COMMUNITY PANEL NUMBER 25001C 0528 J, EFFECTIVE DATE JULY 16, 2014, THE PROPOSED FACILITY IS WITHIN ZONE X (AREA OF MINIMAL FLOODING).
4. ALL BEARINGS SHOWN HEREON ARE ROTATED TO TRUE NORTH.
5. UNDERGROUND UTILITIES OR IMPROVEMENTS, IF ANY AND NOT VISIBLE AT TIME OF SURVEY ARE NOT SHOWN.
6. THIS SURVEY IS SUBJECT TO THE FINDINGS OF AN UP TO DATE ABSTRACT OF THE TITLE.
7. THIS SURVEY PLAN IS FOR SITE PLAN/ENGINEERING PURPOSES ONLY AND IS NOT INTENDED TO BE USED FOR THE TRANSFER OF TITLE.
8. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
9. THERE ARE NO NEW STREETS, CURBS, SIDEWALKS OR WALKWAYS PROPOSED.
10. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.

ZONING DATA

ZONING DISTRICT:	LOW DENSITY RESIDENTIAL (R-2) (WATER RESOURCES OVERLAY DISTRICT)	
	REQUIRED	PROPOSED
MINIMUM FRONT YARD:	50'	207'± (COMPOUND)
MINIMUM SIDE YARD:	45'	129'± (COMPOUND)
MINIMUM REAR YARD:	45'	1070'± (COMPOUND)
MAXIMUM TOWER HEIGHT:	150'	135'
TOWER SETBACK:	1 x HEIGHT	234'± / 160'± / 1098'±

LEGEND

---	PROPERTY LINE - SUBJECT PARCEL
---	PROPERTY LINE - ABUTTERS
---	EXISTING ROAD
---	EXISTING ROW
[Hatched Box]	EXISTING BUILDING

ENGINEER

APPLICANT

SITE INFORMATION

DESIGN RECORD

PROFESSIONAL STAMP

ENGINEER

SHEET TITLE

SHEET NUMBER



NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELSEA, MA 02154
(978) 856-8308



240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
(919) 636-6810

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

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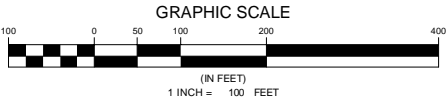


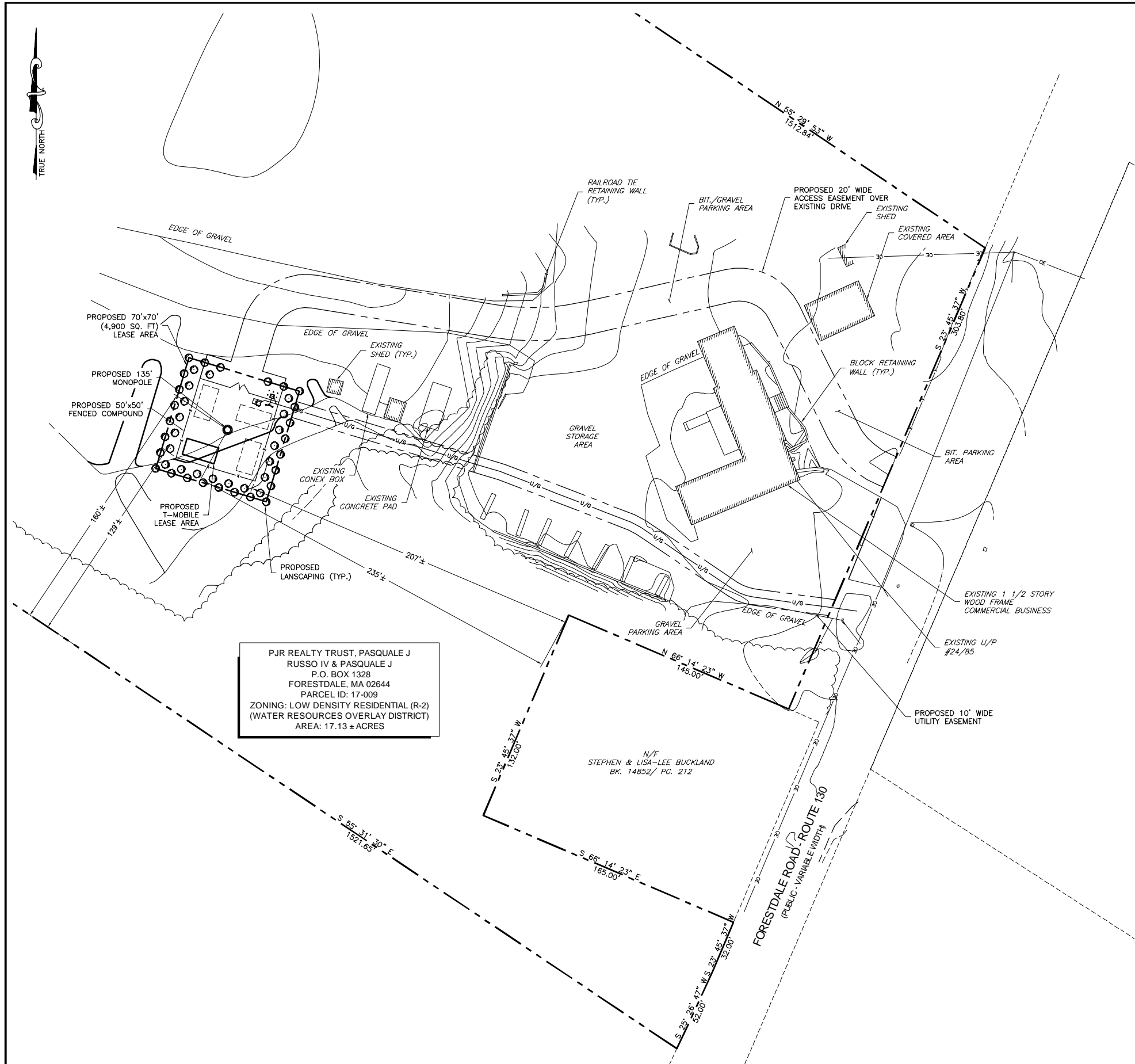
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

OVERALL
SITE PLAN

C-1

1 OVERALL SITE PLAN
C-1 SCALE: 1" = 100'





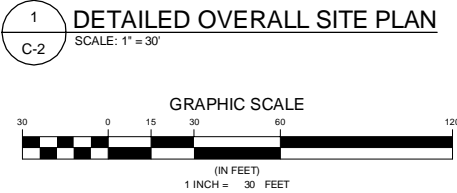
PJR REALTY TRUST, PASQUALE J
RUSSO IV & PASQUALE J
P.O. BOX 1328
FORESTDALE, MA 02644
PARCEL ID: 17-009
ZONING: LOW DENSITY RESIDENTIAL (R-2)
(WATER RESOURCES OVERLAY DISTRICT)
AREA: 17.13 ± ACRES

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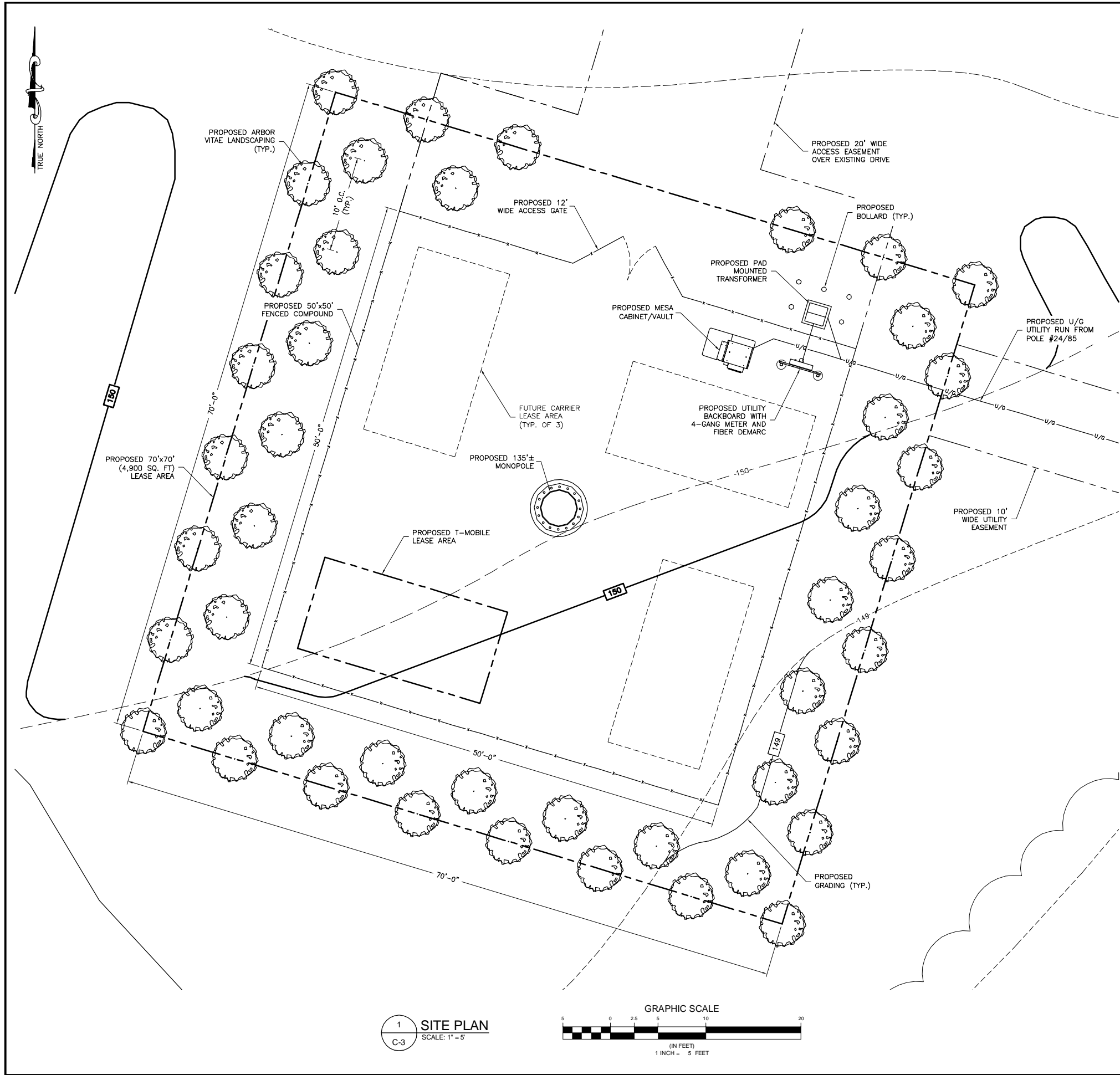
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	EXISTING ROAD
	EXISTING ROW
	EXISTING BUILDING

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APPLICANT	 240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 636-6810																																
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SHEET TITLE	DETAILED OVERALL SITE PLAN																																
SHEET NUMBER	C-2																																



GENERAL NOTES

- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES COMPANY OR OTHER PUBLIC AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
- THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES AND NOTIFY UNDERGROUND FACILITIES PROTECTIVE ORGANIZATION AT 1 (800) 962-7962 PRIOR TO EXCAVATION AT SITE.
- ANY UNDERGROUND UTILITIES OR STRUCTURES THAT EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE IT AND CONTACT THE APPLICANT & THE OWNER'S REPRESENTATIVE.
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY 2 TIMES PER MONTH.
- ALL EXCAVATION WITHIN 36" OF EITHER SIDE OF UNDERGROUND UTILITIES MUST BE COMPLETED BY HAND EXCAVATION METHODS.
- NO SIGNIFICANT NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
- THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS REQUIRED).
- THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
- POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.
- THERE ARE NO COMMERCIAL SIGNS PROPOSED FOR THIS INSTALLATION.
- RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING.
- THE AREAS DISTURBED DUE TO CONSTRUCTION ACTIVITY SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEED,ED, AND COVERED WITH MULCH.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE NEW YORK STATE GUIDELINES FOR EROSION AND SEDIMENT CONTROL, AND COORDINATED WITH THE TOWN.

ENGINEER

NB+C
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.
100 APOLLO DRIVE, SUITE 303
CHELSEA, MA 01924
(978) 856-8308

APPLICANT

Eco-Site

240 LEIGH FARM ROAD, SUITE 415
DURHAM, NC 27707
(919) 636-6810

SITE INFORMATION

RUSSO
MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

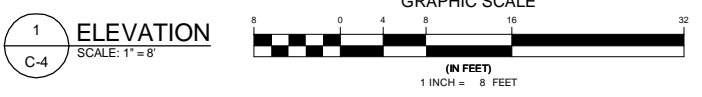
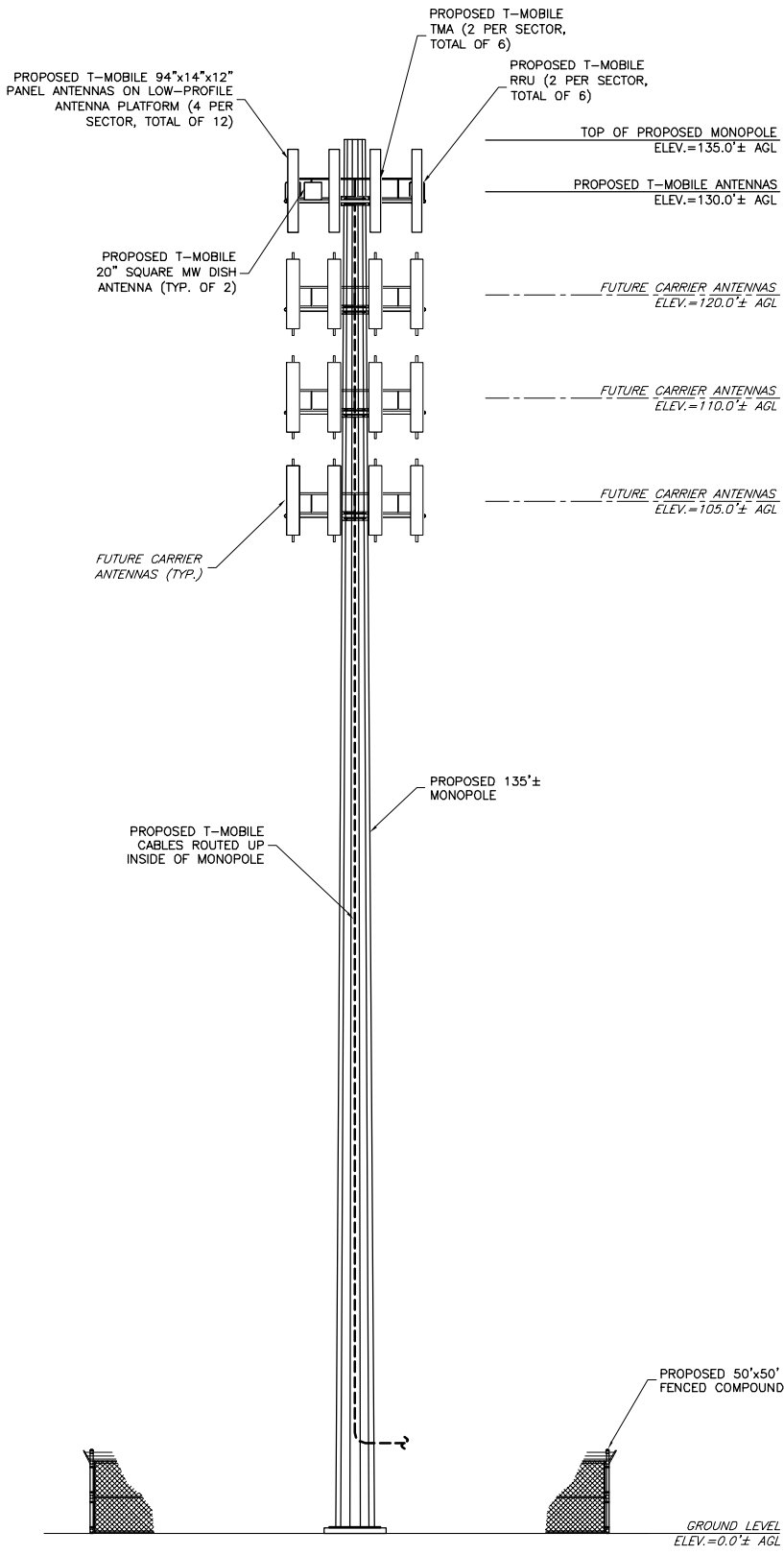
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE




SITE PLAN

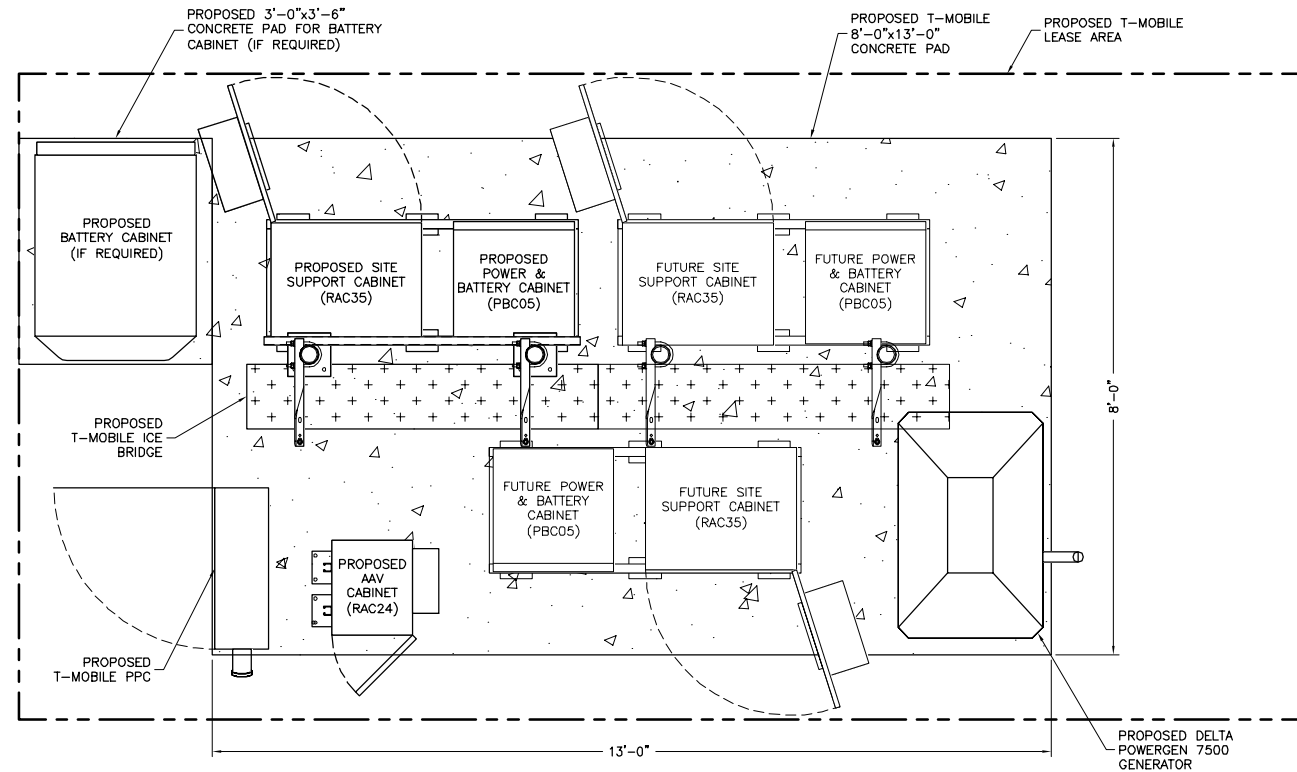
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C-3

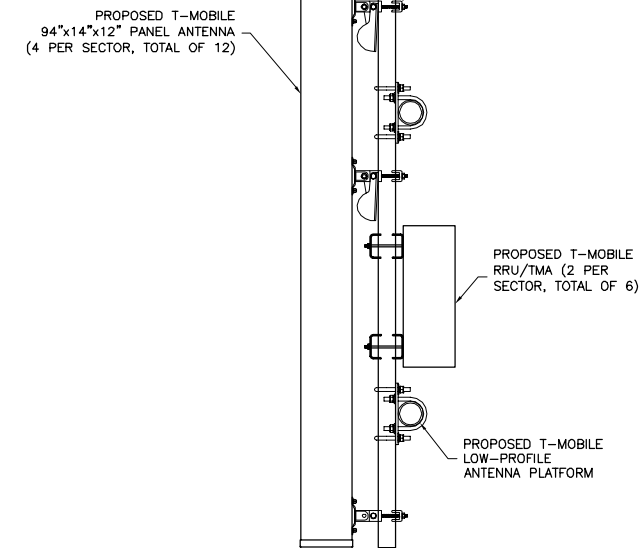


STRUCTURAL NOTE:
CONTRACTOR TO VERIFY ALL PROPOSED AND EXISTING ANTENNAS AND CABLES WERE CONSIDERED AND PASSED A STRUCTURAL ANALYSIS PERFORMED BY A LICENSED ENGINEER PRIOR TO INSTALLATION.

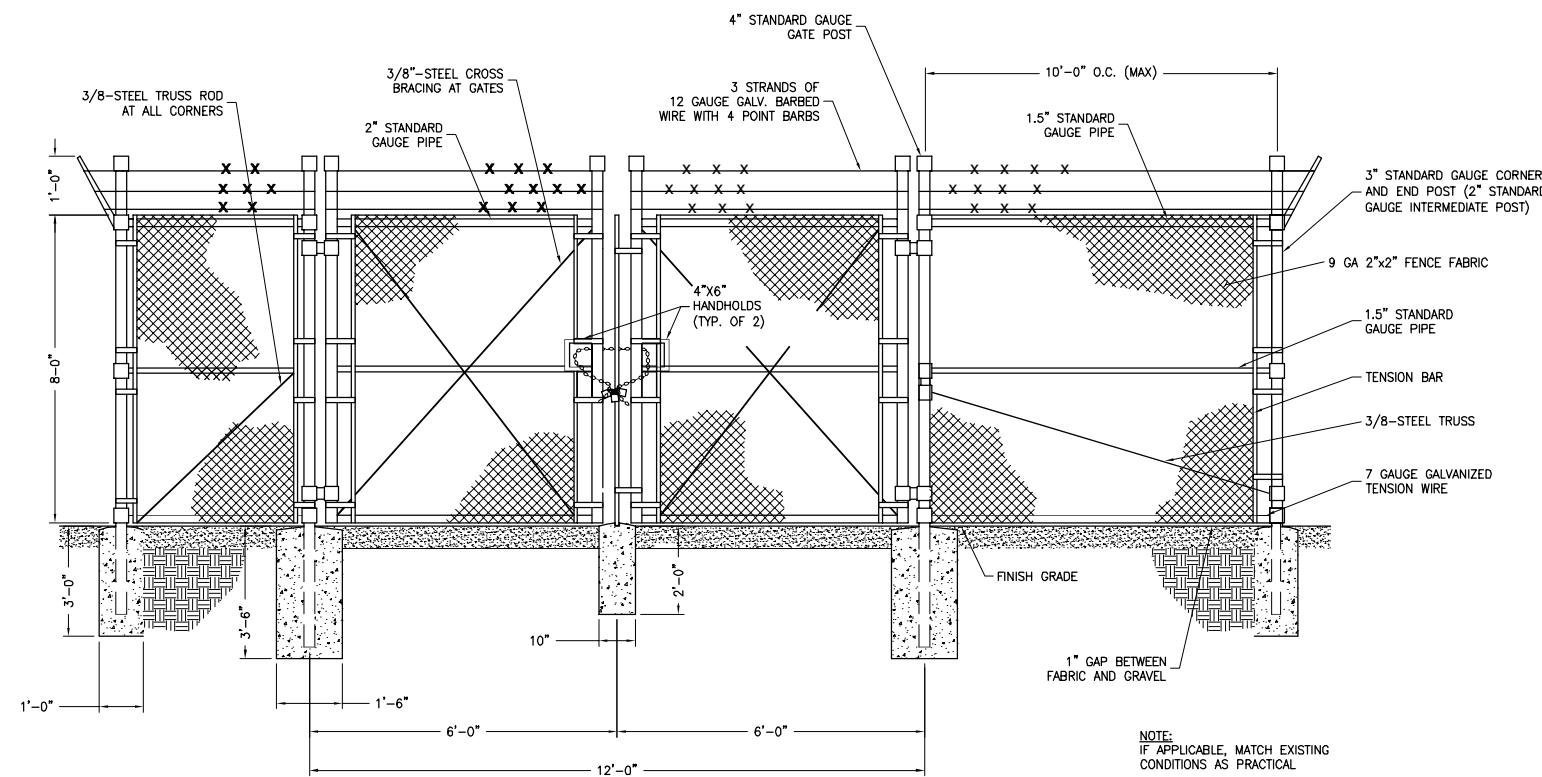
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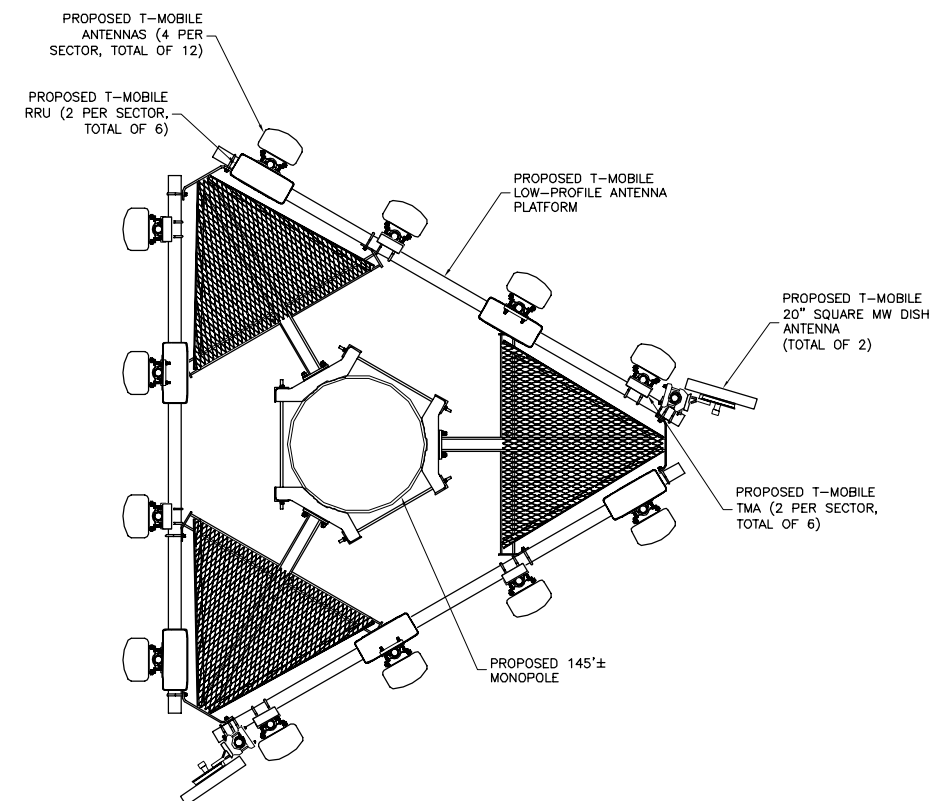
1 PLAN AT EQUIPMENT PAD
C-5 NTS



2 ANTENNA & RRU MOUNTING DETAIL
C-5 NTS



3 TYPICAL FENCE AND GATE DETAIL
C-5 NTS



4 ANTENNA PLAN
C-5 NTS

ENGINEER

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ENGINEER

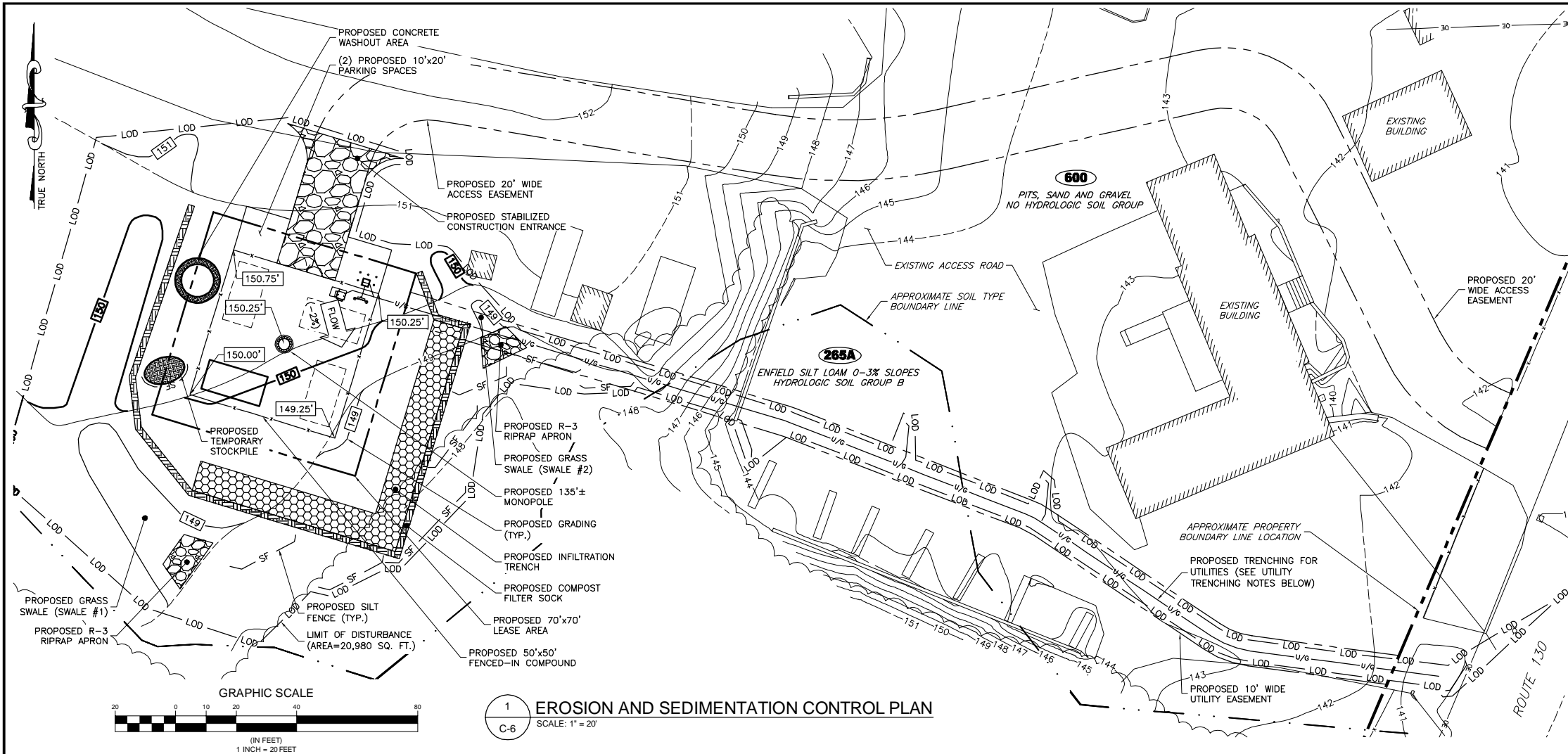
KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

DETAILS

SHEET NUMBER

C-5



1 EROSION AND SEDIMENTATION CONTROL PLAN
C-6 SCALE: 1" = 20'

GENERAL EROSION & SEDIMENT CONTROL PROCEDURES

1. THE OPERATOR/RESPONSIBLE PERSON (O/RP) SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
2. THE EROSION AND SEDIMENT CONTROL PLAN IS TO BE USED FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY. IT SHALL NOT BE USED FOR ANY OTHER CONSTRUCTION RELATED ITEMS.
3. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
4. UNTIL A SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. INSPECTIONS SHALL BE LOGGED ONTO NYDEC FORM FROM APPENDIX H OF "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL", AND KEPT ONSITE AT ALL TIMES. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEANOUT, REPAIR, REPLACEMENT, RE-GRADING, RE-SEEDING, RE-MULCHING AND RE-NETTING MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED, WILL BE REQUIRED.
5. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
6. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE CONSERVATION DISTRICT.
7. THE O/RP SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE MUNICIPALITY CONSERVATION DISTRICT, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.
8. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH STATE OF NEW YORK'S "NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL".
9. THE MUNICIPALITY OR ITS DESIGNEE MAY INSPECT ALL PHASES OF THE CONSTRUCTION, OPERATIONS, MAINTENANCE AND ANY OTHER IMPLEMENTATION OF STORMWATER BMPS.
10. DURING ANY STAGE OF THE REGULATED EARTH DISTURBANCE ACTIVITIES, IF THE MUNICIPALITY OR ITS DESIGNEE DETERMINES THAT ANY BMPS ARE NOT BEING IMPLEMENTED IN ACCORDANCE WITH THIS ORDINANCE, THE MUNICIPALITY MAY SUSPEND OR REVOKE ANY EXISTING PERMITS OR OTHER APPROVALS UNTIL THE DEFICIENCIES ARE CORRECTED.
11. WHEN REQUIRED, ADEQUATE PROVISIONS SHALL BE MADE FOR DUST CONTROL MEASURES AS ARE DEEMED ACCEPTABLE BY THE MUNICIPAL ENGINEER.
12. ALL PUMPING OF SEDIMENT-LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER UNDISTURBED AREAS. NO SEDIMENT OR SEDIMENT LADEN WATER IS ALLOWED TO LEAVE THE SITE WITHOUT FIRST BEING PROPERLY FILTERED.
13. DISTURBED AREAS ON WHICH EARTH MOVING ACTIVITIES HAVE CEASED AND WHICH WILL REMAIN EXPOSED SHALL BE STABILIZED IMMEDIATELY, EITHER TEMPORARILY OR PERMANENTLY, INCLUDING THE RESTORATION OF DRIVEWAYS, STOCKPILES, OFF-SITE UNDERGROUND UTILITY LINES AND GRADED PERIMETER AREAS. DISTURBED AREAS THAT ARE AT FINISHED GRADE OR WHICH WILL NOT BE RE-DISTURBED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS. DURING NON-GERMINATION PERIODS, MULCH MUST BE APPLIED AT RECOMMENDED RATES. CRUSHED STONE ON PAVEMENT SUBGRADES IS CONSIDERED ADEQUATE PROTECTION.

14. WHERE DISTURBED AREAS ARE DIFFICULT TO STABILIZE, NETTING SHOULD BE USED TO HOLD SEED AND MULCH IN PLACE; THIS IS ESPECIALLY IMPORTANT AROUND WATERCOURSES, IN SWALES AND AREAS OF CONCENTRATED FLOWS AND STEEP SLOPES.
15. CONTRACTOR SHALL NOTIFY THE MUNICIPALITY CONSERVATION DISTRICT OF DISPOSAL METHOD AND LOCATION OF MATERIALS (IF ANY) TO BE REMOVED FROM SITE.
16. ALL BUILDING MATERIAL AND WASTES MUST BE REMOVED FROM THE SITE AND RECYCLED IN ACCORDANCE WITH NYDEC'S SOLID WASTE REGULATIONS (REGULATIONS CHAPTER IV, SUPPORT 360-1), AND/OR ANY ADDITIONAL LOCAL, STATE OR FEDERAL REGULATIONS. NO BUILDING MATERIALS (USED OR UNUSED) OR WASTE MATERIALS SHALL BE BURNED, BURIED, DUMPED OR DISCHARGED AT THE SITE.
17. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED OR PLACED IN SOIL STOCKPILES AND STABILIZED.
18. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET; STOCKPILE SLOPES MUST NOT EXCEED 2:1.
19. REFER TO THE SITE / RECORD PLAN FOR ADDITIONAL NOTES.

UTILITY TRENCH EXCAVATION/DISTURBANCE GUIDELINES

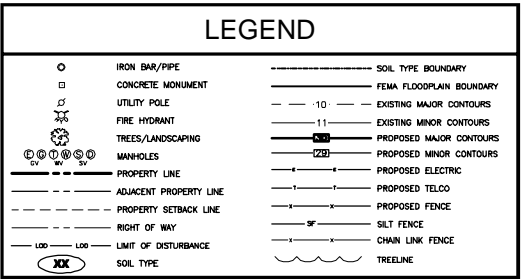
1. LIMIT ADVANCED CLEARING AND GRUBBING OPERATIONS TO A DISTANCE EQUAL TO TWO TIMES THE LENGTH OF PIPE INSTALLATION THAT CAN BE COMPLETED IN ONE DAY.
2. WORK CREWS AND EQUIPMENT FOR TRENCHING, PLACEMENT OF PIPE, PLUG CONSTRUCTION AND BACKFILLING SHALL BE SELF CONTAINED AND SEPARATE FROM CLEARING AND GRUBBING AND SITE RESTORATION AND STABILIZATION OPERATIONS.
3. ALL SOIL EXCAVATED FROM THE TRENCH SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
4. LIMIT DAILY TRENCH EXCAVATION TO THE LENGTH OF PIPE PLACEMENT, PLUG INSTALLATION AND BACKFILLING THAT CAN BE COMPLETED THE SAME DAY.
5. WATER WHICH ACCUMULATES IN THE OPEN TRENCH SHALL BE COMPLETELY REMOVED BY PUMPING BEFORE PIPE PLACEMENT AND / OR BACKFILLING BEGINS. WATER REMOVED FROM THE TRENCH SHALL BE PUMPED THROUGH A FILTRATION DEVICE.
6. ON THE DAY FOLLOWING PIPE PLACEMENT AND TRENCH BACKFILLING, THE DISTURBED AREA SHALL BE GRADED TO FINAL CONTOURS AND IMMEDIATELY STABILIZED.
7. SEE SPECIFICATIONS AND DETAILS FOR BACKFILLING AND COMPACTION REQUIREMENTS IN UTILITY TRENCH. ALL FILL COMPACTION AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION SHALL BE AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND SHALL BE COORDINATED WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS.
8. THE CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
9. REFER TO SITE PLAN FOR ADDITIONAL NOTES.

NOTE:

CONSTRUCTION OF SITE WILL TAKE BETWEEN 30 AND 60 DAYS. SILT FENCE WILL BE INSPECTED DAILY AND IF ANY REPAIR OR REPLACEMENT IS REQUIRED IT WILL BE DONE IMMEDIATELY.

PROPOSED IMPERVIOUS COVERAGE

GRAVEL PARKING SPACES	750 SQFT / 0.017 ACRES
GRAVEL COMPOUND	2,500 SQFT / 0.057 ACRES
PROPOSED IMPERVIOUS COVERAGE	3,250 SQFT / 0.075 ACRES
TOTAL AREA OF DISTURBANCE	12,580 SQFT / 0.293 ACRES



CONSTRUCTION SEQUENCE

AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE O/RP SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE CONSERVATION DISTRICT TO AN ON-SITE MEETING. ALSO, AT LEAST 3 WORKING DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE MASSACHUSETTS ONE CALL SYSTEM INCORPORATED AT 1-888-344-7233 FOR BURIED UTILITIES LOCATIONS.

EROSION AND SEDIMENT BMPS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMPS.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.

1. MOBILIZATION
2. CONSTRUCT TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES
3. ROUGH GRADE SITE
4. INSTALL INFILTRATION TRENCH (SEE NOTES ON ES-3)
5. CONSTRUCT AND MAINTAIN TEMPORARY COVER TO STABILIZE DISTURBED AREAS
6. INSTALL UTILITIES
7. STABILIZE PROPOSED ACCESS ROAD W/ STONE SUB-BASE & PLACE STONE WITHIN COMPOUND AREA
8. COLLECT SILT AND SEDIMENT AND PLACE BACK ON SITE
9. ESTABLISH PERMANENT COVER
10. REMOVE EROSION AND CONTROL MEASURES

IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE O/RP SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

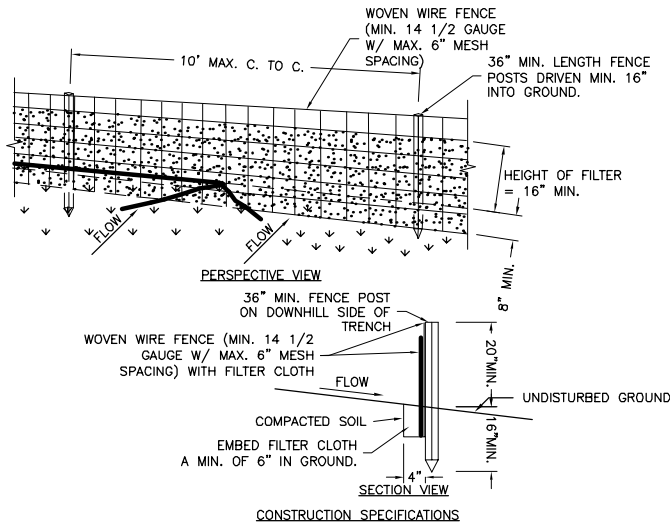
AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.



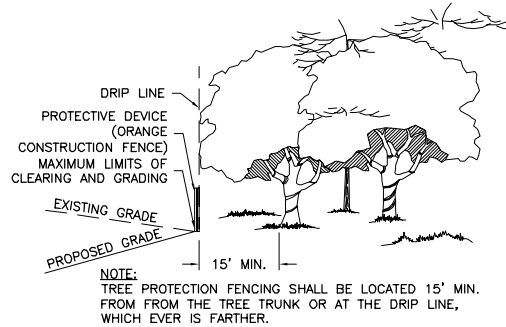
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Call before you dig.

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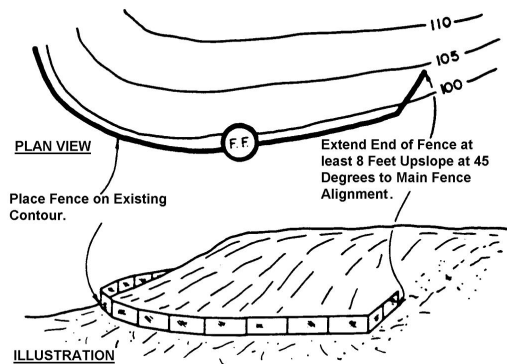


- WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
- FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
- PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
- REMOVE ACCUMALATED DEIMENT BEFORE IT IS HALFWAY UP THE FENCE.
- ENSURE THAT SILT FENCE IS TRENCHED IN GROUND AND THRE ARE NO GAPS

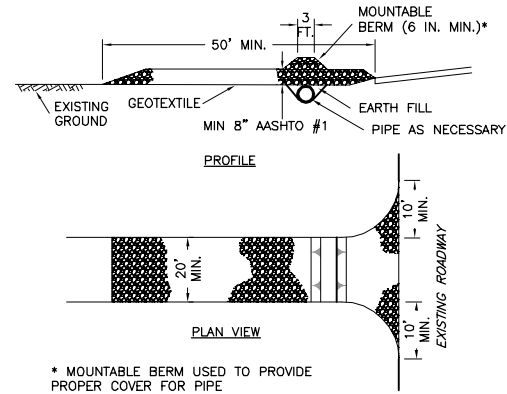
1 STANDARD FILTER FABRIC FENCE
C-7 NTS



4 TREE PROTECTION
C-7 NTS



5 SEDIMENT BARRIER ALIGNMENT
C-7 NTS



NOTES:

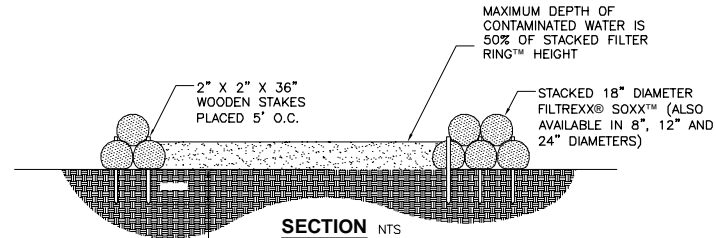
REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.

RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.

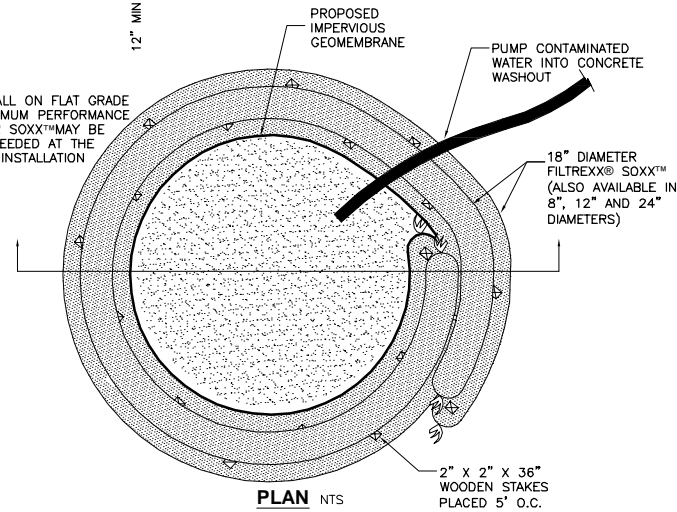
MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK, WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

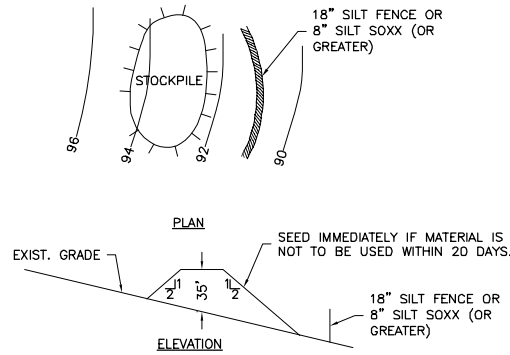
2 ROCK CONSTRUCTION ENTRANCE
C-7 NTS



- INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE
- FILTER SOXX\"/>



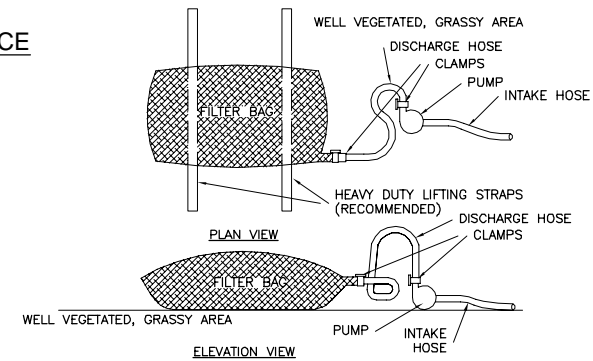
6 FILTREXX CONCRETE WASHOUT DETAIL
C-7 NTS



NOTES:

- INSTALL SILT FENCE DOWNSLOPE OF AREA OF STOCKPILE.
- PLACE STOCKPILE IN AREAS SHOWN ON EROSION CONTROL PLAN WITHOUT BLOCKING NATURAL DRAINAGE PATTERNS.
- FOLLOW DIMENSIONS SHOWN ABOVE. HEIGHT SHOULD NOT EXCEED 35 FT. SIDE SLOPES SHOULD NOT BE STEEPER THAN 2(H):1(V).
- SEED IMMEDIATELY IF MATERIAL IS NOT TO BE USED WITHIN 20 DAYS. FOLLOW "SEEDING, FERTILIZATION SCHEDULE & SPECIFICATIONS."
- LOCATION(S) AND SIZE(S) OF SOIL STOCKPILES ARE APPROXIMATE AND SHALL BE ADJUSTED PER FIELD AND CONSTRUCTION SEQUENCE CONDITIONS. CONTRACTOR SHALL VERIFY REQUIRED SIZE(S). REQUIREMENTS FROM THE STANDARDS DETAIL MUST BE FOLLOWED FOR STOCKPILES.

3 TOPSOIL STOCKPILE AND MAINTENANCE
C-7 NTS



NOTES:

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HO OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

7 PUMPED WATER FILTER BAG
C-7 N.T.S.

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TOTALLY COMMITTED.

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MA-0049
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SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

EROSION &
SEDIMENTATION
CONTROL DETAILS

SHEET NUMBER

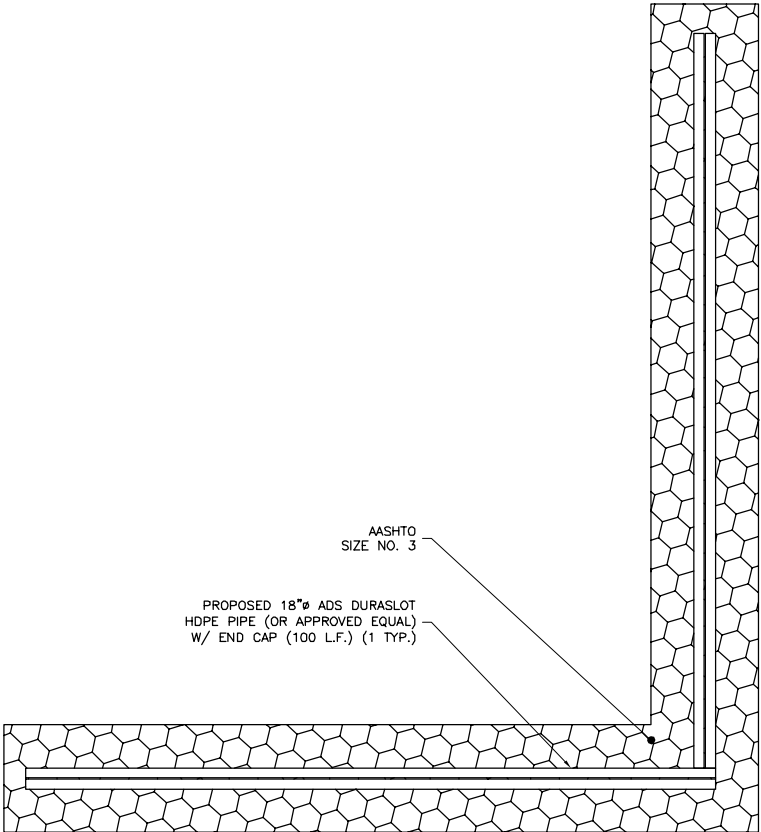
C-7

INFILTRATION TRENCH CONSTRUCTION SEQUENCE

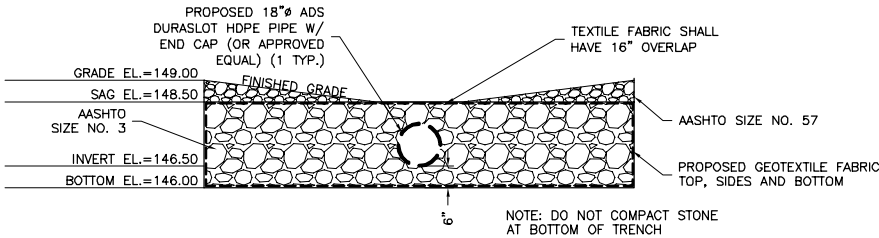
1. MINIMIZE COMPACTION IN AREA OF PROPOSED INFILTRATION TRENCH.
2. IF POSSIBLE, INSTALL TRENCH DURING LAST PHASE OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND /OR DAMAGE FROM CONSTRUCTION ACTIVITY.
3. EXCAVATE INFILTRATION TRENCH BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE. TILL 6 TO 12 INCHES BELOW FINISHED TRENCH BOTTOM TO ENSURE THAT SOIL CONDUCTIVITY IS MAINTAINED. (SCHEDULE INSPECTION WITH CONSERVATION DISTRICT 48 HOURS PRIOR TO EXCAVATION)
4. PLACE NONWOVEN GEOTEXTILE ALONG BOTTOM AND SIDES OF TRENCH. NONWOVEN GEOTEXTILE ROLLS SHOULD OVERLAP BY A MINIMUM OF 16 INCHES WITHIN TRENCH. FOLD BACK AND SECURE EXCESS GEOTEXTILE DURING STONE PLACEMENT.
5. PLACE UNIFORMLY GRADED. CLEAN WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS.
6. INSTALL PERFORATED SLOTTED PIPE AND OBSERVATION WELLS AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED CLEAN WASHED AGGREGATE IN 8 INCH LIFTS.
7. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER INFILTRATION TRENCH, WITH MINIMUM OVERLAP OF 16 INCHES. ALLOW PROPOSED 6 INCH SLOT WITH GRATE TO DAYLIGHT AT TOP OF TRENCH, DO NOT COVER WITH GEOTEXTILE.
8. PLACE 6 INCHES OF AASHTO #57 STONE INDICATED ON PLANS.

INFILTRATION TRENCH CONSTRUCTION NOTES

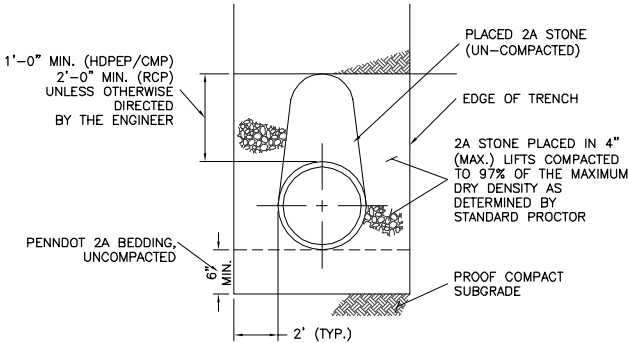
1. DURING CONSTRUCTION OF INFILTRATION TRENCHES, A QUALIFIED DESIGNER MUST OBSERVE AND EVALUATE THE SOIL HORIZONS OF EACH TRENCH EXCAVATION (A PORTION EXTENDING AT LEAST 3 FEET BELOW EACH TRENCH BOTTOM), MUST DETERMINE THE SOIL'S SUITABILITY FOR EACH INFILTRATION TRENCH, AND MUST SUBMIT A SIGNED REPORT OF HIS/HER OBSERVATIONS, EVALUATIONS AND DETERMINATIONS TO YORK TOWNSHIP PRIOR TO CONTINUING CONSTRUCTION OF EACH TRENCH.
2. ORANGE FENCING MUST BE INSTALLED/MAINTAINED TO DELINEATE ALL INFILTRATION AREAS BEFORE/DURING EARTH DISTURBANCE ACTIVITIES.
3. DURING EARTH DISTURBANCE ACTIVITIES, INFILTRATION AREAS MUST BE PROTECTED FROM COMPACTION AND SEDIMENT.
4. NON-WOVEN GEOTEXTILE FOR INFILTRATION TRENCHES SHALL CONSIST OF NEEDED NONWOVEN POLYPROPYLENE FIBERS AND MEET THE FOLLOWING PROPERTIES:
A. GRAB TENSILE STRENGTH (ASTM D4632) ≥ 120 LBS
B. MULLEN BURST STRENGTH (ASTM D3786) ≥ 225 PSI
C. FLOW RATE (ASTM D4491) ≥ 95 GAL/MIN/SFT
D. US RESISTANCE AFTER 500 HRS (ASTM D4355) ≥ 70%
E. HEAT-SET OR HEAT-CALENDARED FABRICS ARE NOT PERMITTED. ACCEPTABLE TYPES INCLUDE MIRAFI 140N, AMOCO 4547, GEOTEX 451, OR APPROVED OTHERS.
5. STONE FOR INFILTRATION TRENCHES SHALL BE 2 INCH TO 1 INCH UNIFORMLY GRADED COARSE AGGREGATE, WITH A WASH LOSS OF NO MORE THAN 0.5%, AASHTO SIZE NUMBER 3 PER AASHTO SPECIFICATIONS, PART 1, 19TH ED., 1998, OR LATER AND SHALL HAVE VOIDS 40% AS MEASURED BY ASTM C29.
6. NON-WOVEN GEOTEXTILE MUST ENVELOP STONE FOR INFULTRATION TRENCHES.
7. GRATES FOR PVC CLEANOUTS SHALL BE AASHTO H10 OR H20 LOAD RATED DEPENDING ON THEIR PLACEMENT (H20 FOR VEHICULAR LOADING).



1 INFILTRATION TRENCH DETAIL
C-8 NTS



2 INFILTRATION TRENCH SECTION
C-8 NTS



- NOTES:
1. IF TRENCH IS EXTREMELY WET DUE TO HIGH GROUNDWATER, USE AASHTO #57 STONE UP TO THE HAUNCHES OF THE PIPE. REMAINDER OF BEDDING TO BE PENNDOT 2A.
 2. FOLLOW 'PIPE INSTALLATION PROCEDURES' PER PENNDOT PUBLICATION 72M - RC-30M.

3 PIPE BEDDING - INFILTRATION TRENCH
C-8 NTS

SEEDING/ STABILIZATION SPECIFICATIONS

1. TOPSOIL STOCKPILE PROTECTION
A. APPLY GROUND LIMESTONE AT A RATE OF 90LBS. PER 1000 SQ.FT.
B. APPLY FERTILIZER (10-20-10) AT A RATE 11LBS. PER 1000 SQ.FT.
C. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ.FT. AND ANNUAL RYEGRASS AT 1 LB. PER 1000 SQ.FT.
D. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
E. PROPERLY ENTRENCH A SILT FENCE AT THE BOTTOM OF THE STOCKPILE.
18. TEMPORARY STABILIZATION SPECIFICATIONS
A. APPLY GROUND LIMESTONE AT A RATE OF 184 LBS. PER 1000 SQ.FT.
B. APPLY FERTILIZER (10-20-10) AT A RATE 11 LBS. PER 1000 SQ.FT.
C. APPLY PERENNIAL RYEGRASS SEED AT 1 LB. PER 1000 SQ.FT. AND ANNUAL RYEGRASS AT 1LB. PER 1000 SQ.FT.
D. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
E. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.
19. PERMANENT STABILIZATION SPECIFICATIONS
A. APPLY TOPSOIL TO A DEPTH OF 5 INCHES (UNSETTLED)
B. APPLY GROUND LIMESTONE AT A RATE OF 184 LBS. PER 1000 SQ.FT. AND WORK FOUR INCHES INTO SOIL.
C. APPLY FERTILIZER (10-20-10) AT A RATE 11 LBS. PER 1000 SQ.FT.
D. APPLY HARD FESCUE SEED AT 2.7 LBS. PER 1000 SQ.FT. AND CREEPING RED FESCUE SEED AT 0.7 LBS. PER 1000 SQ.FT. AND PERENNIAL RYEGRASS SEED AT 0.25 LBS. PER 1000 SQ.FT.
E. MULCH STOCKPILE WITH STRAW OR HAY AT A RATE OF 138 LBS. PER 1000 SQ.FT.
F. APPLY A LIQUID MULCH BINDER OR TACK TO STRAW OR HAY MULCH.

STORMWATER MAINTENANCE PROCEDURES

STRUCTURAL STORMWATER MANAGEMENT AND TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND PRACTICES WILL NEED TO BE MAINTAINED FREQUENTLY. IT IS THE RESPONSIBILITY OF THE OPERATOR TO INSPECT AND MAINTAIN THE CONTROLS SO THAT THEY ARE WORKING EFFICIENTLY. THE OPERATOR NEEDS TO PAY CLOSE ATTENTION TO INSPECTION REPORTS THAT WILL ADVISE OF NEEDED MAINTENANCE. CAPTURED SEDIMENT WILL HAVE TO BE REMOVED PERIODICALLY FROM EACH PRACTICE IN ORDER FOR THE CONTROL TO FUNCTION PROPERLY. IT IS LIKELY THAT IF TEMPORARY CONTROLS ARE NOT MAINTAINED PROPERLY, CONTROLS WILL FAIL CREATING A MASS DISCHARGE OF SEDIMENTATION TO THE WATER BODY PREVIOUSLY PROTECTED. PERIODICALLY REMOVE SEDIMENT FROM THE INFILTRATION TRENCH, CONVEYANCE SWALES, SILT FENCES, CHECK DAMS, SILT SACKS, INLET PROTECTIONS, AND SEDIMENT TRAPS. REPLACE TOP-SOIL, MULCH AND SEED WHERE SEEDING HAS BEEN DISTURBED.

POST-CONSTRUCTION MAINTENANCE FOR THIS PROJECT WILL CONSIST OF ANNUAL INSPECTIONS OF PERMANENT STORMWATER MANAGEMENT FACILITIES. INSPECT AND PERFORM MAINTENANCE TWICE ANNUALLY ON THE CONVEYANCE SWALES AND INFILTRATION TRENCH. THESE MAINTENANCE PROCEDURES ARE ESSENTIAL TO ASSURE CONTINUAL PERFORMANCE OF THE STORMWATER MANAGEMENT PRACTICES ON YOUR SITE. A LICENSED PROFESSIONAL ENGINEER SHALL INSPECT THE SYSTEM ONE YEAR AFTER THE COMPLETION OF THE SYSTEM AND SUBMIT A LETTER CERTIFYING THAT THE SYSTEM WAS INSTALLED AND FUNCTIONS AS DESIGNED. THIS LETTER AND THE MAINTENANCE, INSPECTION, AND OPERATION OF THE CONTROLS ARE THE RESPONSIBILITY OF THE TELECOMMUNICATIONS COMPOUND OWNER.

TEMPORARY STABILIZATION FOR FROZEN CONDITIONS

THE FOLLOWING TEMPORARY STABILIZATION MEASURES MUST BE PERFORMED WHEN CONSTRUCTION IS OCCURRING DURING WINTER/FROZEN GROUND CONDITIONS. THE FOLLOWING REQUIREMENTS DO NOT SUPERCEDE ANY OTHER REQUIREMENTS OF THIS SWPPP AS THEY APPLY TO NON-FROZEN GROUND CONDITIONS.

- PERIMETER EROSION CONTROL MUST STILL BE INSTALLED PRIOR TO EARTHWORK DISTURBANCE AS PER THIS SWPPP.
- ANY AREAS THAT CANNOT BE SEEDED TO TURF BY OCTOBER 1 OR EARLIER WILL RECEIVE A TEMPORARY SEEDING. THE TEMPORARY SEEDING WILL CONSIST OF WINTER RYE SEEDED AT THE RATE OF 120 POUNDS PER ACRE (2.5 POUNDS PER 1,000 SQUARE FEET) OR STABILIZED AS PER THE TEMPORARY STABILIZATION FOR WINTER CONSTRUCTION/FROZEN CONDITIONS.
- ANY AREA OF DISTURBANCE THAT WILL REMAIN INACTIVE FOR A PERIOD OF 14 CONSECUTIVE DAYS MUST BE MULCHED. THIS INCLUDES ANY PREVIOUSLY DISTURBED AREAS THAT ARE COVERED WITH SNOW.
- MULCH MUST CONSIST OF LOOSE STRAW APPLIED AT THE RATE OF 2 TO 3 BALES (90 TO 100 POUNDS) PER THOUSAND SQUARE FEET.
- MULCH MUST BE APPLIED UNIFORMLY OVER THE AREA OF BARE SOIL OR BARE SOIL THAT IS COVERED WITH SNOW. FOR THE LATTER CONDITION, MULCH MUST BE APPLIED ON TOP OF SNOW.
- USING A TRACKED VEHICLE, MULCH MUST BE CRIMPED INTO THE BARE SOIL/SNOW. THE TRACKED VEHICLE MUST BE DRIVEN ACROSS THE MULCHED AREAS IN AT LEAST TWO DIRECTIONS TO MAXIMIZE CRIMPING OF MULCH INTO THE SOIL/SNOW.
- IF MULCH GETS BLOWN OFF AN AREA TO A SIGNIFICANT DEGREE, THE SITE INSPECTOR WILL REQUIRE THAT AN AREA BE RE-MULCHED IN ACCORDANCE WITH ITEMS 2 THROUGH 5 ABOVE, AND THIS AREA WILL BE INCLUDED ON THE INSPECTION CHECKLIST FOR THE NEXT INSPECTION.
- IF A PARTICULAR AREA REPEATEDLY EXPERIENCES LOSS OF MULCH DUE TO WIND, THEN THE INSPECTOR WILL REQUIRE THAT AN ALTERNATIVE METHOD BE USED TO SECURE THE MULCH IN PLACE. SUCH ALTERNATIVES MAY INCLUDE THE USE OF NETTING, TACKIFIER OR OTHER METHODS DEEMED APPROPRIATE BY THE INSPECTOR.
- DURING PERIODS WHEN SNOW IS MELTING AND/OR SURFACE SOILS ARE THAWING DURING DAYTIME HOURS, MULCHED AREAS MUST BE RE-TRACKED (CRIMPED) AS PER ITEM 5 ABOVE AT LEAST ONCE EVERY SEVEN DAYS, MORE FREQUENTLY IF DIRECTED BY THE INSPECTOR. ADDITIONAL MULCH MAY BE REQUIRED TO OBTAIN COMPLETE COVERAGE OF AN AREA. BIODEGRADABLE EROSION CONTROL MATTING MAY BE REQUIRED ON STEEPER SLOPES.
- ADDITIONAL STABILIZATION MEASURES FOR NON-FROZEN GROUND CONDITIONS DESCRIBED IN THE SWPPP WILL BE IMPLEMENTED AT THE TIME DEEMED APPROPRIATE BY THE INSPECTOR.
- DURING THE WINTER SEASON, IF A SITE HAS BEEN STABILIZED AND SOIL DISTURBING ACTIVITIES HAVE BEEN SUSPENDED FOR THE WINTER, WEEKLY INSPECTIONS CAN BE SUSPENDED. HOWEVER, MONTHLY INSPECTIONS MUST STILL BE CONDUCTED. ALL NORMAL WEEKLY INSPECTIONS MUST RESUME WHEN SOIL DISTURBING ACTIVITIES RESUME.

LANDSCAPE MANAGEMENT PLAN

THE LANDSCAPE PLAN DESIGNED FOR THE PROPOSED TELECOMMUNICATION FACILITY IS DESIGNED TO PROVIDE PROPER CONVEYANCE OF STORMWATER RUNOFF, AND A VISUAL BUFFER FOR THE ABUTTERS. THE SEEDING AND STABILIZATION SPECIFICATIONS ARE TO BE FOLLOWED AS LAID OUT WITHIN THE CONSTRUCTION DRAWINGS. UPON COMPLETION OF THE PROJECT AND FINAL STABILIZATION OF THE PROPOSED GRADING, TYPICAL MAINTENANCE AND INSPECTIONS SHALL TAKE PLACE. THE PARTY RESPONSIBLE FOR THE OPERATIONS AND MAINTENANCE OF THE TELECOMMUNICATIONS COMPOUND, OR THEIR REPRESENTATIVE, IS RESPONSIBLE FOR LANDSCAPE MANAGEMENT OF THE PROPOSED INSTALLATION.

GRASS AREAS: PROPOSED GRASS AREAS, INCLUDING THE CONVEYANCE SWALES, ARE TO BE MOWED TWICE A MONTH IN THE SPRING AND FALL MONTHS, AND WEEKLY DURING THE SUMMER MONTHS. LEAF REMOVAL IS TO TAKE PLACE AS NECESSARY DURING THE FALL MONTHS. LEAVES MUST BE REMOVED FROM SWALES AND TRENCH IN ORDER FOR PROPER FUNCTIONALITY OF THE STORMWATER STRUCTURES.

TREE BUFFER: THE PROPOSED TREES SHALL BE PRUNED ONCE YEARLY AS NEEDED TO REMOVE DEAD BRANCHES AND TO ENCOURAGE UPWARD GROWTH. IF AN UNHEALTHY OR DEAD TREE IS FOUND DURING INSPECTION, AN IDENTICAL SPECIES MUST REPLACE THE LOST TREE. TREE STAKES SHALL BE REMOVED FROM TREES AT A TIME SUGGESTED BY THE PROVIDING NURSERY.

LANDSCAPE WASTE: ANY AND ALL WASTE FROM THE INSTALLATION AND MAINTENANCE OF THE PROPOSED LANDSCAPING SHALL BE REMOVED AND DISPOSED OF OFF-SITE.

ENGINEER



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APPLICANT



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SITE INFORMATION

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MA-0049
145 ROUTE 130
SANDWICH, MA 02644
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

REV	DATE	DESCRIPTION	BY
1	01/20/17	REVISED PER COMMENTS	TRD
0	12/06/16	FINAL ZDs	PRC

PROFESSIONAL STAMP



ENGINEER

KRUPAKARAN KOLANDAIVELU, P.E.
MA PROFESSIONAL ENGINEER LIC. #50019

SHEET TITLE

INFILTRATION
TRENCH DETAILS
& LAND
MANAGEMENT
NOTES

SHEET NUMBER

C-8

SWPPP
APPENDIX B

Hydrograph Report

Hyd. No. 1

PRE-DEVELOPMENT

Hydrograph type	= Mod. Rational	Peak discharge	= 25.62 cfs
Storm frequency	= 2 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 23,057 cuft
Drainage area	= 14.960 ac	Runoff coeff.	= 0.67*
Intensity	= 2.556 in/hr	Tc by User	= 15.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = [(0.460 x 0.99) + (7.730 x 0.80) + (6.570 x 0.50) + (0.200 x 0.20)] / 14.960



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

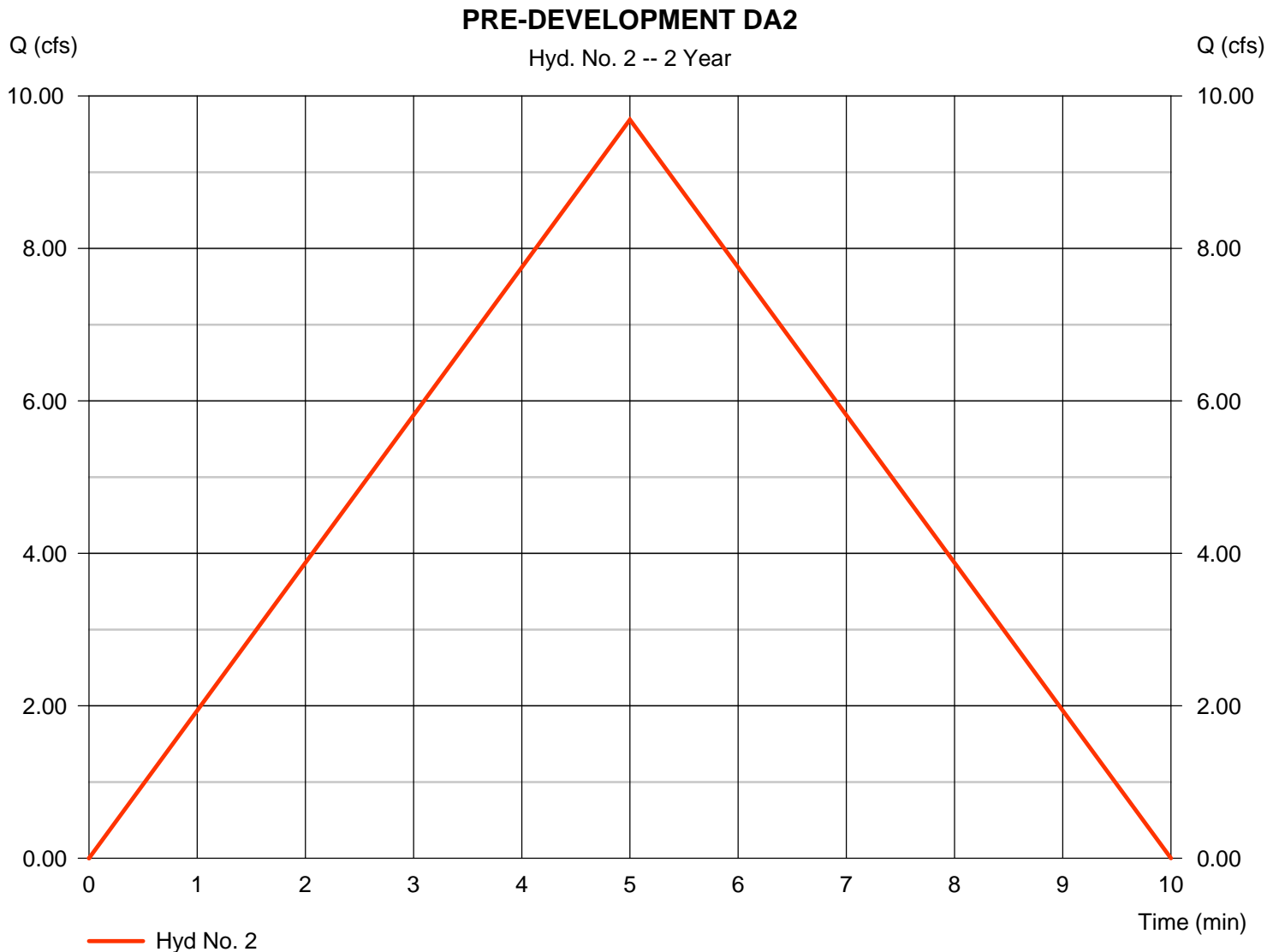
Wednesday, 09 / 28 / 2016

Hyd. No. 2

PRE-DEVELOPMENT DA2

Hydrograph type	= Mod. Rational	Peak discharge	= 9.689 cfs
Storm frequency	= 2 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,907 cuft
Drainage area	= 2.640 ac	Runoff coeff.	= 0.86*
Intensity	= 4.268 in/hr	Tc by User	= 5.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = [(0.910 x 0.99) + (1.650 x 0.80) + (0.080 x 0.50)] / 2.640



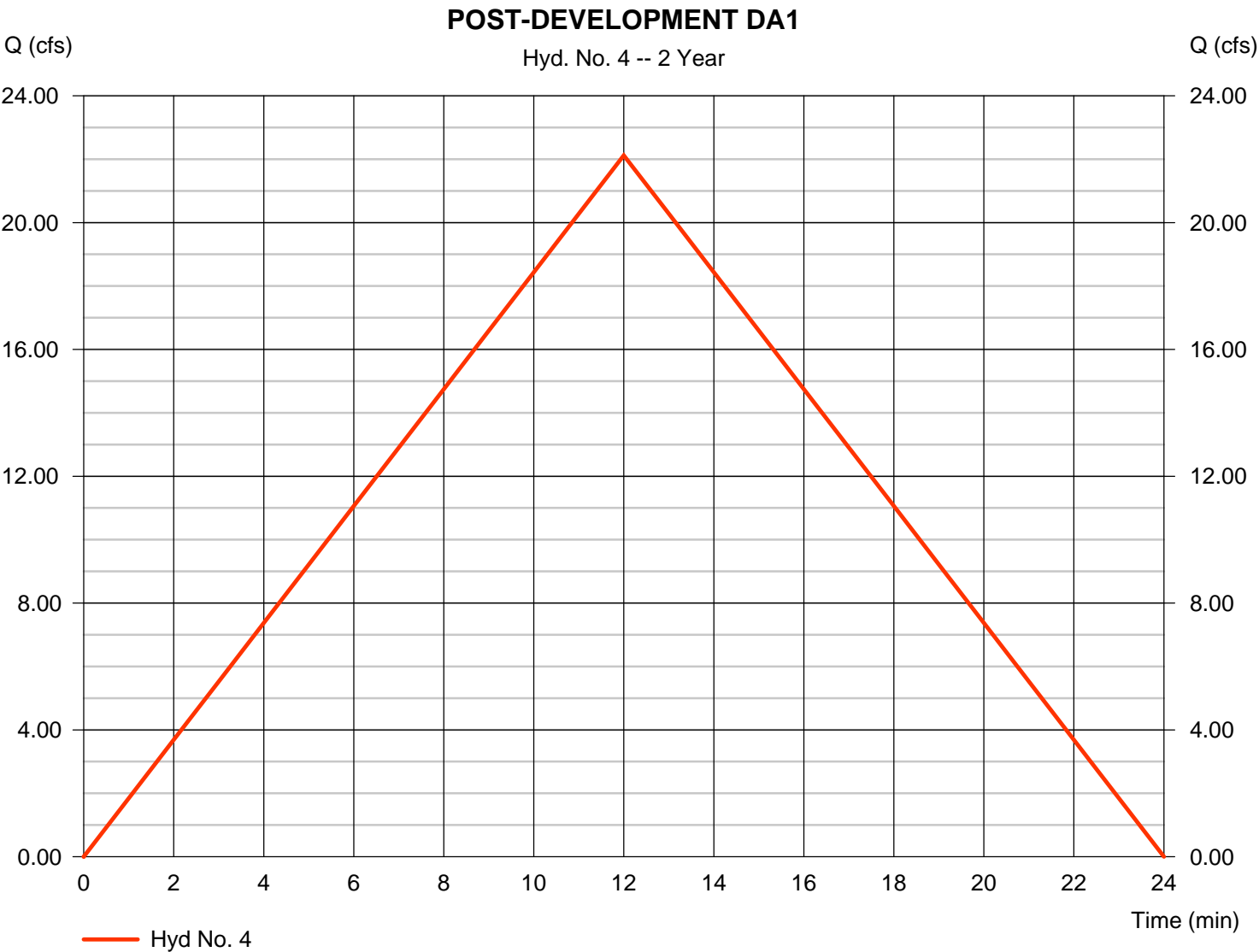
Hydrograph Report

Hyd. No. 4

POST-DEVELOPMENT DA1

Hydrograph type	= Mod. Rational	Peak discharge	= 22.12 cfs
Storm frequency	= 2 yrs	Time to peak	= 12 min
Time interval	= 1 min	Hyd. volume	= 15,926 cuft
Drainage area	= 11.660 ac	Runoff coeff.	= 0.66*
Intensity	= 2.874 in/hr	Tc by User	= 12.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = [(6.260 x 0.80) + (5.400 x 0.50)] / 11.660



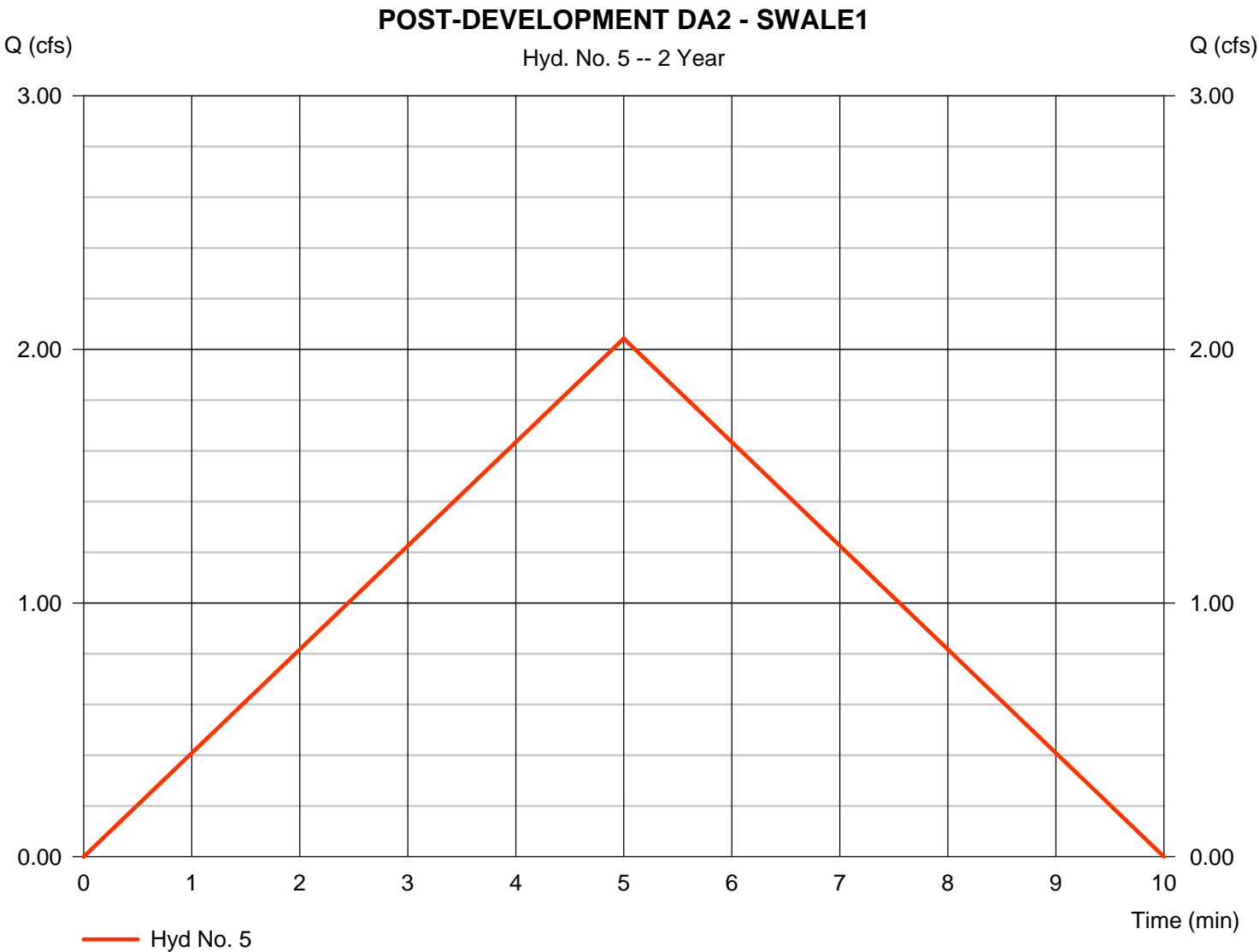
Hydrograph Report

Hyd. No. 5

POST-DEVELOPMENT DA2 - SWALE1

Hydrograph type	=	Mod. Rational	Peak discharge	=	2.043 cfs
Storm frequency	=	2 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	613 cuft
Drainage area	=	0.630 ac	Runoff coeff.	=	0.76*
Intensity	=	4.268 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.570 x 0.80) + (0.060 x 0.40)] / 0.630



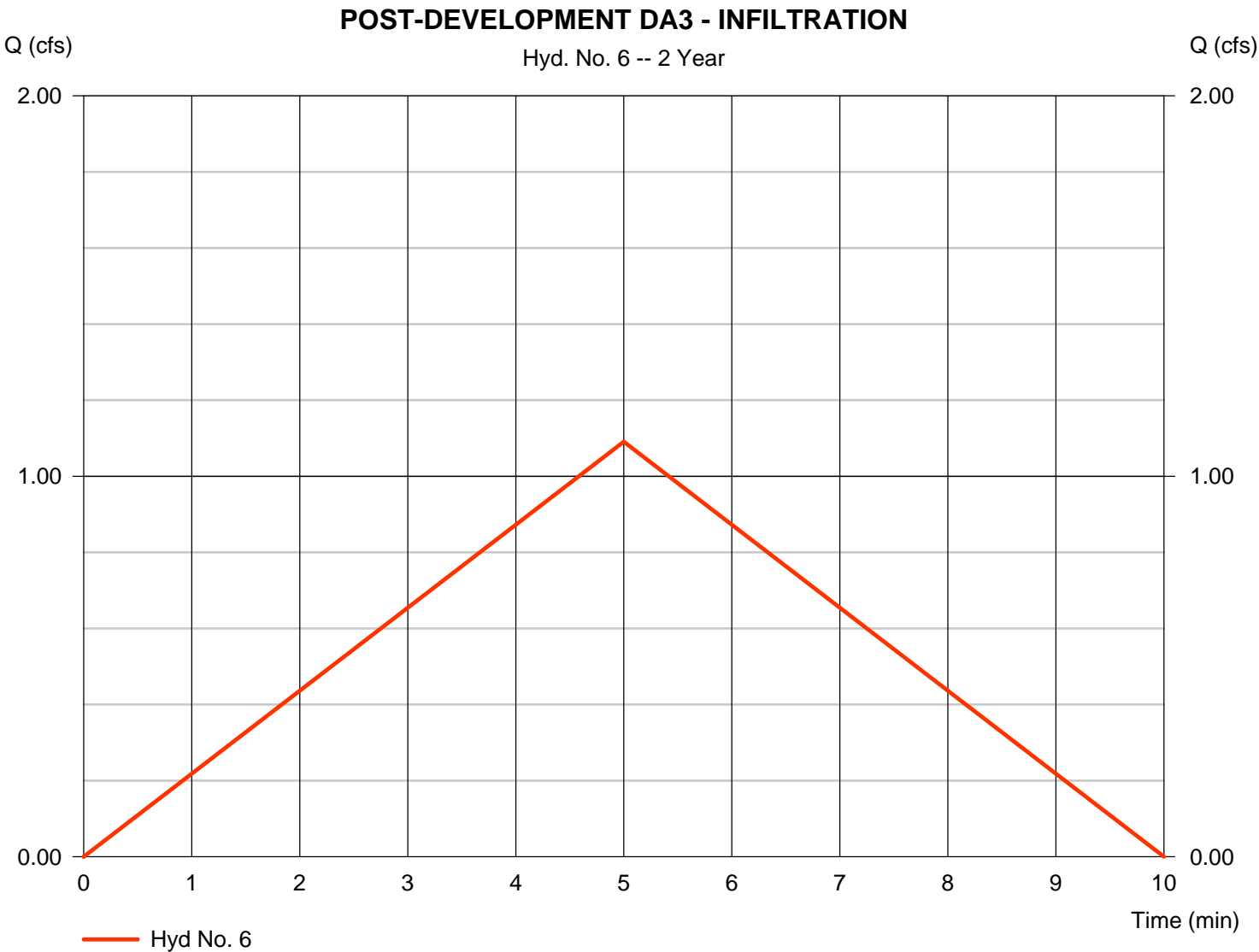
Hydrograph Report

Hyd. No. 6

POST-DEVELOPMENT DA3 - INFILTRATION

Hydrograph type	=	Mod. Rational	Peak discharge	=	1.091 cfs
Storm frequency	=	2 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	327 cuft
Drainage area	=	0.360 ac	Runoff coeff.	=	0.71*
Intensity	=	4.268 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.070 x 0.80) + (0.140 x 0.99) + (0.150 x 0.40)] / 0.360



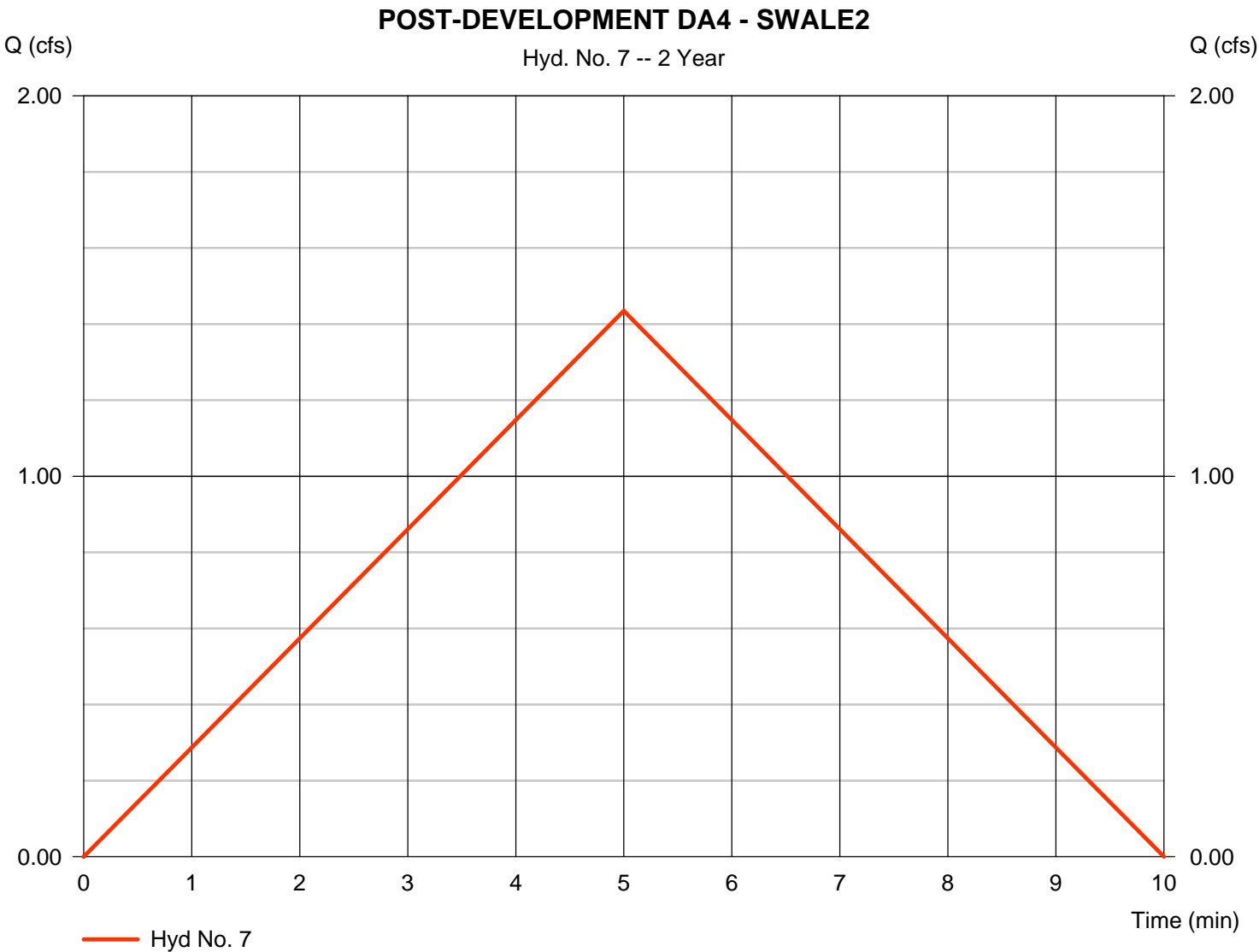
Hydrograph Report

Hyd. No. 7

POST-DEVELOPMENT DA4 - SWALE2

Hydrograph type	=	Mod. Rational	Peak discharge	=	1.435 cfs
Storm frequency	=	2 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	430 cuft
Drainage area	=	0.410 ac	Runoff coeff.	=	0.82*
Intensity	=	4.268 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.340 x 0.80) + (0.060 x 0.99) + (0.010 x 0.40)] / 0.410



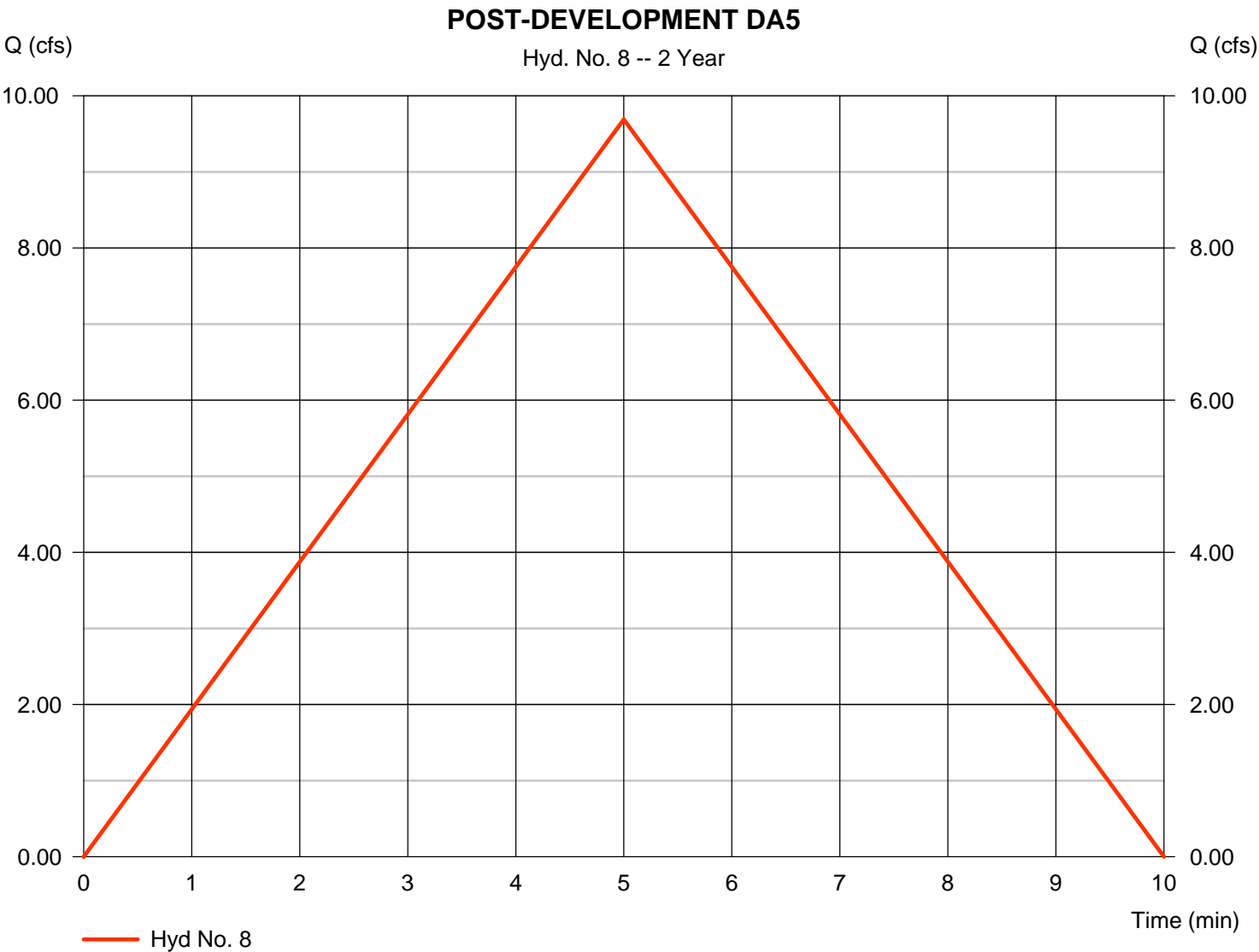
Hydrograph Report

Hyd. No. 8

POST-DEVELOPMENT DA5

Hydrograph type	= Mod. Rational	Peak discharge	= 9.689 cfs
Storm frequency	= 2 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,907 cuft
Drainage area	= 2.640 ac	Runoff coeff.	= 0.86*
Intensity	= 4.268 in/hr	Tc by User	= 5.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = [(1.650 x 0.80) + (0.910 x 0.99) + (0.002 x 0.40) + (0.080 x 0.50)] / 2.640



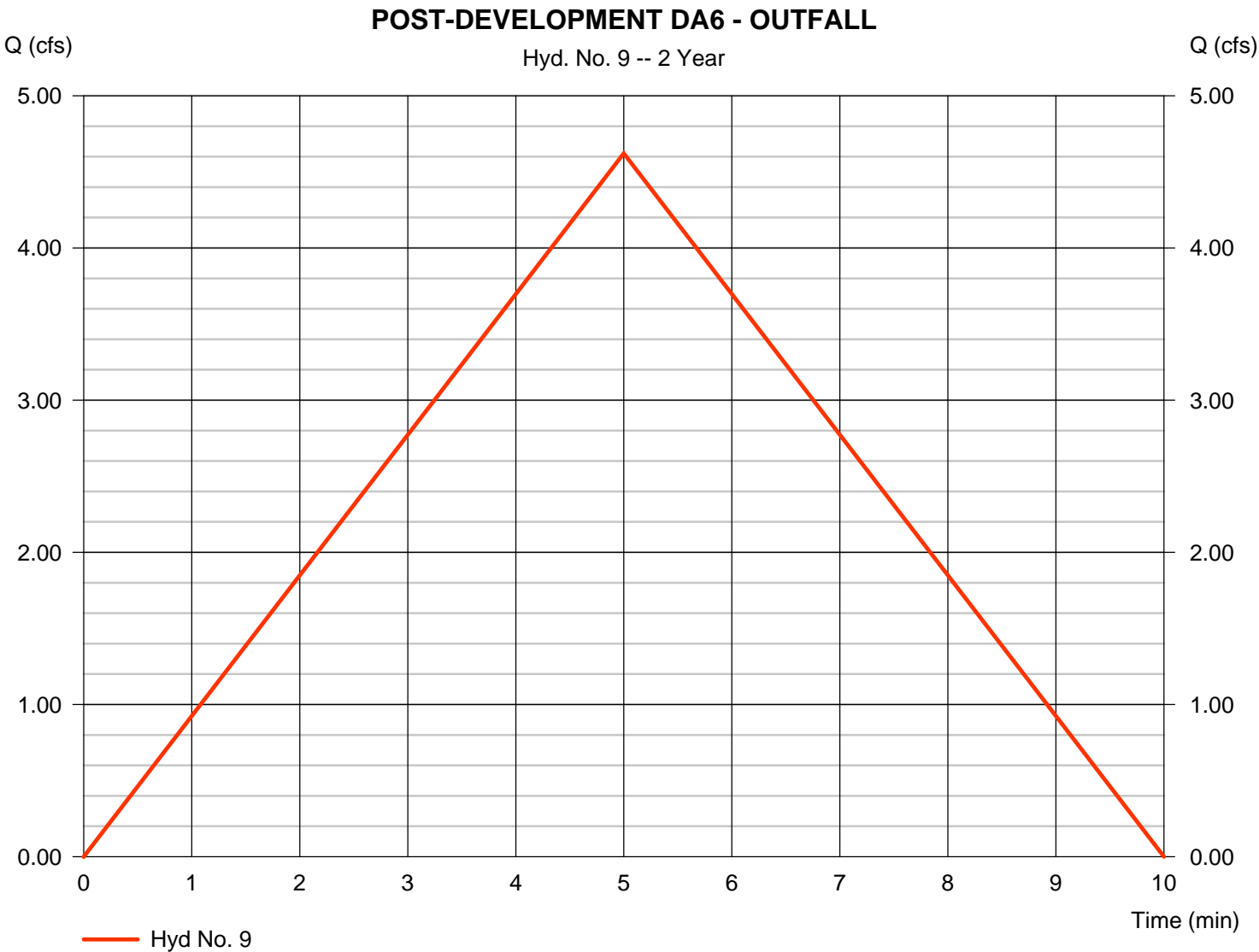
Hydrograph Report

Hyd. No. 9

POST-DEVELOPMENT DA6 - OUTFALL

Hydrograph type	=	Mod. Rational	Peak discharge	=	4.622 cfs
Storm frequency	=	2 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	1,387 cuft
Drainage area	=	1.900 ac	Runoff coeff.	=	0.57*
Intensity	=	4.268 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.100 x 0.80) + (0.350 x 0.99) + (0.130 x 0.40) + (1.120 x 0.50) + (0.200 x 0.20)] / 1.900



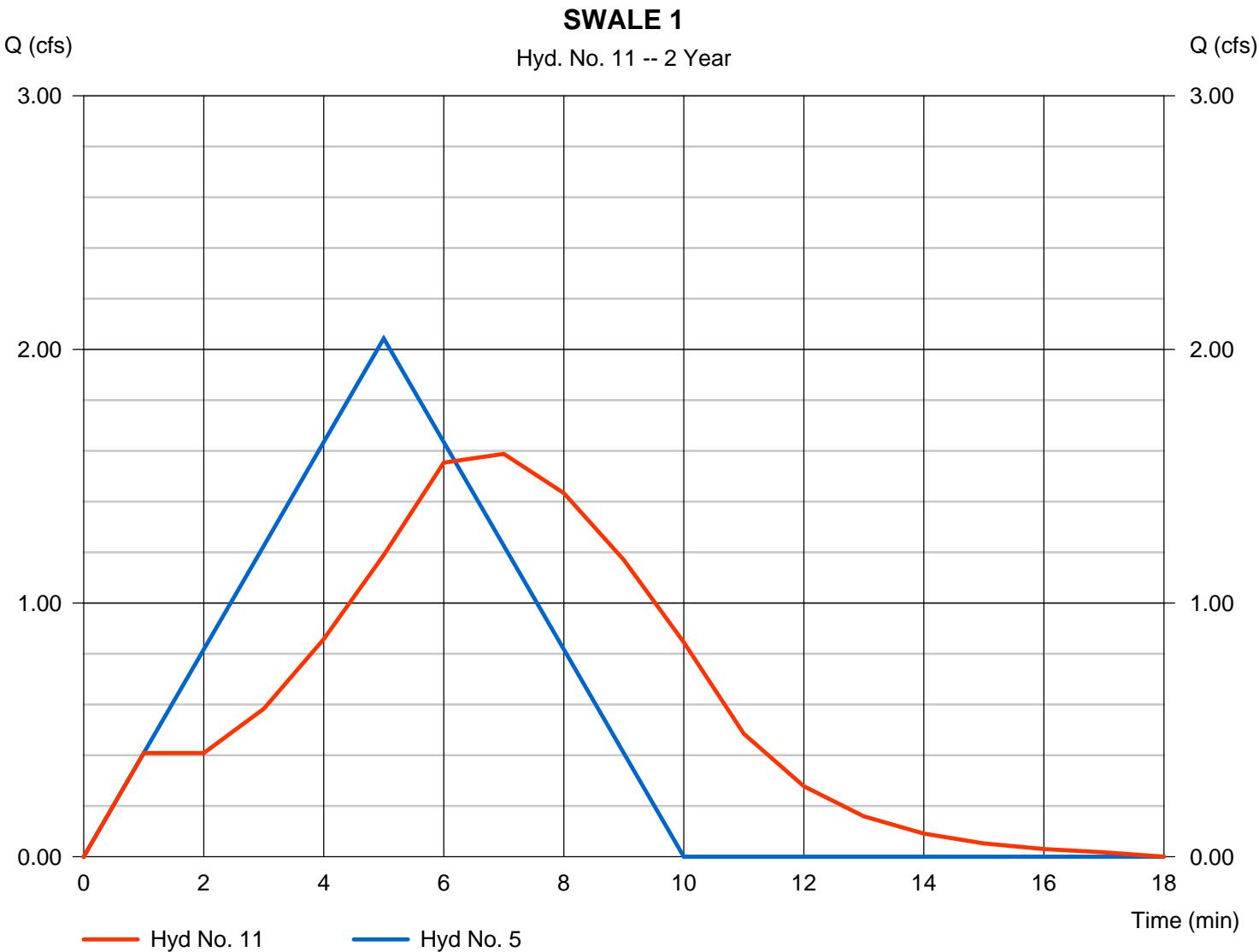
Hydrograph Report

Hyd. No. 11

SWALE 1

Hydrograph type	= Reach	Peak discharge	= 1.588 cfs
Storm frequency	= 2 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 669 cuft
Inflow hyd. No.	= 5 - POST-DEVELOPMENT DASH SWALE	Section type	= Trapezoidal
Reach length	= 150.0 ft	Channel slope	= 1.0 %
Manning's n	= 0.030	Bottom width	= 12.0 ft
Side slope	= 3.0:1	Max. depth	= 0.5 ft
Rating curve x	= 0.947	Rating curve m	= 1.237
Ave. velocity	= 1.10 ft/s	Routing coeff.	= 0.4269

Modified Att-Kin routing method used.



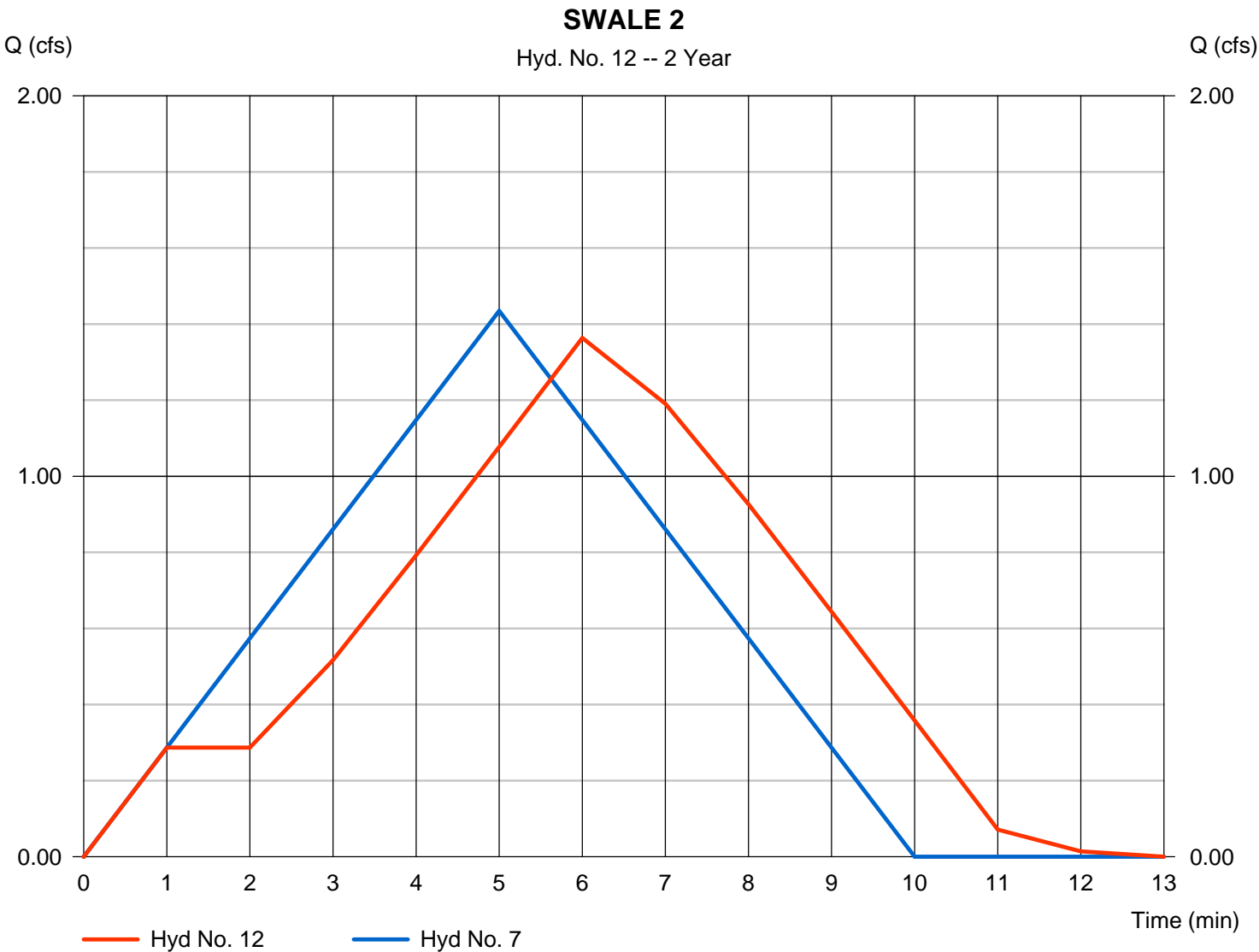
Hydrograph Report

Hyd. No. 12

SWALE 2

Hydrograph type	= Reach	Peak discharge	= 1.364 cfs
Storm frequency	= 2 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 452 cuft
Inflow hyd. No.	= 7 - POST-DEVELOPMENT DASH SWALE 2	Channel type	= Trapezoidal
Reach length	= 60.0 ft	Channel slope	= 1.0 %
Manning's n	= 0.030	Bottom width	= 10.0 ft
Side slope	= 3.0:1	Max. depth	= 0.5 ft
Rating curve x	= 1.069	Rating curve m	= 1.192
Ave. velocity	= 1.12 ft/s	Routing coeff.	= 0.8009

Modified Att-Kin routing method used.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

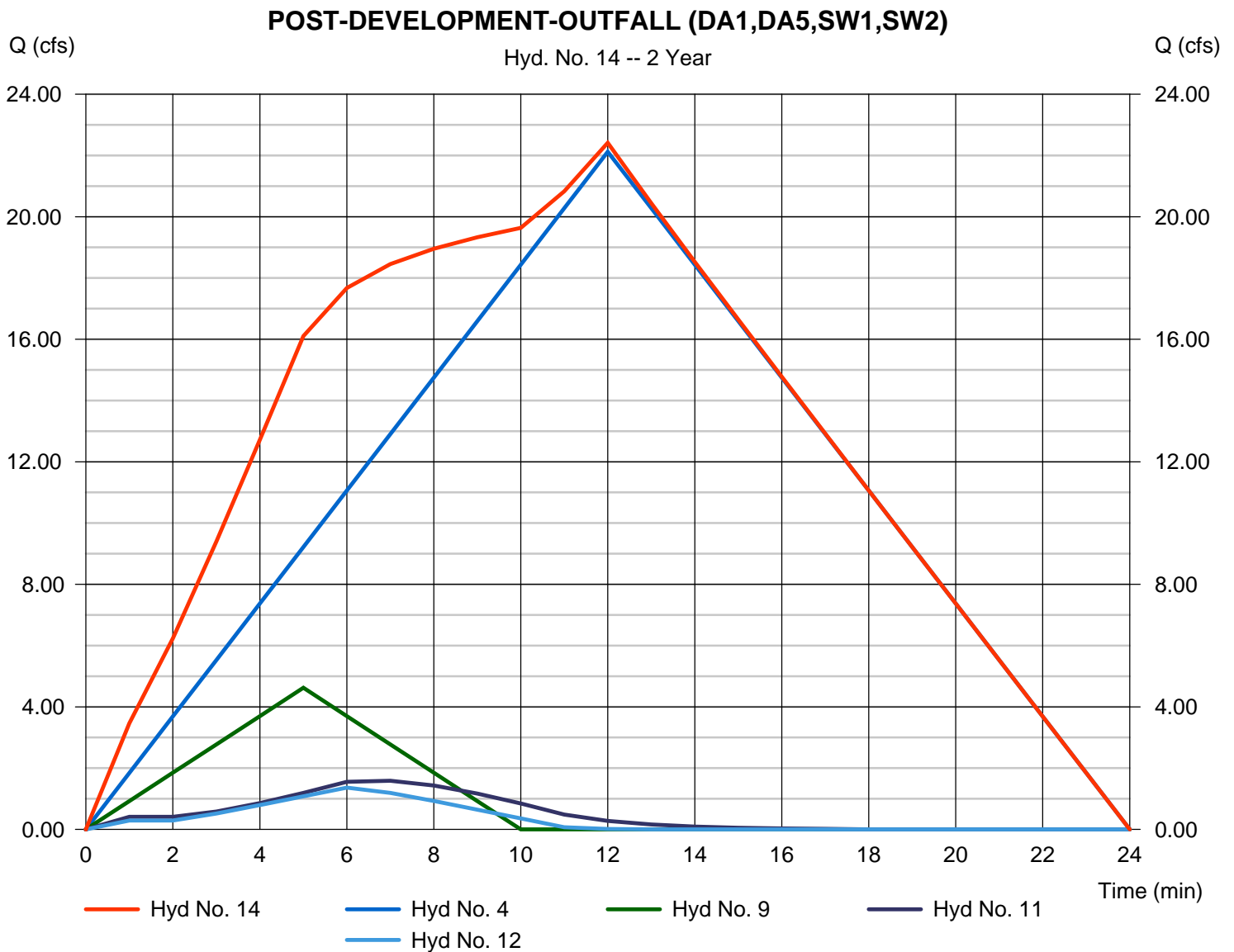
Wednesday, 09 / 28 / 2016

Hyd. No. 14

POST-DEVELOPMENT-OUTFALL (DA1,DA5,SW1,SW2)

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyds. = 4, 9, 11, 12

Peak discharge = 22.41 cfs
Time to peak = 12 min
Hyd. volume = 18,434 cuft
Contrib. drain. area = 13.560 ac



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

Wednesday, 09 / 28 / 2016

Hyd. No. 1

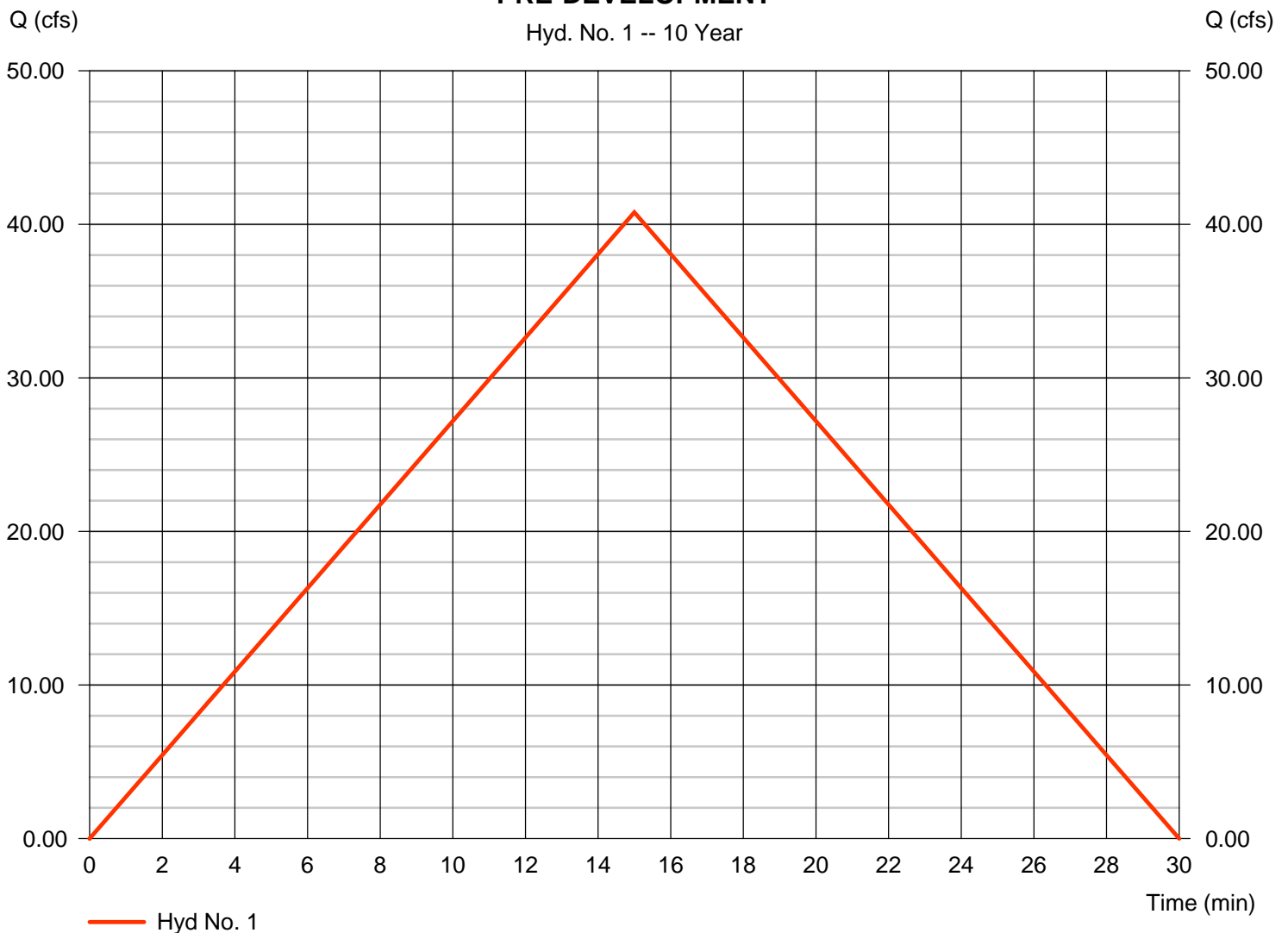
PRE-DEVELOPMENT

Hydrograph type	= Mod. Rational	Peak discharge	= 40.78 cfs
Storm frequency	= 10 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 36,701 cuft
Drainage area	= 14.960 ac	Runoff coeff.	= 0.67*
Intensity	= 4.068 in/hr	Tc by User	= 15.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = [(0.460 x 0.99) + (7.730 x 0.80) + (6.570 x 0.50) + (0.200 x 0.20)] / 14.960

PRE-DEVELOPMENT

Hyd. No. 1 -- 10 Year



Hydrograph Report

Hyd. No. 2

PRE-DEVELOPMENT DA2

Hydrograph type	=	Mod. Rational	Peak discharge	=	15.50 cfs
Storm frequency	=	10 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	4,651 cuft
Drainage area	=	2.640 ac	Runoff coeff.	=	0.86*
Intensity	=	6.828 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.910 x 0.99) + (1.650 x 0.80) + (0.080 x 0.50)] / 2.640



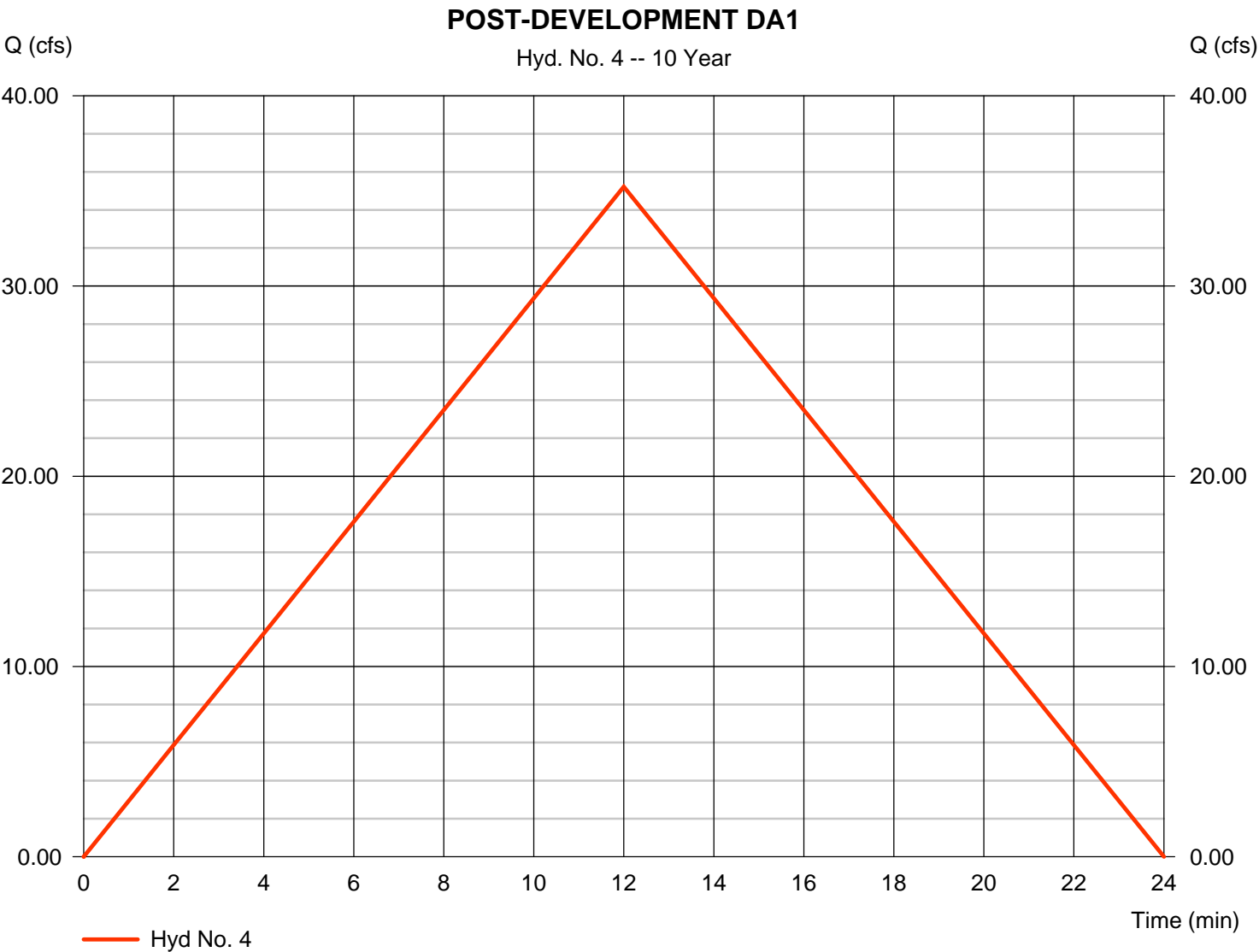
Hydrograph Report

Hyd. No. 4

POST-DEVELOPMENT DA1

Hydrograph type	=	Mod. Rational	Peak discharge	=	35.22 cfs
Storm frequency	=	10 yrs	Time to peak	=	12 min
Time interval	=	1 min	Hyd. volume	=	25,361 cuft
Drainage area	=	11.660 ac	Runoff coeff.	=	0.66*
Intensity	=	4.577 in/hr	Tc by User	=	12.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(6.260 x 0.80) + (5.400 x 0.50)] / 11.660



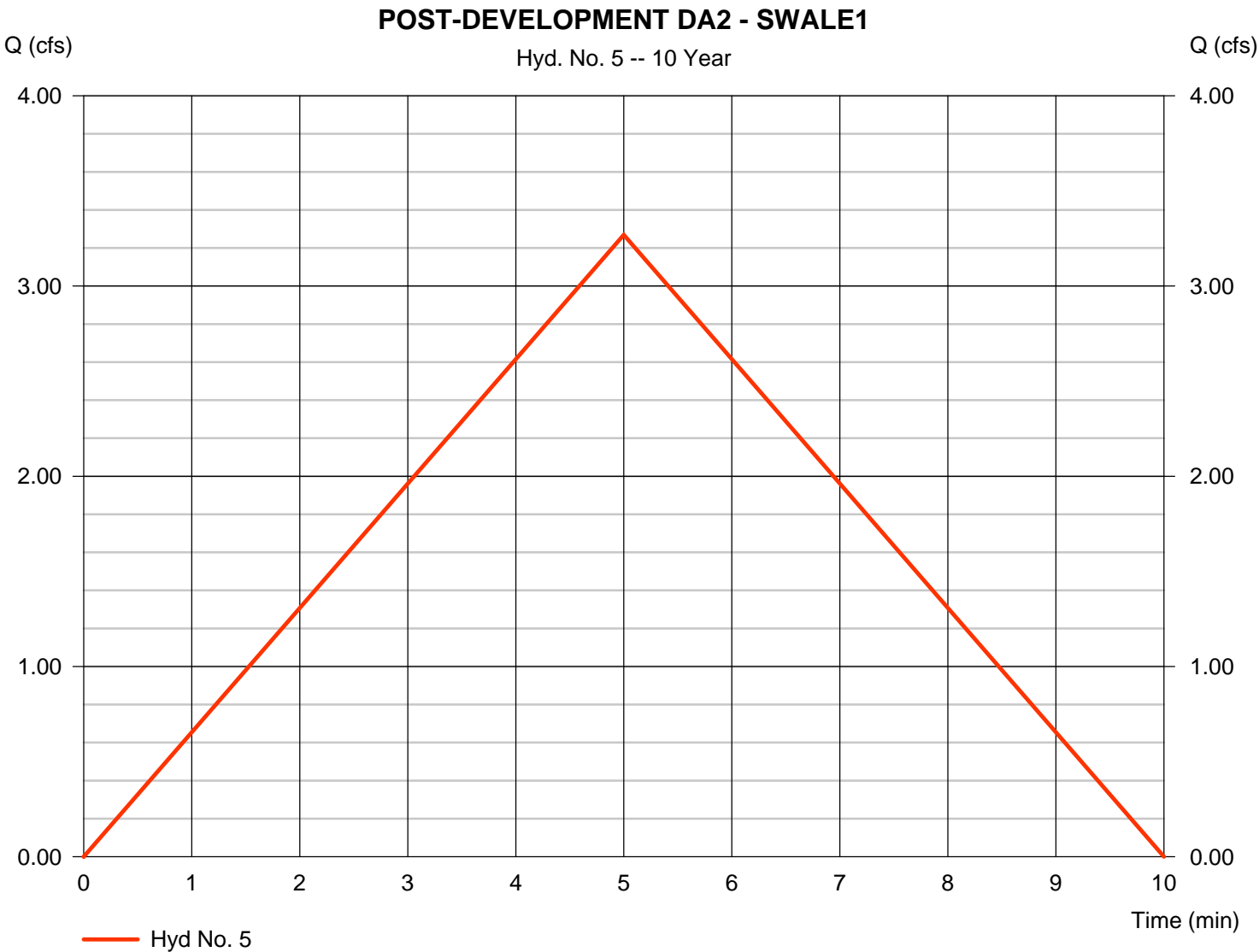
Hydrograph Report

Hyd. No. 5

POST-DEVELOPMENT DA2 - SWALE1

Hydrograph type	=	Mod. Rational	Peak discharge	=	3.269 cfs
Storm frequency	=	10 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	981 cuft
Drainage area	=	0.630 ac	Runoff coeff.	=	0.76*
Intensity	=	6.828 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(0.570 x 0.80) + (0.060 x 0.40)] / 0.630



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

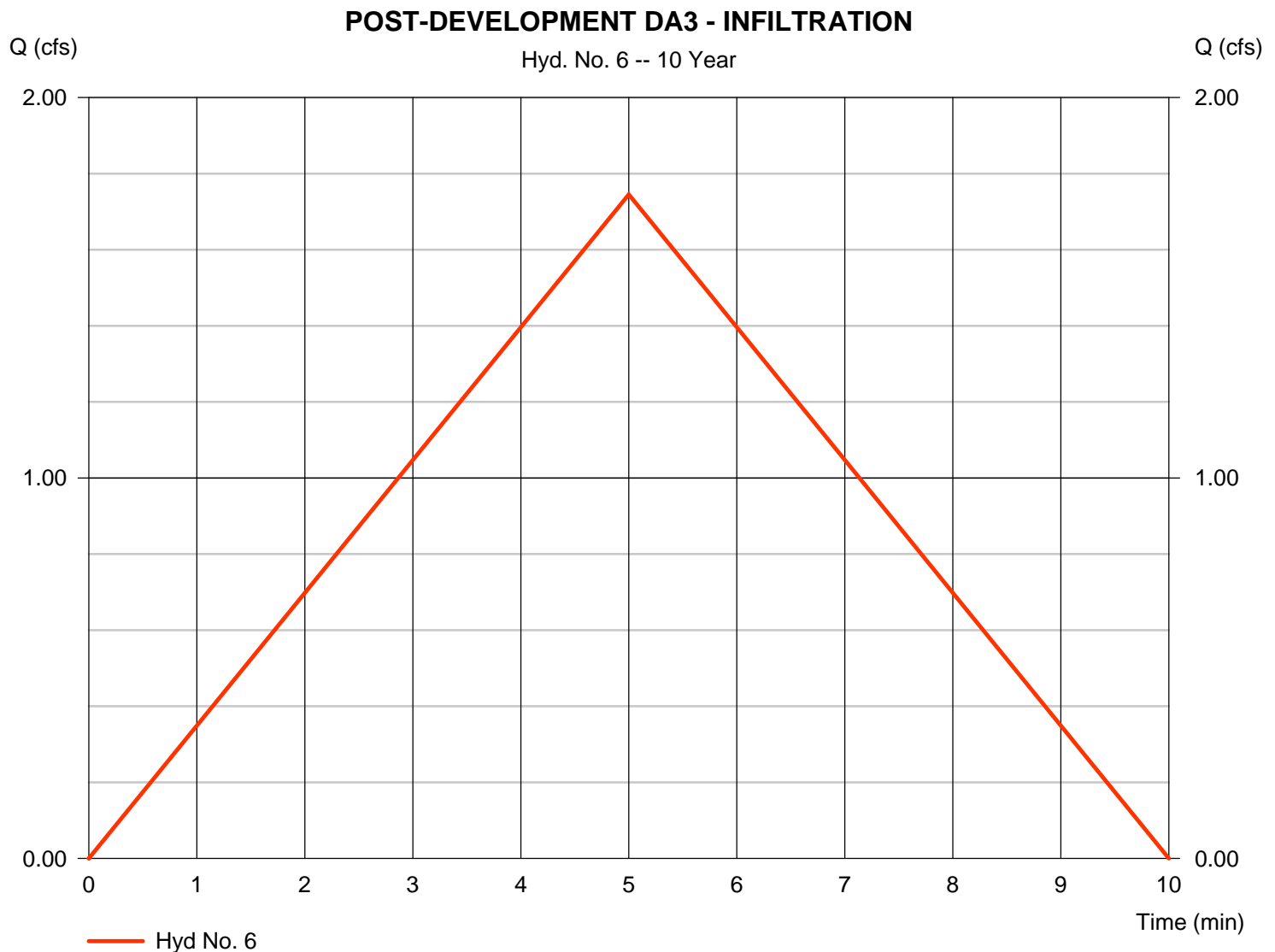
Wednesday, 09 / 28 / 2016

Hyd. No. 6

POST-DEVELOPMENT DA3 - INFILTRATION

Hydrograph type	= Mod. Rational	Peak discharge	= 1.745 cfs
Storm frequency	= 10 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 524 cuft
Drainage area	= 0.360 ac	Runoff coeff.	= 0.71*
Intensity	= 6.828 in/hr	Tc by User	= 5.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = $[(0.070 \times 0.80) + (0.140 \times 0.99) + (0.150 \times 0.40)] / 0.360$



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

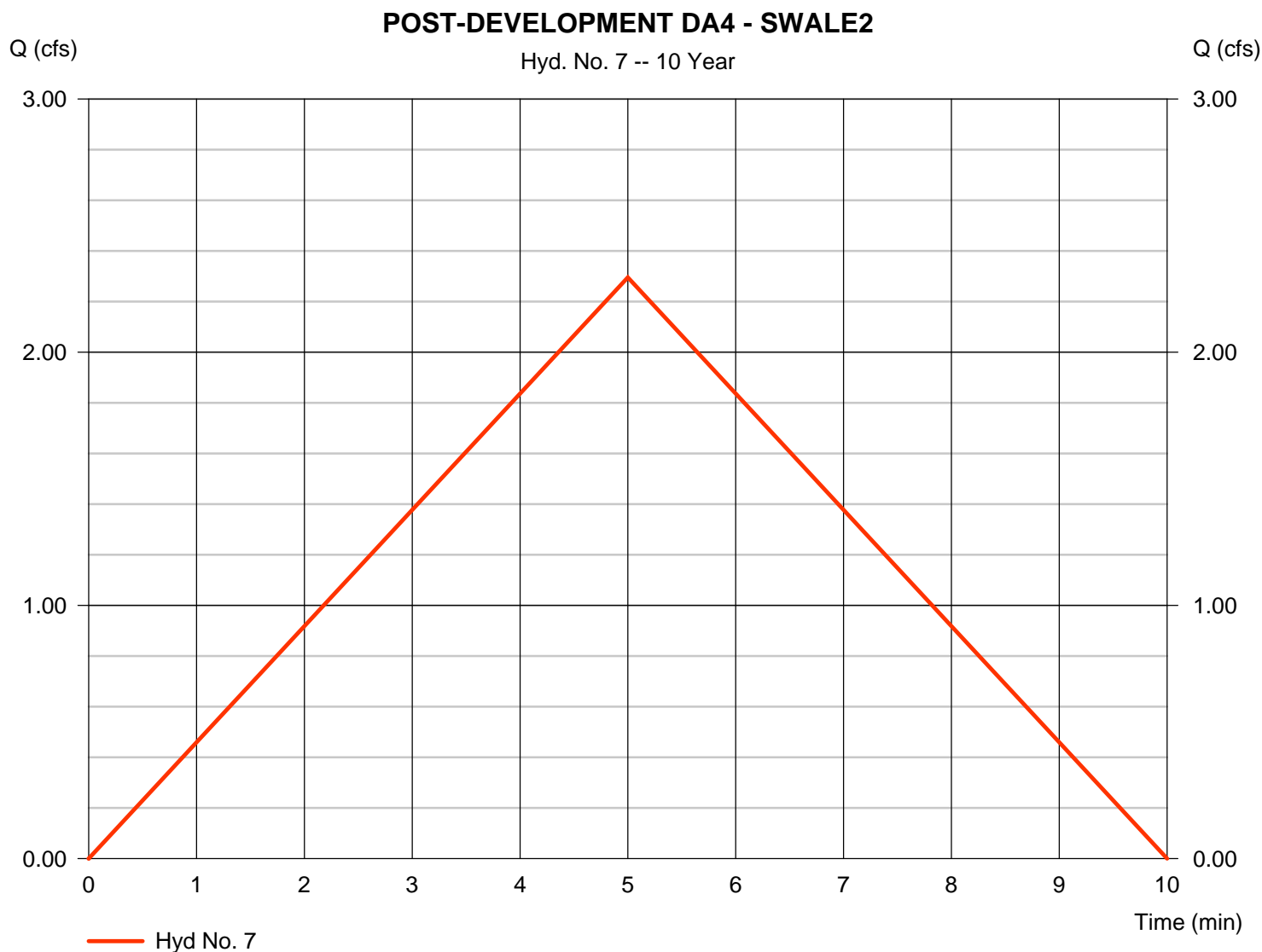
Wednesday, 09 / 28 / 2016

Hyd. No. 7

POST-DEVELOPMENT DA4 - SWALE2

Hydrograph type	= Mod. Rational	Peak discharge	= 2.296 cfs
Storm frequency	= 10 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 689 cuft
Drainage area	= 0.410 ac	Runoff coeff.	= 0.82*
Intensity	= 6.828 in/hr	Tc by User	= 5.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = $[(0.340 \times 0.80) + (0.060 \times 0.99) + (0.010 \times 0.40)] / 0.410$



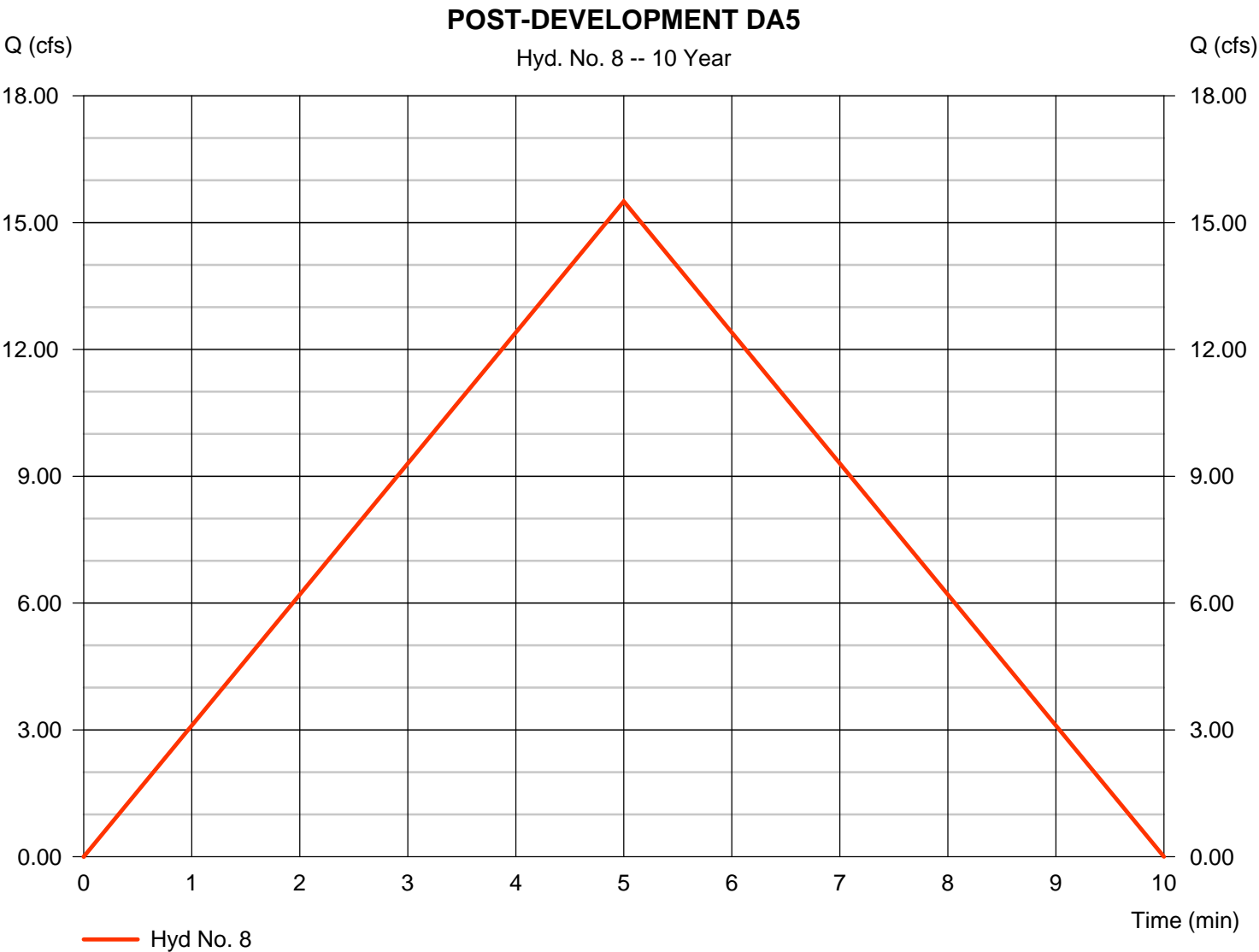
Hydrograph Report

Hyd. No. 8

POST-DEVELOPMENT DA5

Hydrograph type	=	Mod. Rational	Peak discharge	=	15.50 cfs
Storm frequency	=	10 yrs	Time to peak	=	5 min
Time interval	=	1 min	Hyd. volume	=	4,651 cuft
Drainage area	=	2.640 ac	Runoff coeff.	=	0.86*
Intensity	=	6.828 in/hr	Tc by User	=	5.00 min
IDF Curve	=	ma-0049.IDF	Storm duration	=	1.0 x Tc
Target Q	=	n/a	Est. Req'd Storage	=	n/a

* Composite (Area/C) = [(1.650 x 0.80) + (0.910 x 0.99) + (0.002 x 0.40) + (0.080 x 0.50)] / 2.640



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

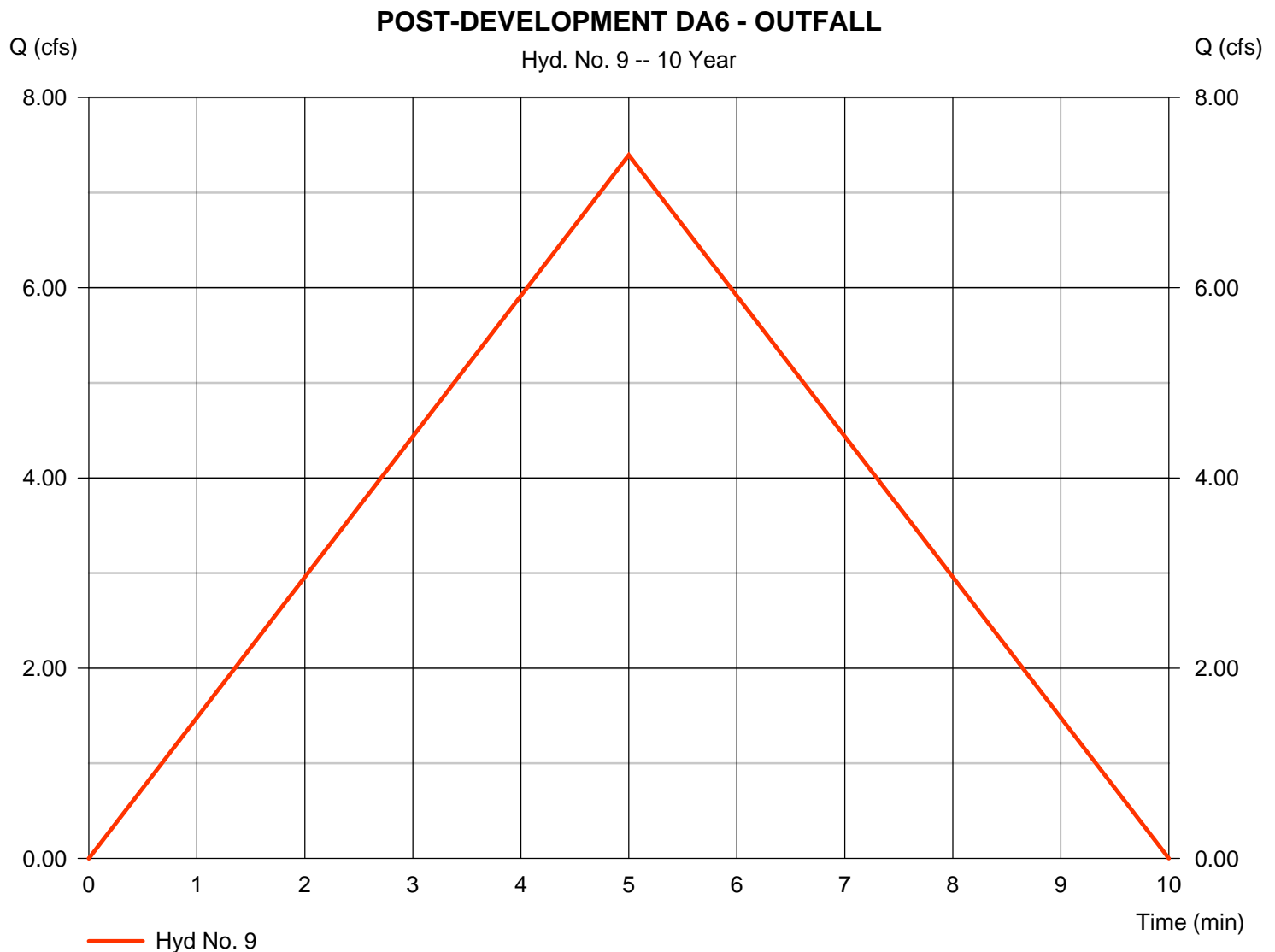
Wednesday, 09 / 28 / 2016

Hyd. No. 9

POST-DEVELOPMENT DA6 - OUTFALL

Hydrograph type	= Mod. Rational	Peak discharge	= 7.395 cfs
Storm frequency	= 10 yrs	Time to peak	= 5 min
Time interval	= 1 min	Hyd. volume	= 2,218 cuft
Drainage area	= 1.900 ac	Runoff coeff.	= 0.57*
Intensity	= 6.828 in/hr	Tc by User	= 5.00 min
IDF Curve	= ma-0049.IDF	Storm duration	= 1.0 x Tc
Target Q	=n/a	Est. Req'd Storage	=n/a

* Composite (Area/C) = $[(0.100 \times 0.80) + (0.350 \times 0.99) + (0.130 \times 0.40) + (1.120 \times 0.50) + (0.200 \times 0.20)] / 1.900$



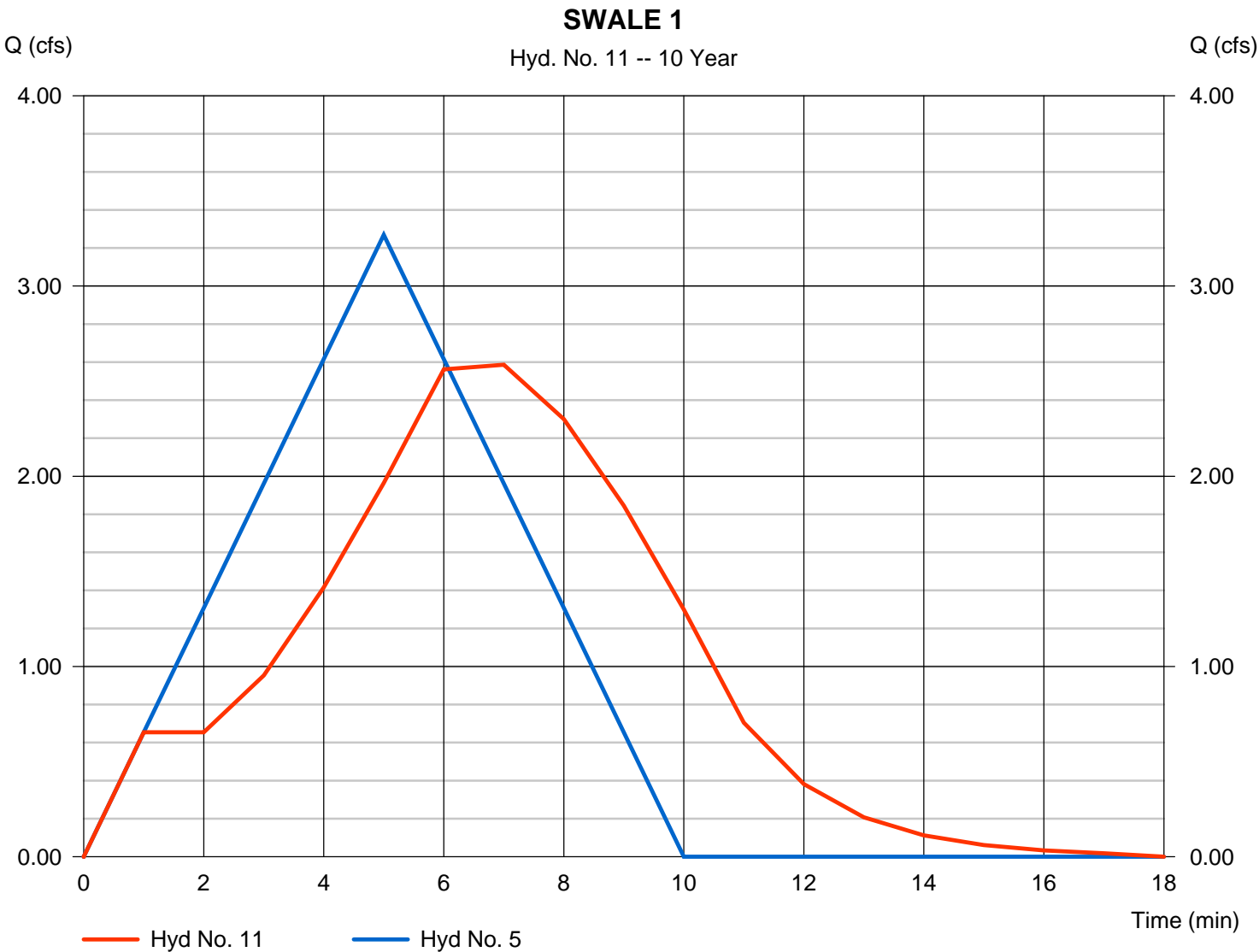
Hydrograph Report

Hyd. No. 11

SWALE 1

Hydrograph type	= Reach	Peak discharge	= 2.586 cfs
Storm frequency	= 10 yrs	Time to peak	= 7 min
Time interval	= 1 min	Hyd. volume	= 1,065 cuft
Inflow hyd. No.	= 5 - POST-DEVELOPMENT DASH SWALE	Section type	= Trapezoidal
Reach length	= 150.0 ft	Channel slope	= 1.0 %
Manning's n	= 0.030	Bottom width	= 12.0 ft
Side slope	= 3.0:1	Max. depth	= 0.5 ft
Rating curve x	= 0.947	Rating curve m	= 1.237
Ave. velocity	= 1.20 ft/s	Routing coeff.	= 0.4579

Modified Att-Kin routing method used.



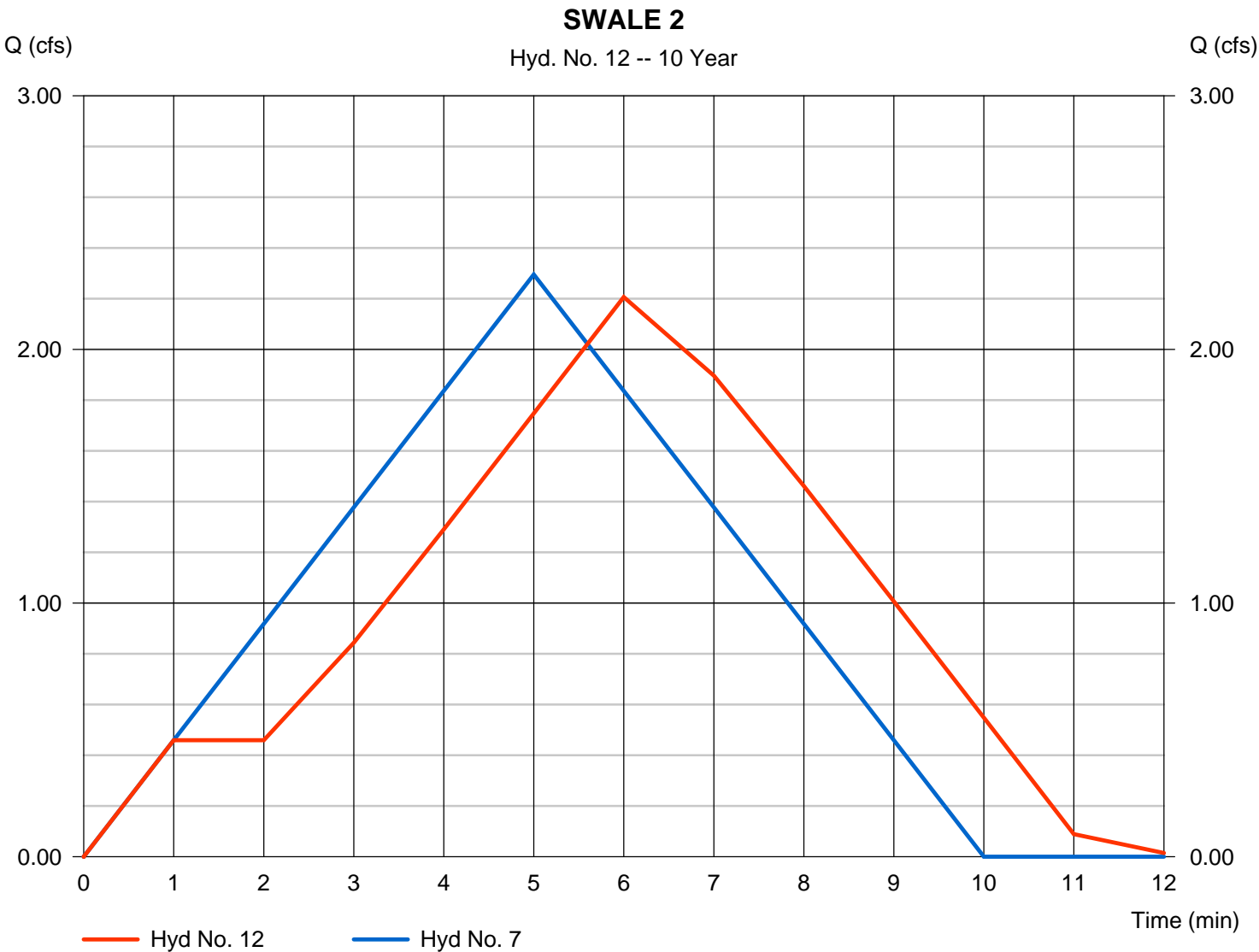
Hydrograph Report

Hyd. No. 12

SWALE 2

Hydrograph type	= Reach	Peak discharge	= 2.206 cfs
Storm frequency	= 10 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 721 cuft
Inflow hyd. No.	= 7 - POST-DEVELOPMENT DASH SWALE 2	Section type	= Trapezoidal
Reach length	= 60.0 ft	Channel slope	= 1.0 %
Manning's n	= 0.030	Bottom width	= 10.0 ft
Side slope	= 3.0:1	Max. depth	= 0.5 ft
Rating curve x	= 1.069	Rating curve m	= 1.192
Ave. velocity	= 1.21 ft/s	Routing coeff.	= 0.8375

Modified Att-Kin routing method used.



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

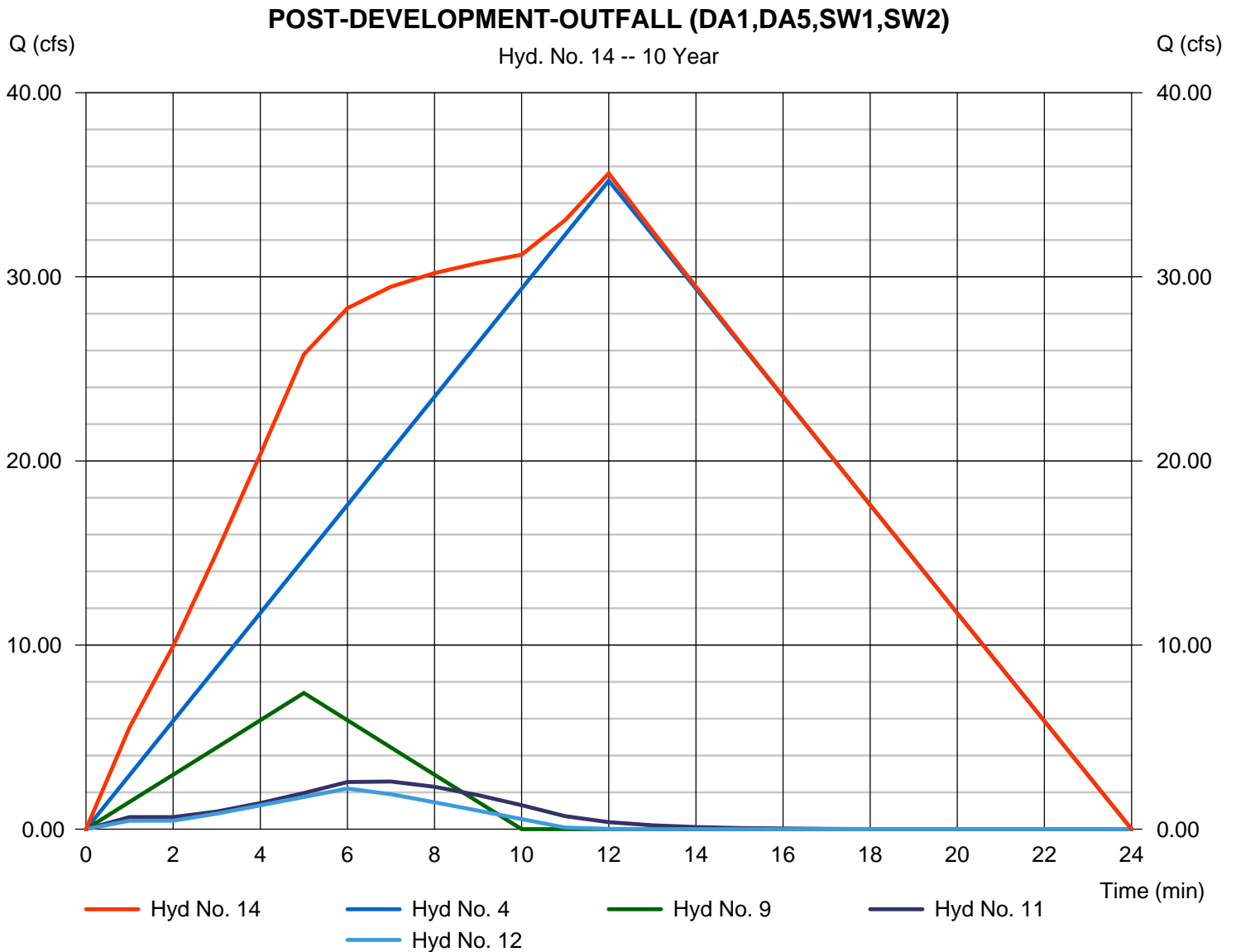
Wednesday, 09 / 28 / 2016

Hyd. No. 14

POST-DEVELOPMENT-OUTFALL (DA1,DA5,SW1,SW2)

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 1 min
Inflow hyds. = 4, 9, 11, 12

Peak discharge = 35.62 cfs
Time to peak = 12 min
Hyd. volume = 29,366 cuft
Contrib. drain. area = 13.560 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	14.6374	3.7000	0.6714	-----
2	18.5338	3.8000	0.6753	-----
3	0.0000	0.0000	0.0000	-----
5	23.5729	3.5000	0.6652	-----
10	28.3822	3.5000	0.6657	-----
25	36.2442	3.7000	0.6745	-----
50	41.4018	3.7000	0.6738	-----
100	46.2257	3.6000	0.6718	-----

File name: ma-0049.IDF

$$\text{Intensity} = B / (Tc + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.43	2.53	2.05	1.75	1.54	1.38	1.26	1.16	1.08	1.01	0.95	0.90
2	4.27	3.15	2.56	2.18	1.92	1.72	1.57	1.44	1.34	1.26	1.18	1.12
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.68	4.17	3.38	2.89	2.54	2.28	2.08	1.92	1.78	1.67	1.57	1.49
10	6.83	5.02	4.07	3.47	3.05	2.74	2.50	2.30	2.14	2.01	1.89	1.79
25	8.43	6.20	5.03	4.29	3.77	3.38	3.08	2.84	2.64	2.47	2.32	2.20
50	9.64	7.10	5.76	4.91	4.31	3.87	3.53	3.25	3.02	2.83	2.66	2.52
100	10.89	8.01	6.49	5.53	4.86	4.36	3.97	3.66	3.40	3.19	3.00	2.84

Tc = time in minutes. Values may exceed 60.

Precip. file name: R:\Boston\Projects\Eco-Site\NE NSB (1182)\MA-0049\E&S Coordination\MA-0049.pcp

[illegible]

INFILTRATION TRENCH SIZING



Project: ECO-SITE MA-0049
 Location: 145 ROUTE 130
 Area: Drainage Area

Date: 9/6/2016
 By: TRD
 Checked by: PB

1. Runoff Calculations (From Hydrographs)

Runoff Volume (100 year post-development)	644 ft ³
Runoff Volume (100 year pre-development)	190 ft ³
Runoff Volume (To be contained)	454

2. Volume Required (40% Void Spacing)

Void Space	0.4
Runoff Volume	454 ft ³
Required Storage	1135 ft ³

3. Trench Sizing

Depth to SHWT	>13 ft
Depth of Trench	2.5 ft
Area Required	454 ft ³
Length of Compound	50 ft
Length of Trench	140 ft
Width of Trench	10 ft
Trench Storage (From Storage Sheet)	1612 ft ³

4. Drain Time

Infiltration Rate	2 in/hr
Area of Trench	1400 ft ²
Outflow Rate	16.66666667 ft ³ /hr
Volume to be Drained	1135 ft ³
Drain Time	68.1 hours
Drain Time Limit	72 hours



JOB NO. _____ SHEET 1 OF 1
 PROJECT: MA-0049
 SUBJECT: DRY WELL CALCS

COMPUTED BY: TRD DATE: 09/26/16
 CHECKED BY: PB DATE: 09/26/16

BASIN NAME:
Basin #1

Stone Bed

Length	140	ft
Width	10.0	ft
or Area		sqft

Pipes

Number	1	
Length	120	ft
Diameter	1.50	ft

	Notes	Elevation (ft)	(Σ) Total Volume (ft ³) Pond Pack Input		(Σ) Main Pipes Volume (ft ³)	(Σ) Stone Bed Volume (40% Void Ratio) (ft ³)	Incremental Volume (ft ³)	(Σ) Total Volume (ft ³)
1	Bottom of Stone Bed	146.00	0			0	0	0
2	Bottom of Pipe	146.50	280		0	280	280	280
3		147.00	597		61.87655723	535	317	597
4		147.50	930		150.1809469	780	333	930
5	Top of Pipe	148.00	1247		212.0575041	1035	317	1247
6	Top of Geotextile/Stone	148.50	1612			1400	365	1612
7	Finished Grade	149.00	1892			1680	280	1892
8						-	-	-
9						-	-	-
10						-	-	-
11						-	-	-
12						-	-	-
13						-	-	-

STANDARD WORKSHEET #23 **Riprap Apron Outlet Protection** **Designed for 10 Year Storm**

PROJECT NAME: MA-0049

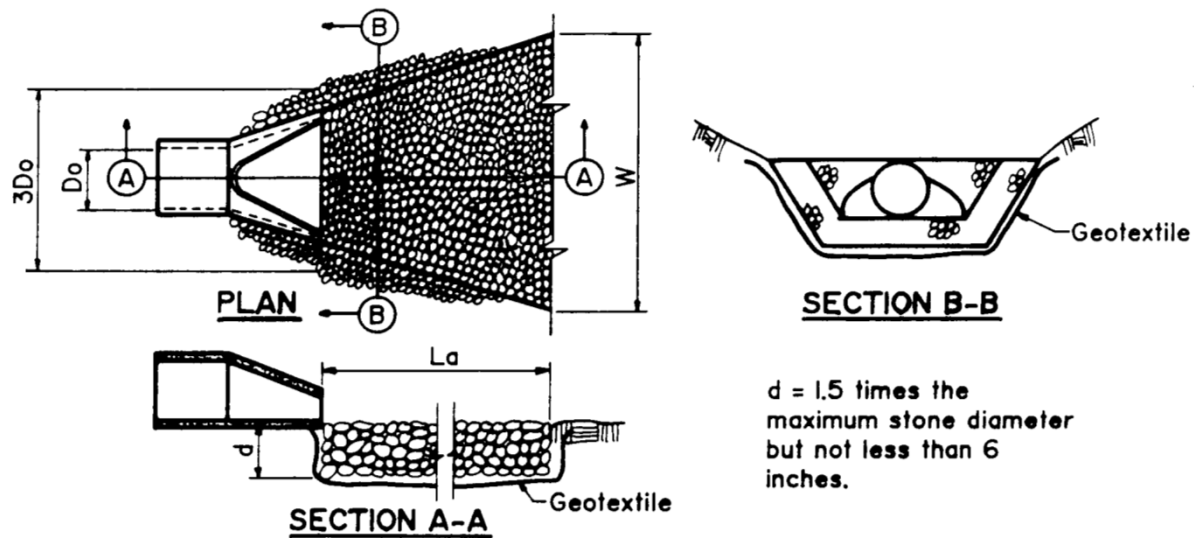
LOCATION: 145 ROUTE 130

PREPARED BY: TRD DATE: September 26, 2016

CHECKED BY: PB DATE: September 26, 2016

CONSTRUCTION DETAIL:

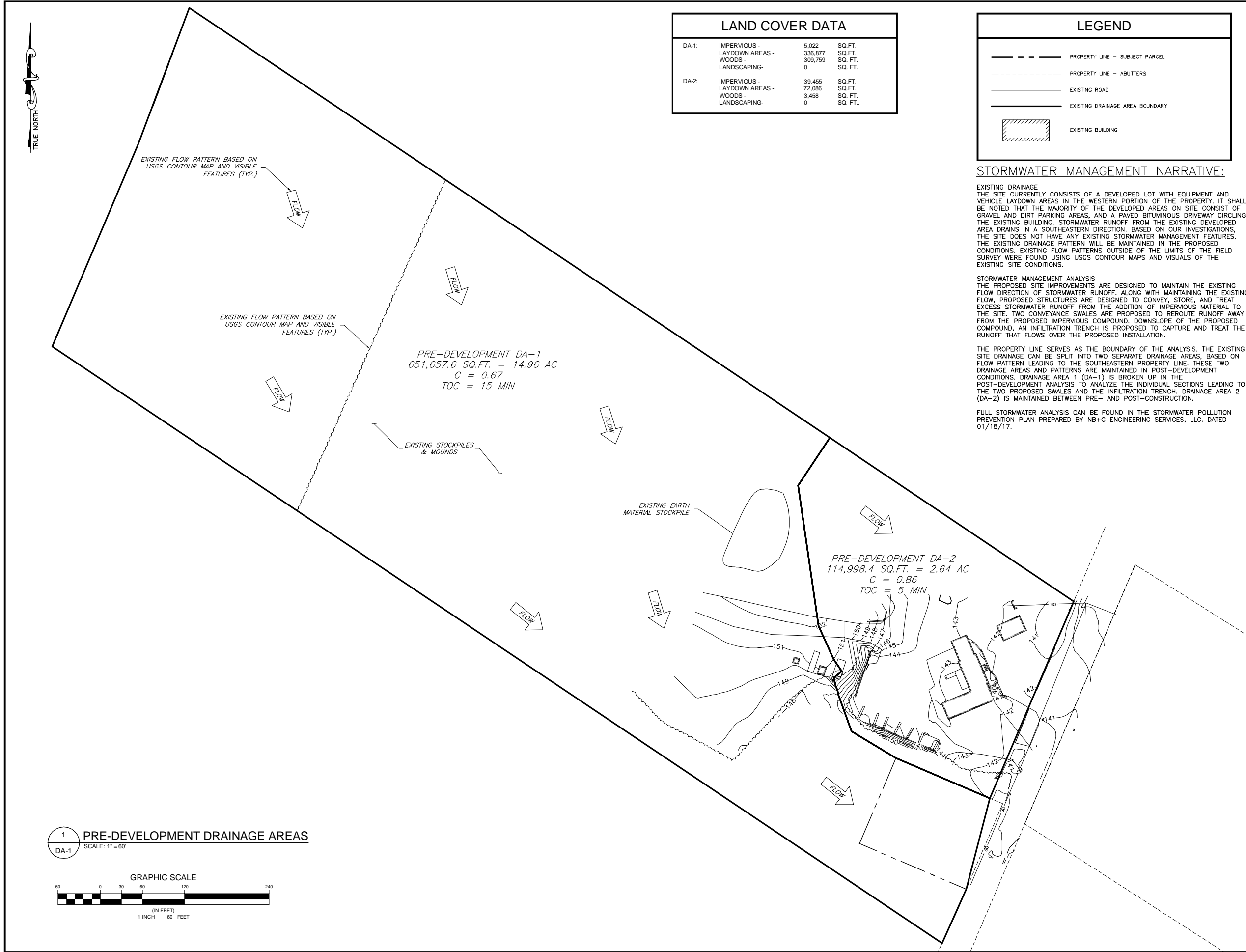
NOTE: SHOW ALL DETAILS AND CONSTRUCTION
 DIMENSIONS ON PLAN DRAWINGS.




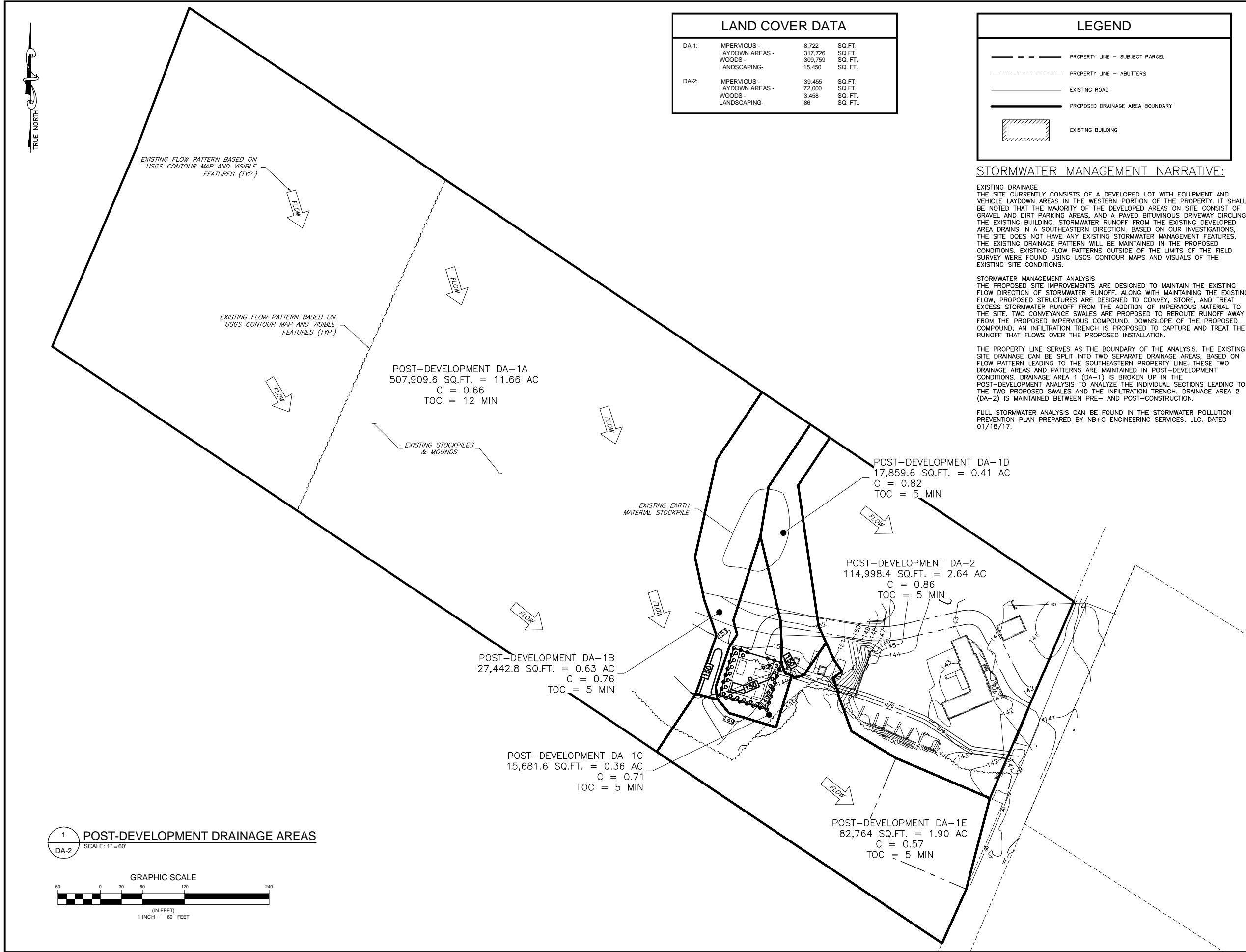
OUTLET NO.	PIPE DIA. Do (in.)	TAILWATER CONDITION (Max or Min)	Q (CFS)	V* (FPS)	RIPRAP SIZE	La (ft)	W (ft)
SWALE #1	12	MIN	2.59	6.06	R-3	6	9
SWALE #2	12	MIN	2.22	5.84	R-3	6	9




Note: The maximum flow velocity of a pipe occurs when the pipe is flowing 81% full. If the pipe is flowing more than 81% full, said maximum velocity is utilized for riprap design.

Note: The anticipated velocity (V) should not exceed the maximum permissible shown in the Program Manual for the proposed riprap protection.



ENGINEER	<div><div>NB+C</div><div>TOTALLY COMMITTED.</div><div>NB+C ENGINEERING SERVICES, LLC. 100 APOLLO DRIVE, SUITE 303 CHELSEA, MA 02154 (978) 856-8308</div></div>																																
APPLICANT	<div><div>Eco-Site</div><div>240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 636-6810</div></div>																																
SITE INFORMATION	<div><div>RUSO</div><div>MA-0049</div><div>145 ROUTE 130</div><div>SANDWICH, MA 02644</div><div>BARNSTABLE COUNTY</div></div>																																
DESIGN RECORD	<div><div>REVISIONS</div><table><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>0</td><td>01/18/17</td><td>DRAINAGE MAPS</td><td>TRD</td></tr><tr><td>REV</td><td>DATE</td><td>DESCRIPTION</td><td>BY</td></tr></table></div>																									0	01/18/17	DRAINAGE MAPS	TRD	REV	DATE	DESCRIPTION	BY
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ENGINEER	<div><div>KRUPAKARAN KOLANDAIVELU, P.E.</div><div>MA PROFESSIONAL ENGINEER LIC. #50019</div></div>																																
SHEET TITLE	<div>PRE-DEVELOPMENT DRAINAGE AREA MAP</div>																																
SHEET NUMBER	<div>DA-1</div>																																



ENGINEER	<div><p>TOTALLY COMMITTED.</p><p>NB+C ENGINEERING SERVICES, LLC. 100 APOLLO DRIVE, SUITE 303 CHELMSFORD, MA 01824 (978) 856-8308</p></div>												
APPLICANT	<div><p>240 LEIGH FARM ROAD, SUITE 415 DURHAM, NC 27707 (919) 636-6810</p></div>												
SITE INFORMATION	<div><p>RUSSO MA-0049 145 ROUTE 130 SANDWICH, MA 02644 BARNSTABLE COUNTY</p></div>												
DESIGN RECORD	<table><thead><tr><th colspan="4">REVISIONS</th></tr><tr><th>REV</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th></tr></thead><tbody><tr><td>0</td><td>01/18/17</td><td>DRAINAGE MAPS</td><td>TRD</td></tr></tbody></table>	REVISIONS				REV	DATE	DESCRIPTION	BY	0	01/18/17	DRAINAGE MAPS	TRD
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REV	DATE	DESCRIPTION	BY										
0	01/18/17	DRAINAGE MAPS	TRD										
PROFESSIONAL STAMP	<div></div>												
ENGINEER	<div><p>KRUPAKARAN KOLANDAIVELU, P.E. MA PROFESSIONAL ENGINEER LIC. #50019</p></div>												
SHEET TITLE	<div><p>POST-DEVELOPMENT DRAINAGE AREA MAP</p></div>												
SHEET NUMBER	<div><p>DA-2</p></div>												

20



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

Jack Buckley, *Director*

October 14, 2016

Darren Johnson
Eco-Site
240 Leigh Farm Road, Suite 415
Durham NC 27707

RE: Project Location: 145 Route 130, Sandwich
Project Description: 135' Monopole
NHESP File No.: 16-36039

Dear Applicant:

Thank you for submitting the MESA Project Review Checklist, site plans (dated 5/17/2016, revised 9/9/2016) and other required materials to the Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information that was provided and the information that is currently contained in our database, the Division has determined that this project, as currently proposed, **will not result in a prohibited Take** of state-listed rare species. This determination is a final decision of the Division of Fisheries & Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Emily Holt, Endangered Species Review Assistant, at (508) 389-6385.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director

cc: Pasquale Russo
Christopher Bond, CBRE, Inc. Telecom Advisory Services

MASSWILDLIFE

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NATURAL RESOURCES CHECKLIST & EXEMPTION REVIEW

Client:	T-Mobile Northeast, LLC c/o Network Building & Consulting, LLC				
Project Name/No.:	4HY0602A / MA-0049	CBRE Project #:	TS60615706	Date:	Oct 7, 2016
Address:	145 Route 130	City:	Sandwich	State:	MA
Latitude:	41 41 41.77	Longitude:	-70 29 57.72		
Date of Site Visit:	Jul 23, 2016	Tower Height:	135 feet		

TYPE OF UNDERTAKING		
Tower Type	<input checked="" type="radio"/> Monopole <input type="radio"/> Self-Support Lattice	<input type="radio"/> Guyed Lattice <input type="radio"/> Stealth Structure <input type="radio"/> Compound Expansion <input type="radio"/> Other:
Tree Removal	Will the Undertaking involve the removal of any trees?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Previous Disturbance	Will the Undertaking involve the removal of any native vegetation (i.e., vegetation other than cultivated plants and lawns)?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Impact Area and Vicinity Description	The area of the proposed Undertaking, currently consists of a grassy area that is utilized for storage. Land in the vicinity of the Undertaking consists of a rural neighborhood, consisting of wooded land improved with residential, commercial and industrial development.	

PROTECTED LAND REVIEW		
Wilderness Area	Will the Undertaking be located within a Designated Wilderness Area? Source: National Wilderness Preservation System (NWPS); National Park Service (NPS); U.S. Forest Service (USFS); U.S. Fish and Wildlife Service (USFWS); Bureau of Land Management (BLM); http://www.wilderness.net/index.cfm?fuse=NWPS	<input type="radio"/> Yes <input checked="" type="radio"/> No
Wildlife Preserve	Will the Undertaking be located within a Designated Wildlife Preserve? Source: National Wildlife Refuge System (NWRS; NPS; USFS; USFWS; BLM; http://www.fws.gov/refuges)	<input type="radio"/> Yes <input checked="" type="radio"/> No
U.S. FWS Threatened & Endangered Species Active Critical Habitat	Will the Undertaking be located with an area designed as active proposed or final habitat for threatened and endangered species? Source: USFWS Critical Habitat Map; http://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77	<input type="radio"/> Yes <input checked="" type="radio"/> No
Wild & Scenic Rivers	Will the Undertaking be located within one mile of a National Wild and Scenic River? Source: NPS; USFS; USFWS; BLM; http://www.rivers.gov	<input type="radio"/> Yes <input checked="" type="radio"/> No
National Scenic Trail	Will the Undertaking be located within one mile of a National Scenic Trail? Source: NPS and Managing Systems and Trails Organization (MSTO); http://www.nps.gov/ncrc/programs/nts/nts_trails.html	<input type="radio"/> Yes <input checked="" type="radio"/> No
Comments	None	

NATURAL RESOURCES CHECKLIST & EXEMPTION REVIEW

FEDERALLY-PROTECTED SPECIES EXEMPTION REVIEW			
U.S. Fish and Wildlife Service 'No Effect' Exemptions	Does the USFWS Region have consultation exemptions for 'No Effect' determinations? <i>Source: USFWS January 22, 2016 correspondence.</i>		● Yes ○ No
	Will the Undertaking have 'No Effect' on listed species? <i>Source: See table below.</i>		● Yes ○ No
FEDERALLY-LISTED SPECIES REVIEW			
<i>Source: the USFWS Information, Planning, and Conservation (IPaC) System (http://ecos.fws.gov/ipac)</i>			
Common Name	Status (Federal)	Habitat	Determination
Northern long-eared bat	Threatened	In the winter hibernate in caves and mines. In summer roost underneath bark, in cavities, or in crevices of both live and dead trees.	No Suitable Habitat / No Effect
FINDINGS			
U.S. Fish and Wildlife Service Consultation	Section 7 consultation is required with the USFWS In accordance with 47 CFR Part 1.1307(a)(3) of the FCC regulations		○ Yes ● No
Comments:			

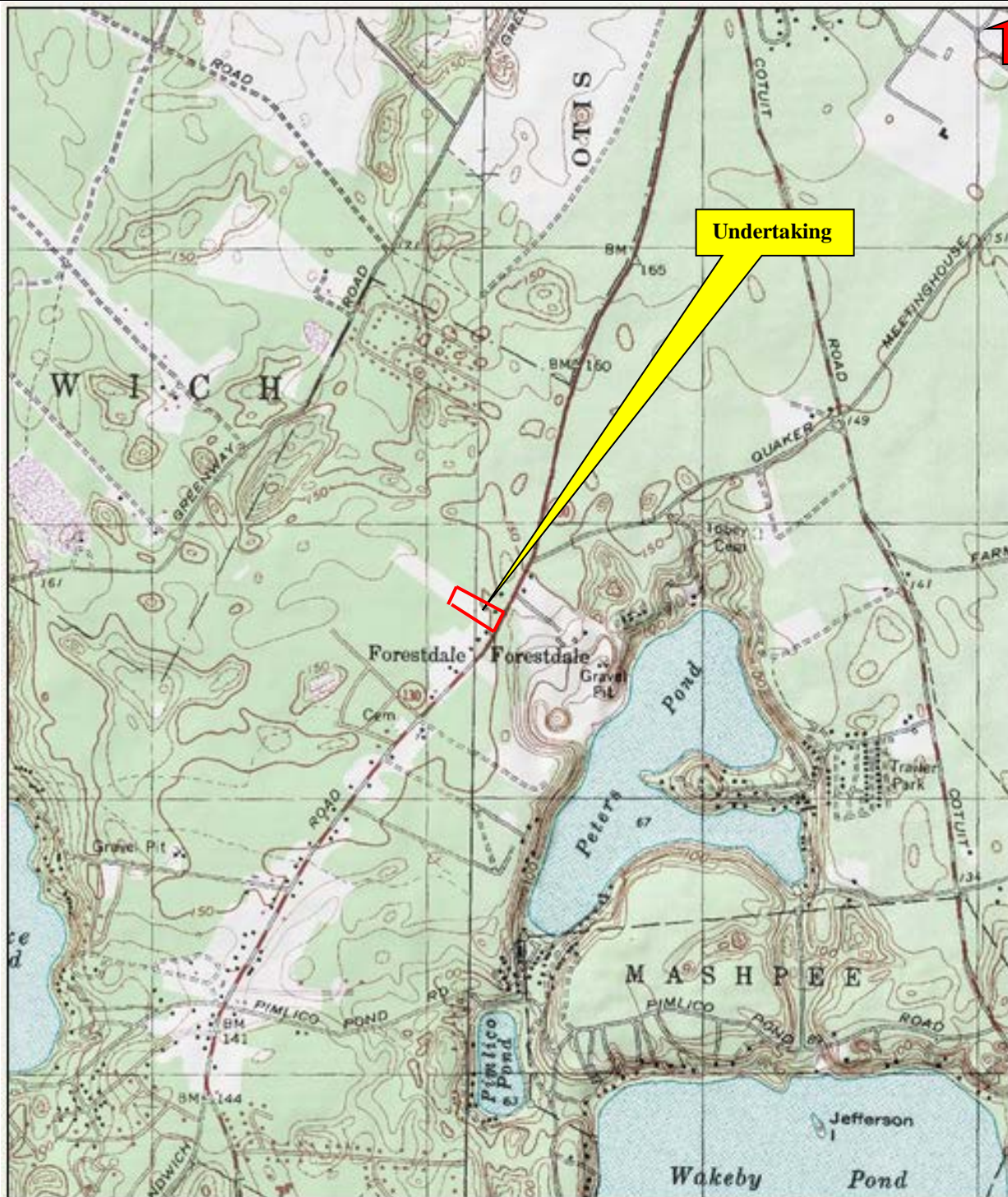
NATURAL RESOURCES CHECKLIST & EXEMPTION REVIEW

STATE-PROTECTED SPECIES EXEMPTION REVIEW		
MA Division of Fisheries & Wildlife No Species Exemptions	Does the MA Division of Fisheries & Wildlife have consultation exemptions for instances when no state-listed (i.e. endangered or threatened) species are known to occur within the project vicinity? <i>Source: 321 CMR 10.13 Massachusetts Endangered Species Act. "Projects and Activities that are not located or will not take place in Priority Habitats shall not be subject to the review provision of 321 CMR 10.18."</i>	<input checked="" type="radio"/> Yes <input type="radio"/> No
	Are there state-listed (i.e. endangered or threatened) species that are known to occur within the Undertaking vicinity? <i>Source: OLIVER MassGIS's Online Mapping Tool</i>	<input checked="" type="radio"/> Yes <input type="radio"/> No
FINDINGS		
MA Division of Fisheries & Wildlife Consultation	Trust Resources consultation is required with the MA Division of Fisheries & Wildlife In accordance with 47 CFR Part 1.1307(a)(3) of the FCC regulations	<input checked="" type="radio"/> Yes <input type="radio"/> No
Comments: A MESA Project Review submittal packet was filled directly with the MA Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program on September 9, 2016. A response has not been received.		
FINDING OF EFFECT		
The Undertaking will have 'no effect' on listed resources.*		<input checked="" type="radio"/>
The Undertaking 'may affect, not likely to adversely affect' listed resources.		<input type="radio"/>
Comments: *Based on the previously disturbed nature of the proposed lease area and lack of high quality natural habitat. CBRE is currently waiting on a response from the MA Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program.		
MIGRATORY BIRD REVIEW		
Tower Height	Will the proposed tower be over 450 feet in height? <i>Source: Client-provided drawings</i>	<input type="radio"/> Yes* <input checked="" type="radio"/> No
Comments: On September 27, 2013, the USFWS revised the "Guidelines for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning. These guidelines outline voluntary federal recommendations designed to minimize the impacts of tower facilities on migratory birds protected under the Migratory Bird Treaty Act (MBTA) and the Endangered Species Act. Based upon the Undertaking design (i.e. non guyed) and height (i.e. less than 200 feet above ground level), the Undertaking meets many of the recommendations set forth in the USFWS's Revised Guidelines. As such, it is unlikely that the Undertaking would adversely impact migratory bird species protected under the MBTA and the Endangered Species Act. *FCC NEPA rules require the preparation of an Environmental Assessment for all towers over 450 feet in height.		
FLOOD ZONE AND WETLANDS REVIEW		
Flood Zone	Will the Undertaking be located within a 100-year floodplain? <i>Source: Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (www.fema.gov; Map Number 25001C0528J effective date 07/16/2014)</i>	<input type="radio"/> Yes* <input checked="" type="radio"/> No
Wetlands	Will the Undertaking be located within a wetland? <i>Source: Site Observations; USFWS National Wetlands Inventory (NWI) map; United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS); MassDEP Online Map Viewer, Wetland and Wetland Change Areas Map</i>	<input type="radio"/> Yes* <input checked="" type="radio"/> No
*FCC NEPA rules require the preparation of an Environmental Assessment for all towers located in Flood Zones and Wetlands.		

NATURAL RESOURCES CHECKLIST & EXEMPTION REVIEW

QUALIFIED PERSONNEL			
Completed By:	<i>Christopher Bond</i>	Reviewed By:	<i>E. Gunn Del Rio</i>
	Christopher Bond Project Manager - Biologist		Gio Del Rivero Director, Project Management

TOPOGRAPHIC MAP



USGS Topographic Map

Source: USGS (Sandwich, MA 1972)

Property Boundary: —

Project: 4HY0602A

Sandwich, MA

Project Number: TS60615706

WILDERNESS AREA MAP

NAVIGATION
 BASEMAPS

ZOOM BY TYPING OR SELECTING A WILDERNESS
 FIND A CITY/ROAD/PLACE
Go!
Aerial
Topo
Roads



Latitude/Longitude: 41.689208, -70.506994

Wildernesses Managed By: ■ Bureau of Land Management ■ Fish and Wildlife Service ■ Forest Service ■ National Park Service



WILDLIFE PRESERVE MAP

Details Basemap

Print Measure 145 Route 130, Sandwich, MA X


About Content Legend


Contents


- ☒ National Wildlife Refuge Boundaries
- ☐ Topographic




USFWS CRITICAL HABITAT MAP

 Details

 Basemap

 Share

 Print

 Measure

 Bookmarks

145 Route 130, Sandwich, MA

 About  Content  Legend

Legend

Final Linear Features



Final Polygon Features



Proposed Linear Features

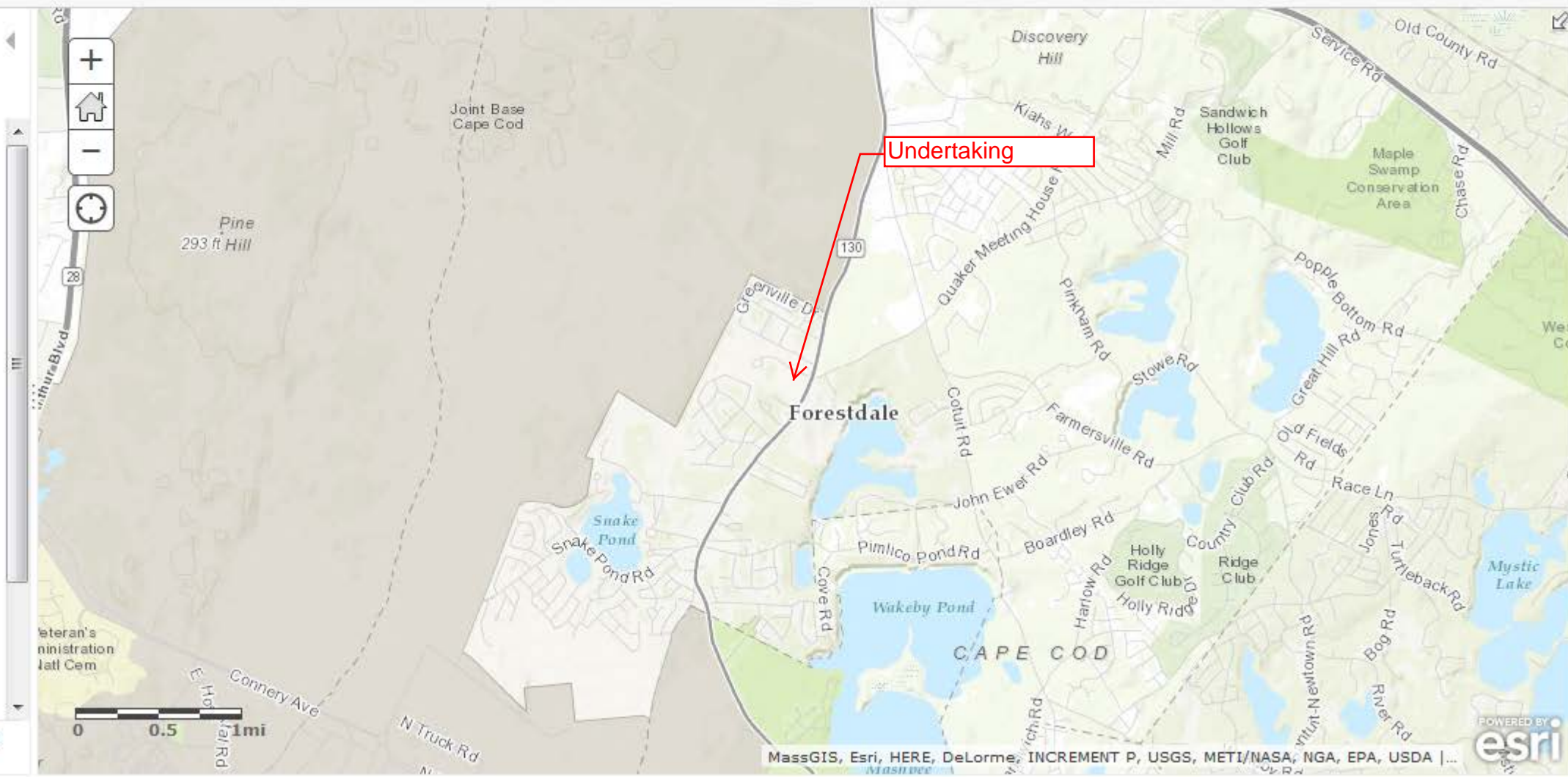


Proposed Polygon Features



Proposed Critical Habitat

Critical Habitat - Linear Features - Proposed

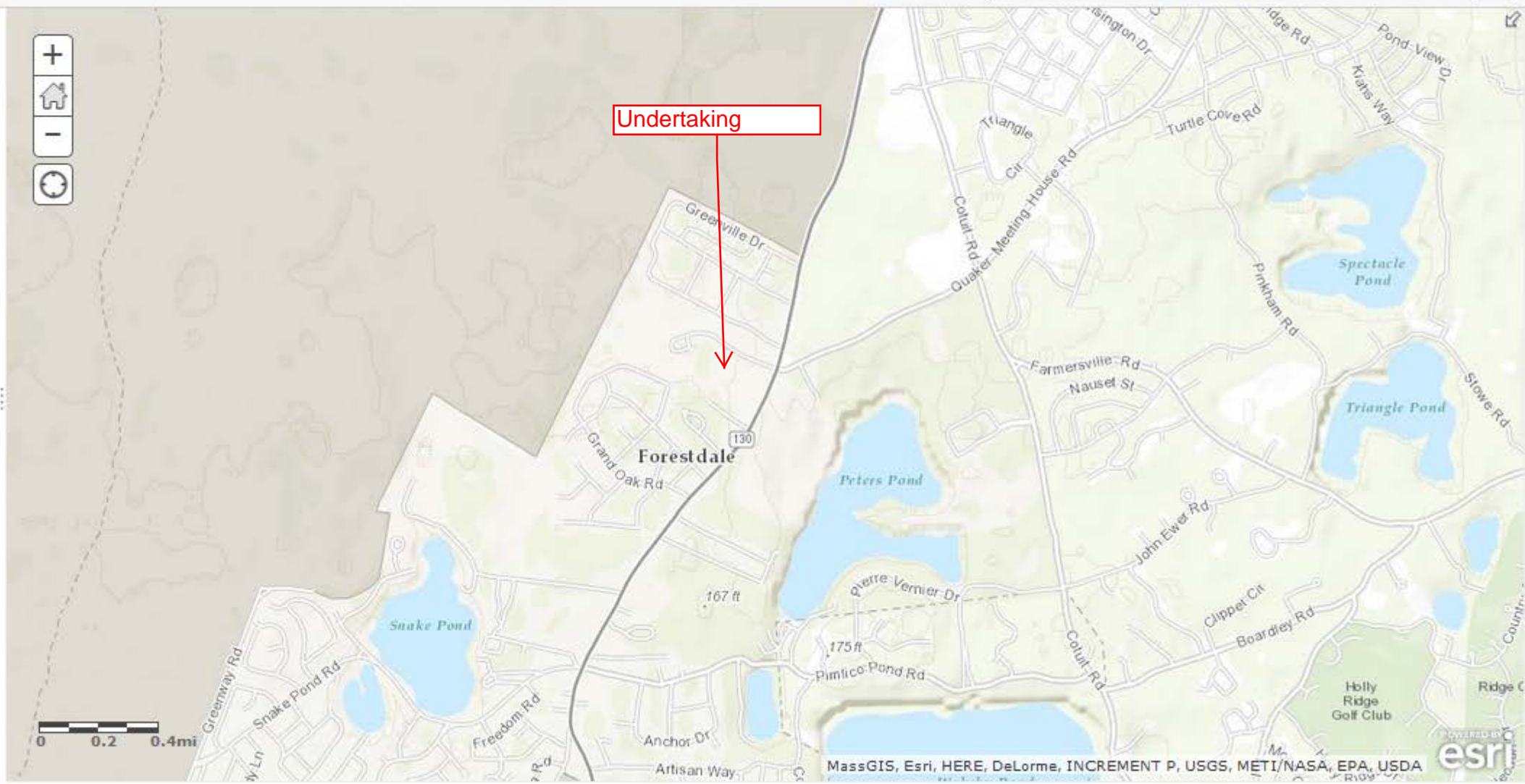


NATIONAL WILD AND SCENIC RIVERS MAP

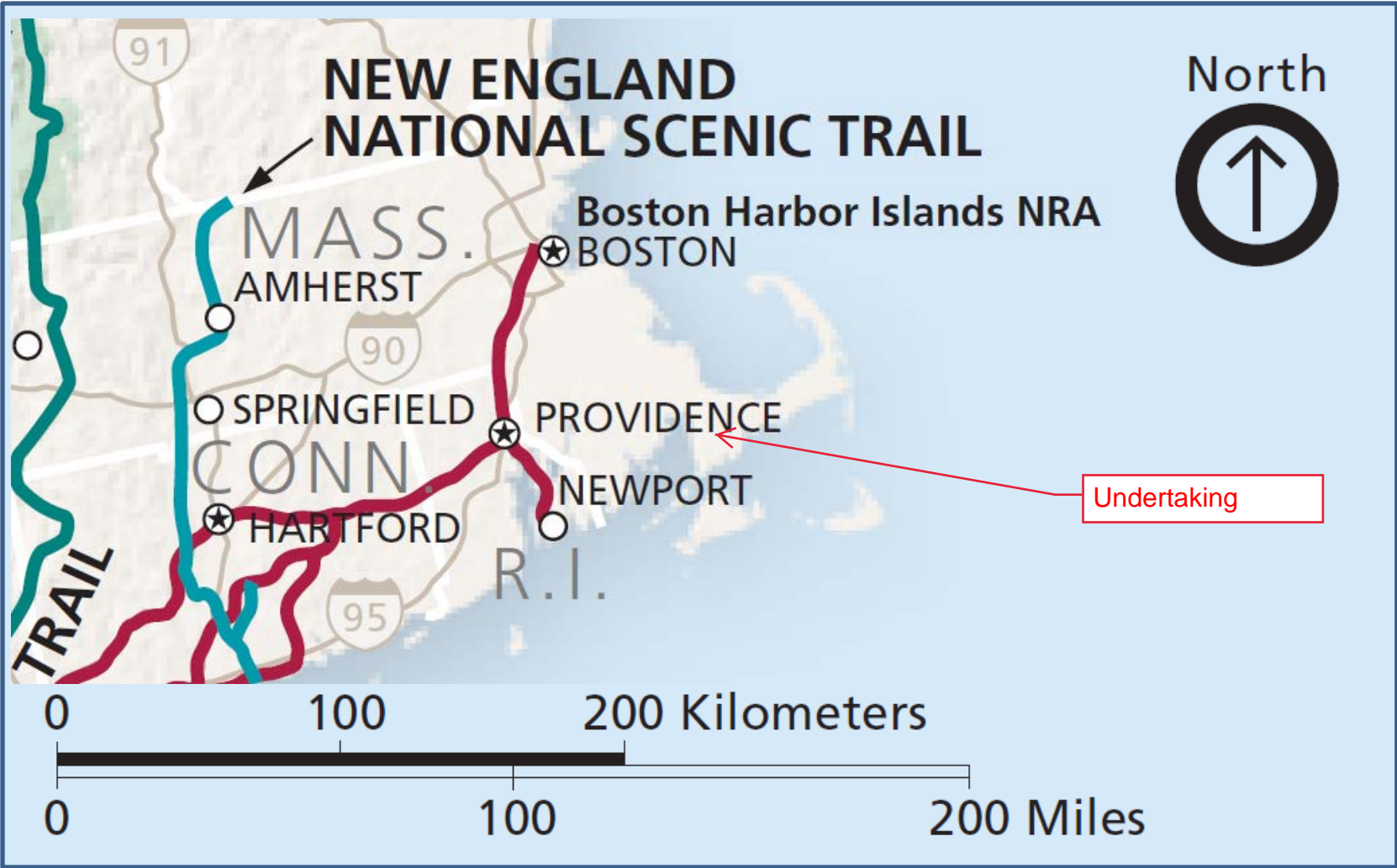
Legend

REC_US_WSR

Wild & Scenic Rivers



NATIONAL SCENIC AND HISTORIC TRAILS MAP



FEDERALLY-PROTECTED SPECIES EXEMPTION REVIEW
SUPPORT DOCUMENTATION



United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>



January 22, 2016

To Whom It May Concern:

The U.S. Fish and Wildlife Service's (Service) New England Field Office has determined that individual project review for certain types of activities associated with communication towers is **not required**. These comments are submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Due to the rapid expansion of the telecommunication industry, we are receiving a growing number of requests for review of **existing** and **new** telecommunication facilities in relation to the presence of federally-listed or proposed, threatened or endangered species, critical habitat, wilderness areas and/or wildlife preserves. We have evaluated our review process for proposed communications towers and believe that individual correspondence with this office is not required for the following types of actions relative to **existing** facilities:

1. the re-licensing of existing telecommunication facilities;
2. audits of existing facilities associated with acquisition;
3. routine maintenance of existing tower sites, such as painting, antenna or panel replacement, upgrading of existing equipment, etc.;
4. co-location of new antenna facilities on/in existing structures;
5. repair or replacement of existing towers and/or equipment, provided such activities do not significantly increase the existing tower mass and height, or require the addition of guy wires.

In order to obviate the need to contact this office in the future for individual environmental review for **existing** communication towers or antenna facilities, please note that we are not aware of any federally-listed, threatened or endangered species that are being adversely affected by any existing communication tower or antenna facility in the following states: Vermont, New Hampshire, Rhode Island, Connecticut and Massachusetts. Furthermore, we are not aware of any **existing** telecommunication towers in federally-designated critical habitats, wilderness areas or wildlife preserves. Therefore, no further consultation with this office relative to the impact of the above referenced activities on federally-listed species is required.

Future Coordination with this Office Relative to New Telecommunication Facilities

We have determined that proposed projects are not likely to adversely affect any federally listed or proposed species when the following steps are taken to evaluate new telecommunication facilities:

1. If the facility will be installed within or on an existing structure, such as in a church steeple or on the roof of an existing building, no further coordination with this office is necessary. Similarly, new antennas or towers in urban and other developed areas, in which no natural vegetation will be affected, do not require further review.
2. If the above criteria cannot be met, your review of our lists of threatened and endangered species locations within Vermont, New Hampshire, Rhode Island, Connecticut and Massachusetts may confirm that no federally-listed endangered or threatened species are known to occur in the town or county where the project is proposed.
3. If a listed species is present in the town or county where the project is proposed, further review of our lists of threatened and endangered species may allow you to conclude that suitable habitat for the species will not be affected. Based on past experiences, we anticipate that there will be few, if any, projects that are likely to impact piping plovers, roseate terns, bog turtles, Jesup's milk-vetch or other such species that are found on coastal beaches, riverine habitats or in wetlands because communication towers typically are not located in these habitats.

For projects that meet the above criteria, there is no need to contact this office for further project review. A copy of this letter should be retained in your file as the Service's determination that no listed species are present, or that listed species in the general area will not be affected. Due to the high workload associated with responding to many individual requests for threatened and endangered species information, we will no longer be providing response letters for activities that meet the above criteria. This correspondence and the species lists remain valid until January 1, 2017. Updated consultation letters and species lists are available on our website:

<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm> (accessed January 2016)

Thank you for your cooperation, and please contact Maria Tur of this office at 603-223-2541 if you need further assistance.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'T. R. Chapman', with a long horizontal flourish extending to the right.

Thomas R. Chapman
Supervisor
New England Field Office



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
PHONE: (603)223-2541 FAX: (603)223-0104
URL: www.fws.gov/newengland

Consultation Code: 05E1NE00-2016-SLI-2058

August 15, 2016

Event Code: 05E1NE00-2016-E-02874

Project Name: 4HY0602A - TS60615706

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: 4HY0602A - TS60615706

Official Species List

Provided by:

New England Ecological Services Field Office

70 COMMERCIAL STREET, SUITE 300

CONCORD, NH 03301

(603) 223-2541

<http://www.fws.gov/newengland>

Consultation Code: 05E1NE00-2016-SLI-2058

Event Code: 05E1NE00-2016-E-02874

Project Type: COMMUNICATIONS TOWER

Project Name: 4HY0602A - TS60615706

Project Description: A 135' monopole within a 50'x50' lease area is proposed. Access will utilize an existing road to connect to Route 130 to the east.

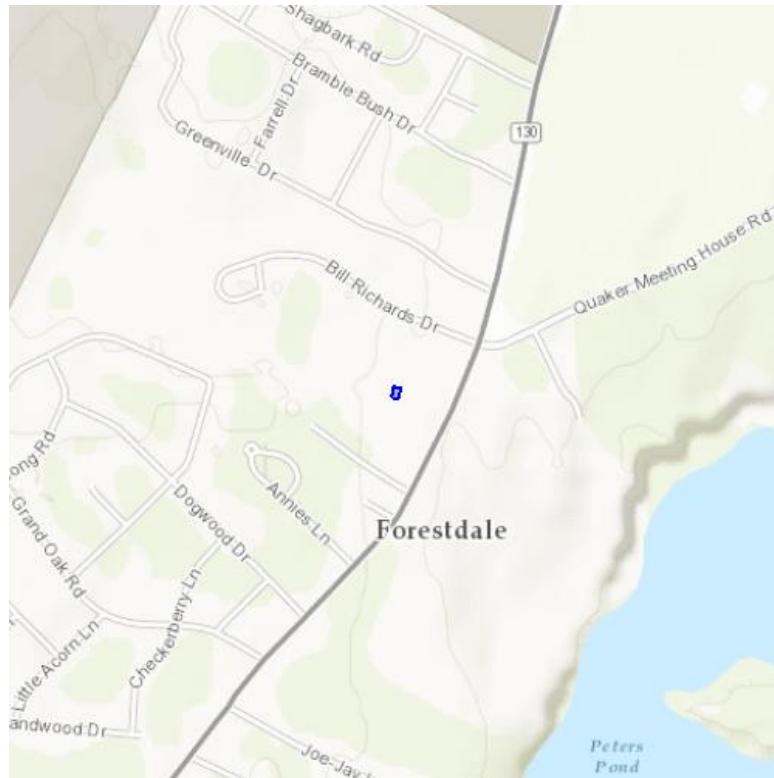
Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: 4HY0602A - TS60615706

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-70.49941778182983 41.69514096470533, -70.49947679042816 41.69492866851165, -70.49931049346924 41.694892618145005, -70.4992139339447 41.69511292562557, -70.49941778182983 41.69514096470533)))

Project Counties: Barnstable, MA



United States Department of Interior
Fish and Wildlife Service

Project name: 4HY0602A - TS60615706

Endangered Species Act Species List

There are a total of 1 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
Northern long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened		



United States Department of Interior
Fish and Wildlife Service

Project name: 4HY0602A - TS60615706

Critical habitats that lie within your project area

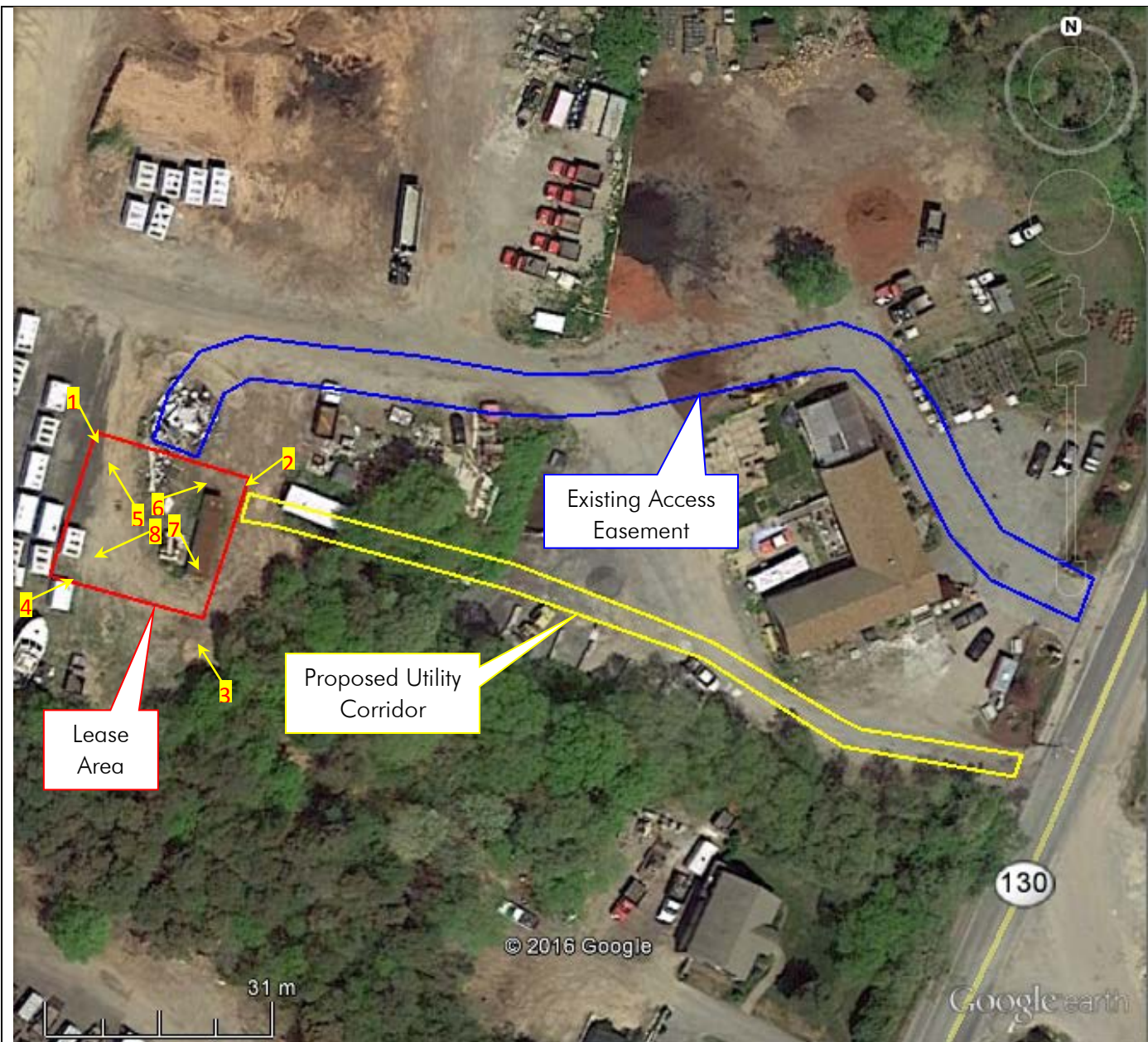
There are no critical habitats within your project area.

PHOTOGRAPHS



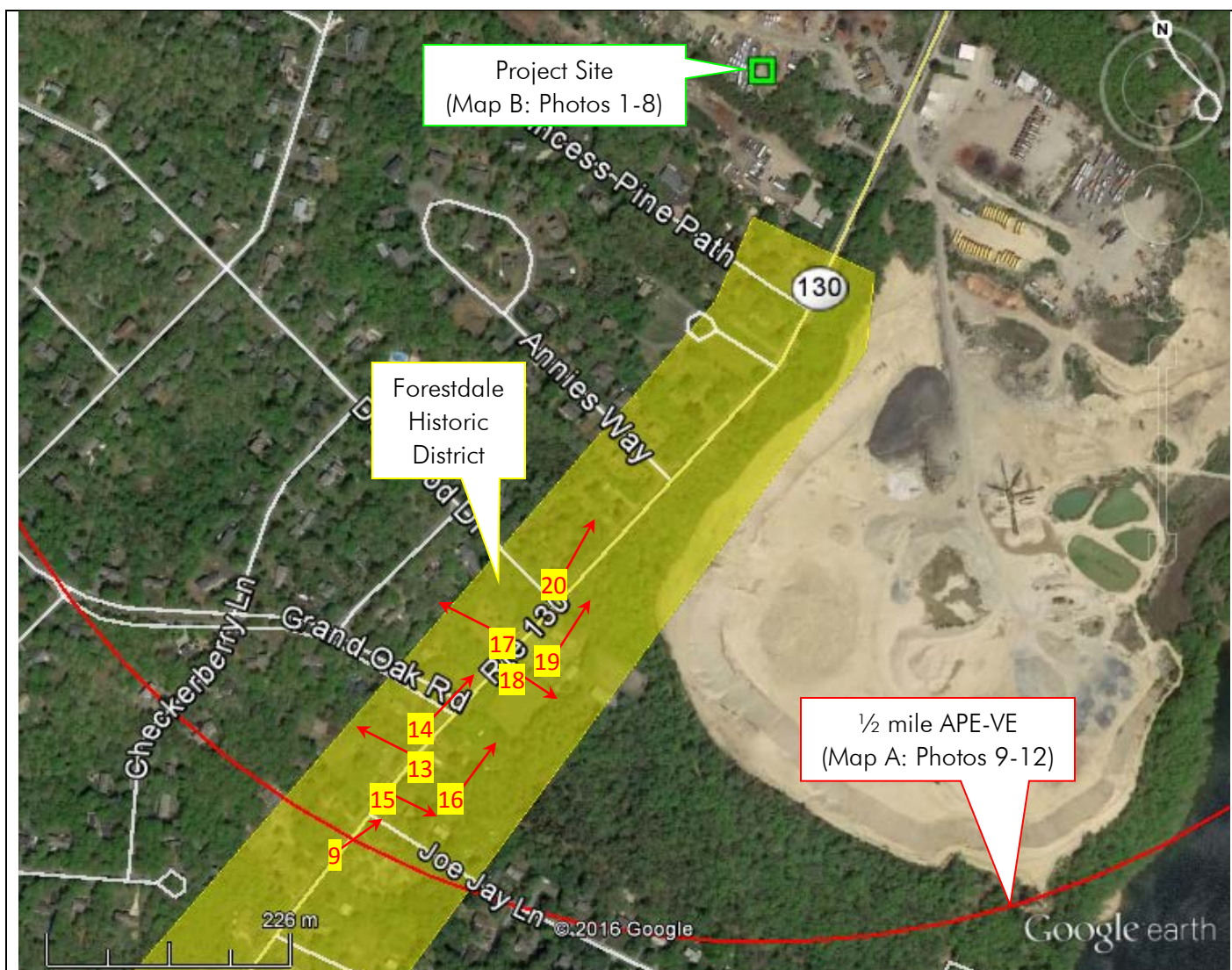
MAP A: APE MAP FOR VISUAL EFFECTS AND PHOTO KEY OVERVIEW

SOURCE: GOOGLE EARTH 2016



MAP B: APE MAP FOR DIRECT EFFECTS AND PHOTO KEY OVERVIEW (PHOTOS 1-8)

SOURCE: GOOGLE EARTH 2016





MAP C: FORESTDALE HISTORIC DISTRICT PHOTO KEY OVERVIEW (PHOTOS 13-20)

SOURCE: GOOGLE EARTH 2016

PHOTOGRAPHS

The following photographs were taken by Vanessa P. Sullivan, M.A., RPA, Project Manager--Archaeologist on July 23, 2016 unless otherwise noted.

1. View looking southeast towards the Project Site.	
2. View looking southwest towards the Project Site.	

3. View looking northwest towards the Project Site.



4. View looking northeast towards the Project Site.



5. View looking northwest from the center of the Project Site.



6. View looking northeast from the center of the Project Site.



7. View looking southeast from the center of the Project Site.



8. View looking southwest from the center of the Project Site.



9. View looking north/northeast towards the Project Site, from Joe Jay Lane. Located 0.5 miles from the Subject Property, within the Forestdale Historic District.



10. View looking east towards the Project Site, from Grand Oak Road and Windsong Road. Located 0.5 miles from the Subject Property.



11. View looking south towards the Project Site, from Woodvue Road and Greenville Drive. Located 0.5 miles from the Subject Property.



12. View looking southwest towards the Project Site, from 34 Quaker Meetinghouse Road. Located 0.5 miles from the Subject Property.



13. View facing northwest towards 99 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



14. View looking northeast towards the Project Site from 99 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



15. View looking southeast towards 100 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



16. View looking northeast towards the Project Site from 100 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



17. View looking northwest towards the Forestdale Cemetery. Located 0.35 miles from the Project Site within the Forestdale Historic District.



18. View looking southeast towards the Forestdale Church. Located 0.35 miles from the Project Site within the Forestdale Historic District.



19. View looking northeast towards the Project Site from the Forestdale Cemetery and the Forestdale Church. Located 0.35 miles from the Project Site within the Forestdale Historic District.



20. View looking north/northeast towards the Project Site, from Dogwood Drive. Located 0.32 miles from the Project Site within the Forestdale Historic District.



STATE-PROTECTED SPECIES EXEMPTION REVIEW
SUPPORT DOCUMENTATION



Christopher Bond
Project Manager
Biologist

CBRE, Inc.
Telecom Advisory Services

4 West Red Oak Lane
White Plains, New York 10604

914-597-6956 Tel
914-316-0303 Cell

Christopher.bond@cbre.com
www.cbre.com

October 7, 2016

Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581
(508) 389-6300
mass.wildlife@state.ma.us

Re: "4HY0602A" – Proposed Wireless Telecommunications Facility
145 Route 130
Sandwich, Barnstable County, MA 02644
CBRE Project No.: **TS60615706**

To whom it may concern:

CBRE, Inc. Telecom Advisory Services (CBRE) is writing on behalf of Network Building and Consulting, LLC to submit the attached application for a MESA Project Review. CBRE is acting as the applicant for this project.

The project consists of a proposed 135' monopole within a 4,900 square foot lease area within a wooded area. A 20' wide access easement over an existing drive will connect the proposed lease area compound to Route 130 to the east. A T-Mobile 10' x 15' lease area is proposed within the 4,900 square foot lease area.

Please mail your response to the address/number provided above or email to WhitePlainsBiology@cbre.com (preferred method). Thank you very much for your assistance and please do not hesitate to contact CBRE for any additional information or questions you may have.

Sincerely,

CBRE, INC.

A handwritten signature in black ink that reads "Christopher Bond".

Chris Bond
Project Manager - Biologist



MESA PROJECT REVIEW CHECKLIST

Massachusetts Endangered Species Act M.G.L. c. 131A and Regulations (321 CMR 10.00)

Massachusetts Division of Fisheries & Wildlife
Natural Heritage & Endangered Species Program

~~~~ CONTACT INFORMATION ~~~~

If you already completed your Notice of Intent- Form 3, you can send page 1 of the NOI in place of questions 1 through 4 in this section

1. Project Location:

Street Address/Location	City/Town	Zip Code
Assessors Map/Plat Number	Parcel	/Lot Number

2. Applicant:

First Name	Last Name	Company
Mailing Address		
City/Town	State	Zip Code
Phone Number	Fax Number	Email address

3. Property owner (if different from applicant):

First Name	Last Name	Company
Mailing Address		
City/Town	State	Zip Code
Phone Number	Fax Number	Email address

4. Representative (if any):

Company			
Contact Person First Name	Contact Person Last Name		
Mailing Address			
City/Town	State	Zip Code	
Phone Number	Fax Number	Email	address


~~~~**ADDITIONAL INFORMATION**~~~~

1. Will this project require a filing with the Conservation Commission and/or DEP? ☐ No ☐ Yes
2. Will this project meet any threshold for a MA Environmental Policy Act (MEPA) filing (excluding rare species, 301 CMR 11.03 (2))? ☐ No ☐ Yes
3. Has this project previously been issued a NHESP Tracking Number (either by previous NOI Submittal or MESA Information Request Form)? ☐ No ☐ Yes

If Yes - Tracking No. \_\_\_\_\_

~~~~**PROJECT DESCRIPTION** (attach separate sheet, as needed)~~~~

Please note, certain projects or activities are exempt from review, see 321 CMR 10.14. The MESA does not allow project segmentation. Your filing must reflect all anticipated work associated with the proposed project (CMR 321 10.16).

~~~~**INCLUDE THE FOLLOWING INFORMATION**~~~~

*The NHESP will notify the applicant within 30 days if the materials submitted do not satisfy requirements for a filing and request submission of any missing materials (321 CMR 10.18(1)).*

**ALL Applicants must submit:**

- ☐ USGS map (1:24,000 or 1:25,000) with property boundary clearly outlined
- ☐ Project plans for entire site (including wetland Resource Areas, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work)
- ☐ Assessor's map or right-of-way plan of site
- ☐ Project description
- ☐ Statement/proof that applicant is the Record Owner or that applicant is a person authorized in writing by the record owner to submit this filing
- ☐ Photographs representative of the site

**Projects altering\* 10 or more acres, must also submit:**

- ☐ A vegetation cover type map of the site
- ☐ Project plans showing Priority Habitat boundaries

The NHESP may request additional information, such as, but not limited to, species and habitat surveys, wetland reports, soil map and reports, and stormwater management reports (321 CMR 10.16).

|                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <p>*Alteration: Any physical alteration of land, soils, drainage or destruction of plant life, see "Project or Activity" (321 CMR 10.02).</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------|



# ~~~~ FILING FEES ~~~~

See Fee Schedule below


a. Total MESA Fee Paid \$300 b. Acreage of Disturbance\* ~0.057 c. Total Site Acreage 17.13

## ~~~~ REQUIRED SIGNATURES ~~~~

I hereby certify under the penalties of perjury that the foregoing MESA filing and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

Signature of Property Owner/Record Owner of Property

Date

  
Signature of Applicant (required, if different from Owner)

8/29/2016

Date

Please send form, required information, and filing fee (payable to "Comm. of MA - NHESP") to:

Regulatory Review  
Natural Heritage & Endangered Species Program  
1 Rabbit Hill Road  
Westborough, MA 01581



Questions regarding this form should be directed according to the county that the property is located:

Berkshire, Essex, Franklin, Hampshire, Hampden, Middlesex & Worcester Counties call: 508-389-6361  
Barnstable, Bristol, Dukes, Nantucket, Norfolk, Plymouth & Suffolk Counties call: 508-389-6385

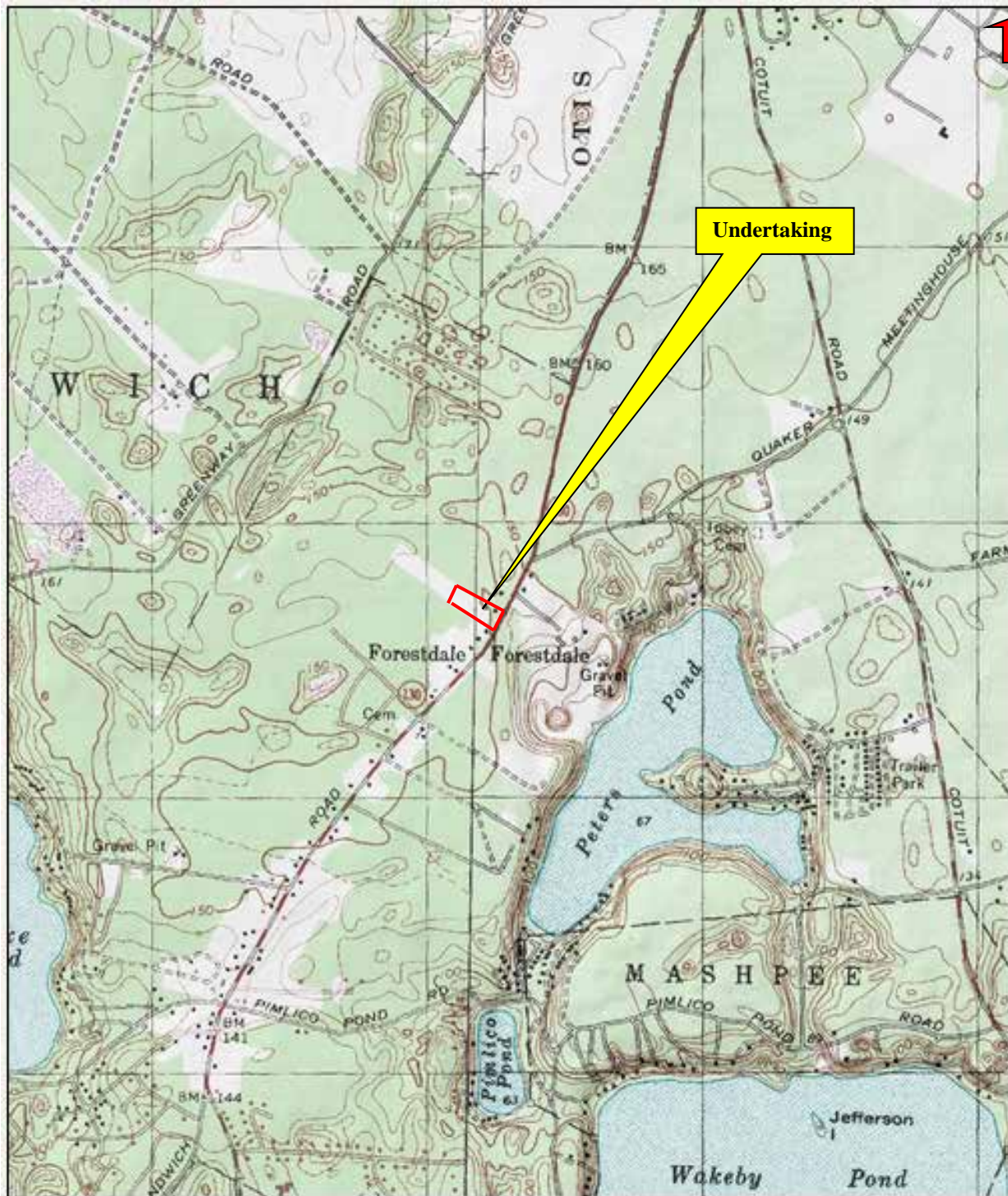
### PROJECT REVIEWS

321 CMR 10.18

| Project Definition         | Project Criteria                                                         | Fee                                         | Response Time                                 |
|----------------------------|--------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------|
| Simple                     | Less than 5 acres of disturbance*                                        | \$ 300.00                                   | 60 days from determination of complete filing |
| Intermediate<br>(Moderate) | 5 to 20 acres of disturbance*                                            | \$ 1800.00                                  | 60 days from determination of complete filing |
| Complex                    | More than 20 acres of disturbance* or project requires wetlands variance | \$ 4000.00                                  | 60 days from determination of complete filing |
| Linear                     | Projects greater than 1 mile in length.                                  | \$ 4000.00 per Priority Habitat intersected | 60 days from determination of complete filing |

\* Disturbance means direct physical disturbance of the land surface or waterbody, soil and/or vegetation, if only a portion of the project site is located within Priority Habitat, indicate total area of disturbance for site as a whole.





## USGS Topographic Map

Source: USGS (Sandwich, MA 1972)  
Property Boundary: —

Project: 4HY0602A  
Sandwich, MA  
Project Number: TS60615706





T-MOBILE NORTHEAST LLC

T-MOBILE SITE NUMBER: 4HY0602B

T-MOBILE SITE NAME: RUSSO

ECO-SITE ID NUMBER: MA-0049

145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY



Know what's below.  
Call before you dig.

### SITE INFORMATION

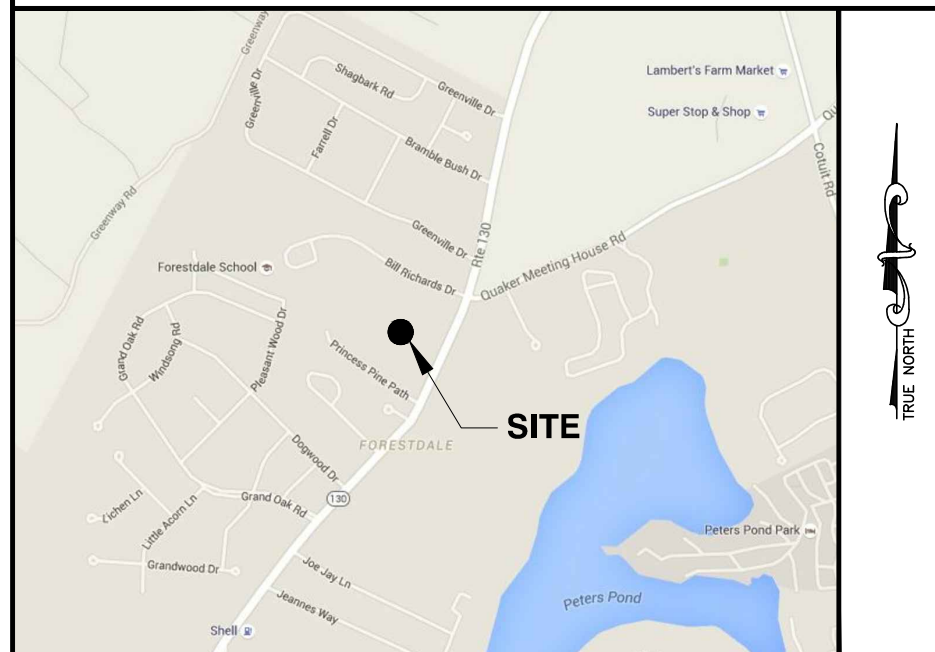
T-MOBILE SITE ID NUMBER: 4HY0602B  
ECO SITE ID NUMBER: MA-0049  
911 SITE ADDRESS: 145 ROUTE 130  
SANDWICH, MA 02644  
LATITUDE (NAD 83): 41.69492°  
LONGITUDE (NAD 83): -70.49946°  
JURISDICTION: BARNSTABLE COUNTY  
ZONING: R2 (RESIDENTIAL 2)  
USE & OCCUPANCY GROUP: U  
CONSTRUCTION TYPE: IIB  
PARCEL ID NUMBER: 17-009  
PARCEL AREA: 17.13± ACRES  
PARCEL OWNER: PJR REALTY TRUST,  
PASQUALE J RUSSO IV & PASQUALE J  
ADDRESS: P.O. BOX 1328  
FORESTDALE, MA 2644  
GROUND ELEVATION: 148.0' (AMSL)  
STRUCTURE TYPE: RAWLAND - MONOPOLE  
STRUCTURE HEIGHT: 135'-0" (AGL)

### PROJECT TEAM

APPLICANT: T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893  
TOWER OWNER: ECO-SITE  
240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
OFFICE: (919) 636-6810  
PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092  
ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

### VICINITY MAP

SCALE: 1" = 2000'



### CODE COMPLIANCE

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

- 2012 INTERNATIONAL BUILDING CODE
- 2012 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECORDIA GR-1275
- ANSI/T 311

### DRAWING INDEX

LE-1 TITLE SHEET  
LE-2 SITE PLAN  
LE-3 COMPOUND PLAN  
LE-4 ELEVATION & ANTENNA PLAN

### DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

### APPROVAL BLOCK

|                              |            |                          |          |                          |                   |                          |                    |
|------------------------------|------------|--------------------------|----------|--------------------------|-------------------|--------------------------|--------------------|
| PROPERTY OWNER _____         | DATE _____ | <input type="checkbox"/> | APPROVED | <input type="checkbox"/> | APPROVED AS NOTED | <input type="checkbox"/> | DISAPPROVED/REVISE |
| PROJECT MANAGER _____        | DATE _____ | <input type="checkbox"/> |          | <input type="checkbox"/> |                   | <input type="checkbox"/> |                    |
| DIRECTOR OF OPERATIONS _____ | DATE _____ | <input type="checkbox"/> |          | <input type="checkbox"/> |                   | <input type="checkbox"/> |                    |

ENGINEER

**NB+C**  
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

APPLICANT

**T-Mobile**

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893

TOWER OWNER

**Eco-Site**  
Urban.Renewal.Wireless.

240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
(919) 636-6810

SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

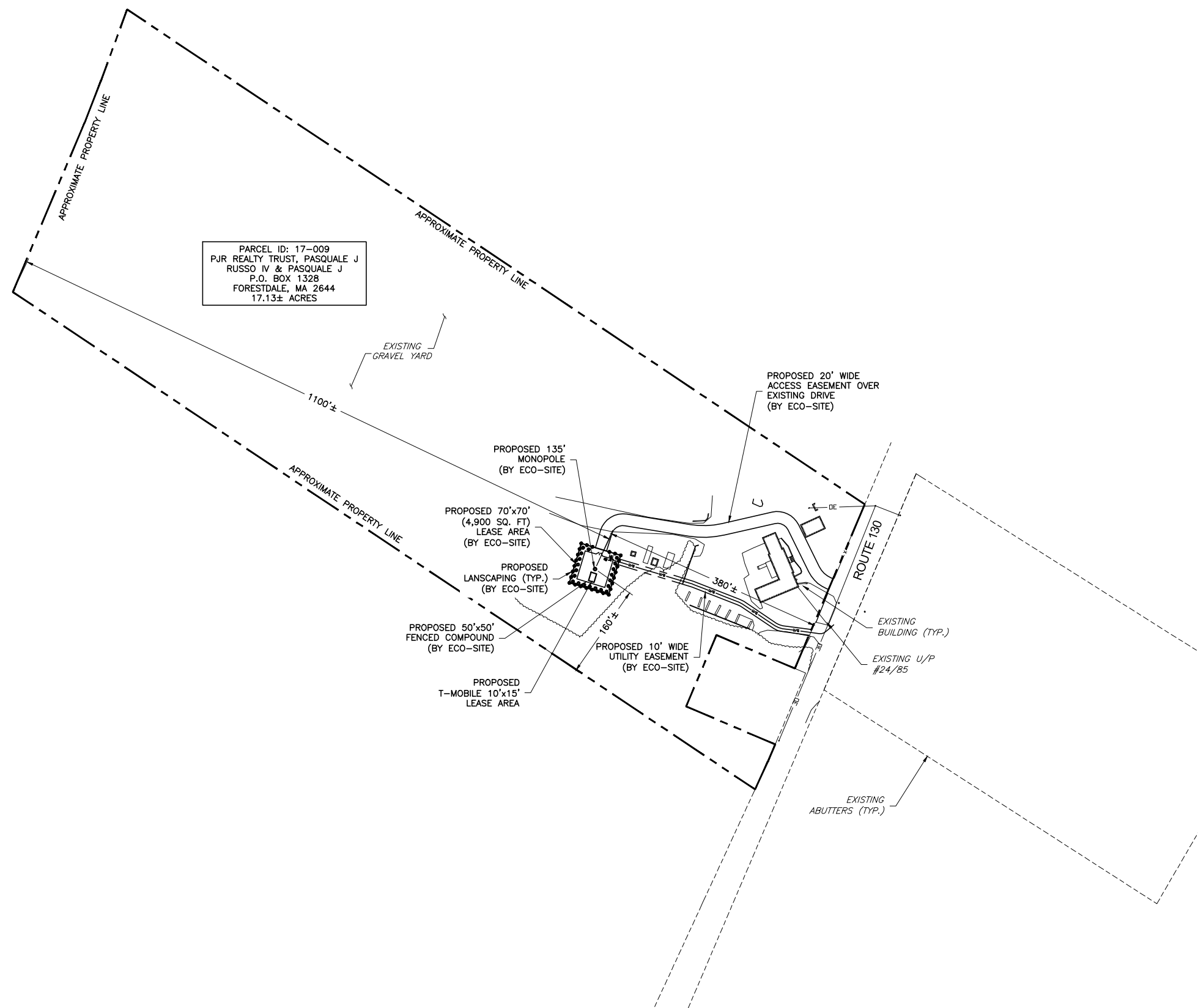
SHEET TITLE

**TITLE SHEET**

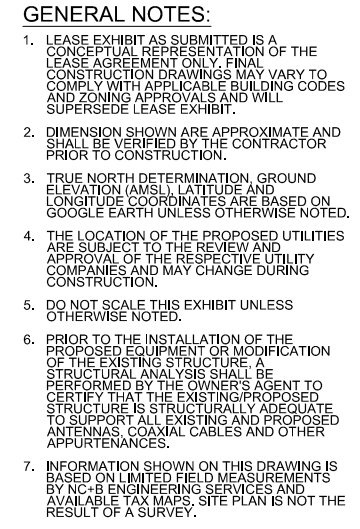
SHEET NUMBER

**LE-1**





1 SITE PLAN  
LE-2 SCALE: 1" = 200'



SHEET NUMBER



**TOTALLY COMMITTED.**

**NB+C ENGINEERING SERVICES, LLC.**  
 100 APOLLO DRIVE, SUITE 303  
 CHELMSFORD, MA 01824  
 (978) 956-8308

**T-Mobile**

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
 NORTON, MA 02766  
 OFFICE: (508) 286-2700  
 FAX: (508) 286-2893



240 LEIGH FARM ROAD, SUITE 415  
 DURHAM, NC 27707  
 (919) 636-6810

4HY0602B  
 RUSSO  
 145 ROUTE 130  
 SANDWICH, MA 02644  
 BARNSTABLE COUNTY

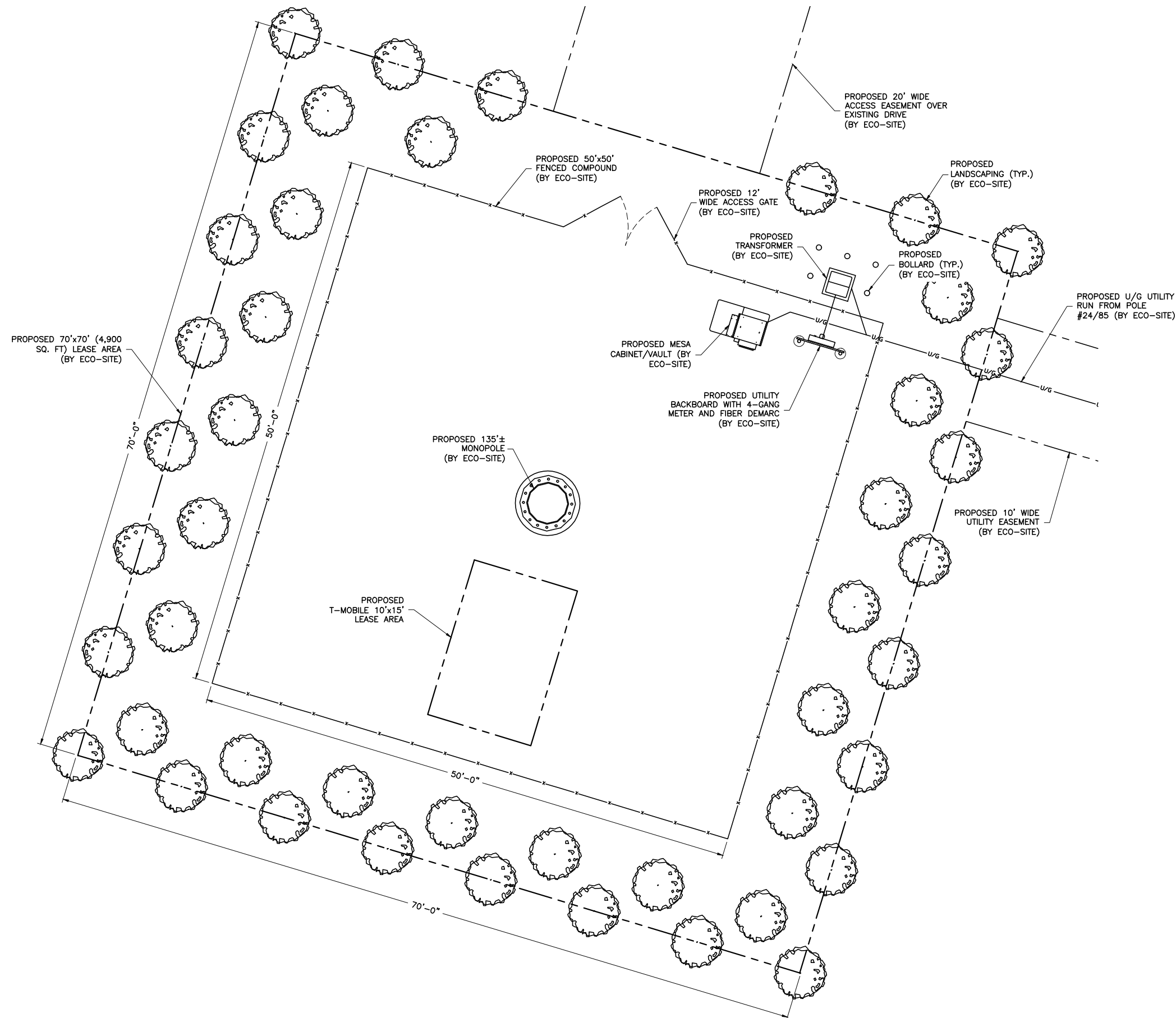
**REVISIONS**

|     |          |                |     |
|-----|----------|----------------|-----|
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |
| REV | DATE     | DESCRIPTION    | BY  |

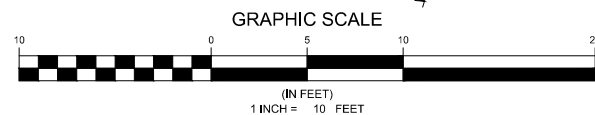
**SITE PLAN**

**LE-2**





1  
LE-3  
COMPOUND PLAN  
SCALE: 1" = 10'



ENGINEER



APPLICANT



TOWER OWNER



SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

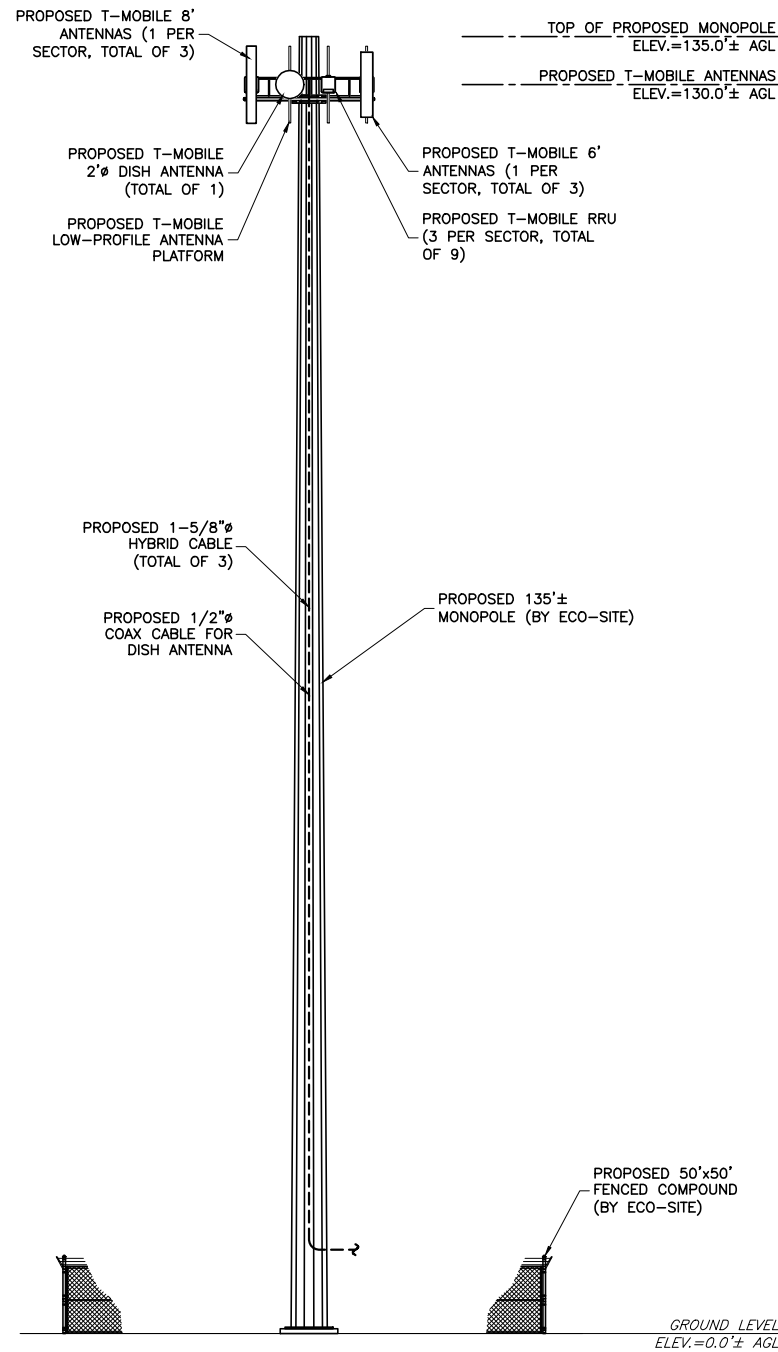
SHEET TITLE

COMPOUND PLAN

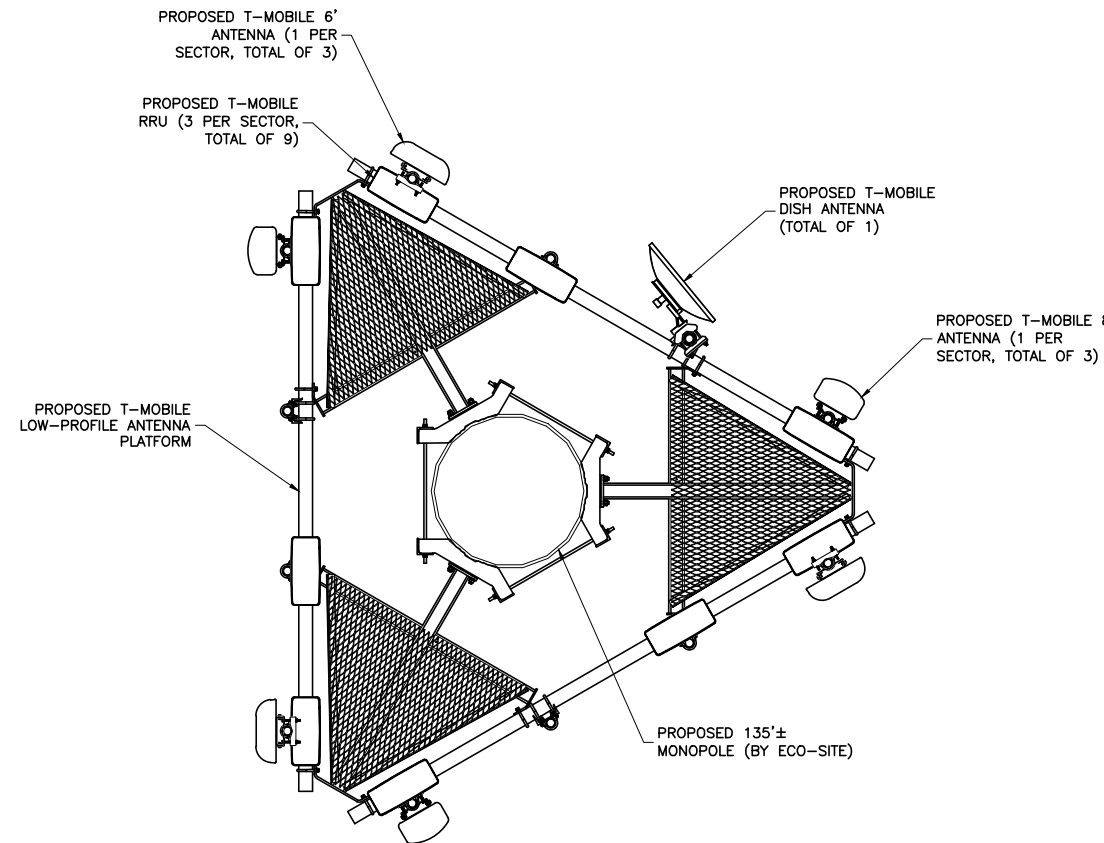
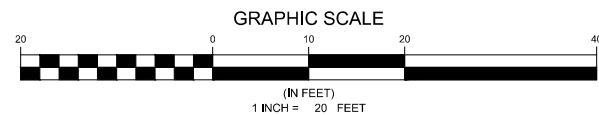
SHEET NUMBER

LE-3

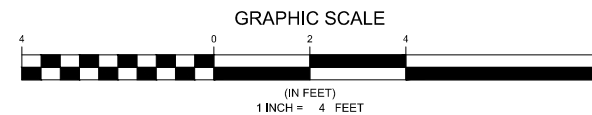




1 ELEVATION  
SCALE: 1" = 20'



2 ANTENNA PLAN  
SCALE: 1/4" = 1'



ENGINEER



APPLICANT



TOWER OWNER



SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

SHEET TITLE

ELEVATION &  
ANTENNA PLAN

SHEET NUMBER

LE-4



to search for properties, toggle map themes, or add mark-up graphics to your map.

Please see the Help link below for additional information.

Contact Information

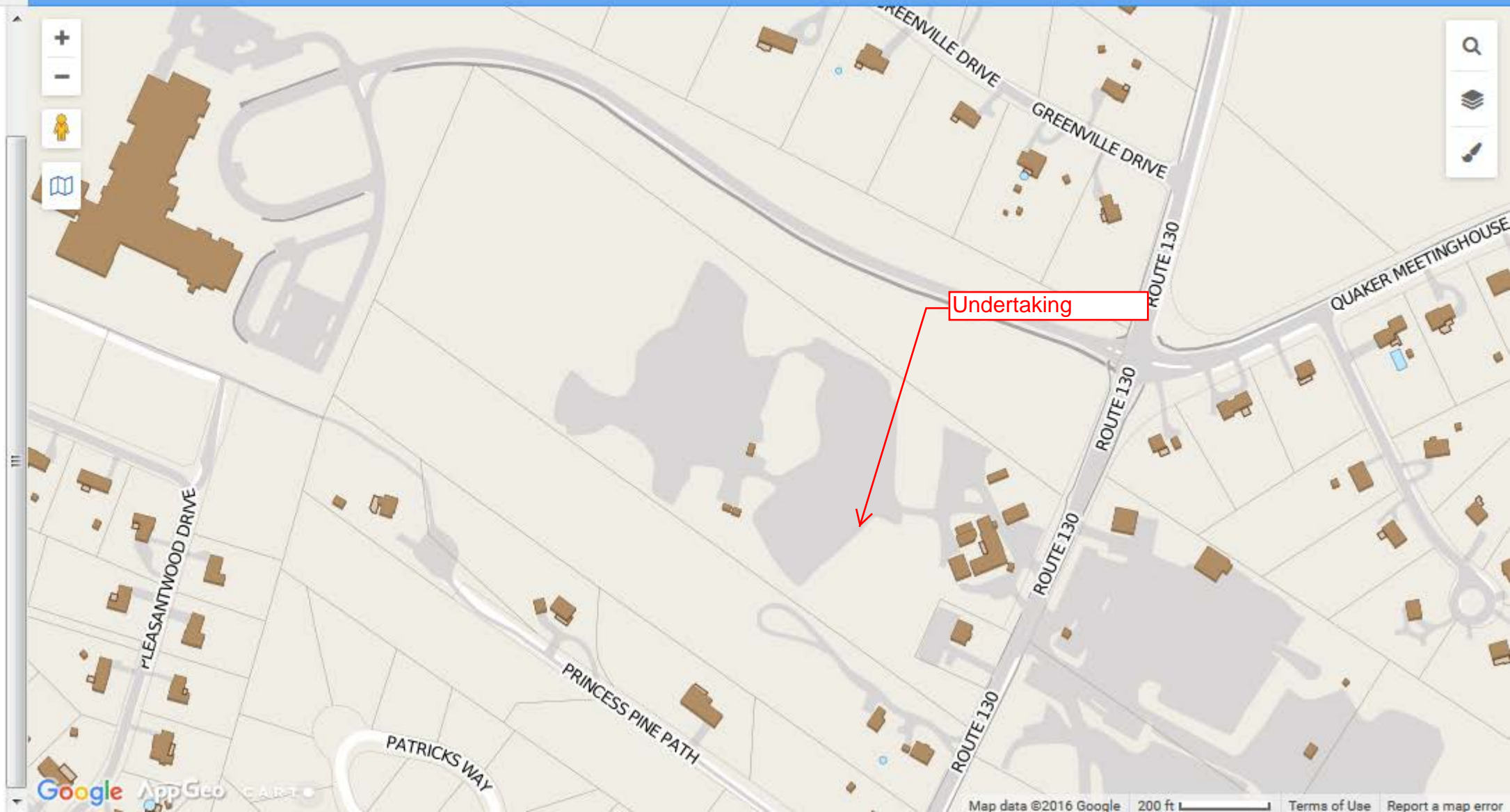
Disclaimer

Feedback

About MapGeo

Login

Help







**Christopher Bond**  
Project Manager  
Biologist

CBRE, Inc.  
Telecom Advisory Services

4 West Red Oak Lane  
White Plains, New York 10604

914-597-6956 Tel  
914-316-0303 Cell

Christopher.bond@cbre.com  
www.cbre.com

August 22, 2016

Division of Fisheries and Wildlife  
1 Rabbit Hill Road  
Westborough, MA 01581  
(508) 389-6300  
[mass.wildlife@state.ma.us](mailto:mass.wildlife@state.ma.us)

Re: "4HY0602A" – Proposed Wireless Telecommunications Facility  
145 Route 130  
Sandwich, Barnstable County, MA 02644  
CBRE Project No.: **TS60615706**

To whom it may concern:

CBRE, Inc. Telecom Advisory Services (CBRE) is writing on behalf of Network Building and Consulting, LLC to submit the attached application for a MESA Project Review. CBRE is acting as the applicant for this project.

The project consists of a proposed 135' monopole within a 4,900 square foot lease area within a wooded area. A 20' wide access easement over an existing drive will connect the proposed lease area compound to Route 130 to the east. A T-Mobile 10' x 15' lease area is proposed within the 4,900 square foot lease area.

Please mail your response to the address/number provided above or email to [WhitePlainsBiology@cbre.com](mailto:WhitePlainsBiology@cbre.com) (preferred method). Thank you very much for your assistance and please do not hesitate to contact CBRE for any additional information or questions you may have.

Sincerely,

CBRE, INC.

A handwritten signature in black ink that reads "Christopher Bond".

Chris Bond  
Project Manager - Biologist



1



Existing Utility Pole and Proposed Route of Underground Utility Easement  
Viewed From Southeast

2



Proposed Route of Underground Utility Easement  
Viewed From Southeast



3



Proposed Lease Area Viewed from Northwest

4



Proposed Lease Area Viewed from Southwest



5



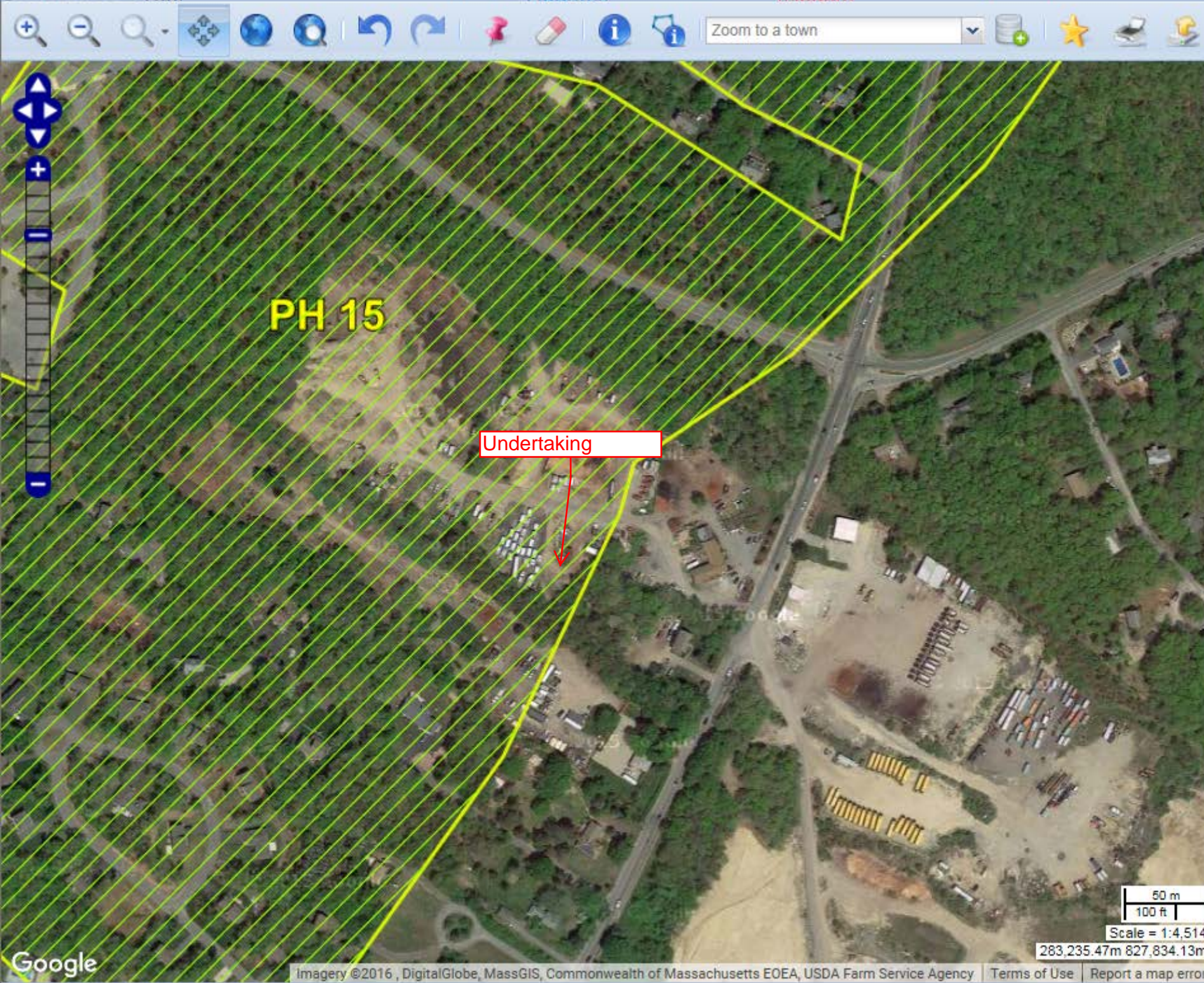
Proposed Lease Area Viewed from Southeast

6



Proposed Lease Area Viewed from Northeast





#### Available Data Layers

- Search data layers
- ⊕ Tiled Layers
  - ⊕ State Facilities
  - ⊕ Census 1990
  - ⊕ Census 2000
  - ⊕ Census 2010
  - ⊕ Coastal and Marine F
  - ⊕ Conservation / Recre
  - ⊕ Cultural Resources
  - ⊕ Environmental Monit
  - ⊕ Images
  - ⊕ Index (grids/tiling sch

#### Active Data Layers

- Check all Uncheck all Re
- ☒ NavTeq MA Ot
  - ☒ Major MassDO
  - ☒ Massachusetts
  - ☒ NHESP Estima

#### Legend

- NavTeq MA Other Streets Names
- Major MassDOT Routes
- Massachusetts Towns
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species



---

## Christopher S. Bond

|                        |                                                                                                          |
|------------------------|----------------------------------------------------------------------------------------------------------|
| Education:             | M.S. Environmental Science, Sacred Heart University<br>B.S. Traditional Biology, Sacred Heart University |
| Licenses/Registrations | Methodology for Delineating Wetlands, Rutgers University<br>NYS Wetlands Forum Member, 2015              |
| Years of Experience:   | 2.5 years                                                                                                |

---

### Summary of Professional Experience

Mr. Bond is a Biologist and Project Manager at IVI Telecom, a CBRE Company for over two years. He has conducted Migratory Bird Surveys, consulted on Wetland Delineations, Natural Resource and NEPA reviews for various clients within the telecommunications industry.

Mr. Bond's environmental experience extends from both his background in biology and chemistry. Specifically, Mr. Bond has conducted environmental sampling of rivers, streams and groundwater for presence of harmful chemicals and suspended solids. Mr. Bond has also conducted biological surveys for different migratory bird species and invertebrate diversity within streams and rivers. He also has experience coordinating and working with the USFWS Field Offices throughout the United States.

Mr. Bond received his Bachelor of Science at Sacred Heart University with majors in Traditional Biology. Mr. Bond also received his Master of Science in Environmental Science at the Sacred Heart University Environmental Graduate Program. While attending graduate school, he participated in Project Limulus where he conducted species surveys of horseshoe crab populations within the Long Island Sound. Mr. Bond was also a co-writer of "Estimation of Short-Term Tag-Induced Mortality in Horseshoe Crab *Limulus Polyphemus*" which was published in *Biology Faculty Publications* in 2011.



FLOOD PLAINS



828000 M



MAP SCALE 1" = 500'

250 0 500 1000  
FEET

NFP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0528J

## FIRM

FLOOD INSURANCE RATE MAP  
BARNSTABLE COUNTY,  
MASSACHUSETTS  
(ALL JURISDICTIONS)

PANEL 528 OF 875

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY         | NUMBER | PANEL | SUFFIX |
|-------------------|--------|-------|--------|
| SANDWICH, TOWN OF | 250012 | 0528  | J      |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER  
25001C0528J  
EFFECTIVE DATE  
JULY 16, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



SURFACE FEATURES  
(WETLANDS)













U.S. Fish and Wildlife Service

# National Wetlands Inventory

## 4HY0602A - NWI Wetland Map



August 15, 2016

|                                                                                     |                                |                                                                                     |                                   |                                                                                       |          |
|-------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Forested/Shrub Wetland |  | Other    |
|  | Estuarine and Marine Wetland   |  | Freshwater Pond                   |  | Riverine |
|  | Freshwater Emergent Wetland    |  | Lake                              |                                                                                       |          |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.




















MassDEP Online Map Viewer



## MassDEP

Massachusetts Department of Environmental Protection

### Map Legend

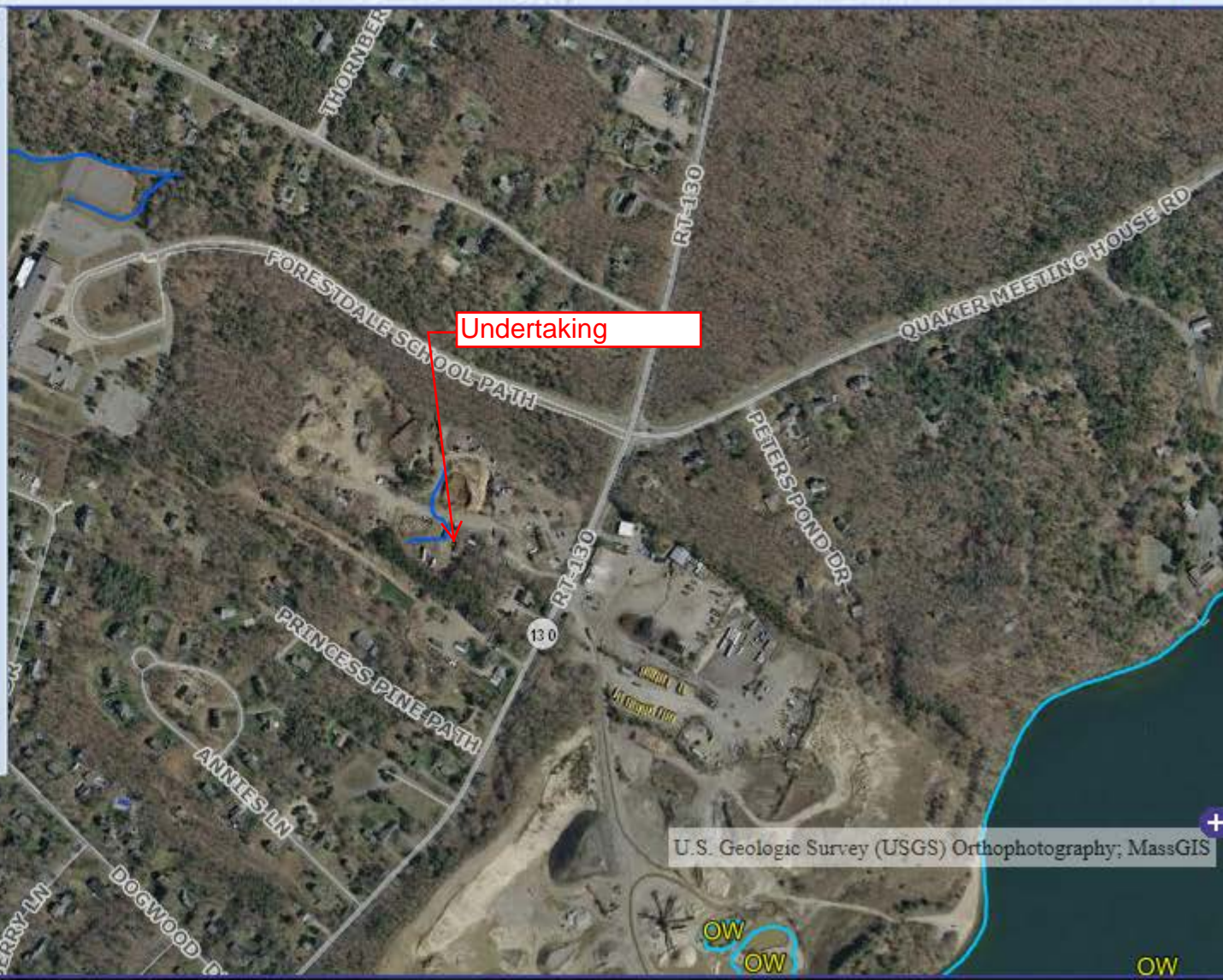
- |                                                                                  |                                   |                                                                                   |                                            |
|----------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | Shoreline                         |  | 15 meter Elevation Contour                 |
|  | Hydrologic Connection             |  | 5 meter Elevation Contour                  |
|  | Mean Low Water Line               |  | MassGIS Level 3 Assessors' Parcel Boundary |
|  | Apparent Wetland Limit            |  | NHESP Estimated Habitats of Rare Wildlife  |
|  | Closure Line                      |  | NHESP Certified Vernal Pool                |
|  | Edge of Interpreted Area          |  | Notice of Intent (NOI)                     |
|  | Wetland Change Area (2001 & 2003) | FEMA National Flood Hazard Layer (NFHL) Flood                                     |                                            |
|  | Wetland Change Area (2005)        |  | A: 1% Annual Chance of Flooding, no BFE    |
|  | Wetland Change Area (2008 & 2009) |  | AE: 1% Annual Chance of Flooding, with BFE |

Overview Map Layers Legend Map Help Contact Query Results

200 m

1000 ft

41°41'27.5"N, 70°30'44.4"W  
(41.691, -70.5123)





## QUALIFIED PERSONNEL



---

## Christopher S. Bond

|                        |                                                                                                          |
|------------------------|----------------------------------------------------------------------------------------------------------|
| Education:             | M.S. Environmental Science, Sacred Heart University<br>B.S. Traditional Biology, Sacred Heart University |
| Licenses/Registrations | Methodology for Delineating Wetlands, Rutgers University<br>NYS Wetlands Forum Member, 2015              |
| Years of Experience:   | 2.5 years                                                                                                |

---

### Summary of Professional Experience

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---

## E. Gio Del Rivero

**Education:** B.S., Earth and Environmental Science, University of Illinois

**Years of Experience:** 7+ years

---

### Summary of Professional Experience

Mr. Del Rivero holds a Bachelor's of Science Degree in Earth and Environmental Science. He has more than 7 years of experience as an Environmental Professional in the telecommunications field, providing environmental and regulatory due diligence under the National Historic Preservation Act, the National Environmental Policy Act, and the Endangered Species Act. As a Project Scientist, he completed hundreds of Section 106 and NEPA reports throughout the United States, as well as Phase I Environmental Site Assessments. In his previous role as Project Manager, Mr. Del Rivero has provided quality control, conducted Natural Resources reviews nationwide, managed portfolios, and acted as a client liaison. In consultation with carriers and USFWS field offices, Mr. Del Rivero has developed mitigation strategies to avoid potential adverse effects to endangered species.

In addition to his experience working with natural resources and environmental due diligence, Mr. Del Rivero has also conducted numerous Phase II Environmental Site Assessments for telecommunications projects and geotechnical investigations for new roadway development projects.



**22**





Laura L. Mancuso  
Director, Cultural Resources

CBRE, Inc.  
Telecom Advisory Services

4 West Red Oak Lane  
White Plains, New York 10604

914.597.6991 Office  
914.439.0527 Cell

[laura.mancuso@cbre.com](mailto:laura.mancuso@cbre.com)  
[www.cbre.com](http://www.cbre.com)

October 6, 2016

Ms. Brona Simon, SHPO  
Massachusetts Historical Commission  
220 Morrissey Boulevard  
Boston, Massachusetts 02125  
617.727.8470

Re: Proposed Telecommunications Facility  
"4HY0602A"  
145 Route 130  
Sandwich, Massachusetts  
**CBRE Project No.: TS60615706**

Dear Ms. Simon:

CBRE is writing on behalf of Eco-Site to solicit your comments on a proposed telecommunications facility at the above referenced address. As the Project is a federal undertaking regulated by the Federal Communications Commission (FCC), it is being reviewed under Section 106 of the National Historic Preservation Act for its impacts to historic architectural and archaeological resources.

The proposed facility will consist of a 135-foot monopole and associated support equipment to be located within a 50-foot by 50-foot fenced compound.

Please do not hesitate to contact me with any questions. Thank you for your time and attention to this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Laura Mancuso", is written over a faint, larger version of the same signature.

Laura L. Mancuso  
Director, Cultural Resources



Notification Date: **7AM EST 10/11/2016****New Tower ("NT") Submission Packet**File Number: **0007495774**See instructions for  
public burden estimates**General Information**

|                                                                                                                               |              |
|-------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1) (Select only one) ( <b>NE</b> )<br><b>NE</b> – New <b>UA</b> – Update of Application <b>WD</b> – Withdrawal of Application |              |
| 2) If this application is for an Update or Withdrawal, enter the file number of the pending application currently on file.    | File Number: |

**Applicant Information**

|                                                     |
|-----------------------------------------------------|
| 3) FCC Registration Number (FRN): <b>0023078488</b> |
| 4) Name: <b>Eco-Site, Inc.</b>                      |

**Contact Name**

|                            |        |                             |            |
|----------------------------|--------|-----------------------------|------------|
| 5) First Name: <b>Ryan</b> | 6) MI: | 7) Last Name: <b>Wehman</b> | 8) Suffix: |
| 9) Title:                  |        |                             |            |

**Contact Information**

|                                                  |                |                                                        |                            |
|--------------------------------------------------|----------------|--------------------------------------------------------|----------------------------|
| 10) P.O. Box:                                    | <b>And /Or</b> | 11) Street Address: <b>1414 Raleigh Road Suite 445</b> |                            |
| 12) City: <b>Chapel Hill</b>                     |                | 13) State: <b>NC</b>                                   | 14) Zip Code: <b>27517</b> |
| 15) Telephone Number: <b>(919)636-6810</b>       |                | 16) Fax Number:                                        |                            |
| 17) E-mail Address: <b>ccarroll@eco-site.com</b> |                |                                                        |                            |

**Consultant Information**

|                                                      |
|------------------------------------------------------|
| 18) FCC Registration Number (FRN): <b>0018180992</b> |
| 19) Name: <b>CBRE Telecom Advisory Services</b>      |

**Principal Investigator**

|                              |                  |                               |             |
|------------------------------|------------------|-------------------------------|-------------|
| 20) First Name: <b>Laura</b> | 21) MI: <b>L</b> | 22) Last Name: <b>Mancuso</b> | 23) Suffix: |
| 24) Title:                   |                  |                               |             |

**Principal Investigator Contact Information**

|                                                                  |                |                                                |                            |
|------------------------------------------------------------------|----------------|------------------------------------------------|----------------------------|
| 25) P.O. Box:                                                    | <b>And /Or</b> | 26) Street Address: <b>4 West Red Oak Lane</b> |                            |
| 27) City: <b>White Plains</b>                                    |                | 28) State: <b>NY</b>                           | 29) Zip Code: <b>10604</b> |
| 30) Telephone Number: <b>(914)597-6991</b>                       |                | 31) Fax Number:                                |                            |
| 32) E-mail Address: <b>WhitePlainsCulturalResources@cbre.com</b> |                |                                                |                            |



**Professional Qualification**

|                                                                                                                                                                                                 |                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 33) Does the Principal Investigator satisfy the Secretary of the Interior's Professional Qualification Standards?                                                                               | ( <input checked="" type="checkbox"/> ) <u>Y</u> es ( ) <u>N</u> o |
| 34) Areas of Professional Qualification:<br>( ) Archaeologist<br>( <input checked="" type="checkbox"/> ) Architectural Historian<br>( ) Historian<br>( ) Architect<br>( ) Other (Specify) _____ |                                                                    |

**Additional Staff**

|                                                                                                                        |                                                                    |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 35) Are there other staff involved who meet the Professional Qualification Standards of the Secretary of the Interior? | ( <input checked="" type="checkbox"/> ) <u>Y</u> es ( ) <u>N</u> o |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|

If "YES," complete the following:

|                                                                                                                                                                                                 |                  |                                |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------|-------------|
| 36) First Name: <b>Vanessa</b>                                                                                                                                                                  | 37) MI: <b>P</b> | 38) Last Name: <b>Sullivan</b> | 39) Suffix: |
| 40) Title:                                                                                                                                                                                      |                  |                                |             |
| 41) Areas of Professional Qualification:<br>( <input checked="" type="checkbox"/> ) Archaeologist<br>( ) Architectural Historian<br>( ) Historian<br>( ) Architect<br>( ) Other (Specify) _____ |                  |                                |             |



## Site Information

### Tower Construction Notification System

1) TCNS Notification Number: **141157**

### Site Information

2) Positive Train Control Filing Subject to Expedited Treatment Under Program Comment: ( ) Yes ( **X** ) No

3) Site Name: **4HY0602A**

4) Site Address: **145 Route 130**

5) Detailed Description of Project:

**4HY0602/MA-0049 - proposed construction of a new telecommunications monopole tower and compound**

6) City: **Sandwich**

7) State: **MA**

8) Zip Code: **02644**

9) County/Borough/Parish: **BARNSTABLE**

10) Nearest Crossroads: **Route 130 and Princess Pine Path**

11) **NAD 83** Latitude (DD-MM-SS.S): **41-41-41.8**

( **X** ) N or ( ) S

12) **NAD 83** Longitude (DD-MM-SS.S): **070-29-57.7**

( ) E or ( **X** ) W

### Tower Information

13) Tower height above ground level (include top-mounted attachments such as lightning rods): **41.1** ( ) Feet ( **X** ) Meters

14) Tower Type (Select One):

( ) Guyed lattice tower

( ) Self-supporting lattice

( **X** ) Monopole

( ) Other (Describe):

### Project Status

15) Current Project Status (Select One):

( **X** ) Construction has not yet commenced

( ) Construction has commenced, but is not completed

Construction commenced on: \_\_\_\_\_

( ) Construction has been completed

Construction commenced on: \_\_\_\_\_

Construction completed on: \_\_\_\_\_



**Determination of Effect**

14) Direct Effects (Select One):

- ( ☒ ) No Historic Properties in Area of Potential Effects (APE)
- ( ☐ ) No Effect on Historic Properties in APE
- ( ☐ ) No Adverse Effect on Historic Properties in APE
- ( ☐ ) Adverse Effect on one or more Historic Properties in APE

15) Visual Effects (Select One):

- ( ☐ ) No Historic Properties in Area of Potential Effects (APE)
- ( ☐ ) No Effect on Historic Properties in APE
- ( ☒ ) No Adverse Effect on Historic Properties in APE
- ( ☐ ) Adverse Effect on one or more Historic Properties in APE



### Tribal/NHO Involvement

|                                                                                                                                                                                                                                                  |                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 1) Have Indian Tribes or Native Hawaiian Organizations (NHOs) been identified that may attach religious and cultural significance to historic properties which may be affected by the undertaking within the APEs for direct and visual effects? | ( <input checked="" type="checkbox"/> ) <u>Yes</u> ( <input type="checkbox"/> ) <u>No</u> |
| 2a) Tribes/NHOs contacted through TCNS Notification Number: <u>141157</u> Number of Tribes/NHOs: <u>6</u>                                                                                                                                        |                                                                                           |
| 2b) Tribes/NHOs contacted through an alternate system: Number of Tribes/NHOs: <u>0</u>                                                                                                                                                           |                                                                                           |

### Tribe/NHO Contacted Through TCNS

|                                                         |
|---------------------------------------------------------|
| 3) Tribe/NHO FRN:                                       |
| 4) Tribe/NHO Name: <b>Keweenaw Bay Indian Community</b> |

### Contact Name

|                            |        |                                |                      |
|----------------------------|--------|--------------------------------|----------------------|
| 5) First Name: <b>Gary</b> | 6) MI: | 7) Last Name: <b>Loonsfoot</b> | 8) Suffix: <b>Jr</b> |
| 9) Title: <b>THPO</b>      |        |                                |                      |

### Dates & Response

|                                                               |                                    |
|---------------------------------------------------------------|------------------------------------|
| 10) Date Contacted <u>07/21/2016</u>                          | 11) Date Replied <u>07/28/2016</u> |
| ( <input type="checkbox"/> ) No Reply                         |                                    |
| ( <input type="checkbox"/> ) Replied/No Interest              |                                    |
| ( <input checked="" type="checkbox"/> ) Replied/Have Interest |                                    |
| ( <input type="checkbox"/> ) Replied/Other                    |                                    |

### Tribe/NHO Contacted Through TCNS

|                                                                                   |
|-----------------------------------------------------------------------------------|
| 3) Tribe/NHO FRN:                                                                 |
| 4) Tribe/NHO Name: <b>Lac Vieux Desert Band of Lake Superior Chippewa Indians</b> |

### Contact Name

|                                                 |        |                             |                      |
|-------------------------------------------------|--------|-----------------------------|----------------------|
| 5) First Name: <b>Giiwegiizhigookway</b>        | 6) MI: | 7) Last Name: <b>Martin</b> | 8) Suffix: <b>Ms</b> |
| 9) Title: <b>THPO and NAGPRA Representative</b> |        |                             |                      |

### Dates & Response

|                                                       |                                    |
|-------------------------------------------------------|------------------------------------|
| 10) Date Contacted <u>07/20/2016</u>                  | 11) Date Replied <u>07/20/2016</u> |
| ( <input type="checkbox"/> ) No Reply                 |                                    |
| ( <input type="checkbox"/> ) Replied/No Interest      |                                    |
| ( <input type="checkbox"/> ) Replied/Have Interest    |                                    |
| ( <input checked="" type="checkbox"/> ) Replied/Other |                                    |



### Tribal/NHO Involvement

|                                                                                                                                                                                                                                                  |                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1) Have Indian Tribes or Native Hawaiian Organizations (NHOs) been identified that may attach religious and cultural significance to historic properties which may be affected by the undertaking within the APEs for direct and visual effects? | ( <input checked="" type="checkbox"/> ) <u>Yes</u> (    ) <u>No</u> |
| 2a) Tribes/NHOs contacted through TCNS Notification Number: <u>141157</u> Number of Tribes/NHOs: <u>6</u>                                                                                                                                        |                                                                     |
| 2b) Tribes/NHOs contacted through an alternate system:      Number of Tribes/NHOs: <u>0</u>                                                                                                                                                      |                                                                     |

#### Tribe/NHO Contacted Through TCNS

|                                                          |
|----------------------------------------------------------|
| 3) Tribe/NHO FRN:                                        |
| 4) Tribe/NHO Name: <b>Mashpee Wampanoag Indian Tribe</b> |

#### Contact Name

|                              |        |                             |            |
|------------------------------|--------|-----------------------------|------------|
| 5) First Name: <b>Ramona</b> | 6) MI: | 7) Last Name: <b>Peters</b> | 8) Suffix: |
| 9) Title: <b>THPO</b>        |        |                             |            |

#### Dates & Response

|                                                  |                        |
|--------------------------------------------------|------------------------|
| 10) Date Contacted <u>07/21/2016</u>             | 11) Date Replied _____ |
| ( <input checked="" type="checkbox"/> ) No Reply |                        |
| (    ) Replied/No Interest                       |                        |
| (    ) Replied/Have Interest                     |                        |
| (    ) Replied/Other                             |                        |

#### Tribe/NHO Contacted Through TCNS

|                                                     |
|-----------------------------------------------------|
| 3) Tribe/NHO FRN:                                   |
| 4) Tribe/NHO Name: <b>Narragansett Indian Tribe</b> |

#### Contact Name

|                                  |        |                           |            |
|----------------------------------|--------|---------------------------|------------|
| 5) First Name: <b>Sequahna</b>   | 6) MI: | 7) Last Name: <b>Mars</b> | 8) Suffix: |
| 9) Title: <b>Program Manager</b> |        |                           |            |

#### Dates & Response

|                                                       |                                    |
|-------------------------------------------------------|------------------------------------|
| 10) Date Contacted <u>07/21/2016</u>                  | 11) Date Replied <u>07/27/2016</u> |
| (    ) No Reply                                       |                                    |
| (    ) Replied/No Interest                            |                                    |
| (    ) Replied/Have Interest                          |                                    |
| ( <input checked="" type="checkbox"/> ) Replied/Other |                                    |



### Tribal/NHO Involvement

|                                                                                                                                                                                                                                                  |                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1) Have Indian Tribes or Native Hawaiian Organizations (NHOs) been identified that may attach religious and cultural significance to historic properties which may be affected by the undertaking within the APEs for direct and visual effects? | ( <input checked="" type="checkbox"/> ) <u>Yes</u> (    ) <u>No</u> |
| 2a) Tribes/NHOs contacted through TCNS Notification Number: <u>141157</u> Number of Tribes/NHOs: <u>6</u>                                                                                                                                        |                                                                     |
| 2b) Tribes/NHOs contacted through an alternate system:      Number of Tribes/NHOs: <u>0</u>                                                                                                                                                      |                                                                     |

#### Tribe/NHO Contacted Through TCNS

|                                              |
|----------------------------------------------|
| 3) Tribe/NHO FRN:                            |
| 4) Tribe/NHO Name: <b>Oglala Sioux Tribe</b> |

#### Contact Name

|                                |        |                                |            |
|--------------------------------|--------|--------------------------------|------------|
| 5) First Name: <b>Trina</b>    | 6) MI: | 7) Last Name: <b>Lone Hill</b> | 8) Suffix: |
| 9) Title: <b>THPO/Director</b> |        |                                |            |

#### Dates & Response

|                                                             |                                    |
|-------------------------------------------------------------|------------------------------------|
| 10) Date Contacted <u>07/21/2016</u>                        | 11) Date Replied <u>07/26/2016</u> |
| (    ) No Reply                                             |                                    |
| ( <input checked="" type="checkbox"/> ) Replied/No Interest |                                    |
| (    ) Replied/Have Interest                                |                                    |
| (    ) Replied/Other                                        |                                    |

#### Tribe/NHO Contacted Through TCNS

|                                                                |
|----------------------------------------------------------------|
| 3) Tribe/NHO FRN:                                              |
| 4) Tribe/NHO Name: <b>Wampanoag Tribe of Gay Head-Aquinnah</b> |

#### Contact Name

|                                                   |        |                                 |            |
|---------------------------------------------------|--------|---------------------------------|------------|
| 5) First Name: <b>Bettina</b>                     | 6) MI: | 7) Last Name: <b>Washington</b> | 8) Suffix: |
| 9) Title: <b>Senior Cultural Resource Monitor</b> |        |                                 |            |

#### Dates & Response

|                                                  |                        |
|--------------------------------------------------|------------------------|
| 10) Date Contacted <u>07/21/2016</u>             | 11) Date Replied _____ |
| ( <input checked="" type="checkbox"/> ) No Reply |                        |
| (    ) Replied/No Interest                       |                        |
| (    ) Replied/Have Interest                     |                        |
| (    ) Replied/Other                             |                        |



## Other Tribes/NHOs Contacted

### Tribe/NHO Information

|                                   |
|-----------------------------------|
| 1) FCC Registration Number (FRN): |
| 2) Name:                          |

### Contact Name

|                |        |               |            |
|----------------|--------|---------------|------------|
| 3) First Name: | 4) MI: | 5) Last Name: | 6) Suffix: |
| 7) Title:      |        |               |            |

### Contact Information

|                                                                                                       |            |                    |               |
|-------------------------------------------------------------------------------------------------------|------------|--------------------|---------------|
| 8) P.O. Box:                                                                                          | And<br>/Or | 9) Street Address: |               |
| 10) City:                                                                                             |            | 11) State:         | 12) Zip Code: |
| 13) Telephone Number:                                                                                 |            | 14) Fax Number:    |               |
| 15) E-mail Address:                                                                                   |            |                    |               |
| 16) Preferred means of communication:<br><br>(     ) E-mail<br><br>(     ) Letter<br><br>(     ) Both |            |                    |               |

### Dates & Response

|                               |                        |
|-------------------------------|------------------------|
| 17) Date Contacted _____      | 18) Date Replied _____ |
| (     ) No Reply              |                        |
| (     ) Replied/No Interest   |                        |
| (     ) Replied/Have Interest |                        |
| (     ) Replied/Other         |                        |



## Historic Properties

### Properties Identified

|                                                                                                                                                                                                                |                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1) Have any historic properties been identified within the APEs for direct and visual effect?                                                                                                                  | ( <input checked="" type="checkbox"/> ) <u>Y</u> es (    ) <u>N</u> o |
| 2) Has the identification process located archaeological materials that would be directly affected, or sites that are of cultural or religious significance to Tribes/NHOs?                                    | (    ) <u>Y</u> es ( <input checked="" type="checkbox"/> ) <u>N</u> o |
| 3) Are there more than 10 historic properties within the APEs for direct and visual effect?<br>If "Yes", you are required to attach a Cultural Resources Report in lieu of adding the Historic Property below. | (    ) <u>Y</u> es ( <input checked="" type="checkbox"/> ) <u>N</u> o |

### Historic Property

|                                                       |
|-------------------------------------------------------|
| 4) Property Name: <b>Forestdale Historic District</b> |
| 5) SHPO Site Number:                                  |

### Property Address

|                                              |                     |                           |
|----------------------------------------------|---------------------|---------------------------|
| 6) Street Address: <b>Multiple</b>           |                     |                           |
| 7) City: <b>Sandwich</b>                     | 8) State: <b>MA</b> | 9) Zip Code: <b>02644</b> |
| 10) County/Borough/Parish: <b>BARNSTABLE</b> |                     |                           |

### Status & Eligibility

|                                                                                                        |                                                                       |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 11) Is this property listed on the National Register?<br><br>Source: _____                             | (    ) <u>Y</u> es ( <input checked="" type="checkbox"/> ) <u>N</u> o |
| 12) Is this property eligible for listing on the National Register?<br><br>Source: <b>MACRIS</b> _____ | ( <input checked="" type="checkbox"/> ) <u>Y</u> es (    ) <u>N</u> o |
| 13) Is this property a National Historic Landmark?                                                     | (    ) <u>Y</u> es ( <input checked="" type="checkbox"/> ) <u>N</u> o |

|                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14) Direct Effects (Select One):<br><br>( <input checked="" type="checkbox"/> ) No Effect on this Historic Property in APE<br>(    ) No Adverse Effect on this Historic Property in APE<br>(    ) Adverse Effect on this Historic Property in APE |
| 15) Visual Effects (Select One):<br><br>(    ) No Effect on this Historic Property in APE<br>( <input checked="" type="checkbox"/> ) No Adverse Effect on this Historic Property in APE<br>(    ) Adverse Effect on this Historic Property in APE |



## Local Government Involvement

### Local Government Agency

|                                                |
|------------------------------------------------|
| 1) FCC Registration Number (FRN):              |
| 2) Name: <b>Sandwich Historical Commission</b> |

### Contact Name

|                            |        |                               |            |
|----------------------------|--------|-------------------------------|------------|
| 3) First Name: <b>Greg</b> | 4) MI: | 5) Last Name: <b>Anderson</b> | 6) Suffix: |
| 7) Title: <b>Chair</b>     |        |                               |            |

### Contact Information

|                                                                                              |            |                      |                            |
|----------------------------------------------------------------------------------------------|------------|----------------------|----------------------------|
| 8) P.O. Box: <b>P.O. Box 1905</b>                                                            | And<br>/Or | 9) Street Address:   |                            |
| 10) City: <b>Sandwich</b>                                                                    |            | 11) State: <b>MA</b> | 12) Zip Code: <b>02563</b> |
| 13) Telephone Number: <b>(111)111-1111</b>                                                   |            | 14) Fax Number:      |                            |
| 15) E-mail Address:                                                                          |            |                      |                            |
| 16) Preferred means of communication:<br>(    ) E-mail<br>( <b>X</b> ) Letter<br>(    ) Both |            |                      |                            |

### Dates & Response

|                                      |                        |
|--------------------------------------|------------------------|
| 17) Date Contacted <b>07/20/2016</b> | 18) Date Replied _____ |
| ( <b>X</b> ) No Reply                |                        |
| (    ) Replied/No Interest           |                        |
| (    ) Replied/Have Interest         |                        |
| (    ) Replied/Other                 |                        |

### Additional Information

|                                                                    |
|--------------------------------------------------------------------|
| 19) Information on local government's role or interest (optional): |
|--------------------------------------------------------------------|



## Other Consulting Parties

### Other Consulting Parties Contacted

|                                                                                  |                                                                     |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1) Has any other agency been contacted and invited to become a consulting party? | ( <input checked="" type="checkbox"/> ) <u>Yes</u> (    ) <u>No</u> |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------|

### Consulting Party

|                                                                |
|----------------------------------------------------------------|
| 2) FCC Registration Number (FRN):                              |
| 3) Name: <b>Sandwich Historical Society &amp; Glass Museum</b> |

### Contact Name

|                                     |                 |                               |            |
|-------------------------------------|-----------------|-------------------------------|------------|
| 4) First Name: <b>Katharine</b>     | 5) MI: <b>H</b> | 6) Last Name: <b>Campbell</b> | 7) Suffix: |
| 8) Title: <b>Executive Director</b> |                 |                               |            |

### Contact Information

|                                                                                                                         |         |                      |                            |
|-------------------------------------------------------------------------------------------------------------------------|---------|----------------------|----------------------------|
| 9) P.O. Box: <b>P.O. Box 103</b>                                                                                        | And /Or | 10) Street Address:  |                            |
| 11) City: <b>Sandwich</b>                                                                                               |         | 12) State: <b>MA</b> | 13) Zip Code: <b>02563</b> |
| 14) Telephone Number: <b>(508)888-0251</b>                                                                              |         | 15) Fax Number:      |                            |
| 16) E-mail Address:                                                                                                     |         |                      |                            |
| 17) Preferred means of communication:<br>(    ) E-mail<br>( <input checked="" type="checkbox"/> ) Letter<br>(    ) Both |         |                      |                            |

### Dates & Response

|                                                  |                        |
|--------------------------------------------------|------------------------|
| 18) Date Contacted <b>07/20/2016</b>             | 19) Date Replied _____ |
| ( <input checked="" type="checkbox"/> ) No Reply |                        |
| (    ) Replied/No Interest                       |                        |
| (    ) Replied/Have Interest                     |                        |
| (    ) Replied/Other                             |                        |

### Additional Information

|                                                                           |
|---------------------------------------------------------------------------|
| 20) Information on other consulting parties' role or interest (optional): |
|---------------------------------------------------------------------------|



## Designation of SHPO/THPO

1) Designate the Lead State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) based on the location of the tower.

### SHPO/THPO

Name: **Massachusetts Historical Commission**

2) You may also designate up to three additional SHPOs/THPOs if the APEs include multiple states. If the APEs include other countries, enter the name of the National Historic Preservation Agency and any state and provincial Historic Preservation Agency.

SHPO/THPO Name: \_\_\_\_\_

SHPO/THPO Name: \_\_\_\_\_

SHPO/THPO Name: \_\_\_\_\_

### Certification

I certify that all representations on this FCC Form 620 Submission Packet and the accompanying attachments are true, correct, and complete.

#### Party Authorized to Sign

First Name: **Laura**

MI: **L**

Last Name: **Mancuso**

Suffix:

Signature: **Laura L Mancuso**

Date: **10/07/2016**

**FAILURE TO SIGN THIS APPLICATION MAY RESULT IN DISMISSAL OF THE APPLICATION AND FORFEITURE OF ANY FEES PAID.**

**WILLFUL FALSE STATEMENTS MADE ON THIS FORM OR ANY ATTACHMENTS ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. Code, Title 18, Section 1001) AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).**



**Attachments :**

| Type                                   | Description                                        | Date Entered |
|----------------------------------------|----------------------------------------------------|--------------|
| Resumes/Vitae                          | <a href="#">Resume Vitae</a>                       | 10/06/2016   |
| Resumes/Vitae                          | <a href="#">Laura Mancuso Resume</a>               | 10/06/2016   |
| Resumes/Vitae                          | <a href="#">Vanessa Sullivan Resume</a>            | 10/06/2016   |
| Map Documents                          | <a href="#">Map Documents</a>                      | 10/06/2016   |
| Area of Potential Effects              | <a href="#">Area of Potential Effects</a>          | 10/06/2016   |
| Tribal/NHO Involvement                 | <a href="#">NOO</a>                                | 10/06/2016   |
| Local Government Involvement           | <a href="#">ITC Letter - Historical Commission</a> | 10/06/2016   |
| Public Involvement                     | <a href="#">PN Tearsheet</a>                       | 10/06/2016   |
| Public Involvement                     | <a href="#">ITC Letter - Historical Society</a>    | 10/06/2016   |
| Historic Properties for Visual Effects | <a href="#">Visual Effects</a>                     | 10/06/2016   |
| Historic Properties for Direct Effects | <a href="#">Direct Effects</a>                     | 10/06/2016   |
| Additional Site Information            | <a href="#">Site Drawings</a>                      | 10/06/2016   |
| Other                                  | <a href="#">Cover Letter</a>                       | 10/06/2016   |
| Historic Properties for Direct Effects | <a href="#">Arch Report</a>                        | 10/06/2016   |
| Additional Site Information            | <a href="#">Additional Site Information</a>        | 10/07/2016   |
| Photographs                            | <a href="#">Photographs</a>                        | 10/07/2016   |



## RESUMES/VITAE

The below listed professionals contributed to this report and meet the Secretary of the Interior's Professional Qualification Standards in their respective fields:

| NAME                | TITLE                           | SECRETARY OF THE INTERIOR'S<br>PROFESSIONAL QUALIFICATIONS<br>STANDARDS AREA OF EXPERTISE |
|---------------------|---------------------------------|-------------------------------------------------------------------------------------------|
| Laura L. Mancuso    | Director, Cultural Resources    | Architectural Historian                                                                   |
| Vanessa P. Sullivan | Project Manager – Archaeologist | Archaeologist                                                                             |



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706



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## Laura L. Mancuso

**Education:** Master Historic Preservation, University of Maryland, College Park  
B.A., Humanities, Providence College

**Years of Experience:** 10+ years

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### Summary of Professional Experience

Ms. Mancuso holds a Master's Degree in Historic Preservation and has more than 10 years of experience as an Architectural Historian/Historic Preservation Professional.

As Deputy State Historic Preservation Officer and the Construction Grant Coordinator for the State of Connecticut, Ms. Mancuso provided technical assistance on hundreds of restoration and Section 106 projects and managed a portfolio of over \$5 million in grants. In this capacity she developed multiple grant programs and guidelines, applications, and contracts. She assisted grantees and potential grantees with project planning and design to ensure projects met the Secretary of the Interior's Standards for the Treatment of Historic Properties. Ms. Mancuso developed and reviewed hundreds of determinations of eligibility for properties for submitted for listing in the National Register of Historic Places. She hosted and attended numerous meetings and training sessions to improve the public's understanding of historic preservation policies and programs. Ms. Mancuso also attended annual National Conference of State Historic Preservation Officers (NCSHPO) meetings and developed relationships with many of the State Historic Preservation Officers.

In addition, Ms. Mancuso has over 5 years of experience in the telecommunications field, providing environmental and regulatory due diligence under the National Historic Preservation Act and the National Environmental Policy Act. As an Architectural Historian, she completed hundreds of Section 106 and NEPA reports throughout the United States. Ms. Mancuso has provided quality control, performed building analyses and historical research, conducted SHPO file reviews, managed portfolios, and acted as a client manager. In consultation with carriers, SHPOs, and stakeholders, Ms. Mancuso has facilitated redesigns of installations and developed mitigation strategies to avoid potential adverse effects to historic resources.



---

## Vanessa P. Sullivan, MA, RPA

|                                |                                                                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Title:</b>                  | Project Manager—Archaeologist                                                                                                       |
| <b>Education:</b>              | Master of Archaeology, Flinders University (Adelaide, SA, AUS)<br>B.A. Anthropology/Archaeology, Mercyhurst College (Erie, PA, USA) |
| <b>Licenses/Registrations:</b> | Register of Professional Archaeologists (RPA)                                                                                       |
| <b>Years of Experience:</b>    | 5+                                                                                                                                  |

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### Summary of Professional Experience

Ms. Sullivan has over 5 years of professional experience in environmental consulting, especially as it pertains to the fields of cultural heritage management and archaeology. She has assisted clients in navigating the environmental review process to ensure compliance with Federal Communications Commission (FCC) requirements under the National Environmental Policy Act (NEPA). As a Project Manager, Ms. Sullivan has the responsibility of preparing the scope of work for cultural resources projects throughout the United States. All projects are conducted per FCC and State Historic Preservation Office (SHPO) guidelines. She also supervises site file reviews, field surveys, submission of archaeological reports, and submission of FCC Form 620 and 621 for Section 106 Review on telecommunications projects. Furthermore, Ms. Sullivan conveys all necessary information to the parties involved on projects involving the installation of telecommunications facilities.

As an Archaeologist, Ms. Sullivan meets the standards set forth by the United States Secretary of the Interior (Code of Federal Regulations, 36 CFR Part 61). She is responsible for completing file reviews, archival searches, documentary analyses, and archaeological survey work for the telecom industry. Her fieldwork focus is primarily in the Northeast; however, she has completed projects throughout the United States to the standards of relevant SHPOs in the respective regions in accordance with FCC guidelines. Additional duties include assisting in the completion of FCC NEPA Assessments and Phase I Environmental Site Assessments for various telecommunications facilities.

Prior to her work at CBRE, Ms. Sullivan focused on Indigenous Archaeology in both the United States and Australia. In 2015 she received a Master of Archaeology degree from Flinders University (Adelaide, SA, AUS), where she researched conflict during the European settlement period in South Australia. In addition, she has completed research on North American pre-contact ceramics and textiles, submerged archaeological sites, cultural heritage management UNESCO legislation, GIS systems, and non-invasive methods utilizing archaeological-geophysics.



## **ASSESSMENT AND CONSULTING SERVICES**

### **Relevant Work Experience**

**IVI Telecom Services, a CBRE Company**, White Plains, NY, USA

June 2015—Present

**Project Manager—Archaeologist:** Assists clients in navigating the environmental review process to ensure compliance with Federal Communications Commission (FCC) requirements under the National Environmental Policy Act (NEPA). As a Project Manager—Archaeologist, responsibilities include: preparing scope of work for historic consultation projects; supervising and completing site file reviews, field surveys, submission of archaeological reports, and submission of FCC Form 620 and 621 for Section 106 Review on telecommunications projects to SHPO; and, completion of FCC NEPA Assessments and Phase I Environmental Site Assessments for various telecommunications facilities.

**EBI Consulting**, Burlington, MA, USA

February—December 2013

**Project Archaeologist:** Assisted clients in navigating the environmental review process to ensure compliance with Federal Communications Commission (FCC) requirements under the National Environmental Policy Act (NEPA). As a Project Archaeologist, responsibilities included completing file reviews, archival searches, documentary analyses, and archaeological evaluations and mitigations for telecom projects.

**EBI Consulting**, Burlington, MA, USA

January 2009—February 2013

**Field Archaeologist/Research Assistant:** Assisted clients in navigating the environmental review process to ensure compliance with Federal Communications Commission (FCC) requirements under the National Environmental Policy Act (NEPA). As a Field Archaeologist/Research Assistant, responsibilities included completing file reviews, archival searches, documentary analyses, and archaeological evaluations and mitigations for telecom projects throughout the United States. Involvement in all aspects of archaeological survey work for the telecom industry and assistance with the State Historic Preservation Office (SHPO) compliance and procedures occurred on a regular basis.

### **Certificates**

- Australasian Institute for Maritime Archaeology (AIMA)/Nautical Archaeology Society (NAS) Certificate in Foreshore Archaeology I
- Australasian Institute for Maritime Archaeology (AIMA)/Nautical Archaeology Society (NAS) Certificate in Foreshore Archaeology II
- The National Association of Underwater Instructors (NAUI) SCUBA Open Water Certification
- Diver's Alert Network (DAN), Asia-Pacific Oxygen First Aid for Dive Accidents Certificate



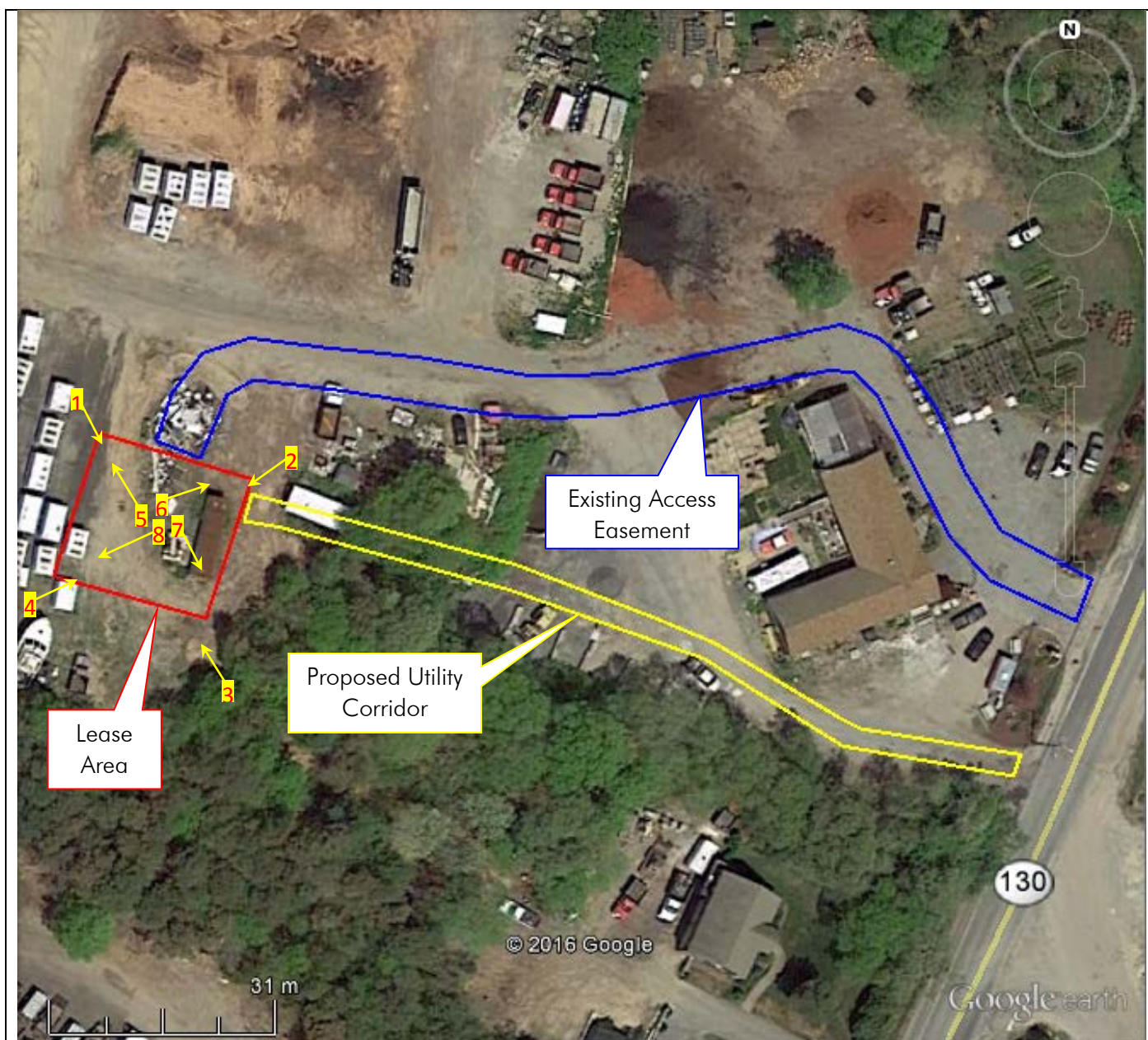
## PHOTOGRAPHS



**MAP A: APE MAP FOR VISUAL EFFECTS AND PHOTO KEY OVERVIEW**

SOURCE: GOOGLE EARTH 2016

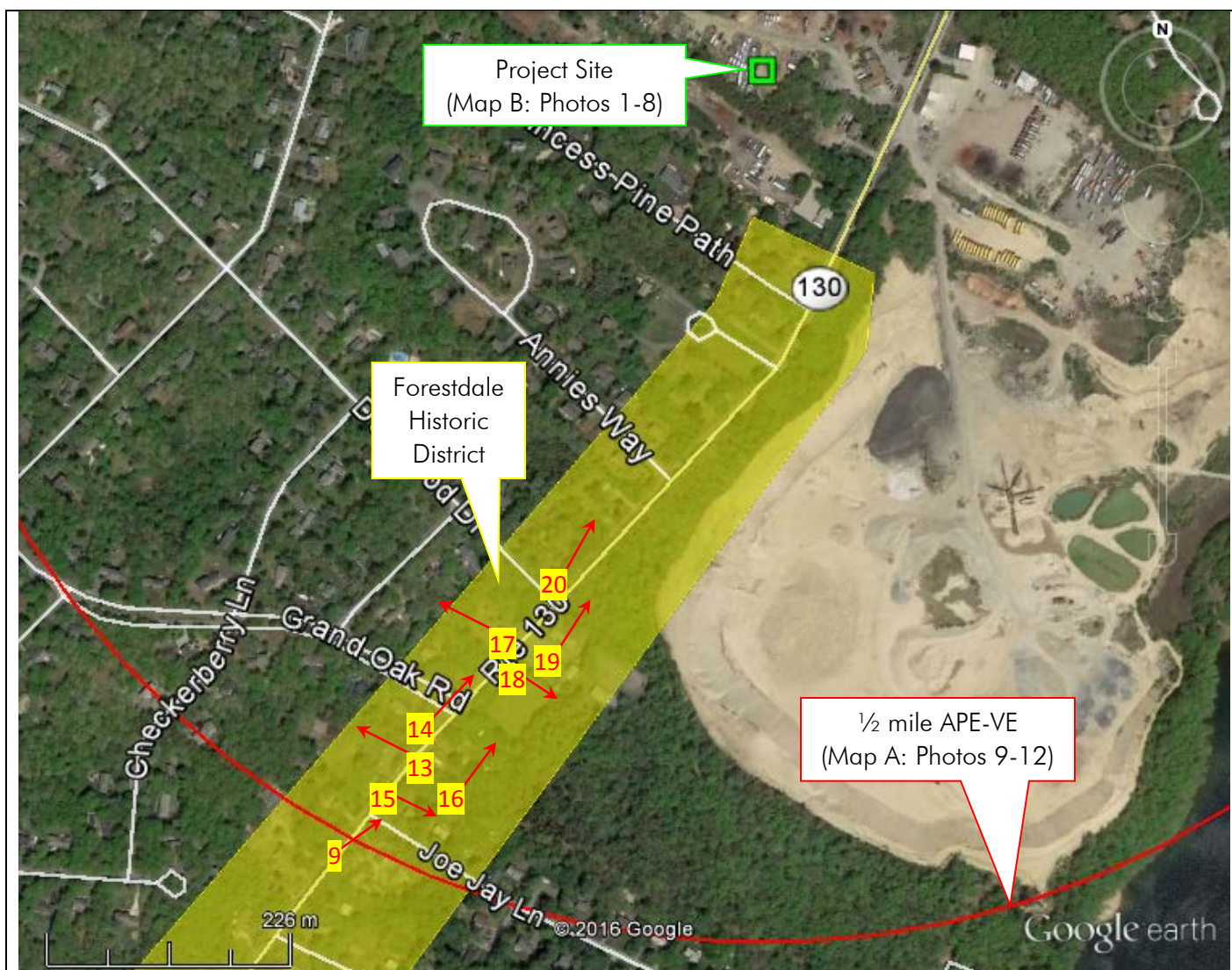




**MAP B: APE MAP FOR DIRECT EFFECTS AND PHOTO KEY OVERVIEW (PHOTOS 1-8)**

SOURCE: GOOGLE EARTH 2016







**MAP C: FORESTDALE HISTORIC DISTRICT PHOTO KEY OVERVIEW (PHOTOS 13-20)**

SOURCE: GOOGLE EARTH 2016



## PHOTOGRAPHS

The following photographs were taken by Vanessa P. Sullivan, M.A., RPA, Project Manager--Archaeologist on July 23, 2016 unless otherwise noted.

|                                                            |                                                                                      |
|------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>1. View looking southeast towards the Project Site.</p> |   |
| <p>2. View looking southwest towards the Project Site.</p> |  |



3. View looking northwest towards the Project Site.



4. View looking northeast towards the Project Site.





5. View looking northwest from the center of the Project Site.



6. View looking northeast from the center of the Project Site.





7. View looking southeast from the center of the Project Site.



8. View looking southwest from the center of the Project Site.





9. View looking north/northeast towards the Project Site, from Joe Jay Lane. Located 0.5 miles from the Subject Property, within the Forestdale Historic District.



10. View looking east towards the Project Site, from Grand Oak Road and Windsong Road. Located 0.5 miles from the Subject Property.





11. View looking south towards the Project Site, from Woodvue Road and Greenville Drive. Located 0.5 miles from the Subject Property.



12. View looking southwest towards the Project Site, from 34 Quaker Meetinghouse Road. Located 0.5 miles from the Subject Property.





13. View facing northwest towards 99 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



14. View looking northeast towards the Project Site from 99 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.





15. View looking southeast towards 100 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.



16. View looking northeast towards the Project Site from 100 Route 130. Located 0.45 miles from the Project Site within the Forestdale Historic District.





17. View looking northwest towards the Forestdale Cemetery. Located 0.35 miles from the Project Site within the Forestdale Historic District.



18. View looking southeast towards the Forestdale Church. Located 0.35 miles from the Project Site within the Forestdale Historic District.





19. View looking northeast towards the Project Site from the Forestdale Cemetery and the Forestdale Church. Located 0.35 miles from the Project Site within the Forestdale Historic District.



20. View looking north/northeast towards the Project Site, from Dogwood Drive. Located 0.32 miles from the Project Site within the Forestdale Historic District.





## ADDITIONAL SITE INFORMATION

The Subject Property is located at 145 Route 130 in Sandwich, Barnstable County, Massachusetts. The proposed lease area currently consists of grassy area that is utilized for storage. The Subject Property is located in a rural neighborhood, consisting of wooded improved with residential, commercial and industrial development.

Eco-Site proposes to construct a new telecommunications facility at the Subject Property. The facility will consist of a 135-foot monopole and utility backboard to be located within a 50-foot by 50-foot fenced compound. A 20-foot wide access easement will emanate off of Route 30 toward the compound. The access easement will utilize an existing drive. Utilities will be routed underground from an existing utility pole toward the compound in a 3-foot wide utility easement.

Please see the attached lease exhibits for your review and information.



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706





T-MOBILE NORTHEAST LLC

T-MOBILE SITE NUMBER: 4HY0602B

T-MOBILE SITE NAME: RUSSO

ECO-SITE ID NUMBER: MA-0049

145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY



Know what's below.  
Call before you dig.

### SITE INFORMATION

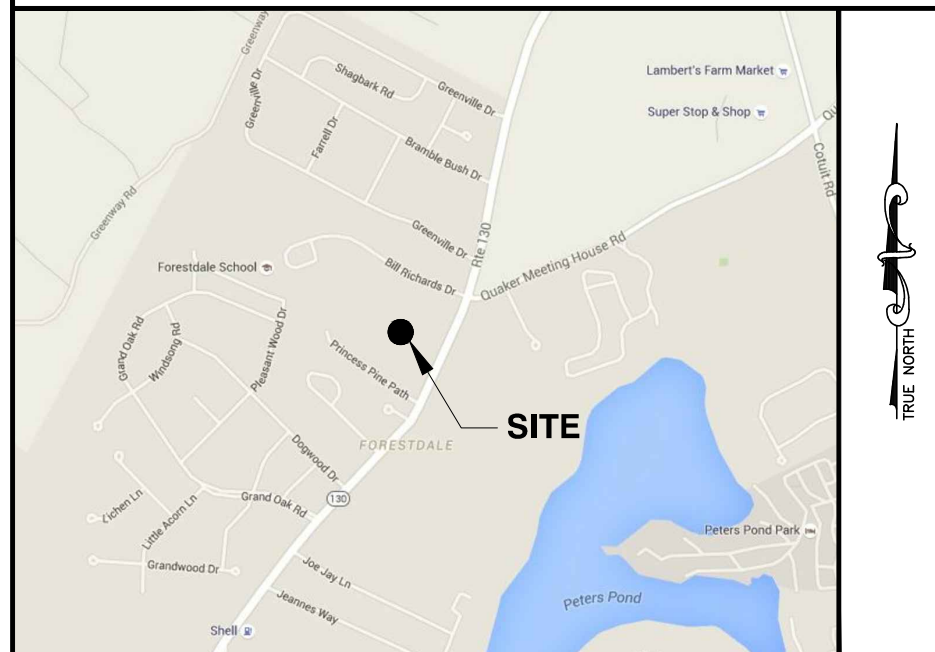
T-MOBILE SITE ID NUMBER: 4HY0602B  
ECO SITE ID NUMBER: MA-0049  
911 SITE ADDRESS: 145 ROUTE 130  
SANDWICH, MA 02644  
LATITUDE (NAD 83): 41.69492°  
LONGITUDE (NAD 83): -70.49946°  
JURISDICTION: BARNSTABLE COUNTY  
ZONING: R2 (RESIDENTIAL 2)  
USE & OCCUPANCY GROUP: U  
CONSTRUCTION TYPE: IIB  
PARCEL ID NUMBER: 17-009  
PARCEL AREA: 17.13± ACRES  
PARCEL OWNER: PJR REALTY TRUST,  
PASQUALE J RUSSO IV & PASQUALE J  
ADDRESS: P.O. BOX 1328  
FORESTDALE, MA 2644  
GROUND ELEVATION: 148.0' (AMSL)  
STRUCTURE TYPE: RAWLAND - MONOPOLE  
STRUCTURE HEIGHT: 135'-0" (AGL)

### PROJECT TEAM

APPLICANT: T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893  
TOWER OWNER: ECO-SITE  
240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
OFFICE: (919) 636-6810  
PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092  
ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

### VICINITY MAP

SCALE: 1" = 2000'



### CODE COMPLIANCE

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

- 2012 INTERNATIONAL BUILDING CODE
- 2012 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECORDIA GR-1275
- ANSI/T 311

### DRAWING INDEX

LE-1 TITLE SHEET  
LE-2 SITE PLAN  
LE-3 COMPOUND PLAN  
LE-4 ELEVATION & ANTENNA PLAN

### DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

### APPROVAL BLOCK

|                        |      |          |                   |                    |
|------------------------|------|----------|-------------------|--------------------|
| PROPERTY OWNER         | DATE | APPROVED | APPROVED AS NOTED | DISAPPROVED/REVISE |
| PROJECT MANAGER        | DATE |          |                   |                    |
| DIRECTOR OF OPERATIONS | DATE |          |                   |                    |

ENGINEER



APPLICANT

T-Mobile  
T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893

TOWER OWNER

Eco-Site  
Urban.Renewal.Wireless.  
240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
(919) 636-6810

SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

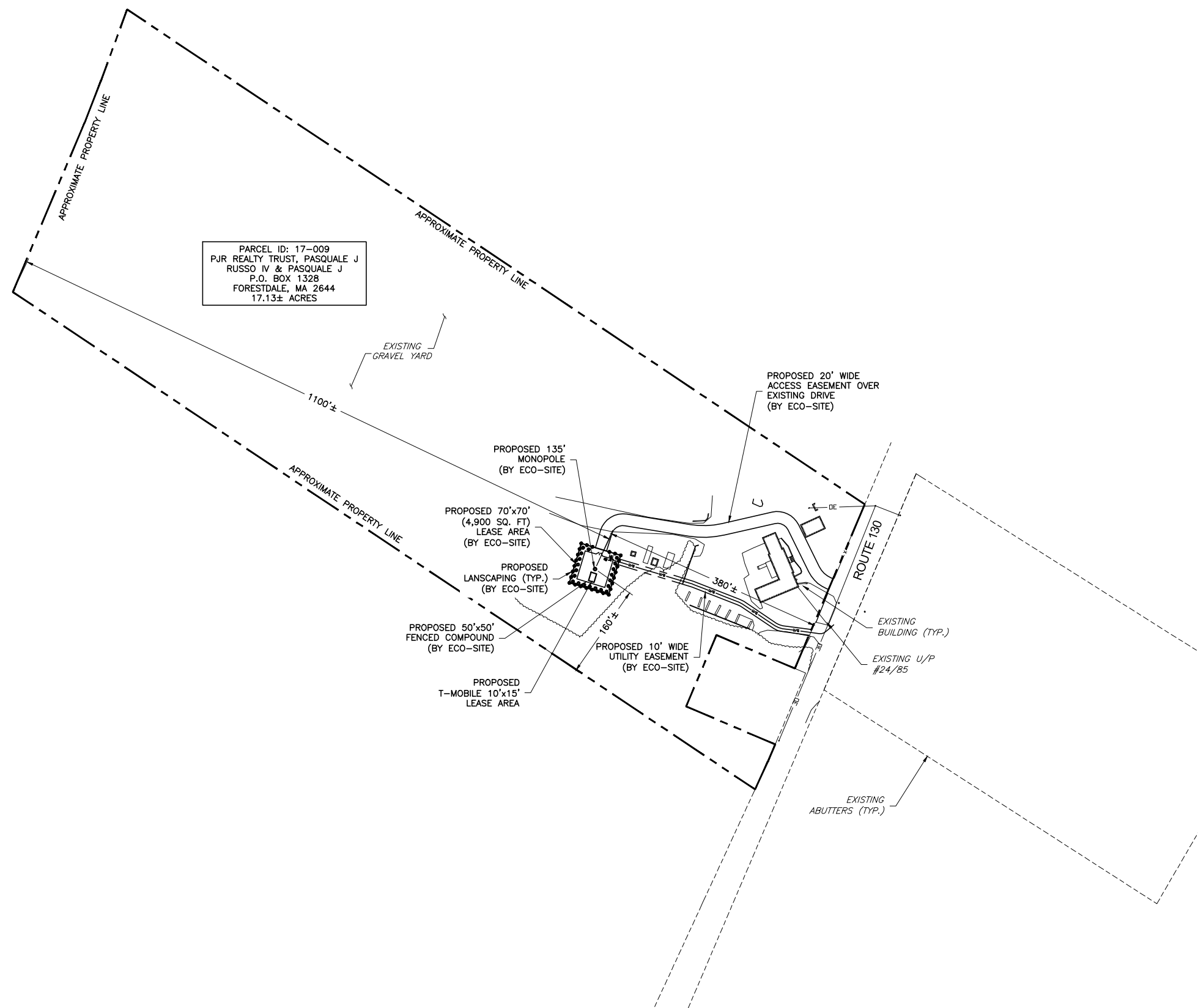
SHEET TITLE

TITLE SHEET

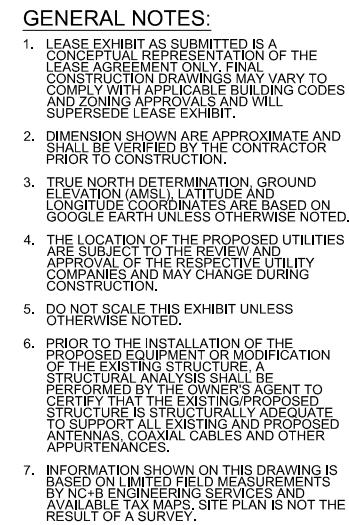
SHEET NUMBER

LE-1

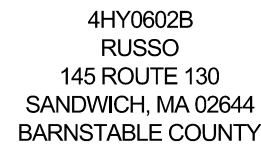




1 SITE PLAN  
LE-2 SCALE: 1" = 200'



SHEET NUMBER

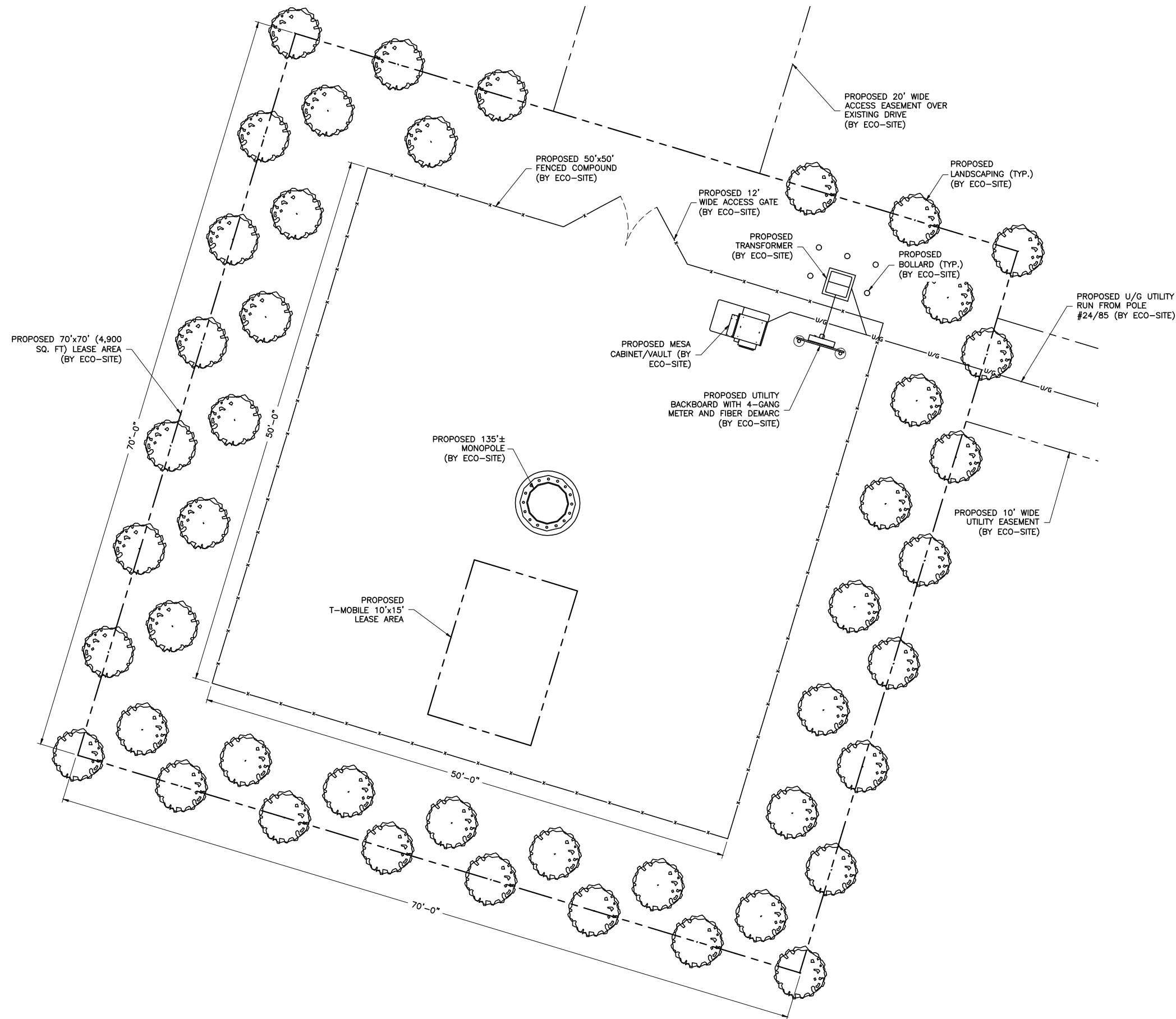


|     |          |                |
|-----|----------|----------------|
|     |          |                |
|     |          |                |
|     |          |                |
|     |          |                |
|     |          |                |
| C   | 09/09/16 | REVISED LE     |
| B   | 05/18/16 | REVISED LE     |
| A   | 05/17/16 | PRELIMINARY LE |
| REV | DATE     | DESCRIPTION    |

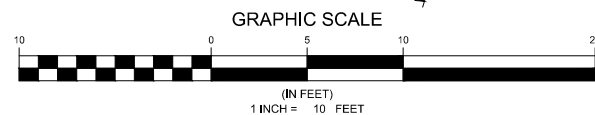
## SITE PLAN

# LE-2





1  
LE-3  
COMPOUND PLAN  
SCALE: 1" = 10'



ENGINEER

**NB+C**  
TOTALLY COMMITTED.

NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 956-8308

APPLICANT

**T-Mobile**

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893

TOWER OWNER

**Eco-Site**  
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240 LEIGH FARM ROAD, SUITE 415  
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SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
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BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
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| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

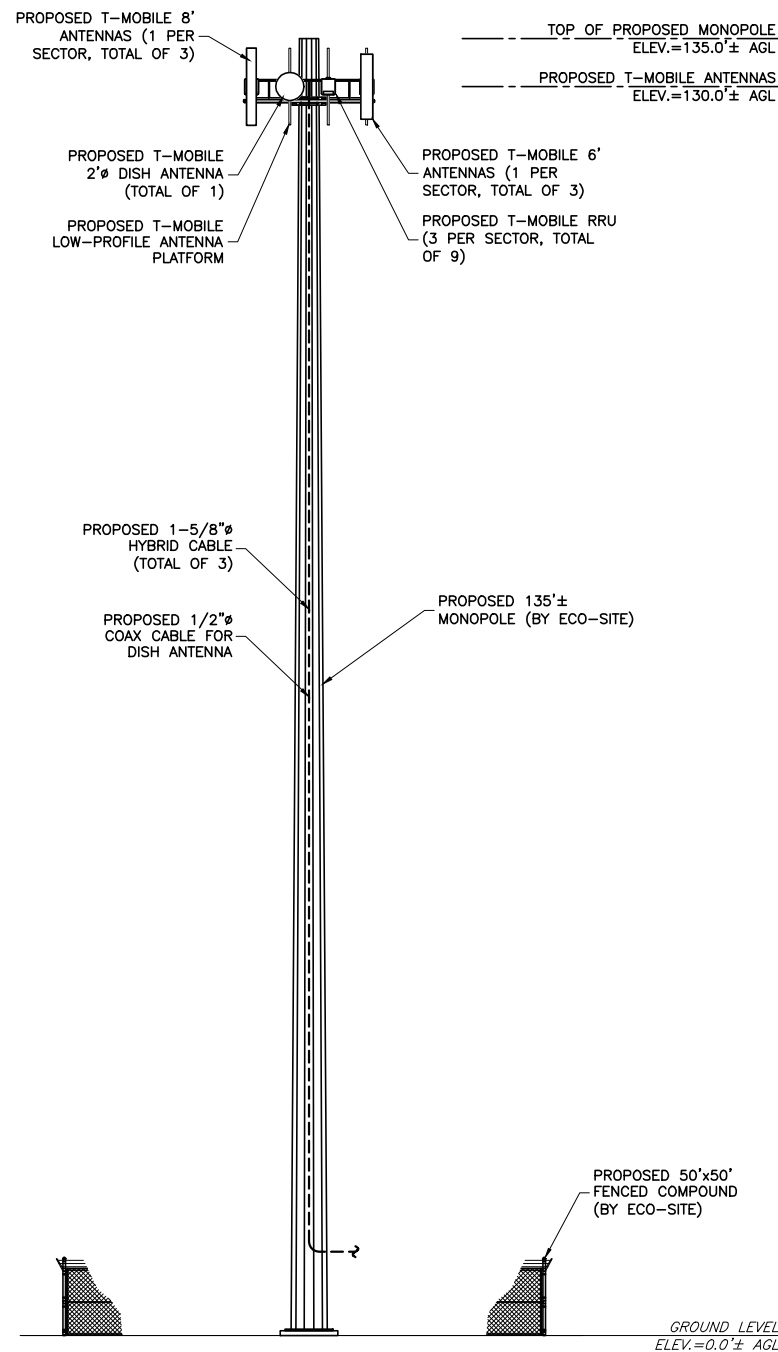
SHEET TITLE

COMPOUND PLAN

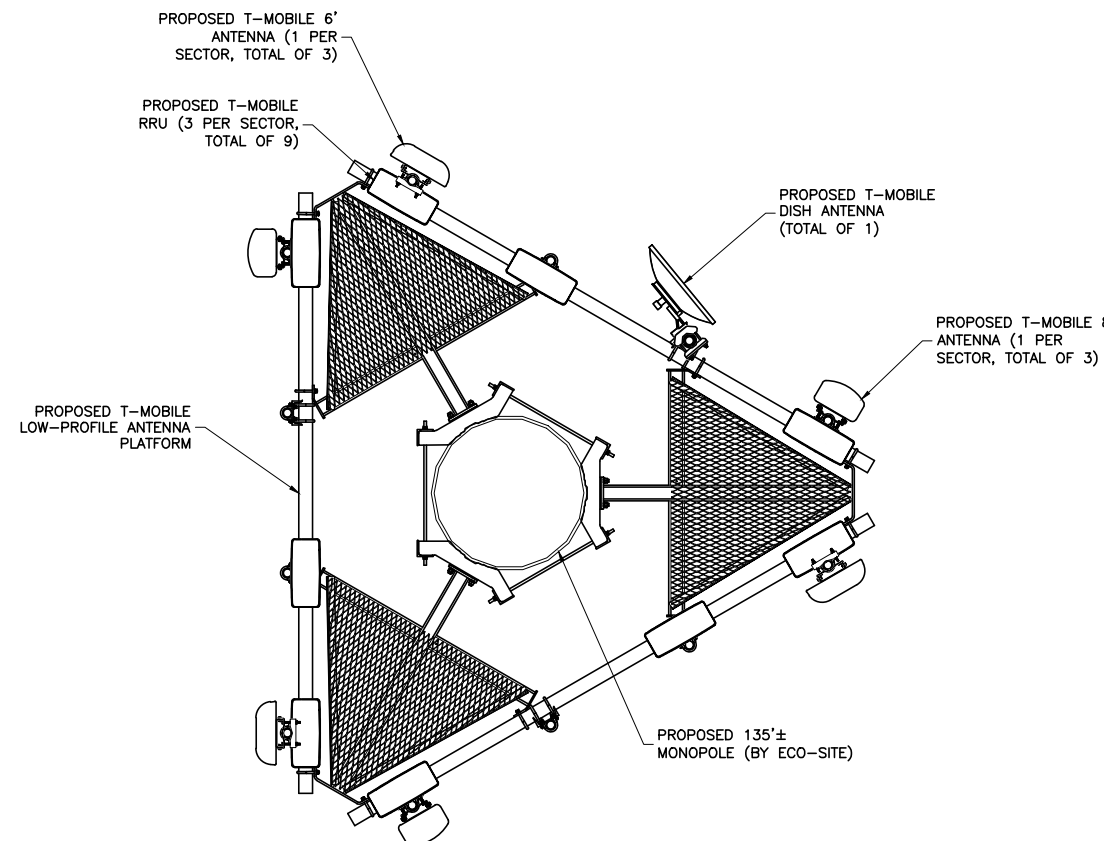
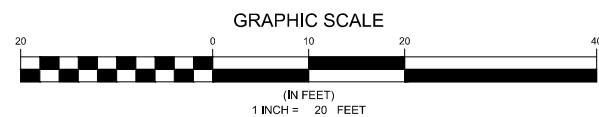
SHEET NUMBER

LE-3

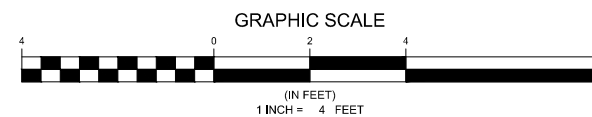




1 ELEVATION  
SCALE: 1" = 20'



2 ANTENNA PLAN  
SCALE: 1/4" = 1'



ENGINEER



APPLICANT



TOWER OWNER



SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

SHEET TITLE

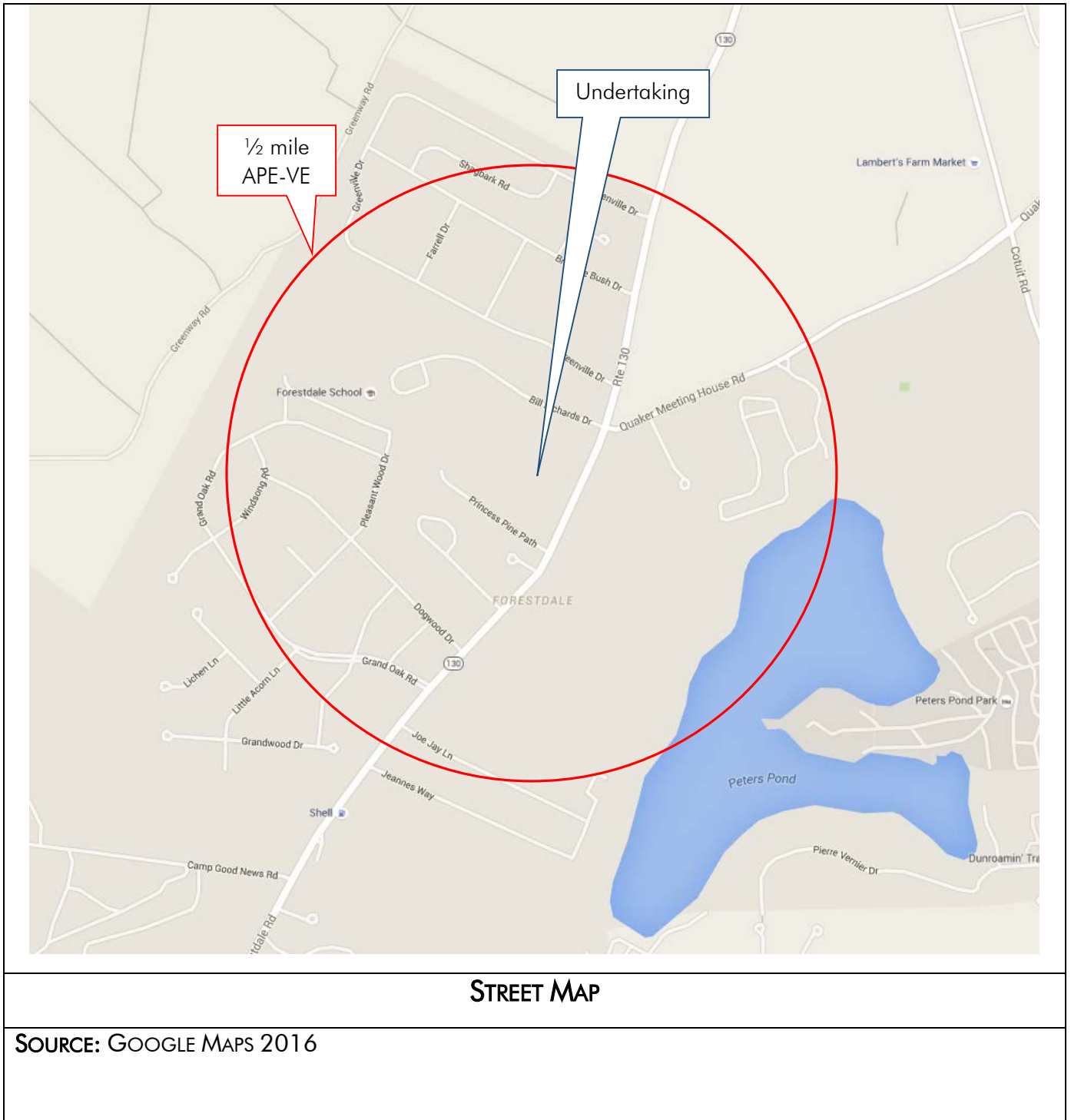
ELEVATION &  
ANTENNA PLAN

SHEET NUMBER

LE-4



## MAP DOCUMENTS





## MAP DOCUMENTS



USGS 7.5 MINUTE QUADRANGLE MAP

SOURCE: USGS (Pocasset, Massachusetts – 1979 and Sandwich, Massachusetts – 1972)

**CBRE**

Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706



## **Gilmore, Talia @ York**

---

**From:** towernotifyinfo@fcc.gov  
**Sent:** Friday, July 22, 2016 3:02 AM  
**To:** Gilmore, Talia @ York  
**Cc:** Jonathan.Jonas@fcc.gov; diane.dupert@fcc.gov  
**Subject:** NOTICE OF ORGANIZATION(S) WHICH WERE SENT PROPOSED TOWER CONSTRUCTION NOTIFICATION INFORMATION - Email ID #4649519

Dear Sir or Madam:

Thank you for using the Federal Communications Commission's (FCC) Tower Construction Notification System (TCNS). The purpose of this electronic mail message is to inform you that the following authorized persons were sent the information you provided through TCNS, which relates to your proposed antenna structure. The information was forwarded by the FCC to authorized TCNS users by electronic mail and/or regular mail (letter).

Persons who have received the information that you provided include leaders or their designees of federally-recognized American Indian Tribes, including Alaska Native Villages (collectively "Tribal Nations"), Native Hawaiian Organizations (NHOs), and State Historic Preservation Officers (SHPOs). For your convenience in identifying the referenced Tribal Nations and NHOs and in making further contacts, the City and State of the Seat of Government for each Tribal Nation and NHO, as well as the designated contact person, is included in the listing below. We note that Tribal Nations may have Section 106 cultural interests in ancestral homelands or other locations that are far removed from their current Seat of Government. Pursuant to the Commission's rules as set forth in the Nationwide Programmatic Agreement for Review of Effects on Historic Properties for Certain Undertakings Approved by the Federal Communications Commission (NPA), all Tribal Nations and NHOs listed below must be afforded a reasonable opportunity to respond to this notification, consistent with the procedures set forth below, unless the proposed construction falls within an exclusion designated by the Tribal Nation or NHO. (NPA, Section IV.F.4).

The information you provided was forwarded to the following Tribal Nations and NHOs. If a Tribal Nation or NHO does not respond within a reasonable time, you should make a reasonable effort at follow-up contact, unless the Tribal Nation or NHO has agreed to different procedures (NPA, Section IV.F.5). In the event a Tribal Nation or NHO does not respond to a follow-up inquiry, or if a substantive or procedural disagreement arises between you and a Tribal Nation or NHO, you must seek guidance from the Commission (NPA, Section IV.G). These procedures are further set forth in the FCC's Declaratory Ruling released on October 6, 2005 (FCC 05-176).

1. Program Manager-Cell Tower Division Sequahna Mars - Narragansett Indian Tribe - (PO Box: 350) Wyoming, RI - sequahna@yahoo.com - 401-419-2959

Details: NITHPO respectfully requests that additional contacts following initial TCNS notification be made via e-mail to Sequahna Mars, at sequahna@yahoo.com.

NITHPO respectfully requests a site map and photographs for all projects that involve ground disturbance.

Please note that NITHPO's current review fees are as follows:

For projects in which there is to be no ground disturbance the review fee is \$500.

For ALL projects which include ground disturbance, the review fee is \$1000.



2. THPO Gary Loonsfoot Jr - Keweenaw Bay Indian Community - 16429 Beartown Road . Baraga, MI - gloonsfoot@kbic-nsn.gov - 906-353-4278

Details: The KBIC THPO reviews all projects within historic homelands for the presence of cultural resources with significance to the Anishinaabe. Your request will go through a preliminary review by our THPO/NAGPRA Technician, the review consists of relevant studies submitted by the applicant regarding cultural resources documentation, in house literature search, database search and GIS search for further information. If any cultural resources are identified during this process, the file will be turned over to the Tribal Historic Preservation Officer in order to make a determination of effects.

Information required in order to complete this process are as follows:

Project Name

Project Location

Physical Address

Latitude and Longitude

State, County, Township, Range, Section quarters Brief Project Description Existing studies for archaeological sites, and cultural resources.

As of June 11, 2014 the KBIC THPO will be charging a fee of \$500.00 per review/collocation unless the review covers more than one section of land in which case the fee is \$500.00 per section. Fees in this process cover the research and other activities required to provide you with a timely response so your project can stay on track. Please submit payment of \$500.00 for each project application submitted, checks should be made payable to KBIC THPO, 16429 Beartown Road, Baraga, Michigan 49908. Any questions can be directed to: Gary Loonsfoot Jr via email gloonsfoot@kbic-nsn.gov, or by phone: 906-353-6623 ext. 4108. (Please note that Minogheezhig Sandman-Shelifoe is no longer a contact within the KBIC-THPO office)

3. THPO and NAGPRA Representative Giiwegiizhigookway Martin Ms - Lac Vieux Desert Band of Lake Superior Chippewa Indians - E23857 Poplar Circle (PO Box: 249) Watersmeet, MI - gmartin@lvdtribal.com - 906-358-0137  
Details: Effective January 2016

ELECTRONIC TRANSFER OF MATERIALS - The Lac Vieux Desert Band of Lake Superior Chippewa (Getegitigaaning Ojibwe Nation) will go paperless.

To enable us to participate fully, Lac Vieux Desert (Getegitigaaning Ojibwe Nation) fee for such services is \$500. The fee must be submitted so that the research can be done. This will be the only item received in our office via regular USPS mail or other appropriate carriers.



At that time we will review and make our determinations with the appropriate information that we have on file with our Tribe pertaining to this area and an email response will go to the designated person at that agency.

All Collocation Projects will be handled in the same manner as new projects UNLESS the Getegitigaaning Ojibwe Nation commented on the original project.

The following information shall be emailed for each project to [gmartin@lvdtribal.com](mailto:gmartin@lvdtribal.com) . The information must contain summary of the proposed ground disturbing activity, legal description of the Area of Potential Effects, (APE), Topo maps identifying the proposed area, and copies of any studies that have already been conducted regarding cultural resources and archaeology in their full format, including reports on archaeological and cultural sites identified to the email address below. All responses and tower project closures will be emailed back to the appropriate contact person for your agency.

Should you have any questions, please feel free to contact me at 906-358-0137.

Miigwetch,

giiwegiizhigookway Martin, THPO

Fee can be sent along with the requested information to:

Make Check Payable to:

Getegitigaaning Ojibwe Nation THPO

P.O. 249

Watersmeet, Michigan 49969

Office: 906-358-0137

Fax: 906-358-4850 Email: [gmartin@lvdtribal.com](mailto:gmartin@lvdtribal.com)

4. Senior Cultural Resource Monitor Bettina Washington - Wampanoag Tribe of Gay Head-Aquinnah - 20 Black Brook Road Aquinnah, MA - [bettina@wampanoagtribe.net](mailto:bettina@wampanoagtribe.net) - 508-645-9265

5. THPO Ramona Peters - Mashpee Wampanoag Indian Tribe - 483 Great Neck Road South Mashpee, MA - [106Review@mwtribe.com](mailto:106Review@mwtribe.com) - 508-477-0208

Details: Compliance Review Supervisor, Ramona Peters !! Mashpee Wampanoag Tribe !! Mashpee, MA - electronic mail & regular mail

As of March 5, 2012, The Mashpee Wampanoag Tribe (MWT) is charging an administrative review fee of \$500 per tower. Determinations will be given upon payment of the review fee. Checks should be made payable to Mashpee Wampanoag



Tribe and mailed to: Mashpee Wampanoag Tribe, Tribal Historic Preservation Department 483 Great Neck Road South, Mashpee, MA 02649. Please include the TCNS number on the memo line of the check in order for us to track your project payment. For requests involving multiple towers, a single check in the sum of \$500 per tower is acceptable.

Details: The following additional items should be submitted for each review request: A map showing the exact location of the proposed project, with the GPS coordinates. A copy of the review letter from the State Historic Preservation Office for the state in which the tower is located, with attachments associated with cultural resources to include archaeological assessment/report that includes methodology, findings and field survey results, and project area geomorphology and soils. Please limit submittal of architectural surveys (unless embedded with archaeological information), engineering/construction drawings, and excessive photos. All correspondence shall be conducted via email, with email attachments to; 106Review@mwtribe.com and regular mail.

The Mashpee Wampanoag Tribe considers the Tower Construction Notification System's weekly e-mail to be the first notification that we receive that a tower is proposed to be constructed in an area of our concern. We do not view the TCNS notification as completion of 106 consultation obligations.

Ramona Peters  
Compliance Review Supervisor  
Mashpee Wampanoag Tribe  
Tribal Historic Preservation Office  
483 Great Neck Road South  
Mashpee, MA 02649  
(508) 477-6186  
106Review@mwtribe.com

The information you provided was also forwarded to the following SHPOs in the State in which you propose to construct and neighboring States. The information was provided to these SHPOs as a courtesy for their information and planning. You need make no effort at this time to follow up with any SHPO that does not respond to this notification. Prior to construction, you must provide the SHPO of the State in which you propose to construct (or the Tribal Historic Preservation Officer, if the project will be located on certain Tribal lands), with a Submission Packet pursuant to Section VII.A of the NPA.

6. SHPO Cara Metz - Massachusetts Historical Commission - 220 Morrissey Boulevard Boston, MA - cara.metz@sec.state.ma.us - 617-727-8470

7. Preservation Planner Emily Paulus - NH Division of Historical Resources - 19 Pillsbury Street Concord, NH - Emily.Paulus@dcr.nh.gov - 603-271-6628

8. SHPO Frederick C Williamson - Rhode Island Historic Preservation & Heritage Comm - Old State House 150 Benefit St Providence, RI - - 401-222-2678



9. Deputy SHPO Edward F Sanderson - Rhode Island Historic Preservation & Heritage Comm - Old State House  
150 Benefit St Providence, RI - rgreenwood@preservation.ri.gov - 401-222-4134

10. Director Eric Gilbertson - Vermont Division for Historic Preservation - National Life Building Drawer 20  
Montpelier, VT - ergilbertson@dca.state.vt.us - 802-828-3043

"Exclusions" above set forth language provided by the Tribal Nation or SHPO. These exclusions may indicate types of PTC wayside pole notifications that the Tribal Nation or SHPO does not wish to review. TCNS automatically forwards all notifications to all Tribal Nations and SHPOs that have an expressed interest in the geographic area of a proposal. However, if a proposal falls within a designated exclusion, you need not expect any response and need not pursue any additional process with that Tribal Nation or SHPO. Exclusions may also set forth policies or procedures of a particular Tribal Nation or SHPO (for example, types of information that a Tribal Nation routinely requests, or a policy that no response within 30 days indicates no interest in participating in pre-construction review).

Please be advised that the FCC cannot guarantee that the contact(s) listed above opened and reviewed an electronic or regular mail notification. If you learn any of the above contact information is no longer valid, please contact the FCC. The following information relating to the proposed tower was forwarded to the person(s) listed above:

Notification Received: 07/19/2016  
Notification ID: 141157  
Tower Owner Individual or Entity Name: Eco-Site  
Consultant Name: Talia C Gilmore  
Street Address: 2909 N Sherman Street  
City: York  
State: PENNSYLVANIA  
Zip Code: 17406  
Phone: 717-601-1144  
Email: Talia.Gilmore@cbre.com

Structure Type: MTOWER - Monopole  
Latitude: 41 deg 41 min 41.8 sec N  
Longitude: 70 deg 29 min 57.7 sec W  
Location Description: 145 Route 130  
City: Sandwich  
State: MASSACHUSETTS  
County: BARNSTABLE  
Detailed Description of Project: 4HY0602/MA-0049 - proposed construction of a new telecommunications monopole tower and compound  
Ground Elevation: 45.8 meters  
Support Structure: 41.1 meters above ground level  
Overall Structure: 41.1 meters above ground level  
Overall Height AMSL: 86.9 meters above mean sea level



If you have any questions or comments regarding this notice, please contact the FCC using the electronic mail form located on the FCC's website at:

[https://urldefense.proofpoint.com/v2/url?u=http-3A\\_\\_wireless.fcc.gov\\_outreach\\_notification\\_contact-2Dfcc.html&d=CwIFaQ&c=jozbAXBGpZCeJmn-Q9SThA&r=aDBR5\\_Uw1oREWzSRreHfnliAx1xRIElJOs4nxsFnRcM&m=x8DrwCYXjo-va4\\_N0fJPObTXR75znI\\_5zPi6vdRImDU&s=0obOf5tDVP3SFeyCayJMIjaicRLF-E\\_XFkQFmGJ2oBE&e=](https://urldefense.proofpoint.com/v2/url?u=http-3A__wireless.fcc.gov_outreach_notification_contact-2Dfcc.html&d=CwIFaQ&c=jozbAXBGpZCeJmn-Q9SThA&r=aDBR5_Uw1oREWzSRreHfnliAx1xRIElJOs4nxsFnRcM&m=x8DrwCYXjo-va4_N0fJPObTXR75znI_5zPi6vdRImDU&s=0obOf5tDVP3SFeyCayJMIjaicRLF-E_XFkQFmGJ2oBE&e=) .

You may also call the FCC Support Center at (877) 480-3201 (TTY 717-338-2824). Hours are from 8 a.m. to 7:00 p.m. Eastern Time, Monday through Friday (except Federal holidays). To provide quality service and ensure security, all telephone calls are recorded.

Thank you,  
Federal Communications Commission



## AREA OF POTENTIAL EFFECTS

### AREA OF DIRECT EFFECTS

The APE for direct effects (APE-DE) is limited to the area of potential ground disturbance and any property, or any portion thereof that will be physically altered or destroyed by the project.

Vanessa P. Sullivan, Project Manager-Archaeologist, completed a field survey of the property on July 23, 2016 and determined the APE-DE is limited to the proposed 50-foot by 50-foot fenced compound, the 20-foot wide access easement, and the 3-foot wide utility easement.

### AREA OF VISUAL EFFECTS

The APE for visual effects (APE-VE) is the geographic area in which the Undertaking has the potential to introduce visual elements that diminish or alter the setting, including the landscape, where the setting is a character-defining feature of a Historic Property that makes it eligible for listing on the National Register.

Per Section V.C.4 of the National Programmatic Agreement, the APE-VE for this project is limited to:

|                                     |                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | 1/2 mile from the tower site if the proposed tower is 200 feet or less in overall height                                                                       |
| <input type="checkbox"/>            | 3/4 of a mile from the tower sites if the proposed tower is more than 200 but no more than 400 feet in overall height                                          |
| <input type="checkbox"/>            | 1 1/2 miles from the proposed tower site if the proposed tower is more than 400 feet in overall height                                                         |
| <input type="checkbox"/>            | 250 feet from the center of the installation on the non-tower structure based on CONSULTATION WITH SHPO, NEIGHBORHOOD CONTEXT, OBSERVATIONS IN THE FIELD, ETC. |



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706



## HISTORIC PROPERTIES FOR DIRECT EFFECTS

Based on a file review and research completed by Amanda Sabol, Project Manager, on July 15, 2016 on the Massachusetts Cultural Resource Information System (MACRIS):

|                                     |                                                                                                                                                                                                                                                                    |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | it does not appear that the property located at 145 Route 130 is eligible for listing on the National Register of Historic Places                                                                                                                                  |
| <input type="checkbox"/>            | it appears that the property located at 145 Route 130 is eligible for listing on the National Register of Historic Places (see below)                                                                                                                              |
| <input type="checkbox"/>            | the property located at 145 Route 130 is individually listed on the National Register of Historic Places                                                                                                                                                           |
| <input type="checkbox"/>            | the property located at 145 Route 130 is listed on the National Register of Historic Places as a contributing resource to the NAME OF HISTORIC DISTRICT                                                                                                            |
| <input type="checkbox"/>            | the property located at 145 Route 130 is located within the NAME OF HISTORIC DISTRICT, which is listed on the National Register of Historic Places; however according to the nomination form, the property does not contribute to the significance of the district |

## ARCHAEOLOGICAL RESOURCES

Vanessa P. Sullivan, Project Manager-Archaeologist, completed an evaluation of the proposed APE-DE for the presence of below-grade cultural resources. Please refer to the attached report documenting the findings of this project review including a description of the techniques and the methodology used to identify Historic Properties within the APE for direct effects.

This report concludes that archeological resources are not expected to be impacted by the construction of the proposed tower and installation of associated support equipment at the Project Site.



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706



# **PHASE IA ARCHAEOLOGICAL SENSITIVITY ASSESSMENT**

Proposed Wireless Telecommunications Site

**4HY0602A**

**145 Route 130**

**Sandwich, Barnstable County, Massachusetts**

**MA SHPO Project Review Number: TBD**



**Prepared for:**

**Eco-Site**

**c/o NB+C**

**6095 Marshalee Drive; Suite 300**

**Elkridge, MD 21075**

**Prepared by:**

**Vanessa P. Sullivan, MA, RPA**

**CBRE Telecom Advisory Services**

**CBRE**

**October 4, 2016**

**CBRE Project No.: TS60615706**



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## 1.0 MANAGEMENT SUMMARY

### CBRE Management Summary

Involved State and Federal Agencies (DEC, CORPS, FHWA, etc.): FCC

Phase of Survey: Phase IA Archaeological Assessment

Local Information (Figure 1):

Project Name: 4HY0602A  
Client: Eco-Site  
Site Number: TS60615706  
Location: 145 Route 130  
Minor Civil Division: Sandwich  
County: Barnstable  
USGS 7.5 Minute Quadrangle Map: Sandwich MA 1972  
UTM Coordinates: 19 E 375225.1 N 4616990.5  
Latitude: N 41° 41' 41.71"  
Longitude: W 70° 29' 58.06"

Number of Acres Surveyed: The area surveyed included the proposed 70' by 70' (21.3m by 21.3m) lease area, the existing approximately 500' (152.4m) long by approximately 20' (6.1m) wide access easement, and the proposed approximately 380' (115.8m) long by 10' (3.0m) wide utility easement. The number of acres surveyed for this project totaled **0.43-acres (0.17-hectares)**. All portion of the proposed lease area were assessed and surveyed during this archaeological investigation.

Transect Interval: NA

Number & Interval of Shovel Tests: N.A

Number & name(s) of site(s) identified: N/A

Number of buildings/structures/cemeteries within the APE-DE: 0

Number of previously determined NR listed/ eligible buildings/structures/cemeteries/districts in the APE-DE: 0

Total Area to Be Disturbed: 18,700 square-feet (1,737.3 square-meters) or 0.43-acres (0.17-hectares)

Hours Spent on Fieldwork: 1

Date of Pedestrian Survey/Site Visit: July 23, 2016

Principal Investigator: Vanessa P. Sullivan, MA, RPA

Degree: Master of Archaeology (2015)

Institution: Flinders University (Adelaide, SA, AUS)

Years of Experience: 5+

Report Author(s): Vanessa P. Sullivan, MA, RPA, Project Manager-Archaeologist

Report Date: October 4, 2016



## **2.0 SCOPE & LIMITATIONS**

The Federal Communications Commission (FCC) requires licensees and their representatives to consider the effects of their actions on historic properties, in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and the National Environmental Policy Act of 1969 (NEPA) (Federal Communications Commission 1996). Historic properties include Native American or European-American archaeological sites, architectural resources (historic districts and standing structures), objects, and traditional cultural properties. Applicants are required to assess and report all potential environmental effects as part the Section 106 process prior to construction.

This Phase IA archaeological sensitivity assessment was conducted by Vanessa P. Sullivan, MA, RPA, Project Manager-Archaeologist with CBRE Telecom Advisory Services (here within referred to as 'CBRE'), on October 4, 2016 in accordance with Massachusetts Historical Commission (MHC) Guidelines. It is intended to provide information that will enable the MHC to review the subject project. The Principal Investigator meets and/or exceeds the qualifications described in the Secretary of the Interior's Professional Guidelines (Federal Register 48:190:44738-44739) (United States Department of the Interior 1983). Background research was conducted at the MHC on July 20, 2016. Ms. Sullivan received a Master of Archaeology degree from Flinders University (Adelaide, SA, AUS) in 2015 and has over 5 years of experience in the CRM/Archaeology industry throughout the United States.

## **3.0 SITE DESCRIPTION**

### **The Project and Project Area**

The Project Area is located at 145 Route 130 in Sandwich, Barnstable County, Massachusetts (Figures 1 and 2: USGS 1972). *Eco-Site* proposes to install a self-supporting monopole-style telecommunications tower. The Area of Potential Effect-Direct Effects (APE-DE) consists of a 70' by 70' (21.3m by 21.3m) lease area on the property of Russo's Cape Cod Bark and Garden Center. Access to the site will extend along a 20' (6.1m) wide access easement over the existing gravel drive. Utilities will be routed from the proposed monopole along a 10' (3.0m) wide underground easement along the existing gravel drive and areas of gravel fill (See Figures 3, 4, and 6). The APE-DE is immediately bounded on all sides by the parent tract, which is located within filled land, in a sub-urban setting of Norfolk County. All portion of the proposed lease area, as well as a 25' (7.6m) buffer, were assessed and surveyed during this archaeological investigation.

### **Environmental Setting**

According to the *Sandwich, MA* 1972 United States Geological Survey (USGS) 7.5' Topographic Quadrangle, the Subject Property and Project Area are located within filled section of land in Sandwich, Massachusetts. The APE-DE sits on a level terrain at an elevation of 50.0' (15.2m) above mean sea level (USGS 1972; Figure 1). The closest major water resource to the Project Area is Peters Pond, located 0.40 miles (643.7m) southeast of the APE-DE. Despite the relatively level terrain, the APE-DE's distance to water would have likely made the vicinity unattractive for use



and settlement by Native and European groups. In addition, the filled nature of the soils in the APE-DE suggest prior disturbance and a varied sub-surface profile.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS), the dominant soil composition in the vicinity of the proposed lease area is classified as Pitts, sands, and gravel (600) (Figure 5). Parent material of this soil type consists of glaciofluvial deposit—these deposits have been mined for sand and gravel since the 1970s. Pits, sand, and gravel suggest disturbed soils throughout the APE-DE.

The undelaying bedrock within the APE-DE consists of the “Granite, gneiss, and schist, undivided” formation, a part of the Milford-Dedham Zone. The formation contains Plutonic and metamorphic rocks of probable Proterozoic Z age (Zen et al, 1983).

## **4.0 RECORDS REVIEW**

### **Previously Documented Archaeological Sites**

A review of files conducted at the MHC on July 20, 2016 by Vanessa P. Sullivan, MA, RPA indicated that there are one (1) documented archaeological site within a 1-mile (1.6km) radius of the APE-DE: the “Wendy Nelson” site (19-BN-972) is located 1 mile (1.6km) northeast of the Project Site. Identified artifacts included a stemmed point dated to the Late Archaic period or later. A hammer-stone, chipping debris, and polished pebbles were also identified at the site. The site was discovered by an avocational archaeologist in 2014—no additional work has been completed at the site.

The presence of pre-contact sites within a 1 mile (1.6km) radius of the APE-DE indicates the use of the broader vicinity by Indigenous groups, especially in undeveloped woodland settings. The vicinity of the APE-DE has been the subject of prior ground disturbance and does not fit the environmental characteristics found at the “Wendy Nelson” site. Despite the presence of archaeological sites in the greater vicinity, the likelihood of finding in-tact archaeological remains within the APE-DE seems negligible. The identified archaeological sites will not be impacted by the proposed project.

### **Prior Cultural Resource Surveys**

A review of files conducted at the MHC on July 20, 2016 by Vanessa P. Sullivan, MA, RPA indicated that there has been zero (0) cultural resources surveys conducted on or adjacent to the APE-DE.

### **National Register Files**

According to the files of the National Register of Historic Places (NRHP) and the New York SHPO, no National properties are listed on or determined eligible for listing on the NRHP or National Historic Landmark lie within or adjacent to the APE-DE.



### Historic Map Review

A review of historic cartographic evidence for the area surrounding the Project Site suggest that the APE-DE remained undeveloped up until the latter half of the 20th century (Walling 1857; Geo H. Walker & Co. 1880; USGS 1943, Historic Aerials 2016a; Historic Aerials 2016b: Maps 1-5). Sandwich was well established by the 1850s; however, the vicinity of the Project Site is set-back from major roadways that were present at the time and did not see the rapid development that took place within Greenville, directly south of the Subject Property (Walling 1857; Geo H. Walker & Co. 1880; USGS 1943: Maps 1-3). A small clearing appears to be present in the vicinity of the APE-DE by the 1970s; however, no structures are visible (Historic Aerials 2016a: Map 4). By the 1990s the Subject Property has been cleared and heavily disturbed for industrial/agricultural purposes (Historic Aerials 2016b). The late and limited development of the APE-DE suggests that the vicinity was not subject to extensive activity in the contact period. Furthermore, aerial imagery indicates prior ground disturbance within the immediate vicinity of the proposed lease area and APE-DE.

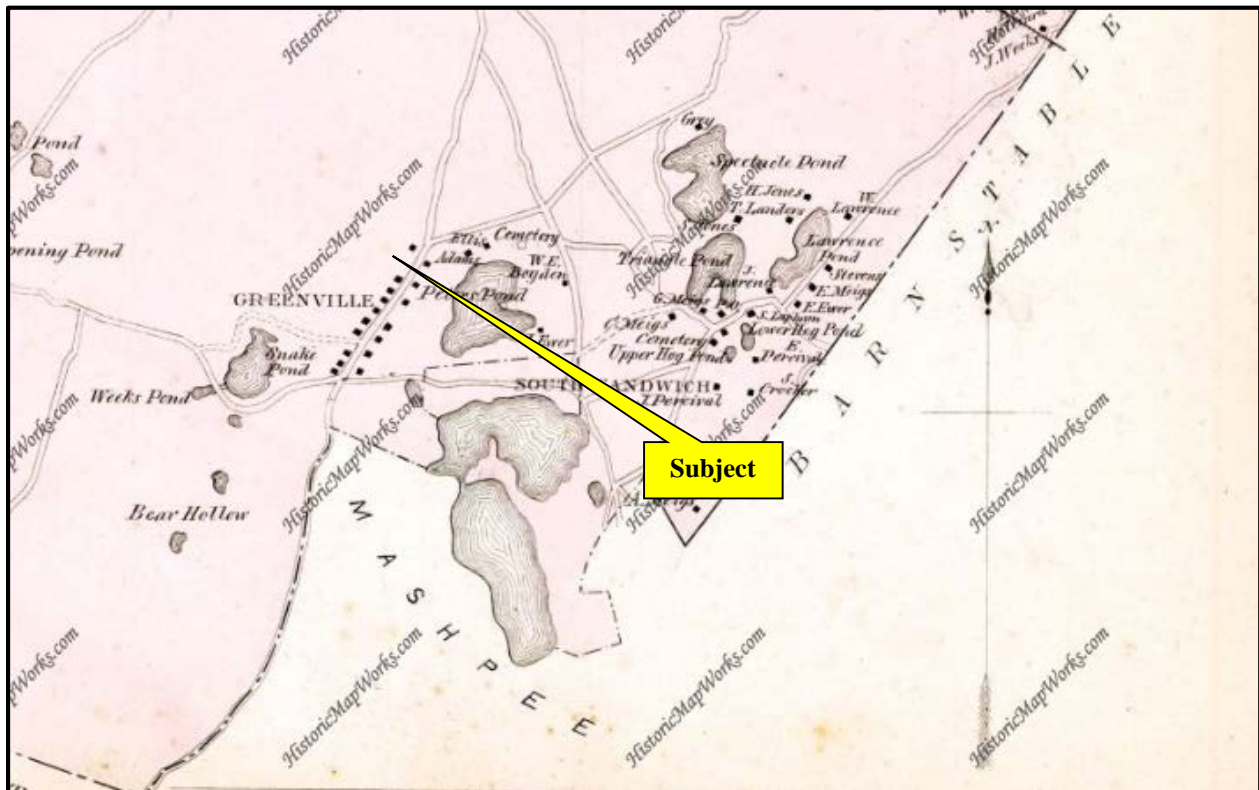


Map 1: Map of the town of Sandwich, Barnstable County, Massachusetts (Walling 1857)



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
145 Route 130  
Sandwich, Massachusetts

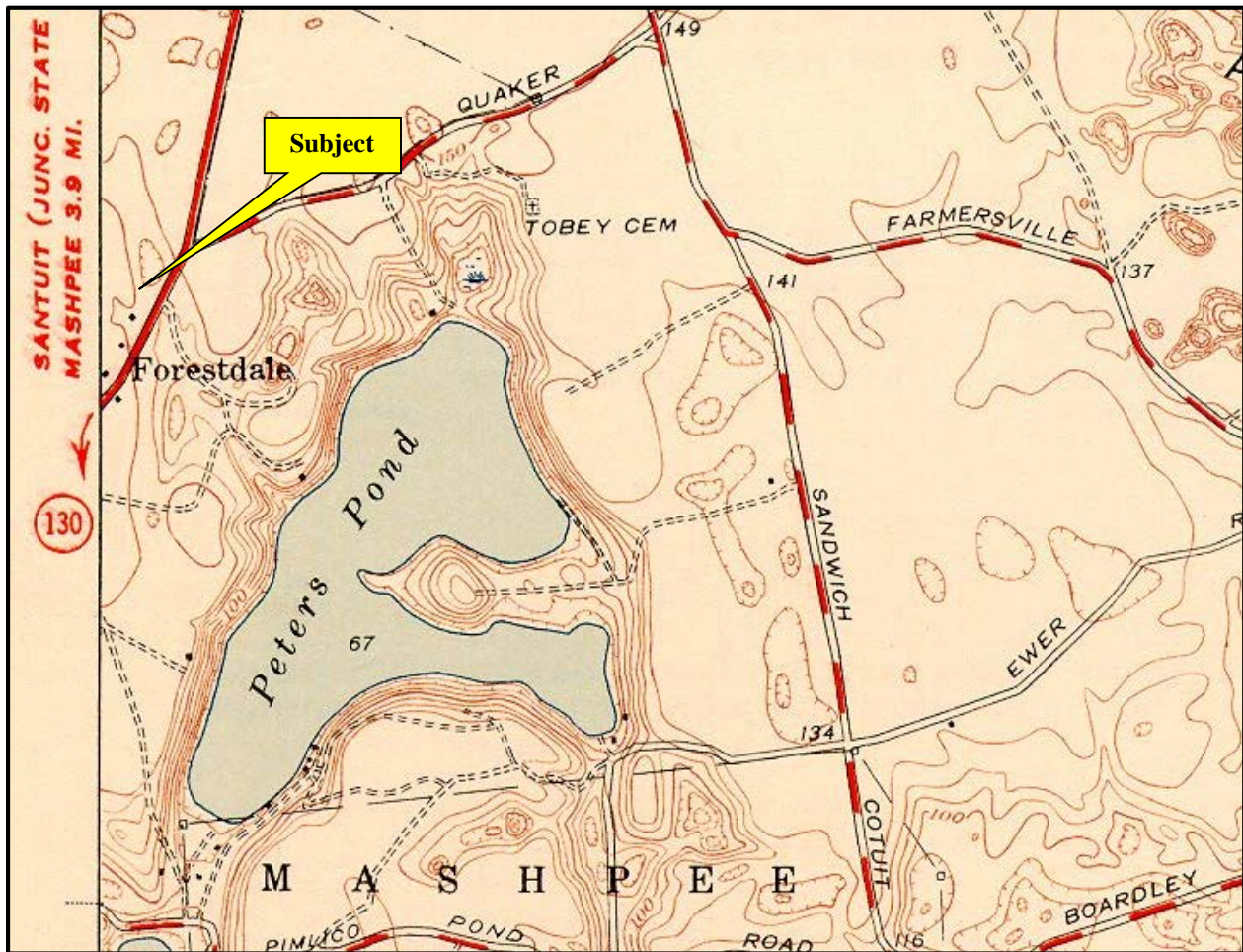


Map 2: Atlas of Barnstable County, Massachusetts: Sandwich Town Plat (Geo H. Walker & Co. 1880)



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

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Sandwich, Massachusetts



Map 1: 1943 Sandwich, MA 7.5 USGS Quadrangle (USGS 1943)



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

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Map 2: 1971 Historic Aerials (Historic Aerials 2016a)



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

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Map 3: 1991 Historic Aerial (Historic Aerials 2016b)



## **5.0 SENSITIVITY ASSESSMENT**

The pre-contact sensitivity of the APE-DE is low. There is one (1) documented pre-contact archaeological sites within 1 mile (1.6km) of the APE-DE. The closest water source is Peters Pond, located 0.40 miles (643.7m) southeast of the APE-DE (USGS 1972: Figure 1). The vicinity of the APE-DE has been subject to extensive ground disturbance, and soils within the vicinity are documented as fill (WSS 2016: Figure 5). Given the less than favorable environmental characteristics of the APE-DE paired with the known prior ground disturbance in the vicinity, pre-contact sensitivity of the APE-DE is considered low.

The sensitivity of the APE-DE for post-contact resources is low. There have been zero (0) documented historic archaeological site within 1 mile (1.6km) of the APE-DE. Historic cartographic evidence indicates that the vicinity of the Project Site remained undeveloped up until the late-20<sup>th</sup> century, as the majority of development prior to the 1970s took place to the south of the Subject Property (Walling 1857; Geo H. Walker & Co. 1880; USGS 1943, Historic Aerials 2016a; Historic Aerials 2016b: Maps 1-5). The late and limited development of the APE-DE suggests that the vicinity was not subject to extensive activity in the contact period. Furthermore, the vicinity of the APE-DE has been subject to extensive ground disturbance, and soils within the vicinity are documented as fill (WSS 2016: Figure 5). For these reasons the potential for identifying archaeological remains within the APE-DE is negligible.

## **6.0 SITE VISIT AND RECOMMENDATIONS**

A site visit of the APE-DE was completed on July 23, 2016. The surface reconnaissance focused on assessing and photographing the general surface conditions found within the project area. The proposed impact area's archeological potential was evaluated based on several factors including proximity to recorded sites, creeks, rivers and wetlands as well as the presence of early historic development.

The APE-DE is located within an undeveloped graveled area, which is used for activities associated with the landscaping company the APE-DE is located on (Figures 1-4; Photos 1-8). No surface anomalies were observed which would indicate historic or prehistoric use of the area. Visual inspection of the surface conditions, observed during the pedestrian survey, identified ground disturbance within the vicinity of the APE-DE. Disturbances included gravel within the proposed lease area and along portion of the access and utility easement, asphalt-pavement along the proposed access and utility easements, and an under-cut hill-side along the proposed utility easement (Figure 3). Ground visibility within the APE-DE was limited to 10-25% due to vegetation cover. In addition, the less than favorable environmental features and lack of historic use in the vicinity of the APE-DE suggest that the potential for the presence of significant cultural resources is low.

In light of available information, it is my professional opinion that the APE-DE for the present project is not sensitive for the presence of significant pre-contact or historic archaeological resources. Accordingly, I recommend that no further archaeological work be conducted in conjunction with the present project.



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

---

4HY0602A  
145 Route 130  
Sandwich, Massachusetts



Vanessa P. Sullivan, MA, RPA  
Project Manager-Archaeologist



## REFERENCES CITED

Federal Communications Commission (FCC)

2005 *Nationwide Programmatic Agreement Regarding the Section 106 National Preservation Act Review Process, Report and Order, FCC 04-222*. Annotated version showing later technical and officially adopted revisions available from the Federal Communications Commission website at <http://wireless.fcc.gov/siting/npa/nap.html>.

Geo H. Walker & Co.

1880 *Atlas of Barnstable County, Massachusetts: Sandwich Town Plat*. Geo H. Walker & Co., Boston, MA.

Google Earth

2016 '145 Route 130, Sandwich, MA'. Accessed on May July 20, 2016 at [http://earth/google.com](http://earth.google.com).

Historic Aerials

2016a '145 Route 130, Sandwich, MA' [1971 Aerial Image Overlay]. Accessed on July 20, 2016 at <http://www.historicaerials.com>.

2016b '145 Route 130, Sandwich, MA' [1991 Aerial Image Overlay]. Accessed on July 20, 2016 at <http://www.historicaerials.com>.

Stutts M.

2014 *National Register properties are located throughout the United States and their associated territories around the globe*. Geospatial Dataset-2210280. National Register of Historic Places. Accessed on December 6, 2015 at <https://irma.nps.gov/App/Reference/Profile/2210280/>.

United States Department of the Interior

1983 *Archaeology and Historic Preservation: Secretary of the Interiors Standards and Guidelines*. Federal Register Part IV, 48(2):44716-44742. Annotated version showing later technical and officially adopted revisions available from the National Park Service's preservation laws, regulations, and standards webpage at [http://cr.nps.gov/local-law/arch\\_stnds\\_0.htm](http://cr.nps.gov/local-law/arch_stnds_0.htm).

United States Geological Survey (USGS)

1943 *Sandwich, Massachusetts 7.5' Topographic Quadrangle*. USGS, Washington, DC.

1972 *Sandwich, Massachusetts 7.5' Topographic Quadrangle*. USGS, Reston, VA.



Walling, W. F.

1857 *Map of the town of Sandwich, Barnstable County, Massachusetts*. W. F. Walling, Boston, MA.

Web Soil Survey (WSS)

2016 *Soil Map—Barnstable County, Massachusetts*. United States Department of Agriculture, Natural Resources Conservation Services (USDA NRCS), Washington, D.C. Accessed on July 20, 2016 at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

Zen, E-an, Richard Goldsmith, N. M. Ratcliffe, Peter Robinson, R. S. Stanley, N. L. hatch, A.F. Shride, E. G. A. Weed, and D. R. Wones

1983 *Bedrock Geologic Map of Massachusetts*. U. S. Geological Survey, Reston, VA.



# PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
145 Route 130  
Sandwich, Massachusetts

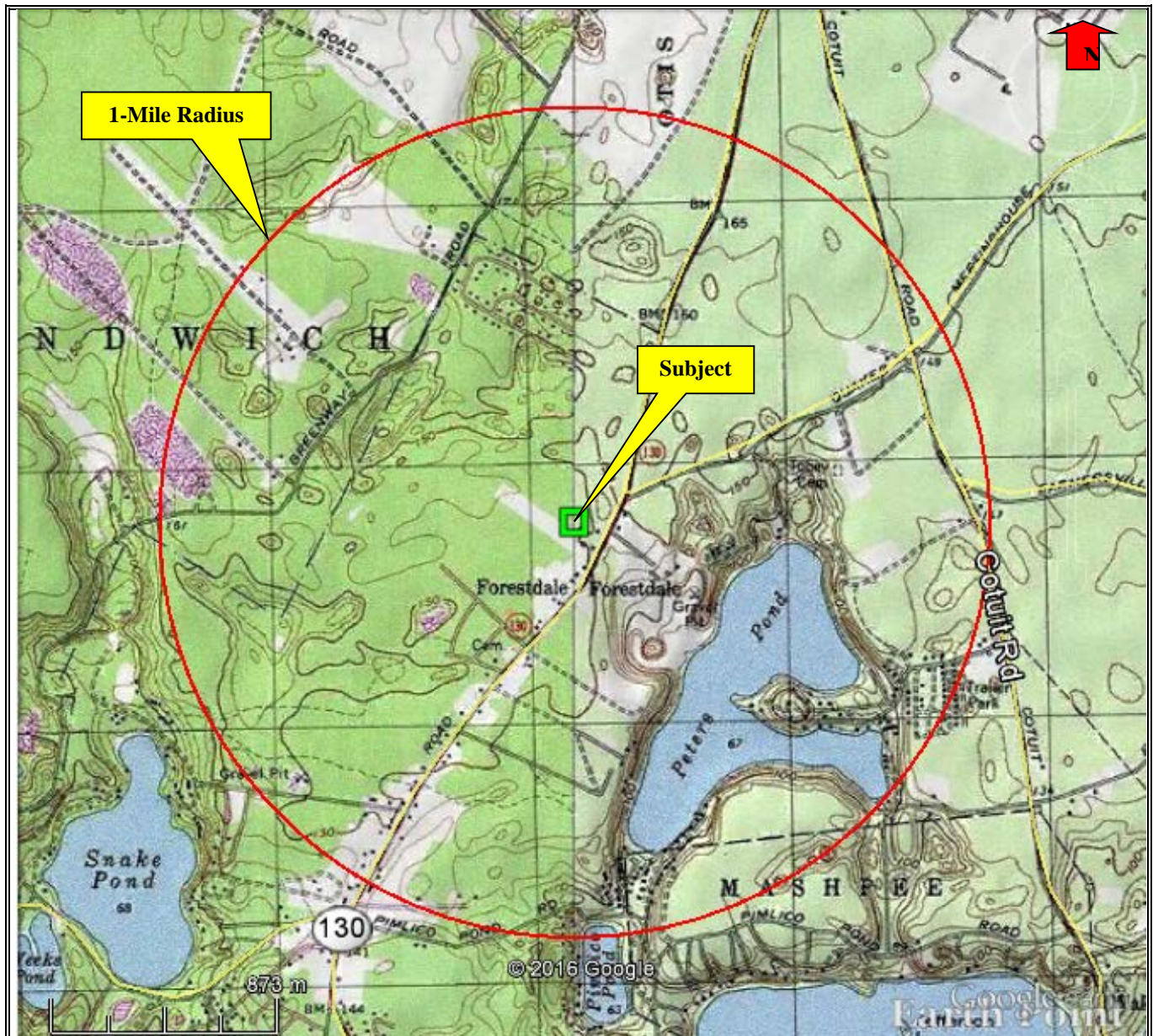


Figure 1: USGS Topographic Map 1972

Source: USGS Quadrangles  
Sandwich, Massachusetts – 1972

Project: 4HY0602A  
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Sandwich, Massachusetts

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## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
145 Route 130  
Sandwich, Massachusetts



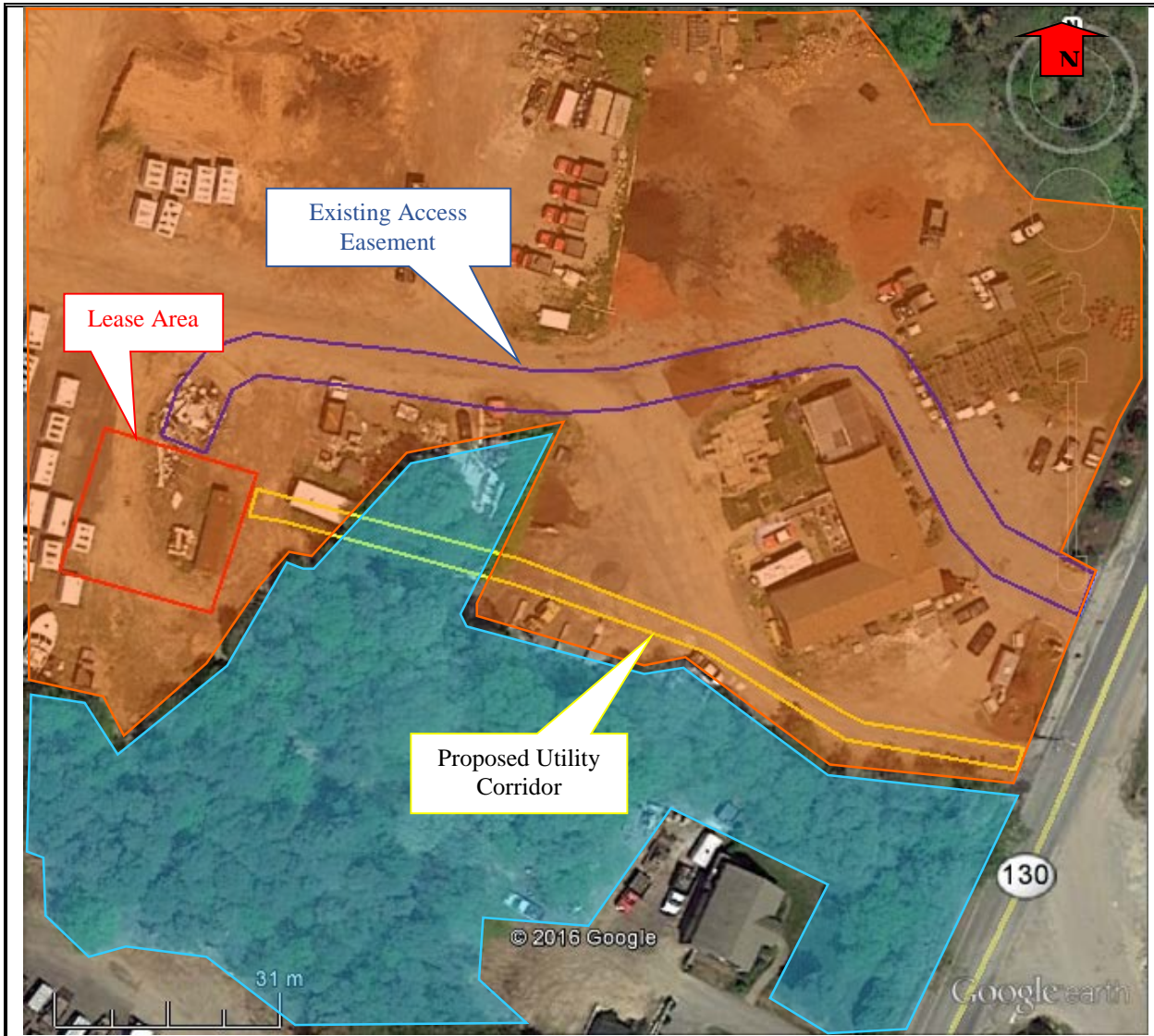
Figure 2: Aerial Photograph 2016

Source: Google Earth 2016

Project: 4HY0602A  
145 Route 130  
Sandwich, Massachusetts

Project Number: TS60615706





**Figure 3: Prior Disturbance and Land Use Map**

|                                                                                                                                                   |                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <p>Source: Google Earth 2015</p> <p>Gravel Fill : <span style="color: blue;">■</span></p> <p>Woodland : <span style="color: orange;">■</span></p> | <p>Project: 4HY0602A<br/>145 Route 130<br/>Sandwich, Massachusetts</p> <p>Project Number: TS60615706</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
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**Figure 4: Photo Location Map**

Source: Google Earth 2016

\*Note : Photo 11 is of the ground cover within the APE-DE and is not denoted on this map.

Project: 4HY0602A  
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## PHOTOGRAPHS

The following photographs were taken by Vanessa P. Sullivan, M.A., RPA, Project Manager-Archaeologist, on July 23, 2016 unless otherwise noted.

|                                                            |                                                                                      |
|------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>1. View looking southeast towards the Project Site.</p> |   |
| <p>2. View looking southwest towards the Project Site.</p> |  |



## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
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3. View looking northwest towards the Project Site.



4. View looking northeast towards the Project Site.





## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

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Sandwich, Massachusetts

5. View looking northwest from the center of the Project Site.



6. View looking northeast from the center of the Project Site.





## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

4HY0602A  
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7. View looking southeast from the center of the Project Site.



8. View looking southwest from the center of the Project Site.





## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

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9. View looking west/ northwest along the proposed utility easement, from Route 130.



10. View looking west/ southwest along the proposed access easement, from the Subject Property's main building.





## PHASE 1A ARCHAEOLOGICAL ASSESSMENT

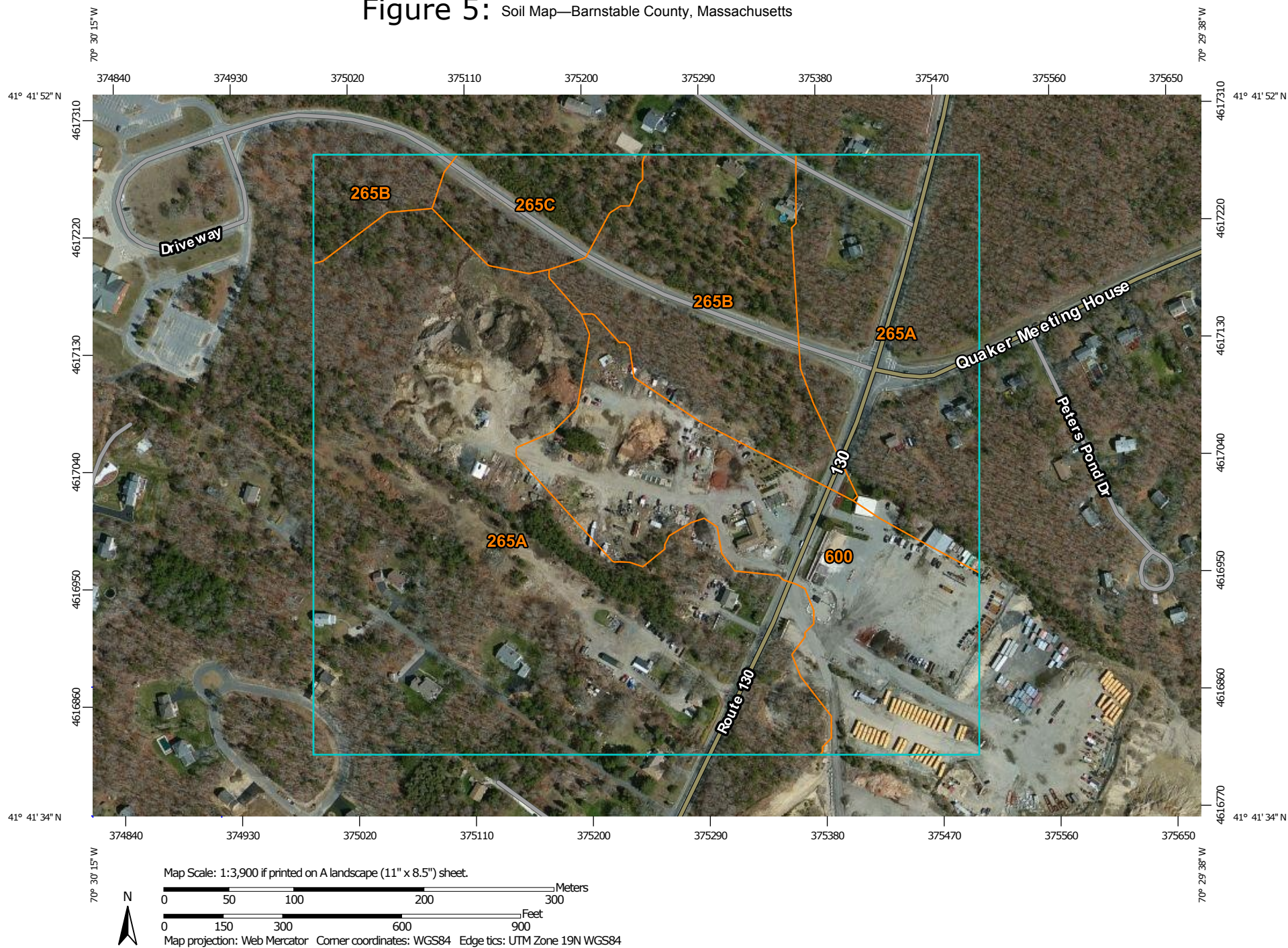
4HY0602A  
145 Route 130  
Sandwich, Massachusetts

11. View of ground cover within the proposed lease area (Note: Gravel).






Figure 5: Soil Map—Barnstable County, Massachusetts





## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Barnstable County, Massachusetts  
Survey Area Data: Version 12, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—Oct 8, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend

| Barnstable County, Massachusetts (MA001) |                                           |              |                |
|------------------------------------------|-------------------------------------------|--------------|----------------|
| Map Unit Symbol                          | Map Unit Name                             | Acres in AOI | Percent of AOI |
| 265A                                     | Enfield silt loam, 0 to 3 percent slopes  | 35.4         | 60.5%          |
| 265B                                     | Enfield silt loam, 3 to 8 percent slopes  | 9.3          | 15.9%          |
| 265C                                     | Enfield silt loam, 8 to 15 percent slopes | 2.7          | 4.6%           |
| 600                                      | Pits, sand and gravel                     | 11.1         | 19.0%          |
| Totals for Area of Interest              |                                           | 58.5         | 100.0%         |





T-MOBILE NORTHEAST LLC

T-MOBILE SITE NUMBER: 4HY0602B

T-MOBILE SITE NAME: RUSSO

ECO-SITE ID NUMBER: MA-0049

145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY



Know what's below.  
Call before you dig.

SITE INFORMATION

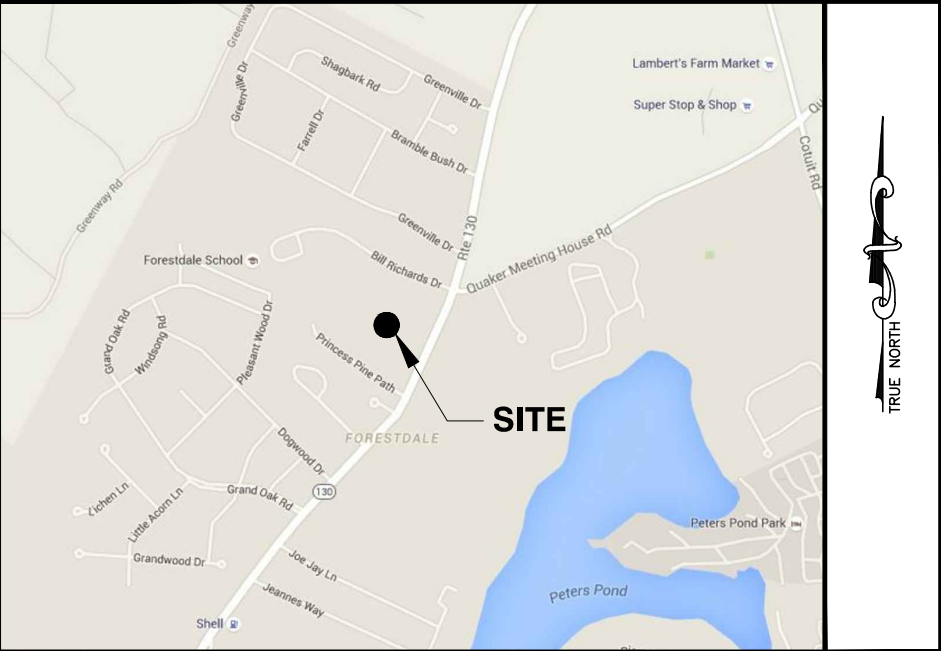
|                          |                                                       |
|--------------------------|-------------------------------------------------------|
| T-MOBILE SITE ID NUMBER: | 4HY0602B                                              |
| ECO SITE ID NUMBER:      | MA-0049                                               |
| 911 SITE ADDRESS:        | 145 ROUTE 130<br>SANDWICH, MA 02644                   |
| LATITUDE (NAD 83):       | 41.69492°                                             |
| LONGITUDE (NAD 83):      | -70.49946°                                            |
| JURISDICTION:            | BARNSTABLE COUNTY                                     |
| ZONING:                  | R2 (RESIDENTIAL 2)                                    |
| USE & OCCUPANCY GROUP:   | U                                                     |
| CONSTRUCTION TYPE:       | IIB                                                   |
| PARCEL ID NUMBER:        | 17-009                                                |
| PARCEL AREA:             | 17.13± ACRES                                          |
| PARCEL OWNER:            | PJR REALTY TRUST,<br>PASQUALE J RUSSO IV & PASQUALE J |
| ADDRESS:                 | P.O. BOX 1328<br>FORESTDALE, MA 2644                  |
| GROUND ELEVATION:        | 148.0' (AMSL)                                         |
| STRUCTURE TYPE:          | RAWLAND - MONOPOLE                                    |
| STRUCTURE HEIGHT:        | 135'-0" (AGL)                                         |

PROJECT TEAM

|                          |                                                                                                                         |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| APPLICANT:               | T-MOBILE NORTHEAST LLC<br>15 COMMERCE WAY, SUITE B<br>NORTON, MA 02766<br>OFFICE: (508) 286-2700<br>FAX: (508) 286-2893 |
| TOWER OWNER:             | ECO-SITE<br>240 LEIGH FARM ROAD, SUITE 415<br>DURHAM, NC 27707<br>OFFICE: (919) 636-6810                                |
| PROJECT MANAGEMENT FIRM: | NETWORK BUILDING + CONSULTING, LLC.<br>6095 MARSHALEE DRIVE, SUITE 300<br>ELKRIDGE, MD 21075<br>(410) 712-7092          |
| ENGINEERING FIRM:        | NB+C ENGINEERING SERVICES, LLC.<br>100 APOLLO DRIVE, SUITE 303<br>CHELMSFORD, MA 01824<br>(978) 856-8308                |

VICINITY MAP

SCALE: 1" = 2000'



CODE COMPLIANCE

|                                                                                                                                                                                                                                                                                              |                                                        |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--|--|
| ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES. |                                                        |  |  |
| • 2012 INTERNATIONAL BUILDING CODE                                                                                                                                                                                                                                                           | • ANSI/TIA-222-G                                       |  |  |
| • 2012 NATIONAL ELECTRICAL CODE                                                                                                                                                                                                                                                              | • TIA 607                                              |  |  |
| • 2009 NFPA 101, LIFE SAFETY CODE                                                                                                                                                                                                                                                            | • INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81   |  |  |
| • 2009 IFC                                                                                                                                                                                                                                                                                   | • IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION |  |  |
| • AMERICAN CONCRETE INSTITUTE                                                                                                                                                                                                                                                                | • TELECORDIA GR-1275                                   |  |  |
| • AMERICAN INSTITUTE OF STEEL CONSTRUCTION                                                                                                                                                                                                                                                   | • ANSI/T 311                                           |  |  |
| • MANUAL OF STEEL CONSTRUCTION 13TH EDITION                                                                                                                                                                                                                                                  |                                                        |  |  |

DRAWING INDEX

|      |                          |
|------|--------------------------|
| LE-1 | TITLE SHEET              |
| LE-2 | SITE PLAN                |
| LE-3 | COMPOUND PLAN            |
| LE-4 | ELEVATION & ANTENNA PLAN |

DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPROVAL BLOCK

|                        |      |                          |                          |                          |
|------------------------|------|--------------------------|--------------------------|--------------------------|
|                        |      | APPROVED                 | APPROVED AS NOTED        | DISAPPROVED/REVISE       |
| PROPERTY OWNER         | DATE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| PROJECT MANAGER        | DATE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| DIRECTOR OF OPERATIONS | DATE | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ENGINEER



APPLICANT



TOWER OWNER



SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

| REVISIONS |          |                |     |
|-----------|----------|----------------|-----|
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
| C         | 09/09/16 | REVISED LE     | PRC |
| B         | 05/18/16 | REVISED LE     | ALM |
| A         | 05/17/16 | PRELIMINARY LE | PRC |
| REV       | DATE     | DESCRIPTION    | BY  |

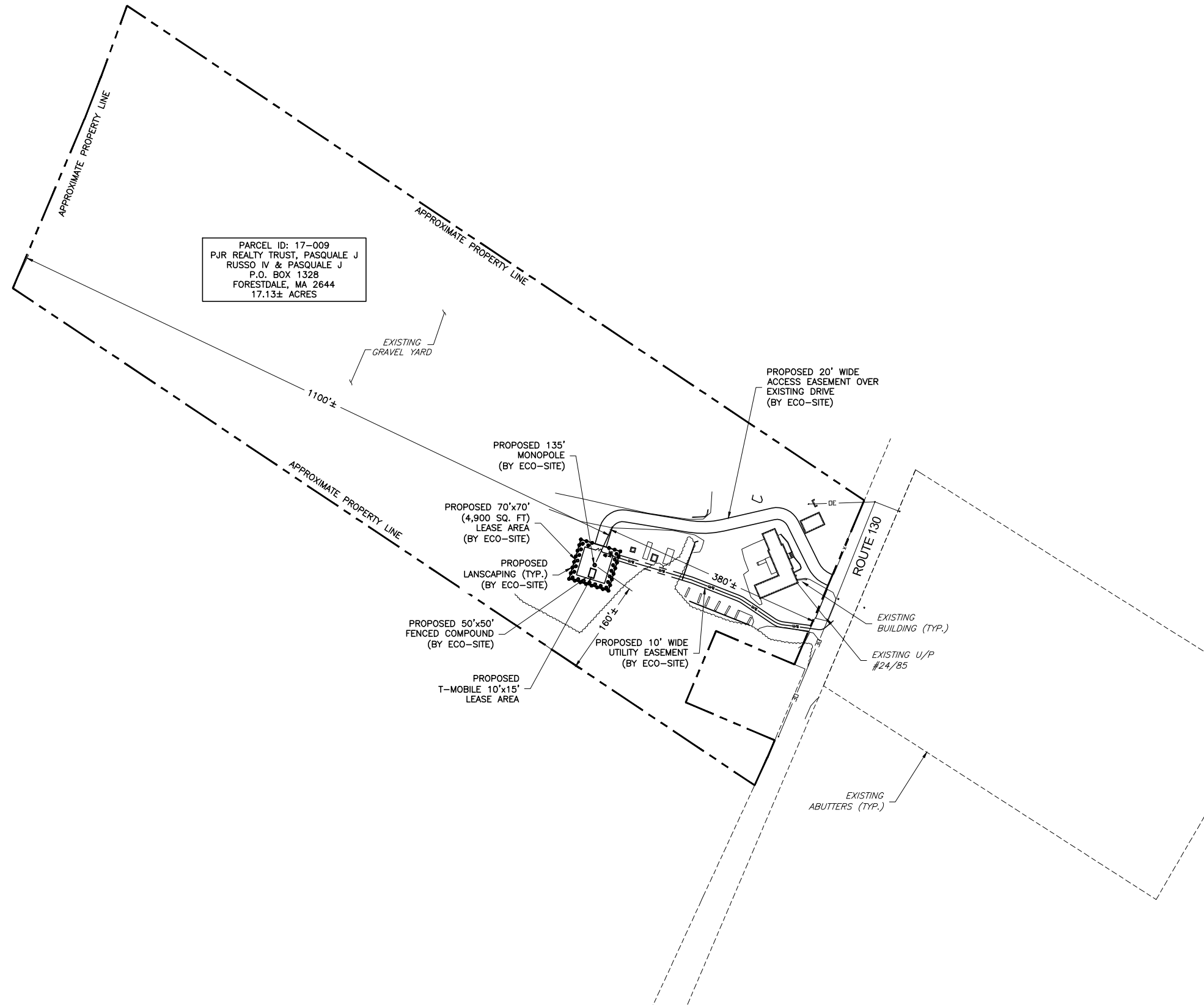
SHEET TITLE

TITLE SHEET

SHEET NUMBER

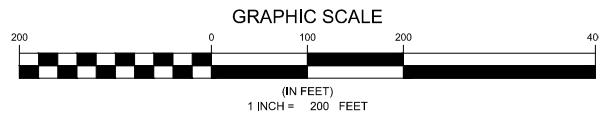
LE-1





1  
LE-2

SITE PLAN  
SCALE: 1" = 200'



#### GENERAL NOTES:

1. LEASE EXHIBIT AS SUBMITTED IS A CONCEPTUAL REPRESENTATION OF THE LEASE AGREEMENT ONLY. FINAL CONSTRUCTION DRAWINGS MAY VARY TO COMPLY WITH APPLICABLE BUILDING CODES AND ZONING APPROVALS AND WILL SUPERSEDE LEASE EXHIBIT.
2. DIMENSION SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
3. TRUE NORTH DETERMINATION, GROUND ELEVATION (AMSL), LATITUDE AND LONGITUDE COORDINATES ARE BASED ON GOOGLE EARTH UNLESS OTHERWISE NOTED.
4. THE LOCATION OF THE PROPOSED UTILITIES ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE RESPECTIVE UTILITY COMPANIES AND MAY CHANGE DURING CONSTRUCTION.
5. DO NOT SCALE THIS EXHIBIT UNLESS OTHERWISE NOTED.
6. PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT OR MODIFICATION OF THE EXISTING STRUCTURE, A STRUCTURAL ANALYSIS SHALL BE PERFORMED BY THE OWNER'S AGENT TO CERTIFY THAT THE EXISTING PROPOSED STRUCTURE IS STRUCTURALLY ADEQUATE TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, COAXIAL CABLES AND OTHER APPURTENANCES.
7. INFORMATION SHOWN ON THIS DRAWING IS BASED ON LIMITED FIELD MEASUREMENTS BY NC+B ENGINEERING SERVICES AND AVAILABLE TAX MAPS. SITE PLAN IS NOT THE RESULT OF A SURVEY.

ENGINEER

**NB+C**  
TOTALLY COMMITTED.

**NB+C ENGINEERING SERVICES, LLC.**  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 956-8308

APPLICANT

**T-Mobile**

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893

TOWER OWNER

**Eco-Site**  
Urban.Renewal.Wireless.

240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
(919) 636-6810

SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

#### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

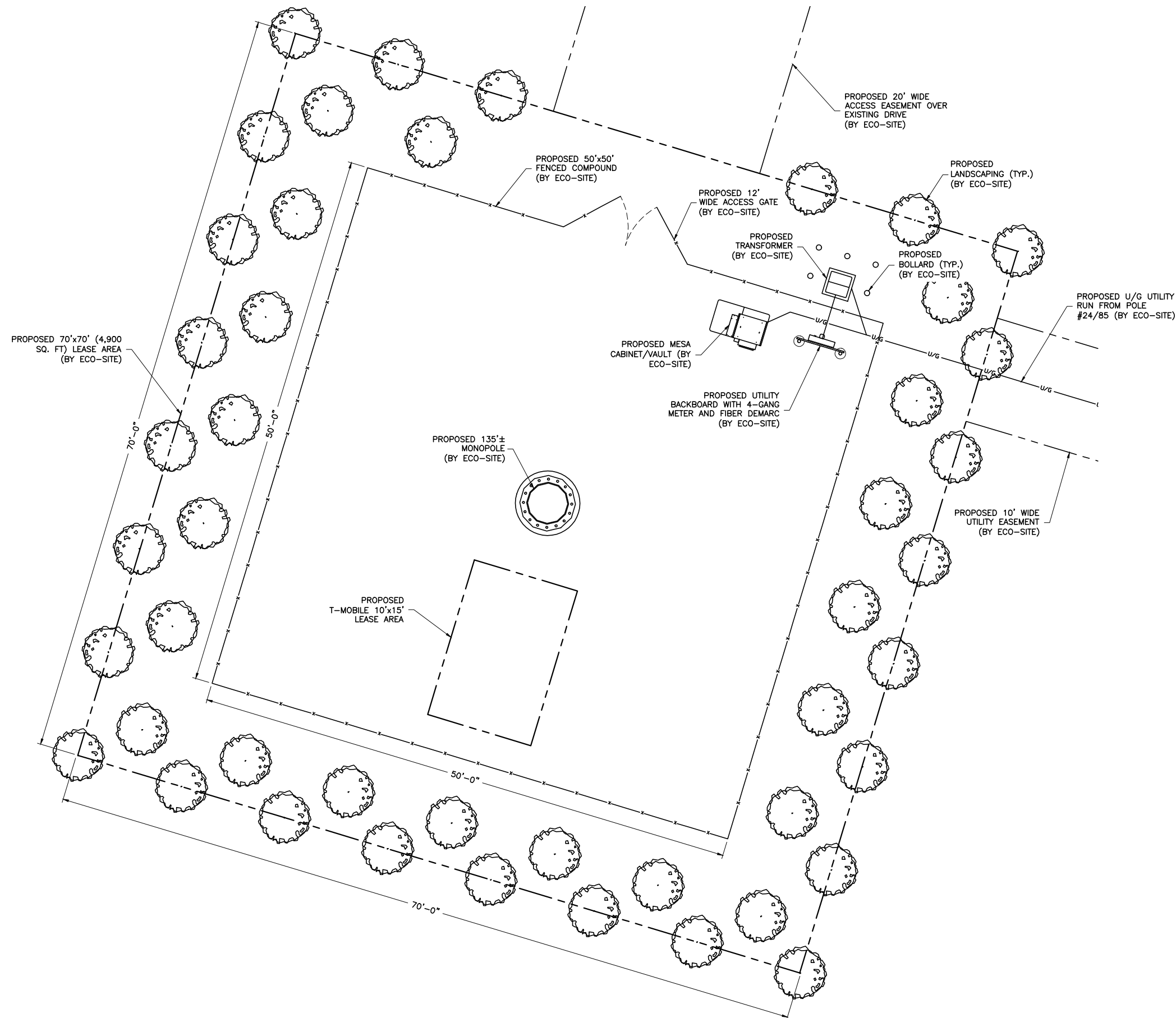
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**SITE PLAN**

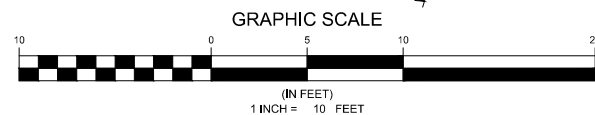
SHEET NUMBER

**LE-2**





1  
LE-3  
COMPOUND PLAN  
SCALE: 1" = 10'



ENGINEER



APPLICANT



TOWER OWNER



SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

### REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

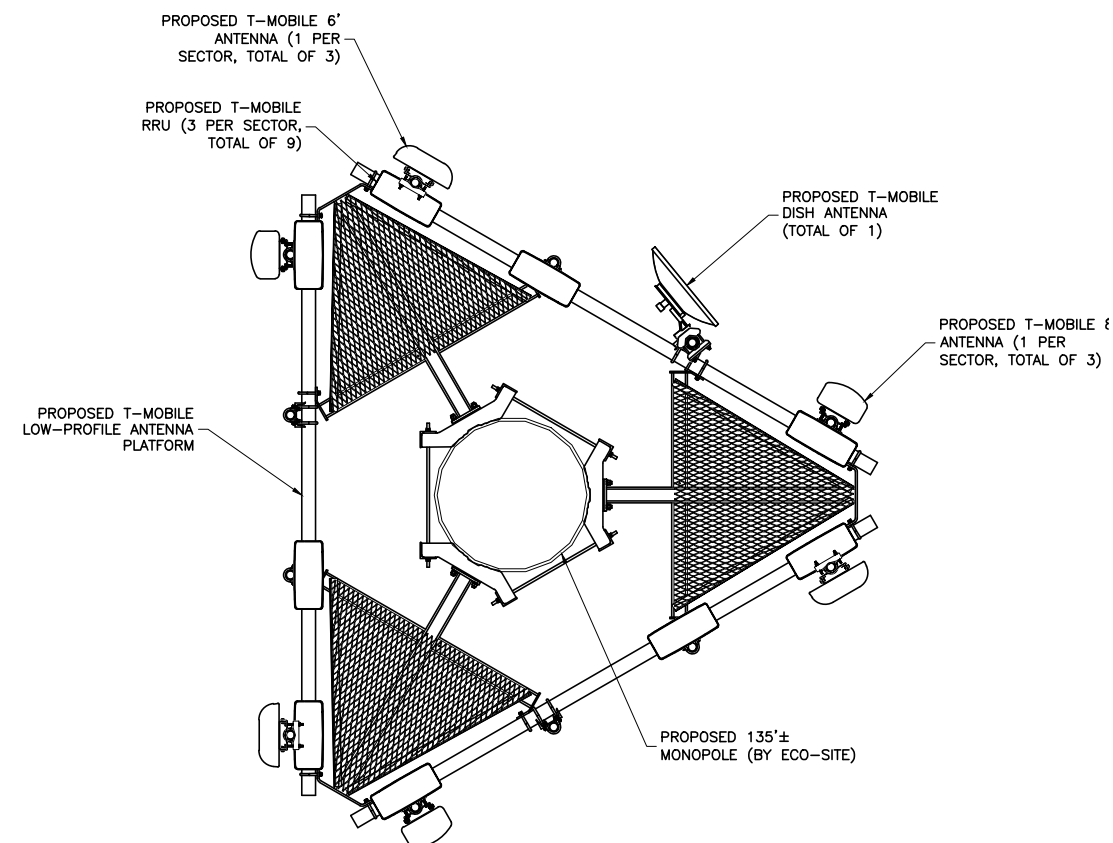
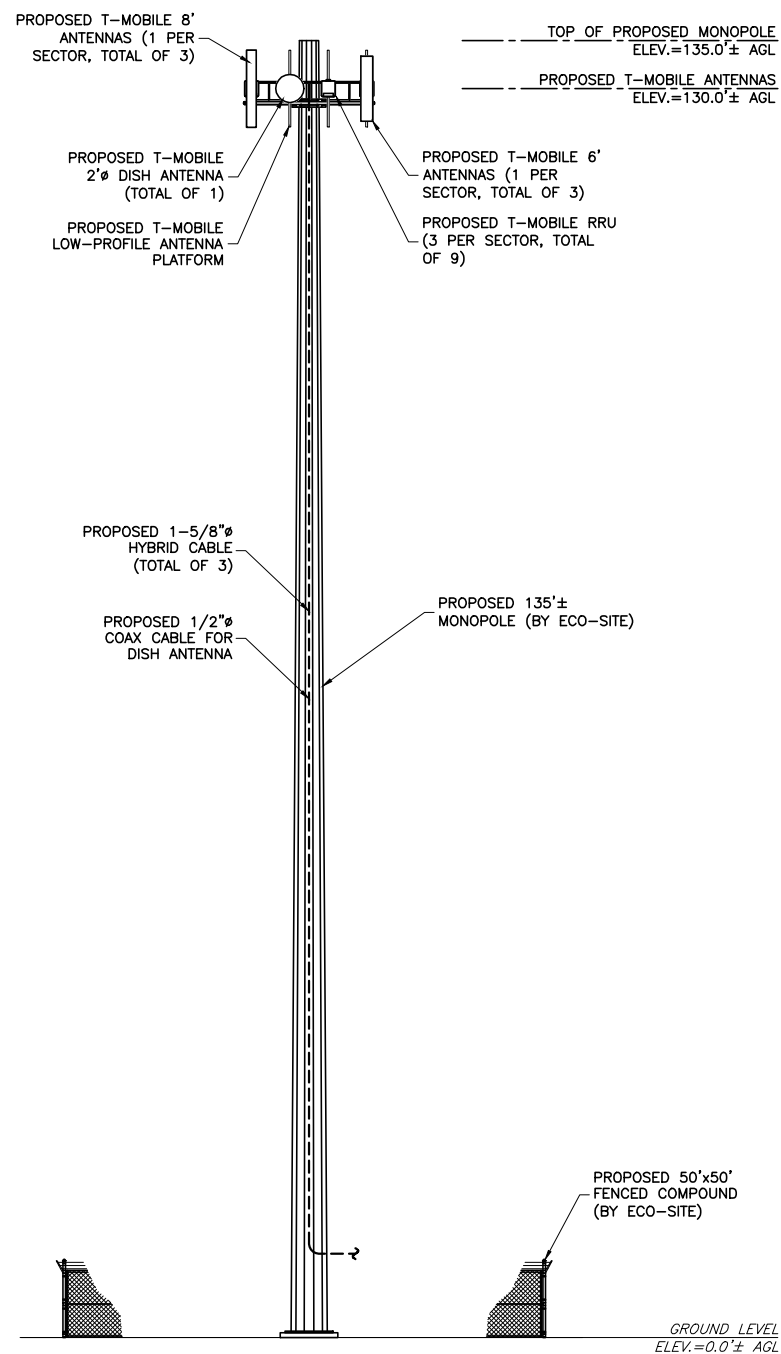
SHEET TITLE

COMPOUND PLAN

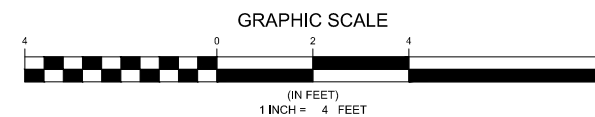
SHEET NUMBER

LE-3

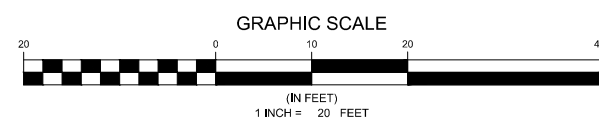




## ANTENNA PLAN



**ELEVATION**  
SCALE: 1" = 20'



ENGINEER

APPLICANT

TOWER OWNER

## SITE INFORMATION

DESIGN RECORD

SHEET TITLE

SHEET NUMBER



**NB+C ENGINEERING SERVICES, LLC.**  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

T-Mobile

T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
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OFFICE: (508) 286-2700  
FAX: (508) 286-2893

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(919) 636-6810

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

## REVISIONS

|     |          |                |     |
|-----|----------|----------------|-----|
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
|     |          |                |     |
| C   | 09/09/16 | REVISED LE     | PRC |
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |
| REV | DATE     | DESCRIPTION    | BY  |

## ELEVATION & ANTENNA PLAN

**LE-4**



---

## Vanessa P. Sullivan, MA, RPA

**Education:** Master of Archaeology, Flinders University (Adelaide, SA, AUS)  
B.A. Anthropology/Archaeology, Mercyhurst College (Erie, PA, USA)

**Licenses/Registrations:** Register of Professional Archaeologists (RPA)

**Years of Experience:** 5+

---

### Summary of Professional Experience

Ms. Sullivan has over 5 years of professional experience in environmental consulting, especially as it pertains to the fields of cultural heritage management and archaeology. She has assisted clients in navigating the environmental review process to ensure compliance with Federal Communications Commission (FCC) requirements under the National Environmental Policy Act (NEPA). As a Project Manager, Ms. Sullivan has the responsibility of preparing the scope of work for cultural resources projects throughout the United States. All projects are conducted per FCC and State Historic Preservation Office (SHPO) guidelines. She also supervises site file reviews, field surveys, submission of archaeological reports, and submission of FCC Form 620 and 621 for Section 106 Review on telecommunications projects. Furthermore, Ms. Sullivan conveys all necessary information to the parties involved on projects involving the installation of telecommunications facilities.

As an Archaeologist, Ms. Sullivan meets the standards set forth by the United States Secretary of the Interior (Code of Federal Regulations, 36 CFR Part 61). She is responsible for completing file reviews, archival searches, documentary analyses, and archaeological survey work for the telecom industry. Her fieldwork focus is primarily in the Northeast; however, she has completed projects throughout the United States to the standards of relevant SHPOs in the respective regions in accordance with FCC guidelines. Additional duties include assisting in the completion of FCC NEPA Assessments and Phase I Environmental Site Assessments for various telecommunications facilities.

Prior to her work at CBRE, Ms. Sullivan focused on Indigenous Archaeology in both the United States and Australia. In 2015 she received a Master of Archaeology degree from Flinders University (Adelaide, SA, AUS), where she researched conflict during the European settlement period in South Australia. In addition, she has completed research on North American pre-contact ceramics and textiles, submerged archaeological sites, cultural heritage management UNESCO legislation, GIS systems, and non-invasive archaeological methods utilizing archaeological-geophysics.



## HISTORIC PROPERTIES FOR VISUAL EFFECTS

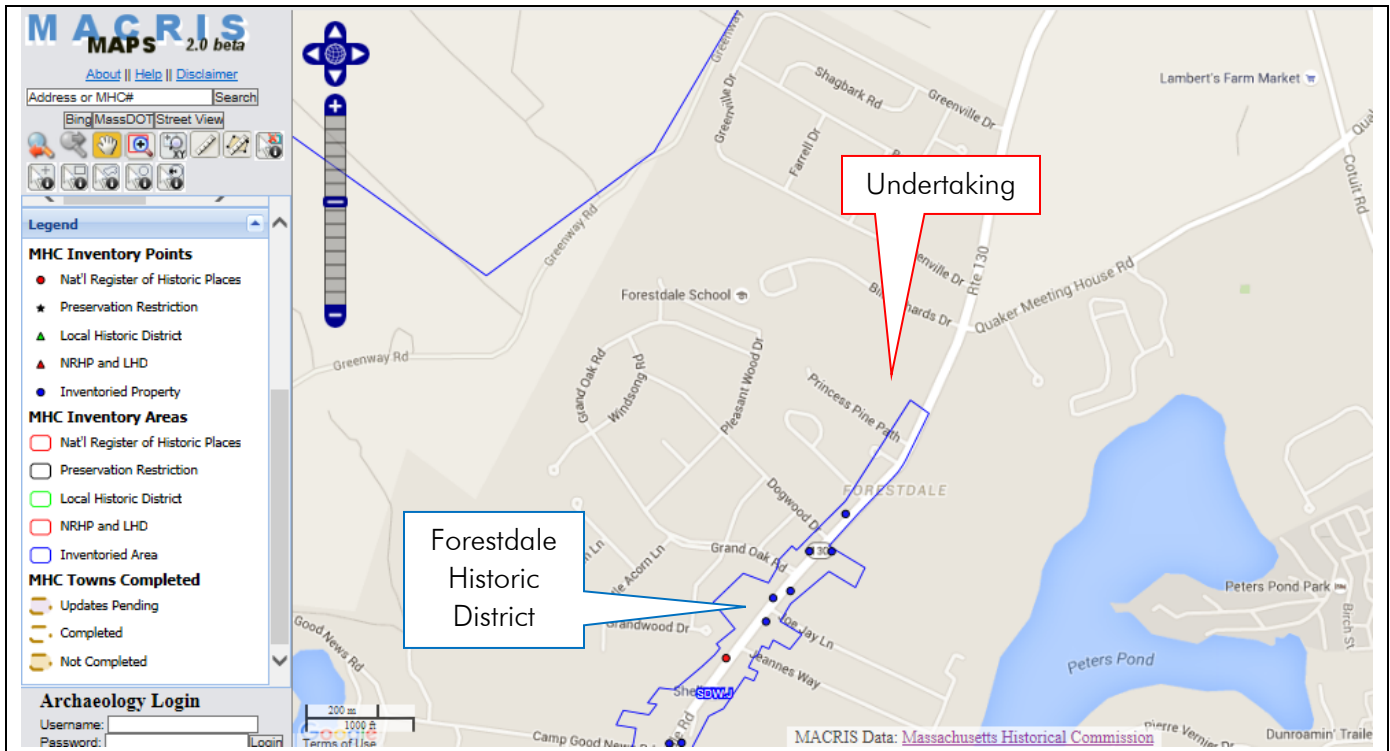
Based on a SHPO file review completed by Amanda Sabol, Project Manager, on July 15, 2016 the following historic resources have been identified within the APE-VE.

| NR NUMBER OR ELIGIBLE | PROPERTY NAME                | STREET ADDRESS | MUNICIPALITY | DETERMINATION OF EFFECT                                                                                                                                                                                                                                                   | PHOTO NUMBER |
|-----------------------|------------------------------|----------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Eligible              | Forestdale Historic District | Multiple       | Sandwich     | Although, the installation may be partially visible from portions of the Forestdale Historic District, the proposed installation will have no adverse effect on characteristics that make this property eligible for listing on the National Register of Historic Places. | 9, 13-20     |



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706





## SHPO HISTORIC PROPERTIES MAP

SOURCE: MASSACHUSETTS CULTURAL RESOURCE INFORMATION SYSTEM (MACRIS)





Amanda Sabol  
Project Manager

CBRE, Inc.  
Telecom Services

4 West Red Oak Lane  
White Plains, New York 10604

717.601.1436 Cell  
914.522.7433 Fax

amanda.sabol@cbre.com  
www.cbre.com

July 20, 2016

Sandwich Historical Commission  
c/o Mr. Greg Anderson, Chair  
P.O. Box 1905  
Sandwich, Massachusetts 02563

Re: Section 106 Public Outreach  
"4HY0602A"  
145 Route 130  
Sandwich, Massachusetts  
CBRE Project No.: TS60615706

Dear Mr. Anderson:

CBRE is writing on behalf of Eco-Site to solicit your input concerning a proposed telecommunications facility at the above referenced address. The facility will include a 135-foot monopole along with the installation of ancillary equipment. CBRE is requesting comments with regards to any potential impacts on historic architectural and/or archaeological resources.

As the Project is a federal undertaking regulated by the Federal Communications Commission (FCC), it is being reviewed under Section 106 of the National Historic Preservation Act for its impacts to historic architectural and archaeological resources. Federal regulations allow for public participation as part of the Section 106 process.

As such, CBRE would like to inquire if you would be interested in commenting on this proposed project. ***Please note that we are requesting your review as part of the Section 106 process only and not as part of the local zoning process.*** Furthermore, only responses related to historic properties potentially affected will be considered.

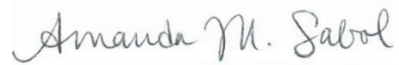
If you are interested in becoming a consulting party and have any comments or concerns regarding the proposed Project, please contact me in writing at CBRE, 4 West Red Oak Lane, White Plains, NY 10604 or at [amanda.sabol@cbre.com](mailto:amanda.sabol@cbre.com). Please reference the project name and address in your comments. Any responses must be received within 30 days of receipt of this letter. Only consulting parties indicating their desire to receive information and/or otherwise participate in the Section 106 review process will be afforded this opportunity.



July 20, 2016  
4HY0602A  
Eco-Site  
Page 2

Thank you for your time and attention to this matter.

Sincerely,

A handwritten signature in cursive script that reads "Amanda M. Sabol". The signature is written in dark ink on a light-colored background.

Amanda Sabol  
Project Manager





## AERIAL MAP

SOURCE: BING BIRD'S EYE VIEW © 2016 MICROSOFT CORPORATION PICTOMETRY BIRD'S EYE © 2016 GEOSPATIAL SERVICES, INC.



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706





T-MOBILE NORTHEAST LLC

T-MOBILE SITE NUMBER: ~~4HY0602B~~

T-MOBILE SITE NAME: RUSSO

ECO-SITE ID NUMBER: MA-0049

145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

REVIEWED

By Ryan Monte de Ramos at 11:43 am, May 23, 2016

RF: Element shows  
Candidate  
"A".....4HY0602A



SITE INFORMATION

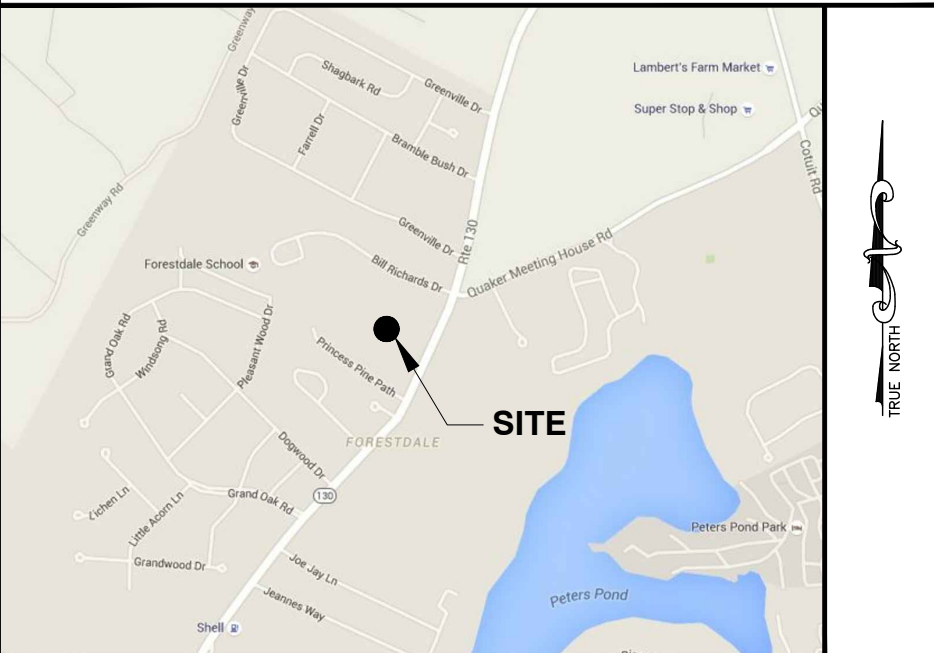
T-MOBILE SITE ID NUMBER: 4HY0602B  
ECO SITE ID NUMBER: MA-0049  
911 SITE ADDRESS: 145 ROUTE 130  
SANDWICH, MA 02644  
LATITUDE (NAD 83): 41.69492°  
LONGITUDE (NAD 83): -70.49946°  
JURISDICTION: BARNSTABLE COUNTY  
ZONING: R2 (RESIDENTIAL 2)  
USE & OCCUPANCY GROUP: U  
CONSTRUCTION TYPE: IIB  
PARCEL ID NUMBER: 17-009  
PARCEL AREA: 17.13± ACRES  
PARCEL OWNER: PJR REALTY TRUST,  
PASQUALE J RUSSO IV & PASQUALE J  
ADDRESS: P.O. BOX 1328  
FORESTDALE, MA 2644  
GROUND ELEVATION: 148.0' (AMSL)  
STRUCTURE TYPE: RAWLAND - MONOPOLE  
STRUCTURE HEIGHT: 135'-0" (AGL)

PROJECT TEAM

APPLICANT: T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893  
TOWER OWNER: ECO-SITE  
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PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.  
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ELKRIDGE, MD 21075  
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ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

VICINITY MAP

SCALE: 1" = 2000'



CODE COMPLIANCE

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

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- 2012 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECORDIA GR-1275
- ANSI/T 311

DRAWING INDEX

LE-1 TITLE SHEET  
LE-2 SITE PLAN  
LE-3 COMPOUND PLAN  
LE-4 ELEVATION & ANTENNA PLAN

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APPROVAL BLOCK

PROPERTY OWNER \_\_\_\_\_ DATE \_\_\_\_\_ APPROVED \_\_\_\_\_  
PROJECT MANAGER \_\_\_\_\_ DATE \_\_\_\_\_ APPROVED AS NOTED \_\_\_\_\_  
DIRECTOR OF OPERATIONS \_\_\_\_\_ DATE \_\_\_\_\_ DISAPPROVED/REVISE \_\_\_\_\_

ENGINEER



APPLICANT

T-Mobile  
T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
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TOWER OWNER

Urban.Renewal.Wireless.  
240 LEIGH FARM ROAD, SUITE 415  
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SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

| REVISIONS |          |                |     |
|-----------|----------|----------------|-----|
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
|           |          |                |     |
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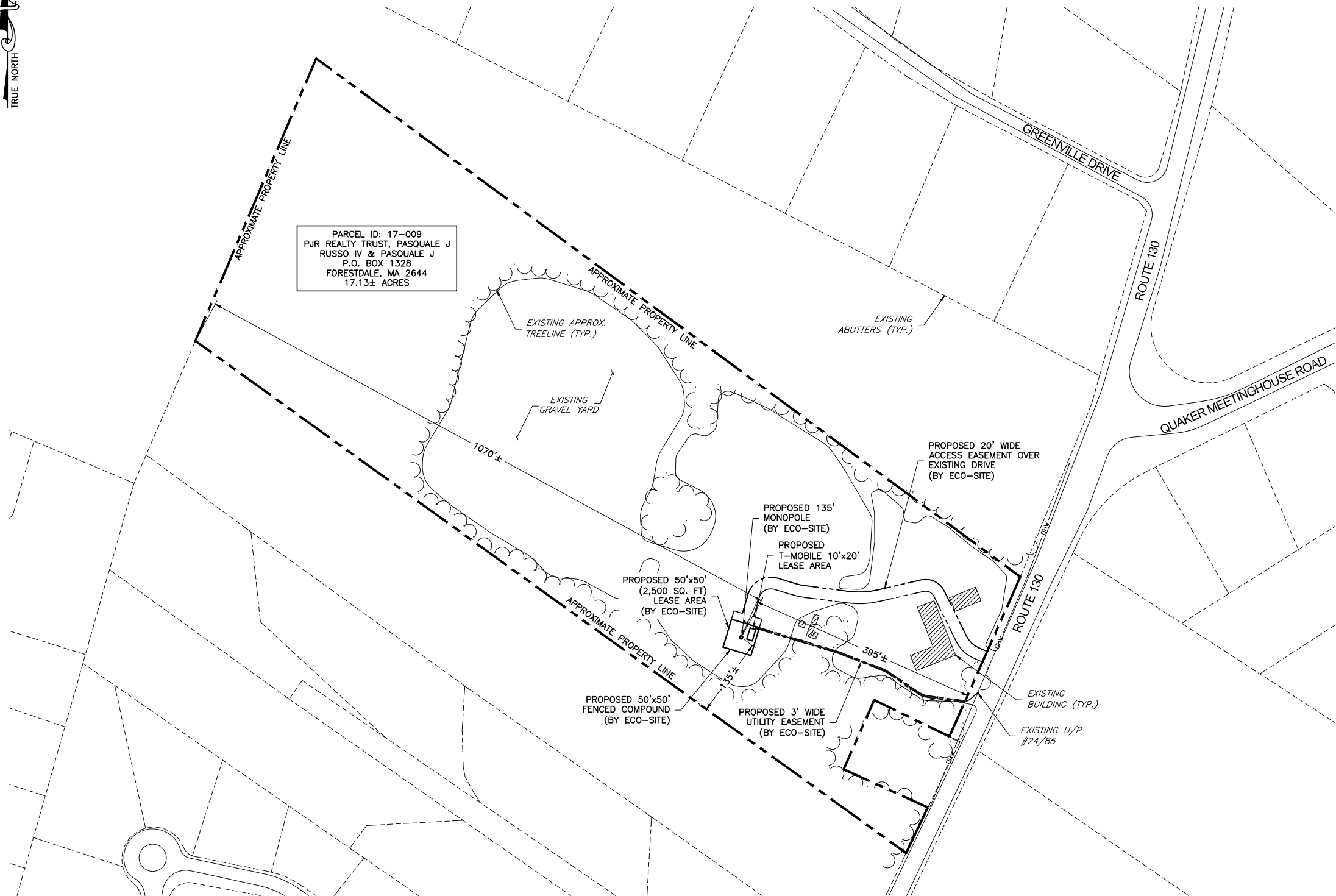
SHEET TITLE

TITLE SHEET

SHEET NUMBER

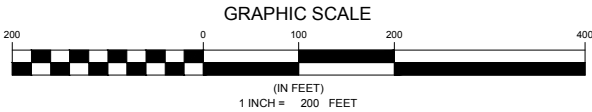
LE-1





PARCEL ID: 17-009  
PJR REALTY TRUST, PASQUALE J  
RUSSO IV & PASQUALE J  
P.O. BOX 1328  
FORESTDALE, MA 2644  
17.13± ACRES

1 SITE PLAN  
LE-2 SCALE: 1" = 200'



- GENERAL NOTES:
1. LEASE EXHIBIT AS SUBMITTED IS A CONCEPTUAL REPRESENTATION OF THE LEASE AGREEMENT ONLY. FINAL CONSTRUCTION DRAWINGS MAY VARY TO COMPLY WITH APPLICABLE BUILDING CODES AND ZONING APPROVALS AND WILL SUPERSEDE LEASE EXHIBIT.
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ENGINEER



NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

APPLICANT



T-MOBILE NORTHEAST LLC

15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893

TOWER OWNER



240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
(919) 636-6810

SITE INFORMATION

4HY0602B  
RUSSO  
145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

DESIGN RECORD

REVISIONS

| REV | DATE     | DESCRIPTION    | BY  |
|-----|----------|----------------|-----|
| B   | 05/18/16 | REVISED LE     | ALM |
| A   | 05/17/16 | PRELIMINARY LE | PRC |

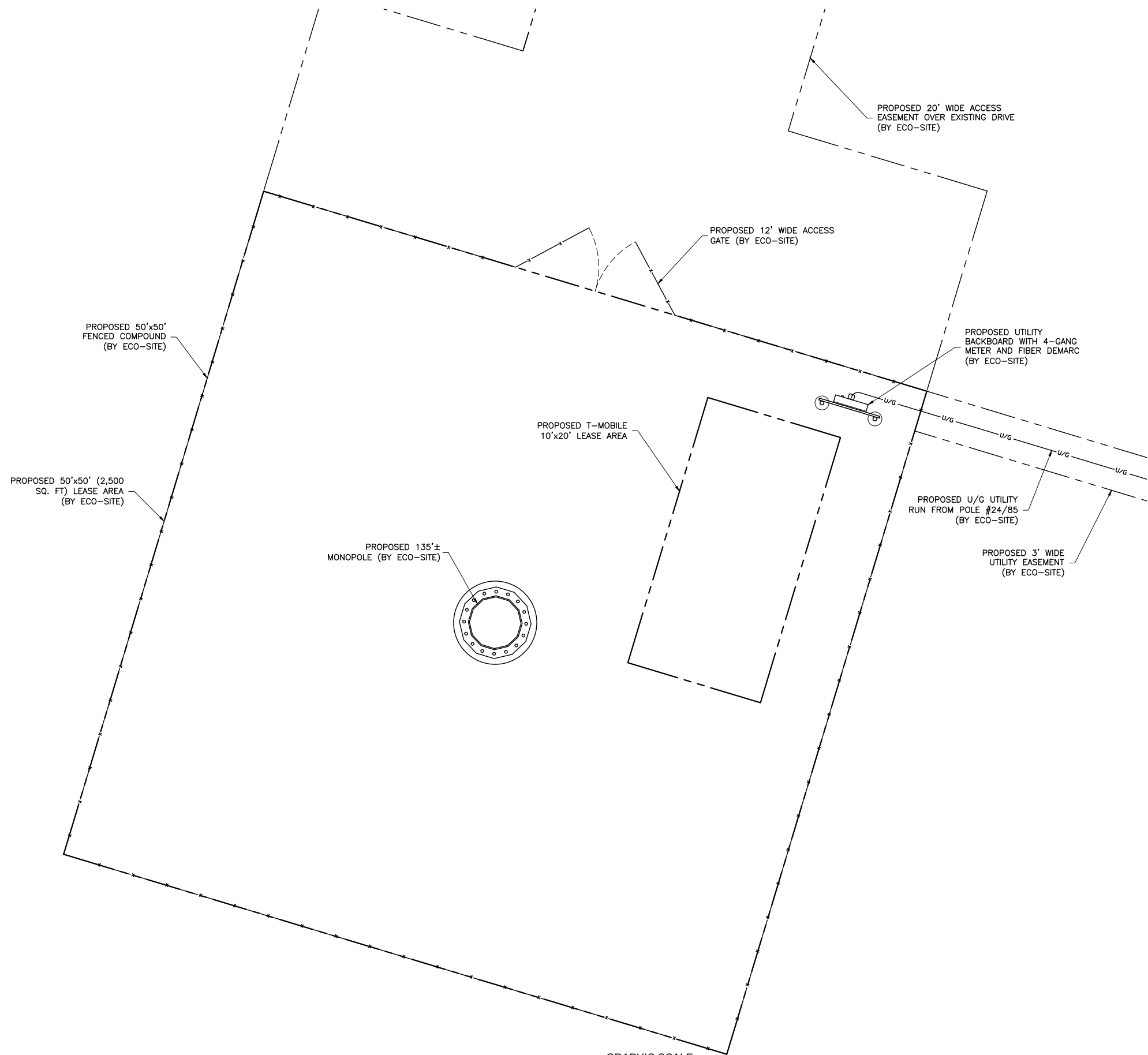
SHEET TITLE

SITE PLAN

SHEET NUMBER

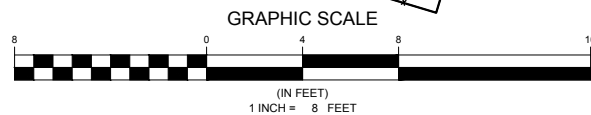
LE-2





1  
LE-3

COMPOUND PLAN  
SCALE: 1/8" = 1'



ENGINEER

**NB+C**  
TOTALLY COMMITTED.

**NB+C ENGINEERING SERVICES, LLC.**  
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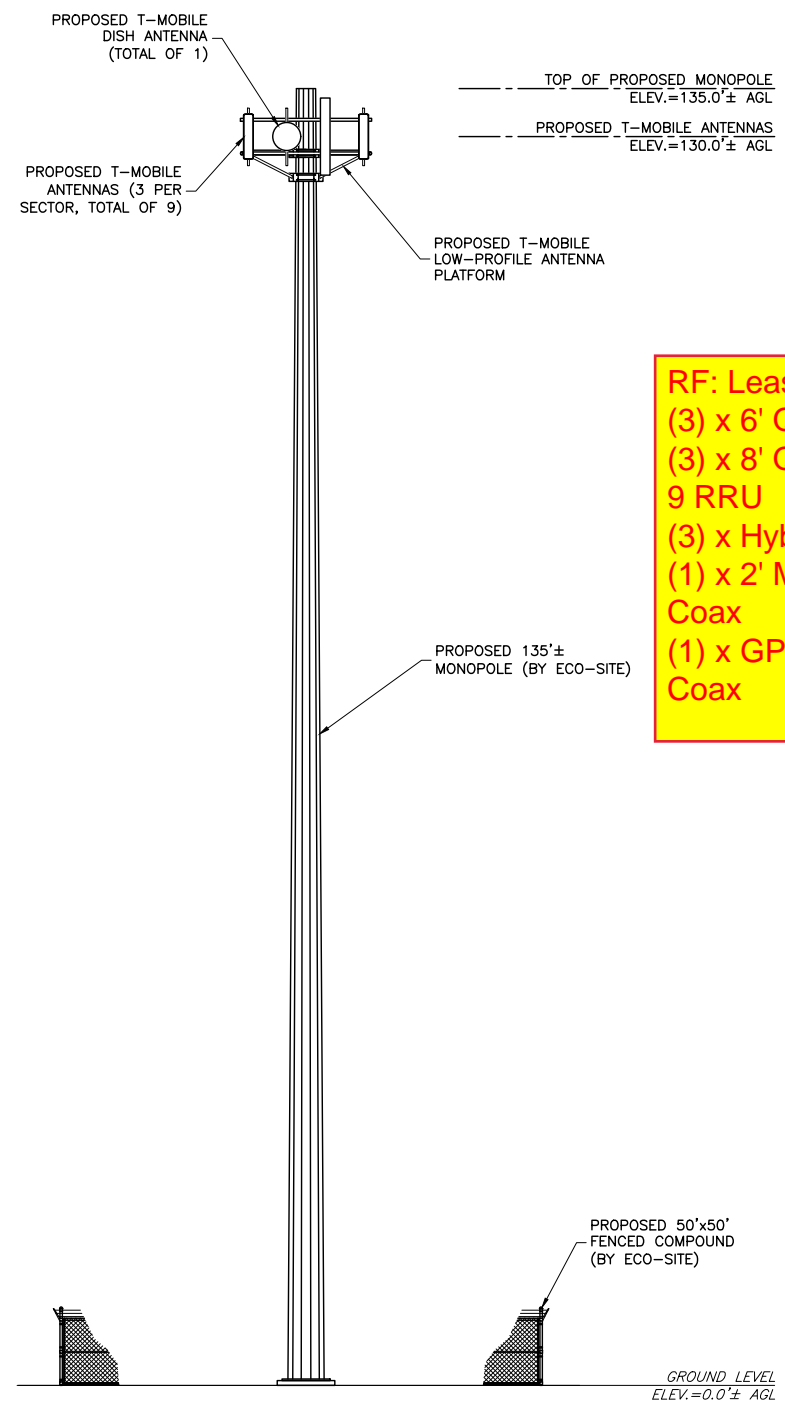
SHEET TITLE

MPN PLAN

SHEET NUMBER

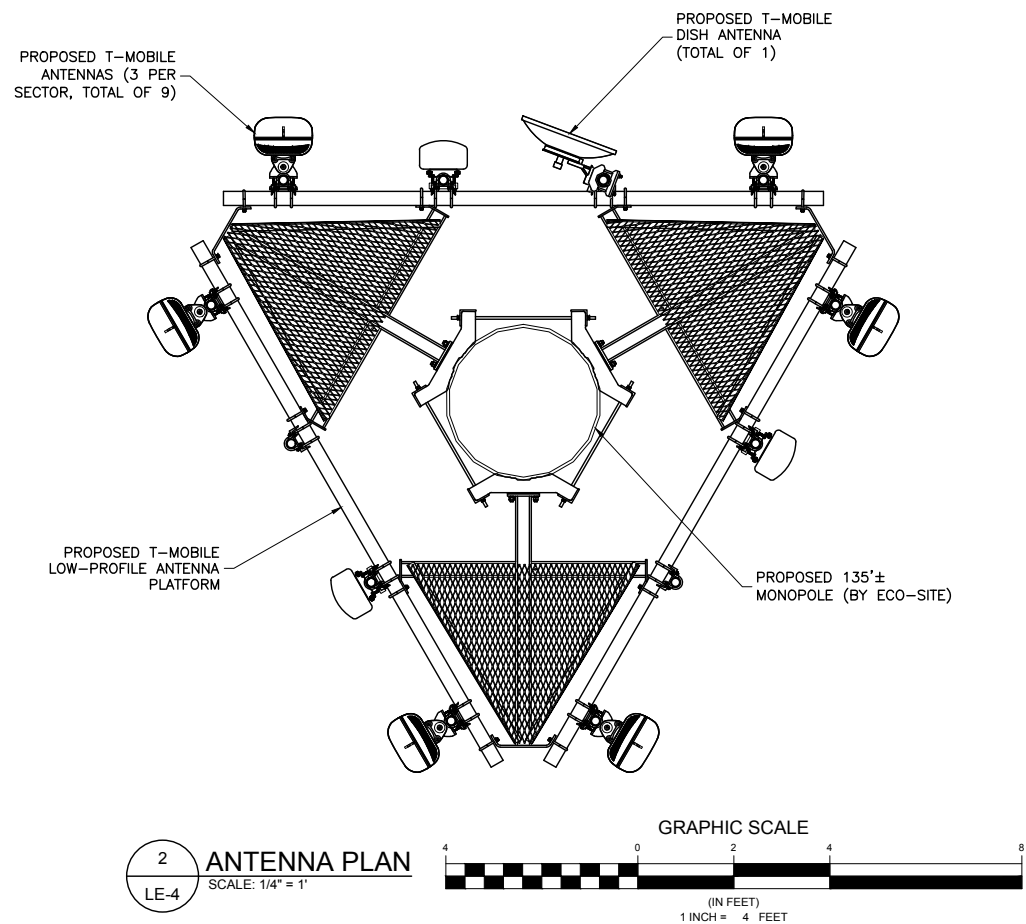
LE-





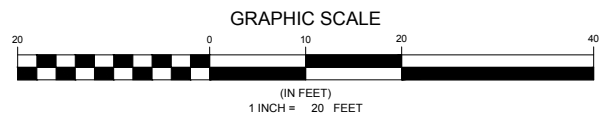
RF: Please see if we can increase the Rad Ctr to 150'

RF: Leasing Guideline:  
(3) x 6' Quad Antenna  
(3) x 8' Quad Antenna  
9 RRU  
(3) x Hybrid 1-5/8)  
(1) x 2' MW Dish with 1/2" Coax  
(1) x GPS Antenna with 1/2" Coax



2 ANTENNA PLAN  
SCALE: 1/4" = 1'

1 ELEVATION  
SCALE: 1" = 20'



| ENGINEER         | <div><b>NB+C</b><br/>TOTALLY COMMITTED.<br/><br/>NB+C ENGINEERING SERVICES, LLC.<br/><small>100 APOLLO DRIVE, SUITE 303<br/>CHELMSFORD, MA 01824<br/>(978) 856-8308</small></div>                                                                                                                                                                                                                                                                                                                  |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|----------|------------|-----|---|----------|----------------|-----|-----|------|-------------|----|
| APPLICANT        | <div><b>T-Mobile</b><br/>T-MOBILE NORTHEAST LLC<br/><br/>15 COMMERCE WAY, SUITE B<br/>NORTON, MA 02766<br/>OFFICE: (508) 286-2700<br/>FAX: (508) 286-2893</div>                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| TOWER OWNER      | <div><b>Eco-?i??</b><br/>Urban.Renewal.Wireless.<br/><br/>240 LEIGH FARM ROAD, SUITE 415<br/>DURHAM, NC 27707<br/>(919) 636-6810</div>                                                                                                                                                                                                                                                                                                                                                             |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SITE INFORMATION | <div>4HY0602B<br/>RUSSO<br/>145 ROUTE 130<br/>SANDWICH, MA 02644<br/>BARNSTABLE COUNTY</div>                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| DESIGN RECORD    | <table><tr><th colspan="4">REVISIONS</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>B</td><td>05/18/16</td><td>REVISED LE</td><td>ALM</td></tr><tr><td>A</td><td>05/17/16</td><td>PRELIMINARY LE</td><td>PRC</td></tr><tr><td>REV</td><td>DATE</td><td>DESCRIPTION</td><td>BY</td></tr></table> | REVISIONS      |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | B | 05/18/16 | REVISED LE | ALM | A | 05/17/16 | PRELIMINARY LE | PRC | REV | DATE | DESCRIPTION | BY |
| REVISIONS        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
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|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| B                | 05/18/16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | REVISED LE     | ALM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| A                | 05/17/16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PRELIMINARY LE | PRC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| REV              | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DESCRIPTION    | BY  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SHEET TITLE      | <div>ELEVATION<br/>ANTENNA PLAN</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SHEET NUMBER     | <div>LE-0</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |





Amanda Sabol  
Project Manager

CBRE, Inc.  
Telecom Services

4 West Red Oak Lane  
White Plains, New York 10604

717.601.1436 Cell  
914.522.7433 Fax

amanda.sabol@cbre.com  
www.cbre.com

July 20, 2016

Sandwich Historical Society & Glass Museum  
c/o Ms. Katharine H. Campbell, Executive Director  
P.O. Box 103  
Sandwich, Massachusetts 02563  
508.888.0251

Re: Section 106 Public Outreach  
"4HY0602A"  
145 Route 130  
Sandwich, Massachusetts  
CBRE Project No.: TS60615706

Dear Ms. Campbell:

CBRE is writing on behalf of Eco-Site to solicit your input concerning a proposed telecommunications facility at the above referenced address. The facility will include a 135-foot monopole along with the installation of ancillary equipment. CBRE is requesting comments with regards to any potential impacts on historic architectural and/or archaeological resources.

As the Project is a federal undertaking regulated by the Federal Communications Commission (FCC), it is being reviewed under Section 106 of the National Historic Preservation Act for its impacts to historic architectural and archaeological resources. Federal regulations allow for public participation as part of the Section 106 process.

As such, CBRE would like to inquire if you would be interested in commenting on this proposed project. ***Please note that we are requesting your review as part of the Section 106 process only and not as part of the local zoning process.*** Furthermore, only responses related to historic properties potentially affected will be considered.

If you are interested in becoming a consulting party and have any comments or concerns regarding the proposed Project, please contact me in writing at CBRE, 4 West Red Oak Lane, White Plains, NY 10604 or at [amanda.sabol@cbre.com](mailto:amanda.sabol@cbre.com). Please reference the project name and address in your comments. Any responses must be received within 30 days of receipt of this letter. Only consulting



July 20, 2016  
4HY0602A  
Eco-Site  
Page 2

parties indicating their desire to receive information and/or otherwise participate in the Section 106 review process will be afforded this opportunity.

Thank you for your time and attention to this matter.

Sincerely,

A handwritten signature in cursive script that reads "Amanda M. Sabol". The signature is written in dark ink on a light-colored background.

Amanda Sabol  
Project Manager





## AERIAL MAP

SOURCE: BING BIRD'S EYE VIEW © 2016 MICROSOFT CORPORATION PICTOMETRY BIRD'S EYE © 2016 GEOSPATIAL SERVICES, INC.



Applicant's Name: Eco-Site  
Project Name: 4HY0602A  
CBRE Project Number: TS60615706





T-MOBILE NORTHEAST LLC

**T-MOBILE SITE NUMBER: ~~4HY0602B~~**  
**T-MOBILE SITE NAME: RUSSO**  
**ECO-SITE ID NUMBER: MA-0049**

145 ROUTE 130  
SANDWICH, MA 02644  
BARNSTABLE COUNTY

**REVIEWED**

By Ryan Monte de Ramos at 11:43 am, May 23, 2016



RF: Element shows  
Candidate  
"A".....4HY0602A



### SITE INFORMATION

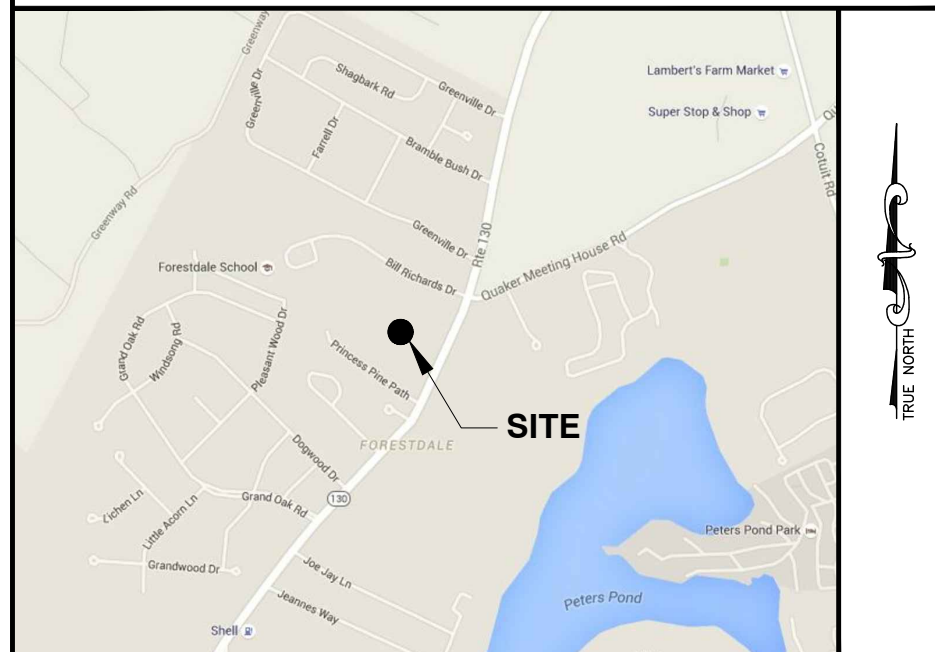
T-MOBILE SITE ID NUMBER: 4HY0602B  
ECO SITE ID NUMBER: MA-0049  
911 SITE ADDRESS: 145 ROUTE 130  
SANDWICH, MA 02644  
LATITUDE (NAD 83): 41.69492°  
LONGITUDE (NAD 83): -70.49946°  
JURISDICTION: BARNSTABLE COUNTY  
ZONING: R2 (RESIDENTIAL 2)  
USE & OCCUPANCY GROUP: U  
CONSTRUCTION TYPE: IIB  
PARCEL ID NUMBER: 17-009  
PARCEL AREA: 17.13± ACRES  
PARCEL OWNER: PJR REALTY TRUST,  
PASQUALE J RUSSO IV & PASQUALE J  
ADDRESS: P.O. BOX 1328  
FORESTDALE, MA 2644  
GROUND ELEVATION: 148.0' (AMSL)  
STRUCTURE TYPE: RAWLAND - MONOPOLE  
STRUCTURE HEIGHT: 135'-0" (AGL)

### PROJECT TEAM

APPLICANT: T-MOBILE NORTHEAST LLC  
15 COMMERCE WAY, SUITE B  
NORTON, MA 02766  
OFFICE: (508) 286-2700  
FAX: (508) 286-2893  
TOWER OWNER: ECO-SITE  
240 LEIGH FARM ROAD, SUITE 415  
DURHAM, NC 27707  
OFFICE: (919) 636-6810  
PROJECT MANAGEMENT FIRM: NETWORK BUILDING + CONSULTING, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092  
ENGINEERING FIRM: NB+C ENGINEERING SERVICES, LLC.  
100 APOLLO DRIVE, SUITE 303  
CHELMSFORD, MA 01824  
(978) 856-8308

### VICINITY MAP

SCALE: 1" = 2000'



### CODE COMPLIANCE

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

- 2012 INTERNATIONAL BUILDING CODE
- 2012 NATIONAL ELECTRICAL CODE
- 2009 NFPA 101, LIFE SAFETY CODE
- 2009 IFC
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECORDIA GR-1275
- ANSI/T 311

### DRAWING INDEX

LE-1 TITLE SHEET  
LE-2 SITE PLAN  
LE-3 COMPOUND PLAN  
LE-4 ELEVATION & ANTENNA PLAN

### DO NOT SCALE DRAWINGS

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 24"X36". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

### APPROVAL BLOCK

|                        |      |                          |          |                          |                   |                          |                    |
|------------------------|------|--------------------------|----------|--------------------------|-------------------|--------------------------|--------------------|
| PROPERTY OWNER         | DATE | <input type="checkbox"/> | APPROVED | <input type="checkbox"/> | APPROVED AS NOTED | <input type="checkbox"/> | DISAPPROVED/REVISE |
| PROJECT MANAGER        | DATE | <input type="checkbox"/> |          | <input type="checkbox"/> |                   | <input type="checkbox"/> |                    |
| DIRECTOR OF OPERATIONS | DATE | <input type="checkbox"/> |          | <input type="checkbox"/> |                   | <input type="checkbox"/> |                    |

ENGINEER



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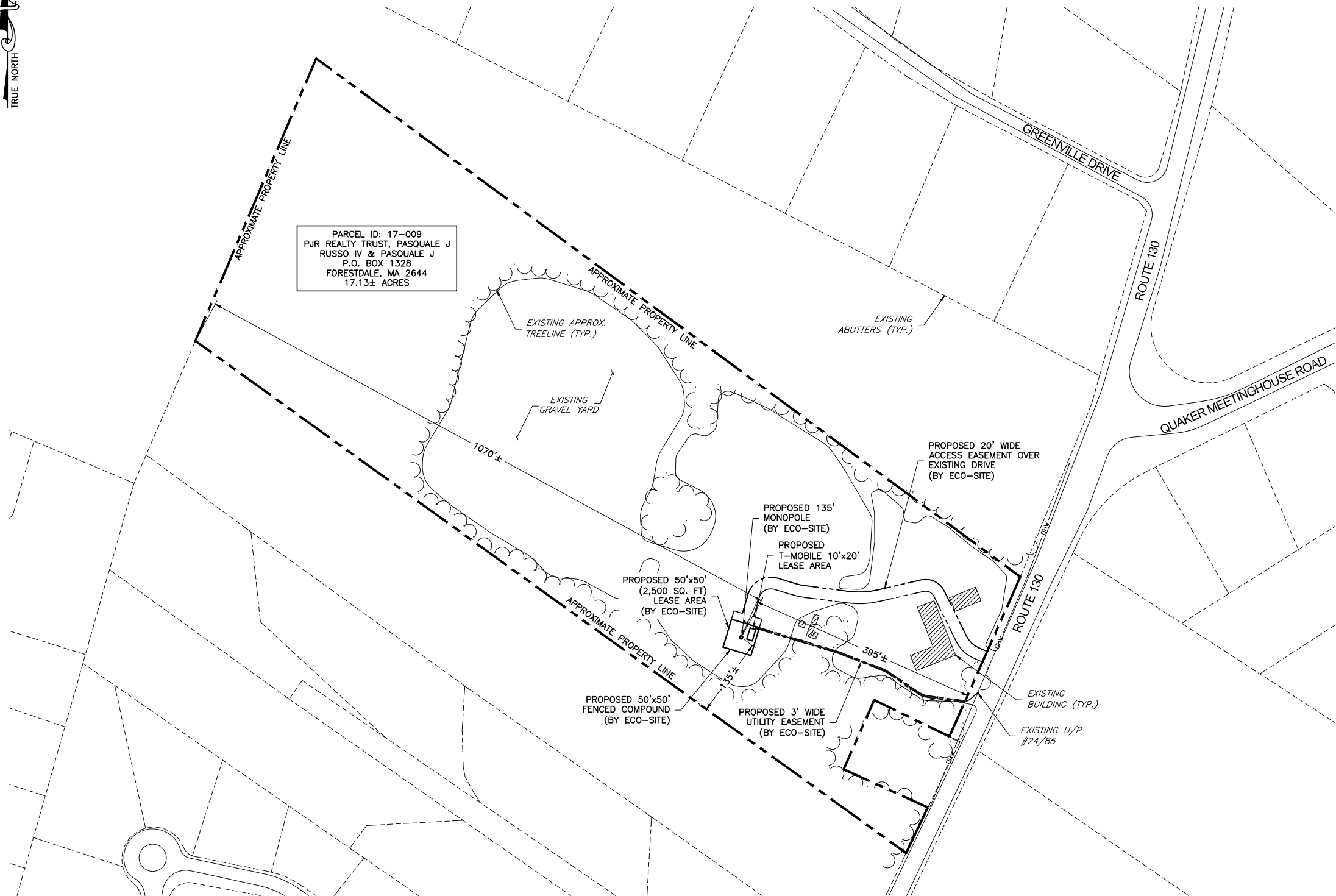
SHEET TITLE

**TITLE SHEET**

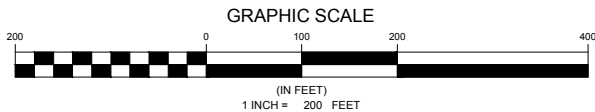
SHEET NUMBER

**LE-1**





1 SITE PLAN  
LE-2 SCALE: 1" = 200'



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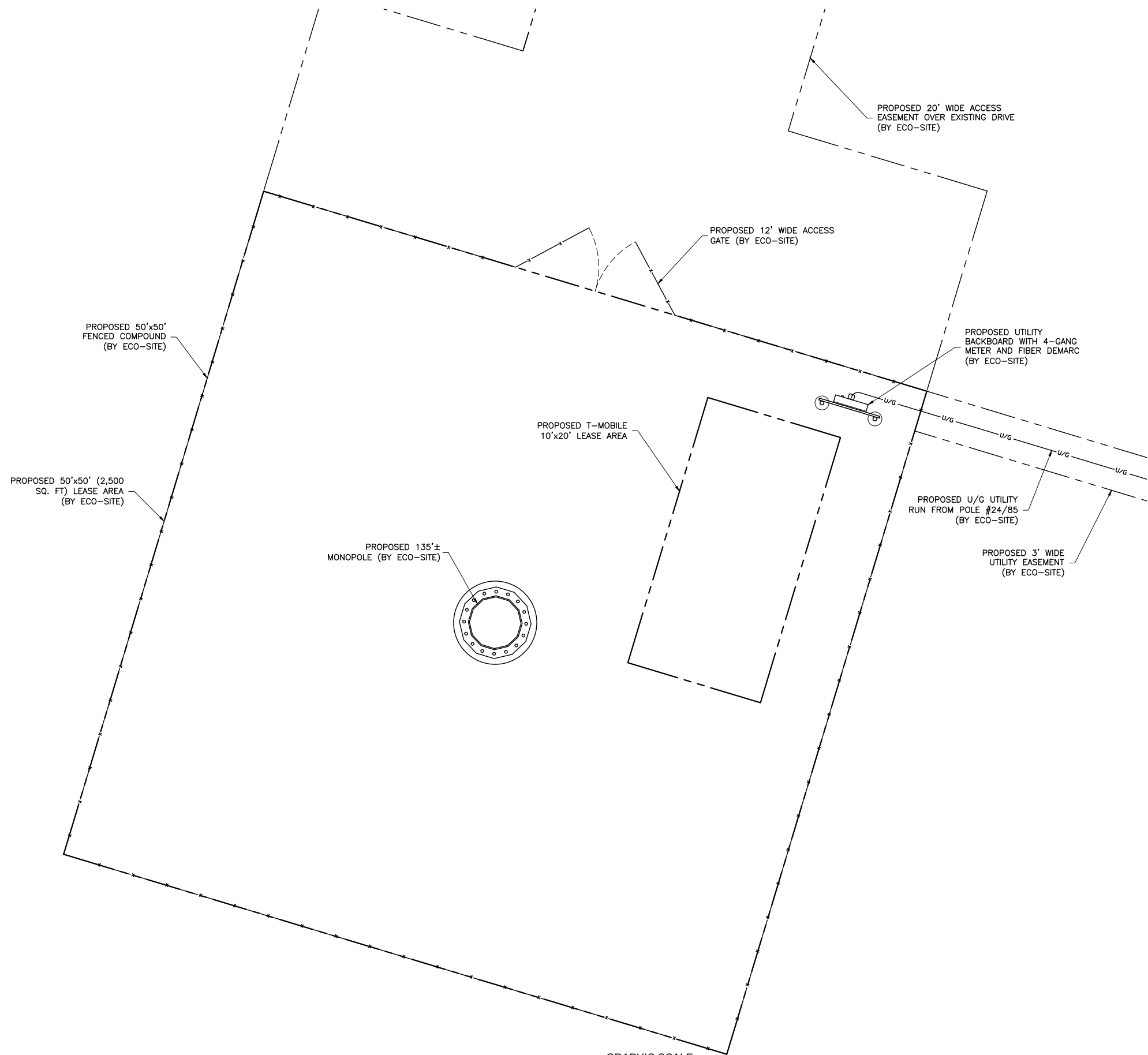
SHEET TITLE

SITE PLAN

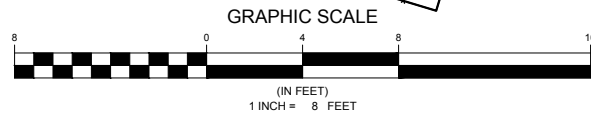
SHEET NUMBER

LE-2





1  
LE-3  
COMPOUND PLAN  
SCALE: 1/8" = 1'



ENGINEER

**NB+C**  
TOTALLY COMMITTED.

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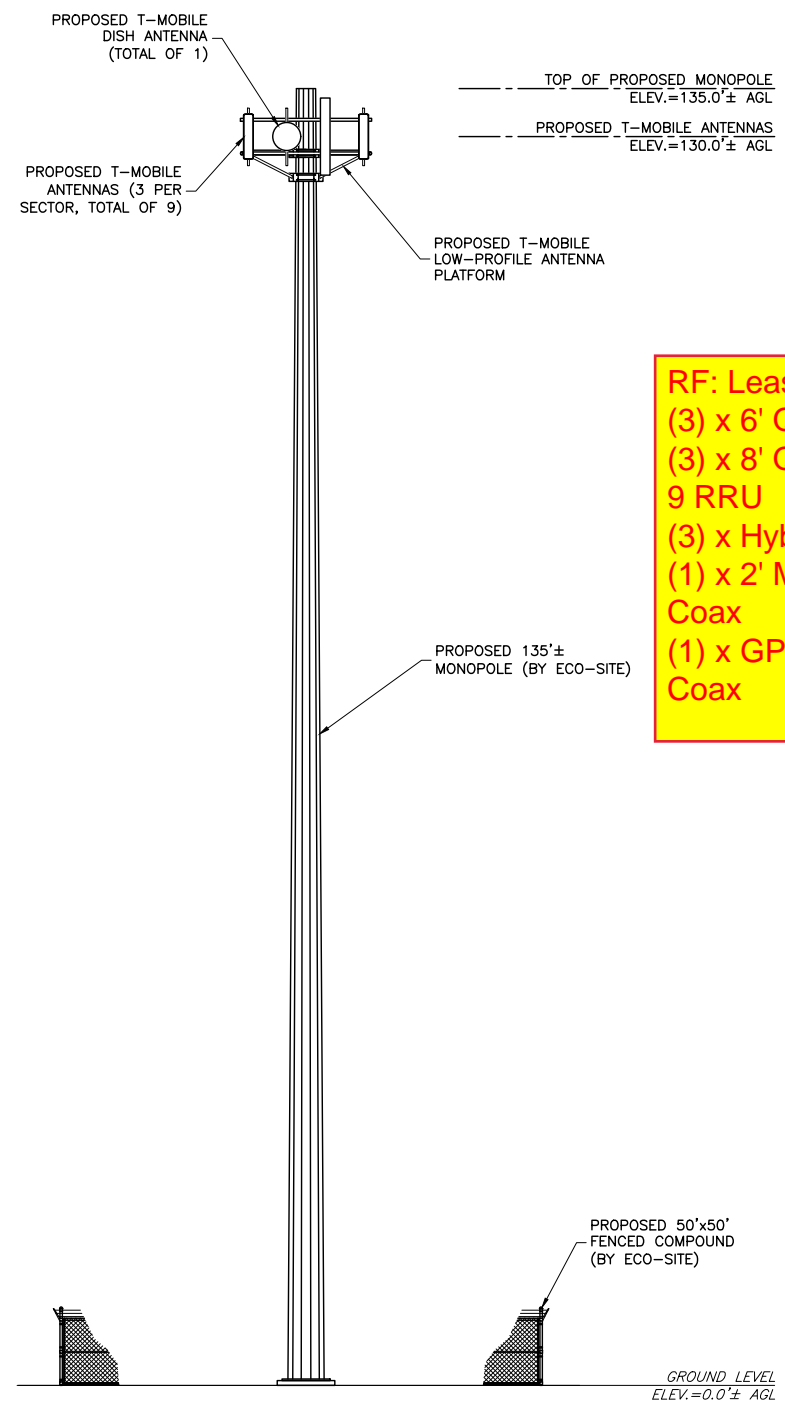
SHEET TITLE

MPN PLAN

SHEET NUMBER

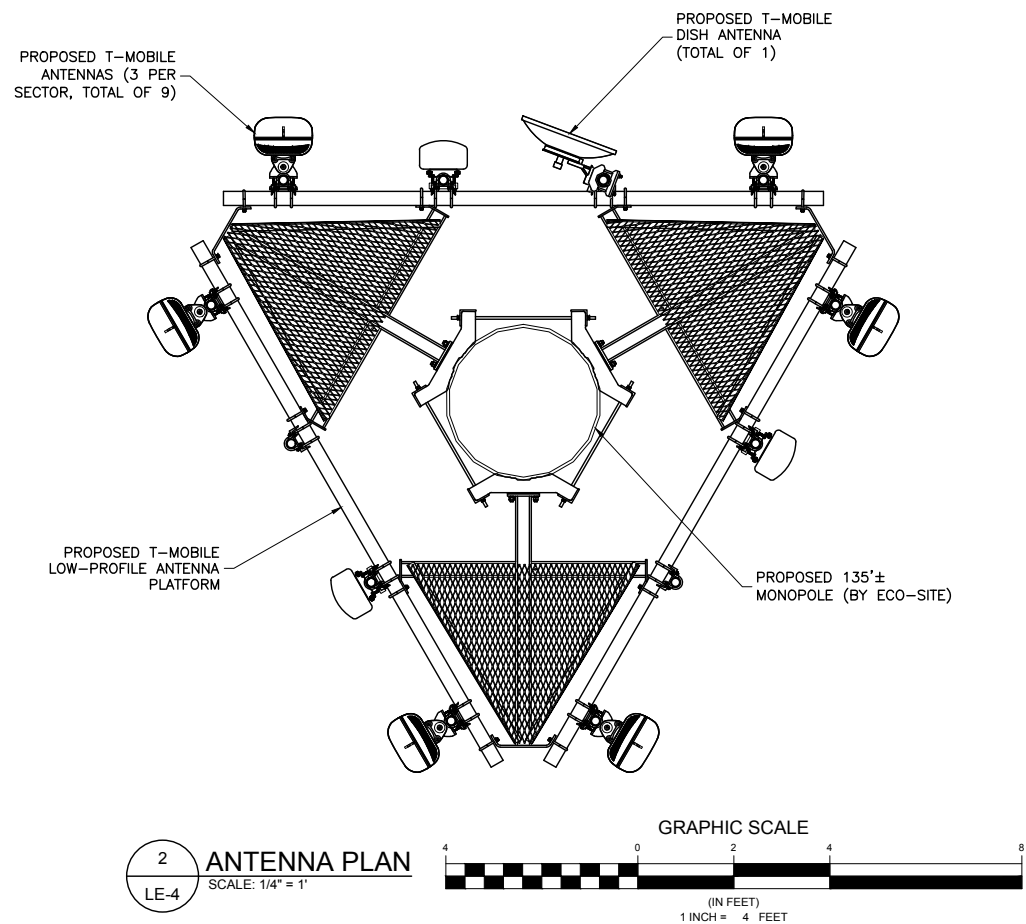
LE-





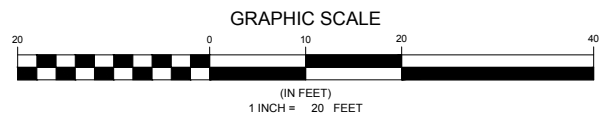
RF: Please see if we can increase the Rad Ctr to 150'

RF: Leasing Guideline:  
(3) x 6' Quad Antenna  
(3) x 8' Quad Antenna  
9 RRU  
(3) x Hybrid 1-5/8)  
(1) x 2' MW Dish with 1/2" Coax  
(1) x GPS Antenna with 1/2" Coax



2 ANTENNA PLAN  
SCALE: 1/4" = 1'

1 ELEVATION  
SCALE: 1" = 20'



| ENGINEER         | <div><b>NB+C</b><br/>TOTALLY COMMITTED.<br/><br/>NB+C ENGINEERING SERVICES, LLC.<br/><small>100 APOLLO DRIVE, SUITE 303<br/>CHELMSFORD, MA 01824<br/>(978) 856-8308</small></div>                                                                                                                                                                                                                                                                                                                  |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|----------|------------|-----|---|----------|----------------|-----|-----|------|-------------|----|
| APPLICANT        | <div><b>T-Mobile</b><br/>T-MOBILE NORTHEAST LLC<br/><br/>15 COMMERCE WAY, SUITE B<br/>NORTON, MA 02766<br/>OFFICE: (508) 286-2700<br/>FAX: (508) 286-2893</div>                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| TOWER OWNER      | <div><b>Eco-?i??</b><br/>Urban.Renewal.Wireless.<br/><br/>240 LEIGH FARM ROAD, SUITE 415<br/>DURHAM, NC 27707<br/>(919) 636-6810</div>                                                                                                                                                                                                                                                                                                                                                             |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SITE INFORMATION | <div>4HY0602B<br/>RUSSO<br/>145 ROUTE 130<br/>SANDWICH, MA 02644<br/>BARNSTABLE COUNTY</div>                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| DESIGN RECORD    | <table><tr><th colspan="4">REVISIONS</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>B</td><td>05/18/16</td><td>REVISED LE</td><td>ALM</td></tr><tr><td>A</td><td>05/17/16</td><td>PRELIMINARY LE</td><td>PRC</td></tr><tr><td>REV</td><td>DATE</td><td>DESCRIPTION</td><td>BY</td></tr></table> | REVISIONS      |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | B | 05/18/16 | REVISED LE | ALM | A | 05/17/16 | PRELIMINARY LE | PRC | REV | DATE | DESCRIPTION | BY |
| REVISIONS        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| B                | 05/18/16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | REVISED LE     | ALM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| A                | 05/17/16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PRELIMINARY LE | PRC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| REV              | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DESCRIPTION    | BY  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SHEET TITLE      | <div>ELEVATION<br/>ANTENNA PLAN</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |
| SHEET NUMBER     | <div>LE-0</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |          |            |     |   |          |                |     |     |      |             |    |



145 ROUTE 130

**LEGAL NOTICE**

**PUBLIC NOTICE - 4HY0602A**

Eco-Site is proposing to construct a 135-foot monopole at 145 Route 130, Sandwich, Barnstable County, MA. Public comments regarding the potential effects from this site on historic properties may be submitted within 30-days from the date of this publication to: Amanda Sabol - CBRE, 4 West Red Oak Lane, White Plains, NY 10604, [amanda.sabol@CBRE.com](mailto:amanda.sabol@CBRE.com), or 717-601-1436.

AD# 13461433  
Sandwich Broadside 8/3/16

**BOURNE COURIER - THE BULLETIN - SANDWICH BROADSIDER**

Wednesday, August 3, 2016