PLAPC
PARISI LAW ASSOCIATES, P.C.

APPLICATION FOR REVIEW OF
DEVELOPMENT OF REGIONAL IMPACT
(Cape Cod Commission)
FOR WIRELESS COMMUNICATIONS FACILTY

SUPPLEMENT NO. 2

Applicant:	**Vertex Towers, LLC**
Site Id:	**VT-MA-0231E**
Property Address:	**481 Quaker Road, Falmouth, MA 02556**
Tax Assessor:	**12-05-001-010**
Property Owner:	**Roman Catholic Bishop of Fall River c/o St Elizibeth Seton Parish**
Date:	**October 23, 2024**

1. (revised) Drainage Calculations
2. (updated) Site Plans

Respectfully submitted,

Francis D. Parisi, Esq.
Parisi Law Associates, P.C.
225 Dyer Street
Providence, RI 02903
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1

ADVANCED ENGINEERING GROUP, P.C.

500 North Broadway
East Providence, RI 02914
Phone: (401) 354-2403

May 27, 2024

Revised October 22, 2024

Town of Falmouth
Zoning Board of Appeals
59 Town Hall Square
Falmouth, MA 02540

Site No: VT-MA-0231E
Vertex Towers, LLC
481 Quaker Road
Falmouth, MA 02556
Barnstable County

RE: Drainage Analysis and Design for Proposed Cell Tower and Communications Facility

Dear Board Members,

Project Overview and Methodology

Advanced Engineering Group, PC (AEG) has prepared a drainage analysis and report for a proposed communication compound. The stormwater analysis is based on the Rational Method for peak discharge. The analysis will determine the stormwater volume and associated peak runoff comparing existing and proposed flows for the design storm periods. Watershed areas are based on topographic survey, MAGIS and USGS Quad Maps.

The project proposes to install a wireless telecommunications facility at the assigned location, as depicted on the plans. The 50' x 50' compound is to be placed adjacent to the eastern limit of the existing parking area of the Bishop of Fall River property. Access to the proposed compound will be set as a 10-foot-wide utility easement through the travel aisles of the existing parking area to the gate of the fenced compound area. There is to be no alteration to the parking area. The wooded area to the rear of the parking lot will be cleared to allow for off grading to match smoothly to the surrounding grades. This area will extend slightly beyond the compound. New landscaping will be added to screen the compound area from the parking area.

The facility will consist of level graded crushed stone inside the fenced area and extend one foot beyond the fence line. The compound area will match existing grades emulating existing stormwater drainage patterns. Equipment will consist of a 120-foot A.G.L. monopole with antennas connecting to radio and power cabinets with coax cables extending to the ground mounted units stationed on a concrete pad.

As mentioned previously, access to the compound will be through the parking area with no additional roadway or access road planned. The easement will extend through the parking area with direct access to Quaker Road. The site will not lie in the vicinity of any BVW resource area. The existing site is

moderately wooded with watershed tributary to a BVW located approximately 100 feet to the east of the compound.

Stormwater Computations: Rational Method (See Enclosed Sheet)

Rational Method Equation: Q = CIA, whereas,

Q = flow (ft^3/s)
C = Runoff Coefficient
I = Rainfall Intensity (in/hr., based on USDA TP40)
A = Drainage Area (acres)

It should be noted that the intensity and area will remain constant for both pre- and post-development conditions since the hydraulic length and size will be below the 5-minute minimum threshold. The only changing variable will be the stormwater coefficient.

Existing Conditions

The existing watershed originates at the edge of the existing parking lot and drains to the north as concentrated sheet flow. Stormwater runoff then enters the wooded area draining to a BVW approximately 300 feet to the north. Land is moderately sloped with a small knoll where the proposed facility will be placed.

Soils for the site are predominantly sandy loam, Hydrologic Soils Group B.

The overall ground cover and corresponding runoff coefficient value (C) for the existing watershed is broken down as follows:

The Existing Watershed has an area of approximately 65,529 SF (1.50 acres) of which,

- Wooded Area = 39,434 SF
  - C = 0.35
- Existing Parking Area = 25,595 SF
  - C = 0.95
- Open Space (unpaved) = 500 SF
  - C = 0.50

Weighted C Value

$C_w = 0.59(.35) + 0.39(0.95) + 0.02(0.50)$

$C_w = 0.587$

Intensity /Time of Concentration

Time of concentration is based on the hydraulic length and average slope related to the MassDOT time of concentration charts.

$H_L = 668$ ft
$H_s = 0.030$ ft/ft
Based on Chart $T_c = <5$ min. (use standard 5 min minimum time)

Based on stormwater Intensity graphs for 25-year storm I = 6.2 in/hr,
For 10 year storm I = 4.8 on/hr
For 2 year storm I = 3.2 in/hr

Design Flow (Q)

For Q = CIA,

Q= (0.587) (6.2in/hr.)(1.49 acres) = 5.42 CFS

Proposed Conditions

Under proposed conditions, all elements of the existing conditions are to remain in place to accommodate the placement of the compound with allowable off grading to blend to the surrounding topography. This area is approximately 5,700 square feet. This will allow the placement of the 3,000 square foot compound area. This area is currently wooded. Any off grading will be loamed and seeded.

Therefore. The new weighted C value is as follows.

- Wooded Area = 33,734 SF (0.77 Acres)
  - C = 0.35
- Existing Parking Area = 25,595 SF (0.59 Acres)
  - C = 0.95
- Open Space (unpaved) = 3,200 SF (0.06 Acres)
  - C = 0.50
- Communications Compound = 3,000 SF (0.06 Acres)
  0.10(0.95) + (0.9) (0.15) * = 0.23

* 0.5-foot crushed stone and area within the crushed stone bottom will act as a storage area for excess stormwater within the compound with minimal runoff. This extends 1 foot beyond the fence limits. A C value of 0.15 was used as a conservative value which assumes minimal runoff over time.

<u>Weighted C Value</u>

C_w = 0.51(.35) + 0.39(0.95) + 0.04(0.50) +0.06(0.23)

C_w= 0.583

Design $Flow_{25}$ = (0.583) (6.2 in/hr.) (1.49) = 5.39 CFS
Q_{10} = (0.583)(4.8)(1.49) = 4.20 CFS
Q_2 = (0.583) (3.2) (1.49) = 2.78 CFS

Storage Computation:

Volume of flow under hydrograph 25-year / 2-year storms:

V_{25} = flow triangle with duration = 2 x (storm duration) = ½ (300 seconds) (5.39 ft^3/s) = 1,617 CF
V_2 = 2 x (½ (300 sec)(2.78)) = **834 CF**

Available Storage:

Pea Gravel Dia. = 0.40 (3' x 3'x 60') = 216 CF
Stone Compound Area = 0.40 (6" x 3,000SF) = 600 CF (40% void ratio in stone)
Swale w/check dam = 38' x 3' x 6" = 57 CF

Total Available Storage = 873 CF *

834 SF < 873 CF Therefore, the entire 2-year storm event is contained.

* Calculations are conservative as they assume zero infiltration.

Summary

Factoring in the available storage within the crushed stone floor of the compound area, pea stone gravel diaphragm and the proposed swale/check dam the overall runoff coefficient is reduced. In addition, stormwater runoff up to the 2-year event completely contained within the voids of system. The composite proposed stormwater flow will be proportionally reduced below a pre-construction level.

All topography within the watershed area will be maintained with no alteration to flow patterns or discharge areas to existing wetland areas. All construction materials will be contained within the site and erosion control will be in place to prevent debris erosion and sediment buildup. All sediment will be removed by the contractor and transported off-site.

Nitrogen Loading

As part of the analysis, the location of the project has been identified as being within a MWRA and thus Objective WR3 is applicable. Wild Harbor is a nitrogen impaired embayment with zero nitrogen loading allowed. Calculating the nitrogen from the stormwater from the compound yields:

Compound Area – 3,000 SF
Impervious Surface within compound (equipment and pads) =500 ft^2

500 ft^2 x [40in/yr] x [ft/12in] x [28.32L/ft^2] x [1 yr/365d] = 141.54 L/day x [0.75mg/L] = 106mg/d

Recharge: impervious surface: 21 in/yr (Falmouth) 1.5 ppm NO_3 – N off paved surfaces and 0.75 ppm NO_3-N off roofs and other non-roadway paved impervious surfaces. It should be noted that this value is for paved surfaces that constitute roadways. These impervious surfaces are treated as roofs with no vehicular traffic.

106mg/141L = 0.75ppm therefore does not exceed threshold

However, for a Coastal Embayment where zero loading is allowed in the Wild Harbor zone, all runoff is captured within the trench and beneath the compound for all storms up to the 2-year storm. With the nitrogen contained in the first two inches of the storm event and the site containing all storms up to the 2 year storm (3.2inches in total in this case), offsite nitrogen is reduced to zero and meets the goal of the WRO and the level of NO is absorbed in the recharge and below the critical thresholds based on CCC WRO Technical Bulletin 91-001 April 1992. Additional landscaping can be placed to limit any runoff produced. This will meet the requirement of zero Nitrogen loading. The 0.75 ppm of computed nitrogen is completely contained within the site area with no residual offsite since the nitrogen load is essentially part of the water quality storm event (first 1-2" of rainfall).

Stormwater Management

The design of the proposed compound has considered the treatment and conveyance of stormwater to emulate existing conditions and make slight improvements where possible. The trench will contain the more frequent storm events mitigated the effects of the impervious surfaces within the compound with the placement of an in-line stone check dam which will work in conjunction with the on-site infiltration.

Additional landscaping will be placed to add to the absorption of any residual stormwater runoff from the site and add to the buffer area around the compound. It should be noted that the compound is flat graded with minimal slope to promote the use of the crushed stone area of the compound as stormwater capture and infiltration and further enhance removal of nitrogen load in offsite runoff.

To mitigate debris transported by runoff during construction erosion control, measures will be placed at the limits of work. The limit of tree clearing will only extend to the limit needed for grading which is confined to approximately 1 foot around the compound. Access will be via the parking lot and no temporary construction roadways will be needed. These measures will consist of filter socks and other measures deemed necessary. Staging will be such to have the trench in place prior to placement of equipment and utility connections and feed placement.

Very truly yours,

Scott N. Adams, P.E.

Advanced Engineering Group. P.C.

2

VT-MA-0231E

NORTH FALMOUTH RT28

481 QUAKER ROAD
FALMOUTH, MA 02556
BARNSTABLE COUNTY

SITE NO: VT-MA-0231E

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE LESEE/LICENSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.

4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.

7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETCETERA DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.

13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.

15. THE CONTRACTOR SHALL NOTIFY THE LESEE/LICENSEE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESEE/LICENSEE REPRESENTATIVE.

16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.

17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION REQUIRED: DIG SAFE SYSTEM (MA, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455

18. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH PROJECT OWNER PRIOR TO CONSTRUCTION.

19. NORTH ARROW SHOWN ON PLANS REFERS TO APPROXIMATE TRUE NORTH. PRIOR TO THE START OF CONSTRUCTION, ORIENTING OR FABRICATING OF ANTENNA MOUNTS, CONTRACTOR SHALL CONSULT WITH PROJECT OWNER'S RF ENGINEER AND FIELD VERIFY ALL ANTENNA SECTOR LOCATIONS AND ANTENNA AZIMUTHS.

20. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

21. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.

22. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE PROJECT OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF PROJECT OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE EXHIBIT 3). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.

23. WHEN "PAINT TO MATCH" IS SPECIFIED FOR ANTENNA CONCEALMENT, PAINT PRODUCT FOR ANTENNA RADOME SHALL BE SHERWIN WILLIAMS COROTHANE II. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PROJECT OWNER'S GUIDELINE'S.

24. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

25. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

26. 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. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.

27. 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 UTILITY COMPANY ENGINEERING. THE AREAS OF THE PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE EQUIPMENT, DRIVEWAY OR LEASE AREA SHALL BE RESTORED TO ORIGINAL CONDITION.

28. GRAVEL SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED AND COVERED WITH MULCH UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SOIL EROSION AND SEDIMENTATION CONTROLS AT ALL TIMES.

29. DURING CONSTRUCTION, PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS.

30. FOR WIRELESS COMMUNICATIONS SYSTEMS. PROJECT OWNER'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE EIS RADIO CABINETS. PROJECT OWNER RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.

31. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

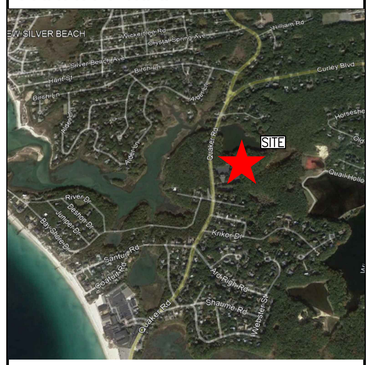
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

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

VICINITY MAP



NORTH

VICINITY MAP
SCALE: NTS

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	5
C-1	ORTHO PLOT PLAN	5
C-2	EXISTING CONDTION PLAN	5
C-3	ORTHO SITE PLAN	5
Z-1	PROPOSED SITE PLAN	5
Z-2	PROPOSED COMPOUND PLAN AND ELEVATION	5
Z-3	DETAILS	5
EC-1	EROSION CONTROL	5

ZONING NOTE:

PER SECTION 5.1.10 AND 5.1.11 OF THE KENSINGTON ZONING THE PLANNING BOARD SHALL SET THE FORM AND AMOUNT OF SECURITY THAT REPRESENTS THE COST FOR REMOVAL AND DISPOSAL OF ABANDONED TOWERS IN THE EVENT THE TOWER IS ABANDONED AND THE TOWER OWNER IS INCAPABLE AND UNWILLING TO REMOVE THE TOWER IN ACCORDANCE WITH 5.1.11, ALL SECURITY SHALL BE MAINTAINED FOR THE LIFE OF THE TOWER. ORDNANCE ANY ANTENNA OR TOWER THAT IS NOT OPERATED FOR A CONTINUOUS PERIOD OF 12 MONTHS SHALL BE CONSIDERED ABANDONED AND HAZARDOUS TO THE PUBLIC HEALTH AND SAFETY, UNLESS THE OWNER OF SAID TOWER PROVIDES PROOF OF QUARTERLY INSPECTIONS. THE OWNER SHALL REMOVE THE ABANDONED STRUCTURE WITHIN 90 DAYS OF RECEIPT OF A DECLARATION OF ABANDONMENT FROM THE TOWN NOTIFYING THE OWNER OF SUCH ABANDONMENT.

PROJECT SUMMARY

SITE NUMBER:	VT-MA-0231E
SITE NAME:	NORTH FALMOUTH RT28
SITE ADDRESS:	481 QUAKER ROAD FALMOUTH, MA 02556
ASSESSOR'S PARCEL NO.:	MAP:12 BLOCK:05 LOT:001-010
CONSTRUCTION TYPE:	NEW SITE BUILD
PROPERTY OWNER:	ROMAN CATHOLIC BISHOP OF FALL RIVER C/O ST ELIZABETH SETON PARISH P.O. BOX 681 NORTH FALMOUTH, MA 02556
APPLICANT, LESSEE/LICENSEE, PROJECT OWNER:	VERTEX TOWERS LLC 2 COMMERCIAL STREET SHARON, MA 02067
TOWER TYPE:	MONOPOLE
TOWER HEIGHT:	120'±

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

Vertex Towers LLC
VERTEX TOWER LLC
155 SOUTH STREET, SUITE 102
WRENTHAM, MA 02093

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications
500 North Broadway
East Providence, RI 02914
Tel: (401) 354-2403
Fax: (401) 633-6354

COMMONWEALTH OF MASSACHUSETTS
SCOTT N. ADAMS
CIVIL
No. 49008
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2023-0008

DRAWN BY: MFR

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
0	03/16/23	ISSUED FOR REVIEW
1	03/27/23	REVISED
2	04/06/23	REVISED
3	07/24/24	ISSUED FOR REVIEW
4	10/10/24	REVISED
5	10/22/24	REVISED

NORTH FALMOUTH RT28

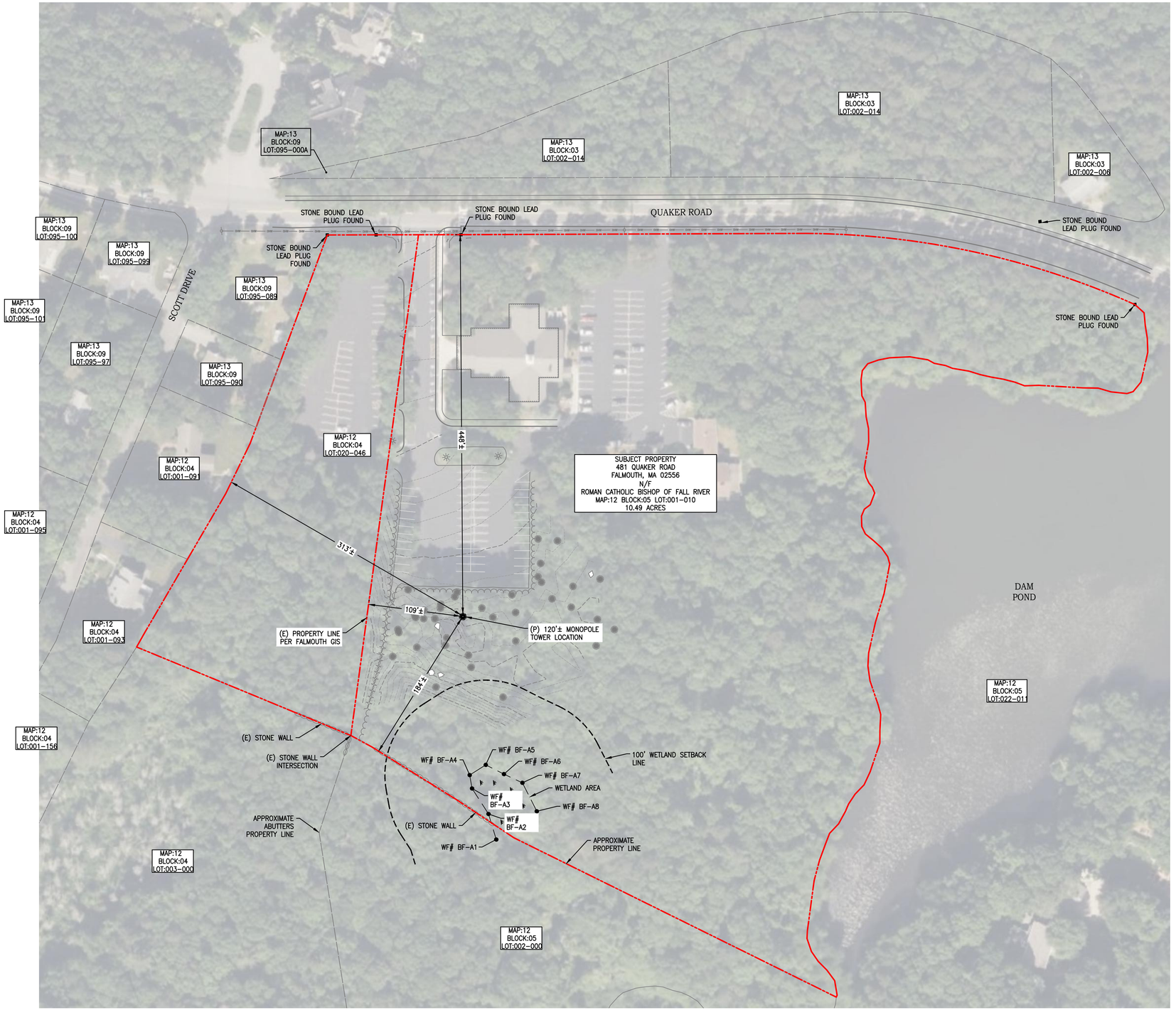
481 QUAKER ROAD
FALMOUTH, MA 02556
BARNSTABLE COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NORTH

1 / C-1 ORTHO PLOT PLAN

SCALE: 1"=60'

0 60' 120'

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- EXIST. R.O.W. LAYOUT
- PROP. EASEMENT/LEASE AREA
- WETLAND SETBACK LINE
- EXIST. FENCE
- PROP. FENCE
- EXIST. CHAIN LINK FENCE
- PROP. CHAIN LINK FENCE
- LIMITS OF WORK
- EROSION CONTROL
- EXIST. EDGE OF TREE CANOPY
- PROP. EDGE OF TREE CANOPY
- 5' MAJOR CONTOURS
- 1' MINOR CONTOURS
- WETLAND LINE
- ZONING LINE

GENERAL NOTES:

1. FIELD SURVEY DATE: JANUARY 27, 2023
2. VERTICAL DATUM: NATIONAL AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
3. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83)
4. CENTER OF PROPOSED TOWER: LATITUDE: 41° 37' 52.70" N
   LONGITUDE: 70° 37' 52.72" W
   ELEVATION: 42'± AMSL
5. PROPERTY OWNER: ROMAN CATHOLIC BISHOP OF FALL RIVER
   C/O ST ELIZABETH SETON PARISH
   P.O. BOX 681
   NORTH FALMOUTH, MA 02556
6. SITE NUMBER: VT-NH-0231
7. SITE ADDRESS: 481 QUAKER ROAD
   FALMOUTH, MA 02556
8. APPLICANT, LESSEE/LICENSEE & PROJECT OWNER: VERTEX TOWERS, LLC
   2 COMMERCIAL STREET
   SHARON, MA 02067
9. JURISDICTION: TOWN OF FALMOUTH
10. TAX ID: MAP:12 BLOCK:05 LOT:001-010
11. DEED REFERENCE: BOOK: 00187 PAGE: 0054
12. ZONING JURISDICTION: RB – SINGLE RESIDENCE B
13. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455
14. PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLANS, DEEDS, AND PLANS OF RECORD AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.
15. WETLANDS WERE NOT OBSERVED WITHIN 100' OF THE LIMIT OF WORK. WETLAND LOCATION PER ECOSYSTEM SOLUTIONS INC. WETLAND REPORT DATED 1/23/2023.
16. THE PURPOSE OF THIS SURVEY IS TO SUPPORT THE DESIGN AND CONSTRUCTION OF A TELECOMMUNICATION FACILITY. USE OF THIS SURVEY BY ANYONE OTHER THAN VERTEX TOWERS, LLC AND USE OF THIS SURVEY FOR ANY PURPOSE NOT RELATED TO THE DESIGN OF THE INTENDED FACILITY IS STRICTLY PROHIBITED.
17. BEARING SYSTEM OF THIS PLAN IS BASED ON TRUE NORTH. TRUE NORTH WAS ESTABLISHED FROM GPS READINGS ON JANUARY 27, 2023.
18. LIMIT OF WORK IS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FLOOD INSURANCE RATE MAP BARNSTABLE COUNTY, TOWN OF FALMOUTH MAP NUMBER: 25001C0494J, EFFECTIVE DATE JULY 16, 2014
19. IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY, ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.
20. THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.
21. ORTHOGRAPHIC IMAGE IS FROM NEAR MAP. ADJACENT BUILDING WERE NOT FIELD LOCATED BY ADVANCED ENGINEERING GROUP.

ZONING SUMMARY TABLE

ZONING DISTRICT: RB – SINGLE RESIDENCE B
ASSESSORS ID: MAP:12 BLOCK:05 LOT:001-010
PROPOSED USE: WIRELESS COMMUNICATION FACILITY

DIMENSION:	REQUIRED MINIMUM	PROVIDED
FRONT YARD SETBACK*	25 FT	448± FT
SIDE YARD SETBACK*	10 FT	109± FT
REAR YARD SETBACK*	10 FT	184± FT

* DIMENSIONS MEASURED FROM PROPOSED TOWER TO THE NEAREST PROPERTY LINE

Vertex Towers LLC
VERTEX TOWER LLC
155 SOUTH STREET, SUITE 102
WRENTHAM, MA 02093

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COMMONWEALTH OF MASSACHUSETTS
SCOTT M. ADAMS
CIVIL
No. 49008
REGISTERED PROFESSIONAL ENGINEER

AEG PROJECT #: 2023-0008

DRAWN BY: MFR

CHECKED BY: SNA

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NORTH FALMOUTH RT28

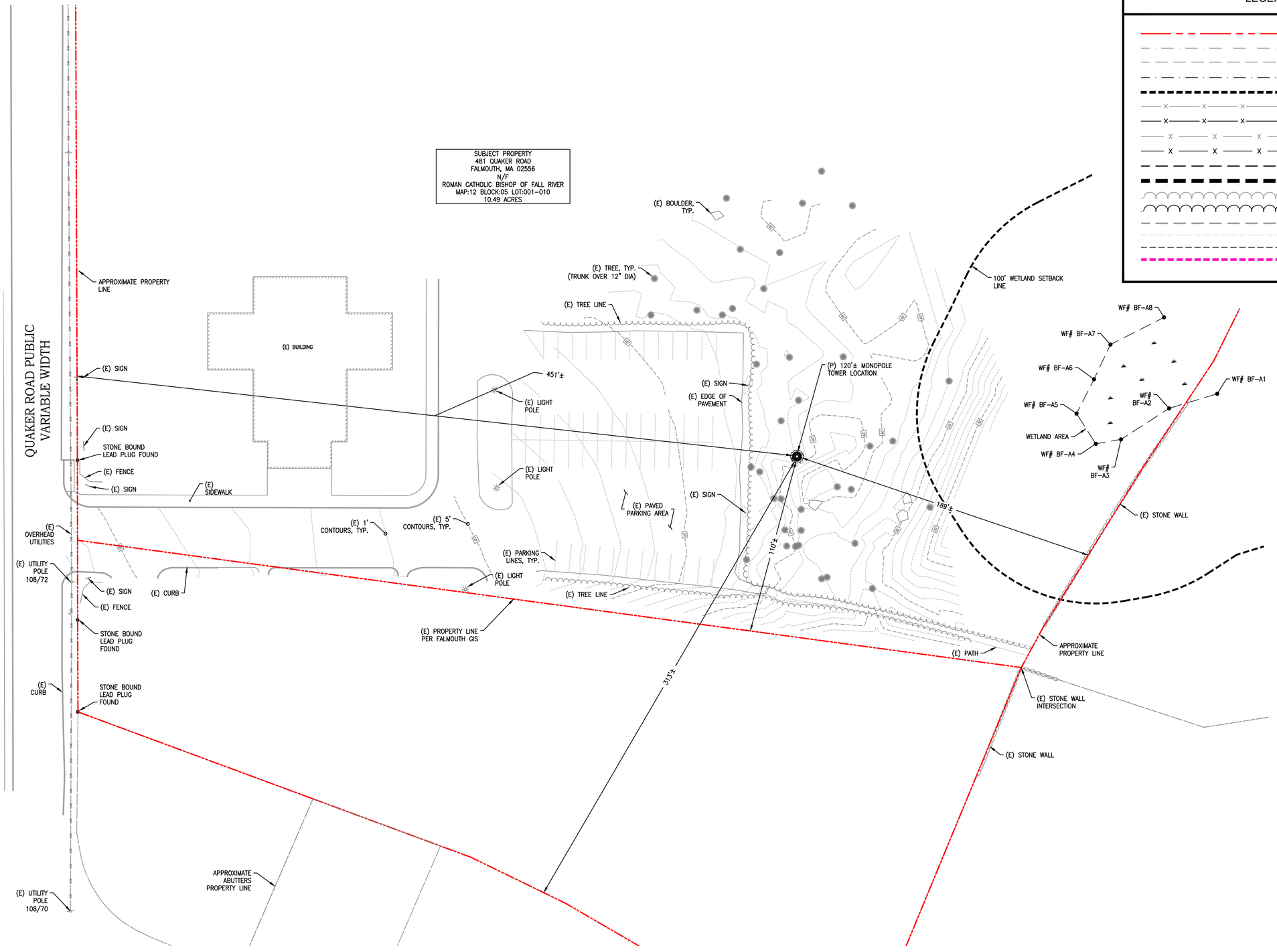
481 QUAKER ROAD
FALMOUTH, MA 02556
BARNSTABLE COUNTY

SHEET TITLE

ORTHO PLOT PLAN

SHEET NUMBER

C-1



LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- EXIST. R.O.W. LAYOUT
- PROP. EASEMENT/LEASE AREA
- WETLAND SETBACK LINE
- EXIST. FENCE
- PROP. FENCE
- EXIST. CHAIN LINK FENCE
- PROP. CHAIN LINK FENCE
- LIMITS OF WORK
- EROSION CONTROL
- EXIST. EDGE OF TREE CANOPY
- PROP. EDGE OF TREE CANOPY
- 5' MAJOR CONTOURS
- 1' MINOR CONTOURS
- WETLAND LINE
- ZONING LINE

NORTH

1 / C-2 EXISTING CONDITIONS PLAN

SCALE: 1"=30'

0 30' 60'

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NORTH
FALMOUTH RT28

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FALMOUTH, MA 02556
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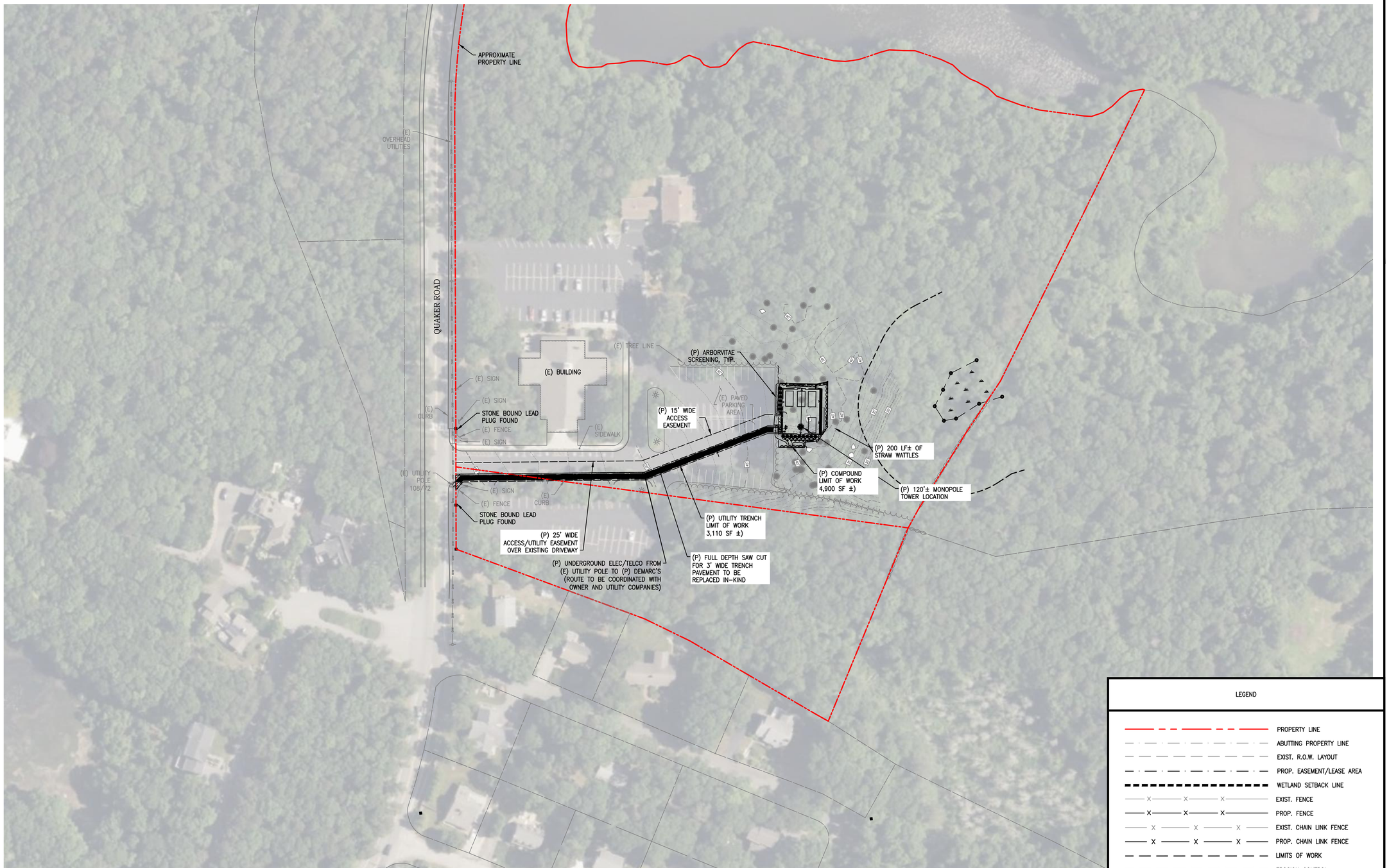
SHEET TITLE

EXISTING CONDITIONS PLAN

SHEET NUMBER

C-2



SUBJECT PROPERTY
481 QUAKER ROAD
FALMOUTH, MA 02556
N/F
ROMAN CATHOLIC BISHOP OF FALL RIVER
MAP:12 BLOCK:05 LOT:001-010
10.49 ACRES

NORTH

1
C-3

ORTHO SITE PLAN

SCALE: 1"=60'

0 60' 120'

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
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FALMOUTH RT28

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SHEET TITLE

ORTHO SITE PLAN

SHEET NUMBER

C-3

SUBJECT PROPERTY
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FALMOUTH, MA 02556
N/F
ROMAN CATHOLIC BISHOP OF FALL RIVER
MAP:12 BLOCK:05 LOT:001-010
10.49 ACRES

QUAKER ROAD

APPROXIMATE PROPERTY LINE

(E) BUILDING

(E) OVERHEAD UTILITIES

(E) SIGN

(E) CURB

STONE BOUND LEAD PLUG FOUND

(E) FENCE

(E) SIDEWALK

(P) 25' WIDE ACCESS/UTILITY EASEMENT OVER EXISTING DRIVEWAY

(P) FULL DEPTH SAW CUT FOR 3' WIDE TRENCH PAVEMENT TO BE REPLACED IN-KIND

(P) 15' WIDE ACCESS EASEMENT

(E) UTILITY POLE 108/72

(P) UNDERGROUND ELEC/TELCO FROM (E) UTILITY POLE TO (P) DEMARC'S (ROUTE TO BE COORDINATED WITH OWNER AND UTILITY COMPANIES)

(P) 10' WIDE UTILITY EASEMENT

(E) LIGHT POLE

(E) TREE, TYP. (TRUNK OVER 12" DIA)

(E) TREE LINE

(E) PARKING LINES, TYP.

(E) 5' CONTOURS, TYP.

(E) 1' CONTOURS, TYP.

(E) PAVED PARKING AREA

100' WETLAND SETBACK LINE

(P) EMERALD SENTINEL EASTERN RED CEDAR TO BE PLANTED 5' O.C., TYP. (TOTAL OF 16)

(P) 3FT WIDE PEA GRAVEL DIAPHRAGM (TYP)

(P) UTILITY TRENCH LIMIT OF WORK 3,110 SF ±)

(P) COMPOUND LIMIT OF WORK 4,900 SF ±)

(P) 120'± MONOPOLE TOWER LOCATION

(P) GRAVEL ACCESS DRIVE

(P) 200 LF± OF STRAW WATTLES

(E) SIGN

(E) BOULDER, TYP.

(E) TREE LINE

(E) EDGE OF PAVEMENT

(E) PATH

NORTH

1 / Z-1 PROPOSED SITE PLAN

SCALE: 1"=50'

0 20' 40'

LEGEND

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SHEET TITLE

PROPOSED SITE PLAN

SHEET NUMBER

Z-1

SITE AREA CALCULATIONS

TOTAL LIMIT OF WORK – COMPOUND AREA (L.O.W.)	4,900 S.F.
PERMANENT DISTURBED AREA W/IN L.O.W.	3,100 S.F.
TEMPORARY DISTURBED AREA W/IN L.O.W.	1,800 S.F.
IMPERVIOUS AREA – ALLOWANCE	500 S.F.

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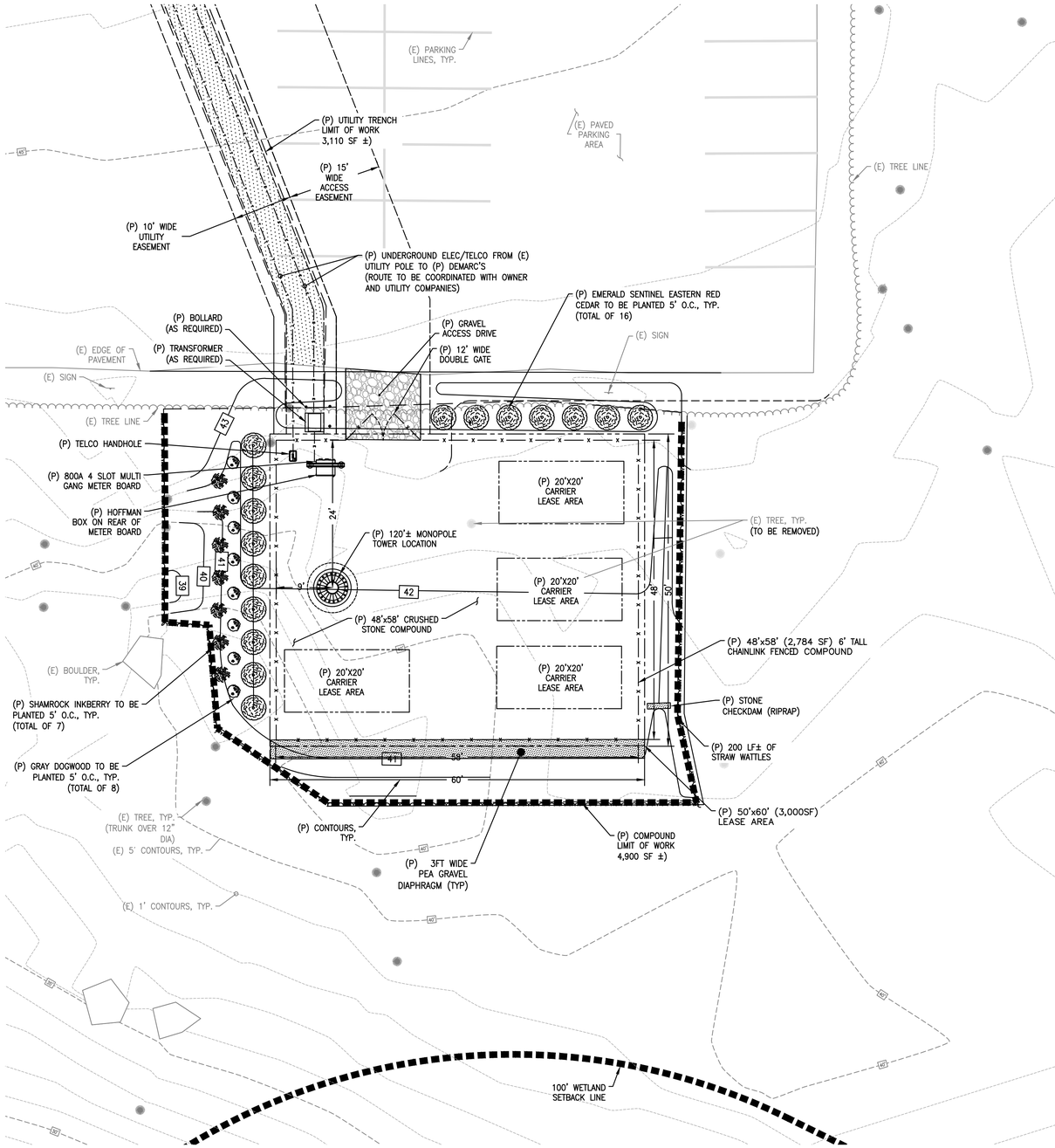
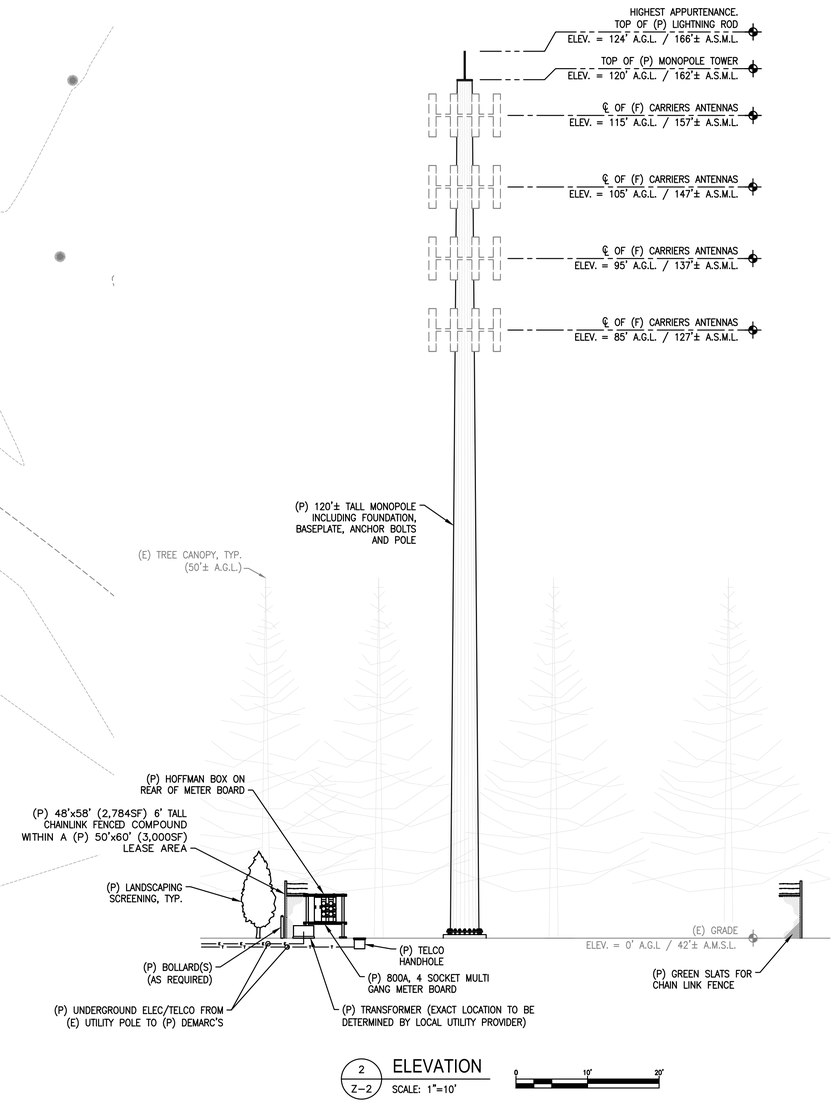


NORTH

1 / Z-2 PROPOSED COMPOUND PLAN

SCALE: 1"=10'



2 / Z-2 ELEVATION

SCALE: 1"=10'

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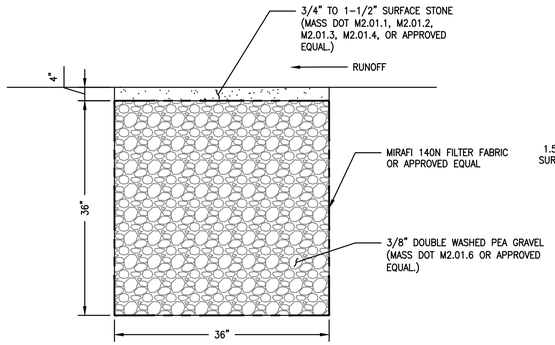
SHEET TITLE

PROPOSED COMPOUND PLAN AND ELEVATION

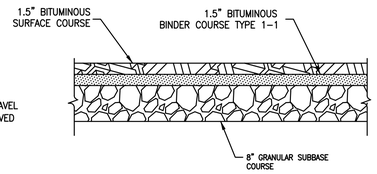
SHEET NUMBER

Z-2

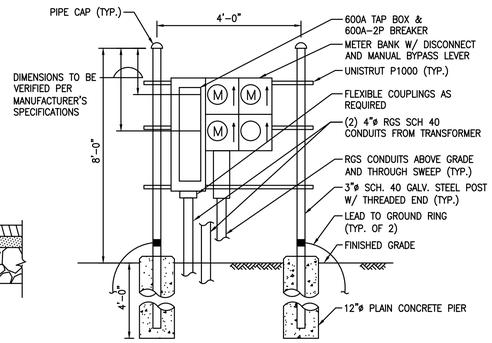


NOTE:
PEA GRAVEL DIAPHRAGM SHALL BE INSTALLED AROUND DOWNHILL SIDE OF FENCED COMPOUND.

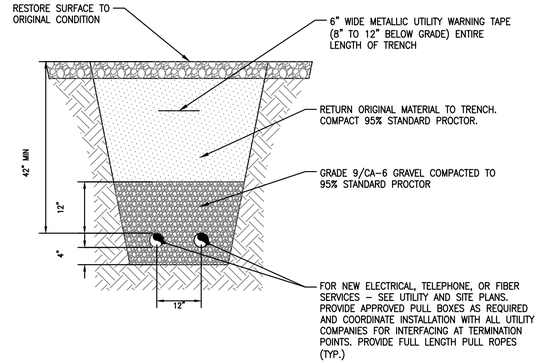
4 Z-3 PEA GRAVEL DIAPHRAGM DETAIL
SCALE: N.T.S.



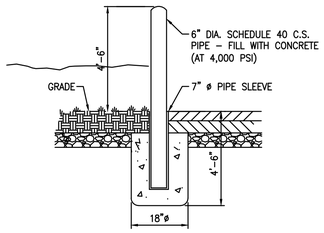
1 Z-3 BITIMINIOUS CONCRETE DETAIL
SCALE: N.T.S.



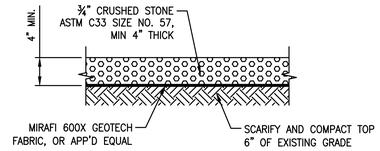
2 Z-3 METER BOARD DETAIL
SCALE: N.T.S.



3 Z-3 TRENCH DETAIL AT ACCESS CROSSING
SCALE: N.T.S.



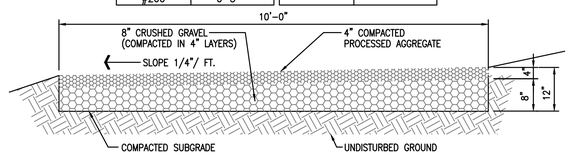
5 Z-3 BOLLARD DETAIL
SCALE: N.T.S.



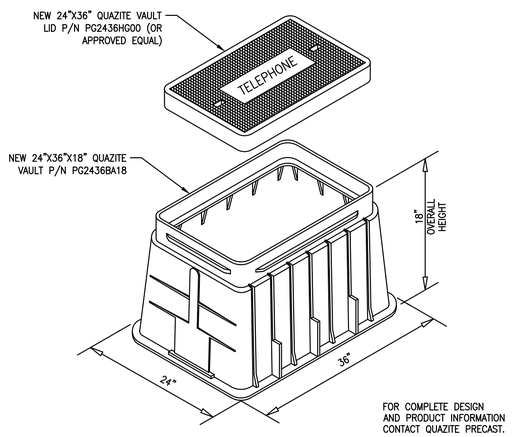
6 Z-3 GRAVEL COMPOUND DETAIL
SCALE: N.T.S.

CRUSHED GRAVEL	
SIEVE	% PASSING BY WEIGHT
5"	100
3 1/2"	90-100
1 1/2"	55-95
1/4"	25-60
#10	15-45
#40	5-25
#100	0-10
#200	0-5

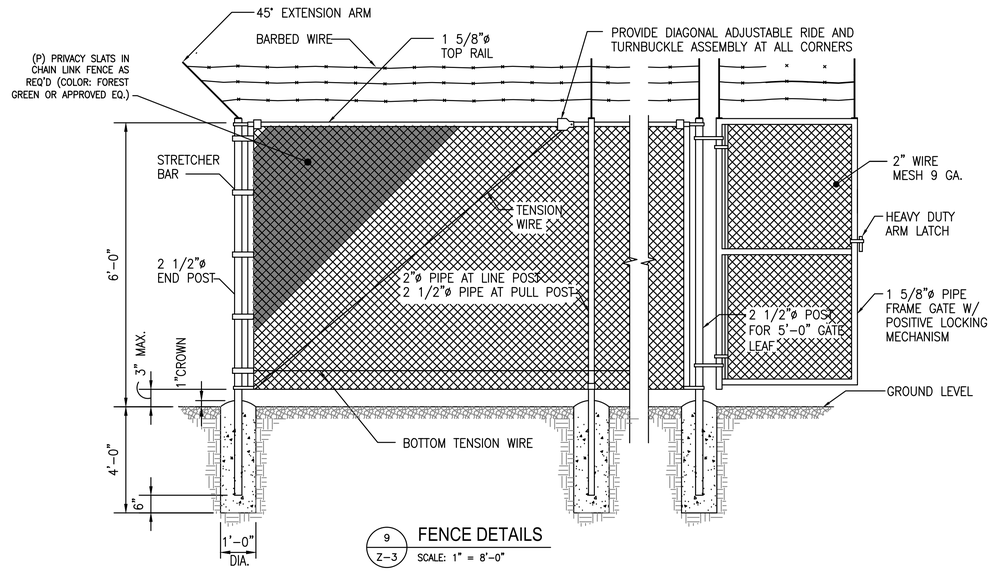
PROCESSED AGGREGATE	
SIEVE	% PASSING BY WEIGHT
2 1/4"	100
2"	95-100
3/4"	50-75
1/4"	25-45
#40	5-20
#100	2-12



7 Z-3 GRAVEL ACCESS CROSS SECTION
SCALE: NTS



8 Z-3 TELCO HANDHOLE ISOMETRIC
SCALE: N.T.S.



9 Z-3 FENCE DETAILS
SCALE: 1" = 8'-0"

FENCE NOTES:

1. INSTALL FENCING PER ASTM F-567, SWING GATE PER ASTM F-900.
2. ALL END POSTS, LINE POSTS, PULL POSTS, POSTS FOR GATE LEAF, PIPES FOR GATE FRAME AND TOP RAILS SHALL BE SCHEDULE 40 PIPE PER ASTM F-1083.
3. FABRIC SHALL BE 12 GA. CORE WIRE SIZE 2" MESH CONFORMING TO ASTM A-392.
4. TENSION WIRE SHALL BE 7 GA. GALV. STEEL.
5. TIE WIRE SHALL BE 11 GA. GALV. STEEL (MIN.) AT POSTS AND RAILS. A SINGLE WRAP FABRIC TIE AT TENSION WIRE BY HOG RINGS SPACED MAX. OF 24" INTERVALS
6. BARBED WIRE SHALL BE DOUBLE STRAND 12 1/2" O.D. TWISTED WIRE TO MATCH W/FABRIC 14 GA., 4 PT. BARBS SPACES AT APPROXIMATELY 5" O.C.
7. STEEL FENCE SYSTEM SHALL INCLUDE THE FENCE POSTS, FABRIC, GATE SYSTEM AND ALL NECESSARY ERECTION ACCESSORIES, FITTINGS AND FASTENINGS. ALL FENCE SYSTEM COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153. GATES SHALL BE SWING GATES WITH 5'-0" LEAFS. REFER TO TYPICAL FENCE DETAIL FOR ADDITIONAL INFORMATION. INSTALL FENCE AFTER CONCRETE HAS ATTAINED 75% OF 28 DAY DESIGN STRENGTH.
8. SCREENING SLATS SHALL BE INSTALLED ON PROPOSED FENCING (COLOR: GREEN OR AS DET'S BY PROJECT OWNER)
9. COMPLY WITH LOCAL ORDINANCES OF BARBED WIRE PERMIT REQUIREMENTS, IF REQUIRED.

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NORTH
FALMOUTH RT28

481 QUAKER ROAD
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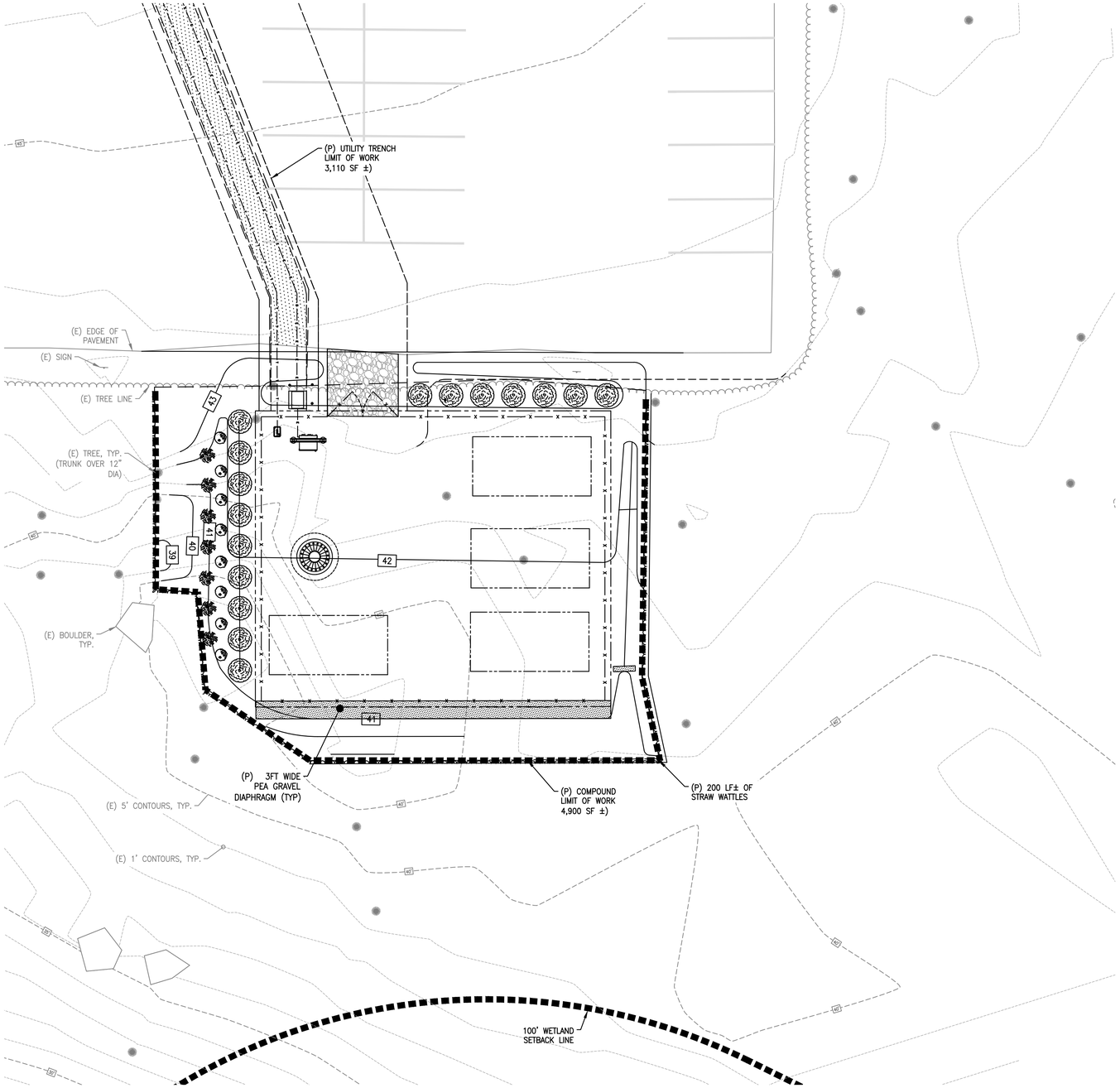
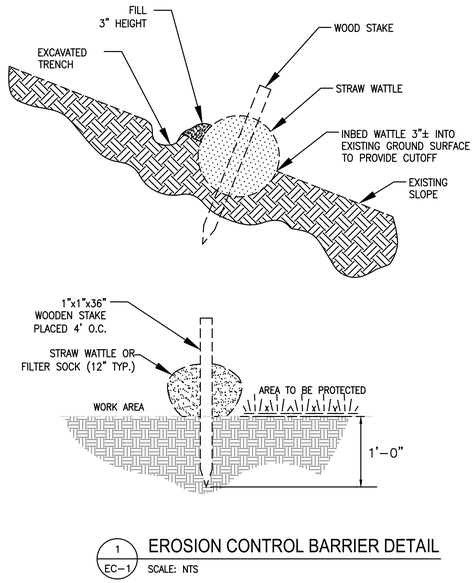
SHEET TITLE
DETAILS

SHEET NUMBER
Z-3



1 EC-1 EROSION CONTROL PLAN
SCALE: 1"=10'

0 10' 20'



1 EC-1 EROSION CONTROL BARRIER DETAIL
SCALE: NTS

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONRTOL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE SYSTEM.

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EROSION CONTROL PLAN

SHEET NUMBER

EC-1