

# CAPE HATTERAS NATIONAL SEASHORE

STATEMENT OF WORK:  
Replace the Septic System at the  
Hatteras Island Double Keepers Quarters



NATIONAL PARK SERVICE  
Region 2

**CAPE HATTERAS NATIONAL SEASHORE**  
**Outer Banks Group**

**Statement of Work**

**Replace Septic System at the Hatteras Island DKQ**

**1.0     INTRODUCTION**

The National Park Service (NPS) Cape Hatteras National Seashore (CAHA) has a requirement to replace the septic tank and drain field for the Double Keepers Quarters (DKQ), also called the Museum of the Sea, at the Cape Hatteras Lighthouse grounds in Buxton NC.

**2.0     CONSTRUCTION SITE LOCATION**

The address for the project site is 46379 Lighthouse Rd Buxton, NC 27920.

**3.0     BACKGROUND AND EXISTING CONDITIONS**

The DKQ at 46379 Lighthouse Rd in Buxton, NC is a museum facility that was the former double keepers' quarters residence for the Cape Hatteras Lighthouse. The building is approximately 90 ft x 36 ft and oriented on site so that the front doors of the building face south southeast. In 1999, the building was relocated to its existing site and the septic system installed. The building is occupied daily by 2 – 3 staff personnel plus visitors who tour and pass through the inside of the museum. The building includes two (staff only) restrooms, each with a single toilet and sink. The restroom is on the northwest side of the building. The wastewater is collected in a PVC pipe and drains by gravity to a 1,500 gal septic tank which drains to a 1,500 gal lift station immediately adjacent to the septic tank. From the lift station the wastewater is pumped through a valve vault, then around the east side of the building to a clearing on the south side of the building to the elevated low pressure drip drainfield. (See photo in Figure 1 and attached sketches of the existing layout). The drain field was disconnected and abandoned in place due to another construction project in mid-2024. Attached are drawings of the existing lift station and drainfield.

Other utilities in the immediate vicinity of the DKQ have been installed including water service, electrical service, and telecommunications service, all of which are underground and enter the building beneath the restroom and septic tanks, and cross over, under, or by the existing septic drainlines, tanks, and force main. A back up generator was previously connected to the DKQ but has been removed and underground electric cables abandoned in place. See figure 2 below for an excerpt of the 1999 utility plan in the vicinity of the DKQ. This plan is incomplete and does not show all utilities in their current configuration. The electric service is provided by Cape Hatteras Electric Cooperative. A pad mounted transformer shown on the attached sketches provides power to the DKQ and the adjacent Principal Keepers Quarters (PKQ).

The site was examined according to North Carolina Administrative Code Title 15A Chapter 18 Environmental Health Subchapter 18E Sanitation Section Sewage Treatment and Disposal Systems. Specifically, the topography, landscape, soil characteristics, soil wetness condition and water table depth, soil depth and restrictive horizons, daily flow rate, and setbacks for the location of tank and drainfield. Using a 48" boring tool, soils adjacent to the existing septic tank were found to be a light brown to medium brown poorly graded sandy soil. The sand was consistently dry down to 48" below existing grade with no noticeable moisture or wetness experienced.

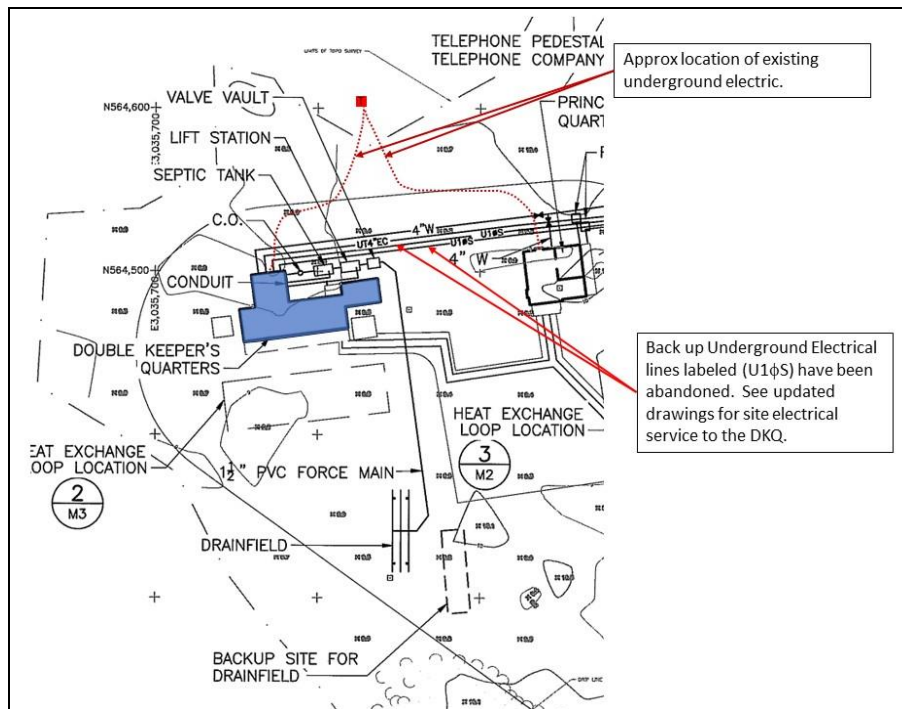
According to an NPS elevation survey, the elevation of the front porch of the DKQ is 3.608 m, or 11.837 ft (or approx 11 ft-10 in) above sea level. On 13 Sept 2024, five locations in the vicinity of the DKQ and PKQ were dug and bored until saturated soil was found. One of the bore locations in the immediate vicinity of the existing septic tank and lift station at the DKQ measured 5 ft 7 below the front porch. Therefore, the saturated soil condition is noted as 6ft-3in above sealevel. Spot elevations surveyed in a recent Landscaping project around the DKQ show the elevation between the PKQ and DKQ as ranging between 8.9ft and 9.3 ft above sea level.

A percolation test was not conducted on site due to the sandy nature of the soil. A maximum Long Term Acceptance Rate of 1.0 is allowable for the drainfield sizing calculations, depending on the type of drainfield installed.

The site around the DKQ and PKQ was landscaped with planted sod in the fall of 2024. Type and vendor for the sod is available from the NPS.



**Figure 1: Existing Lift Station, Wet Well and Septic Tank located behind the DKQ 46377 Lighthouse Rd, Buxton prior to the landscaping and sod placement.**



**Figure 2: Utility Drawing for DKQ.**

#### **4.0 SCOPE OF WORK**

Replace the septic system with a new septic system. New septic system shall be installed by a qualified installer according to North Carolina General Statutes, 15A NCAC 18A, and the North Carolina Building Code/Plumbing Code/Electric Code.

1. Submit product data for products to be used during this project.
2. Locate and mark utilities on site within the construction limits.
  - a. Verify that newly installed fiber optic lines have been located via tone device.
  - b. Verify abandoned electrical lines are disconnected and dead.
  - c. Verify the depth of the water table below existing grade at the site of the proposed bed system.
  - d. Verify the exact location of the water line providing water service to the DKQ.
  - e. Hand dig to find the new fiber optic telecommunications line installed to the DKQ.
  - f. Hand dig at any crossing of existing utilities to remain with the demolition work and new work for this project.
  - g. Damage caused to existing utilities which were not located by the Contractor shall be replaced at the Contractor's expense. Replacement material shall be installed to the nearest utility pedestal or node. Patches/repairs shall not be accepted to damaged communications utilities.
  - h. The contractor shall coordinate with each utility provider (including NPS for NPS owned utilities) prior to digging.



- i. The contractor shall coordinate with the CO/COR prior to digging. The COR shall be notified verbally 24 hours prior to digging.
  - j. The Contractor shall not begin digging without written consent.
- 3. Protect the existing walkway, new fencing around the PKQ/DKQ, and sodded landscape. Provide protection measures to prevent cracking the edges of the walkway, cause rutting of the soils, or other damages to the project property.
- 4. Empty existing septic tank from all solids and fluids.
- 5. Demo existing concrete septic tank and associated piping from the septic tank back to the penetration through the floor of the DKQ, leaving approximately 4" – 12" below the floor to connect new pipe.
- 6. Demo existing lift station and valve vault.
- 7. Demo and disconnect all electrical wiring from the lift station back to the electric panel. Install blank breaker plates on the panel.
- 8. Demo the existing abandoned electrical lines below ground for approximately 60 ft between the DKQ to at least 5 ft past the new septic system. See sketch for details.
- 9. Provide new schedule 40 PVC white drainpipe connecting to existing septic pipe beneath the floor of the DKQ, turning and elevated, supported by earth and hangers beneath the DKQ. Provide a new short or long sweep elbow for vertical to horizontal fitting meeting NC Plumbing Code 706.3. Provide WYE fitting and extension to the edge of the building for cleanout with PVC cap. New pipe shall be elevated approximately 6 inches – 18 inches above existing grade, exiting the crawl space of the building toward the east as shown in the attached sketches. Cover pipe at least 8 inches outside the footprint of the crawlspace with soil. Reuse of soil from site excavation is acceptable. Grade at 5:1 slope on side slopes. Top 6 inches of cover shall be topsoil. Rake smooth and place sod over the raised area above the pipe.
- 10. Provide new 1,000-gallon concrete septic tank. Locate new tank on the north side of the DKQ in the location shown in figure 3 below, approximately 10 ft from the DKQ. (See attached sketches of proposed layout of new drainfield).
  - a. Install septic tank with top of tank approximately 8 inches – 12 inches above existing grade.
  - b. Connect new drainpipe to new septic tank with schedule 40 PVC or approved equal material.
  - c. Provide properly sealed joints and connections from the existing drainpipe to new sections of pipe which seal to the new septic tank.
  - d. Cover tank at least 8 inches outside the footprint of the crawlspace with soil. Reuse of soil from site excavation is acceptable. Grade at 4:1 slope on side slopes. Top 6 inches of cover shall be topsoil. Rake smooth and place sod over the raised area above the pipe.
- 11. The new 1,000-gal septic tank shall include at a minimum:
  - a. Watertight joints
  - b. Concrete baffles
  - c. Effluent filter
  - d. Access opening less than 18 inches from the end of the tank to visually see the inflow pipe.
  - e. Adequate opening less than 12 inches from the effluent filter to be able to visually see and physically reach the effluent filter without entering the tank.
  - f. Access opening to visually see the concrete baffle.

- g. Provide Concrete lids on the concrete septic tank with type 316 stainless steel handles. Concrete tanks with risers do not require concrete lids with stainless handles if the HDPE risers and riser lids meet State requirements for lids.
  - h. HDPE risers and riser lids which extend a minimum of 12 inches above grade. Plastic riser lids shall be locking, mechanically sealed, or above 65 lbs. weight.
12. Provide new distribution tank and bed system drainfield. Follow 15A NCAC 18E paragraph .0903 BED SYSTEMS.
- a. Use #5 washed stone with no fines, 12 inches thick.
  - b. Top of stone layer shall have filter fabric on top of stone, filter fabric extending approx 2 ft on all sides of the stone.
  - c. Filter fabric shall be 9 inches below existing grade, and shall have 9 inches – 11 inches of soil placed above the filter fabric. The top 6 inches of soil shall be top soil suitable for placing sod. Top of soil at grade level shall be crowned 2 inches higher at the center of the drainfield sloping away from the center of the drainfield.
  - d. Drainfield shall have 4 rows of 3 inch diameter perforated pipe set at 3 ft on center connected together inside of the washed stone with a minimum of 6 inches of stone below the pipe and minimum 2 inches of stone above the pipe.
  - e. Provide additional fill material to grade site to fill excavations of old tank, lift station, and valve vault, cover over new tank and drainpipe, and crowned drainfield. Top 6 inches of cover material shall be top soil.
13. Provide sod to the disturbed area including pipe from the DKQ to the new tank, above the new tank, and above the drainfield, approximately 500 sf.
14. Re-establish the landscape grade due to rutting caused by vehicles and equipment accessing the site.
- a. Where vehicles and equipment have driven into the site, through the fenced area, and around the site, causing rutting or soil disturbance, smooth, fill, repair, or otherwise bring the grade back to original grade level. Re-sod ruts of destroyed vegetative grasses to pre-construction condition.

**NOTES:**

- 1. Ensure that the new tank and drainfield are a minimum of 10 ft horizontally from the incoming water service lines and building lateral lines. The Contractor must verify all existing underground utility locations.
- 2. The Contractor must track demolition debris which are removed/recycled and provide NPS with receipts showing the weight and volume and type of material removed/recycled as part of this project.
- 3. No construction debris will be allowed to be left on premises. All public areas will remain clean and passible during normal business hours. During business hours, the contractor will ensure that no music is playing in the work areas and no foul language will be tolerated during or after business hours. Work on this project will be accomplished within the hours of 7:00 AM to 5:00 PM Monday thru Friday.

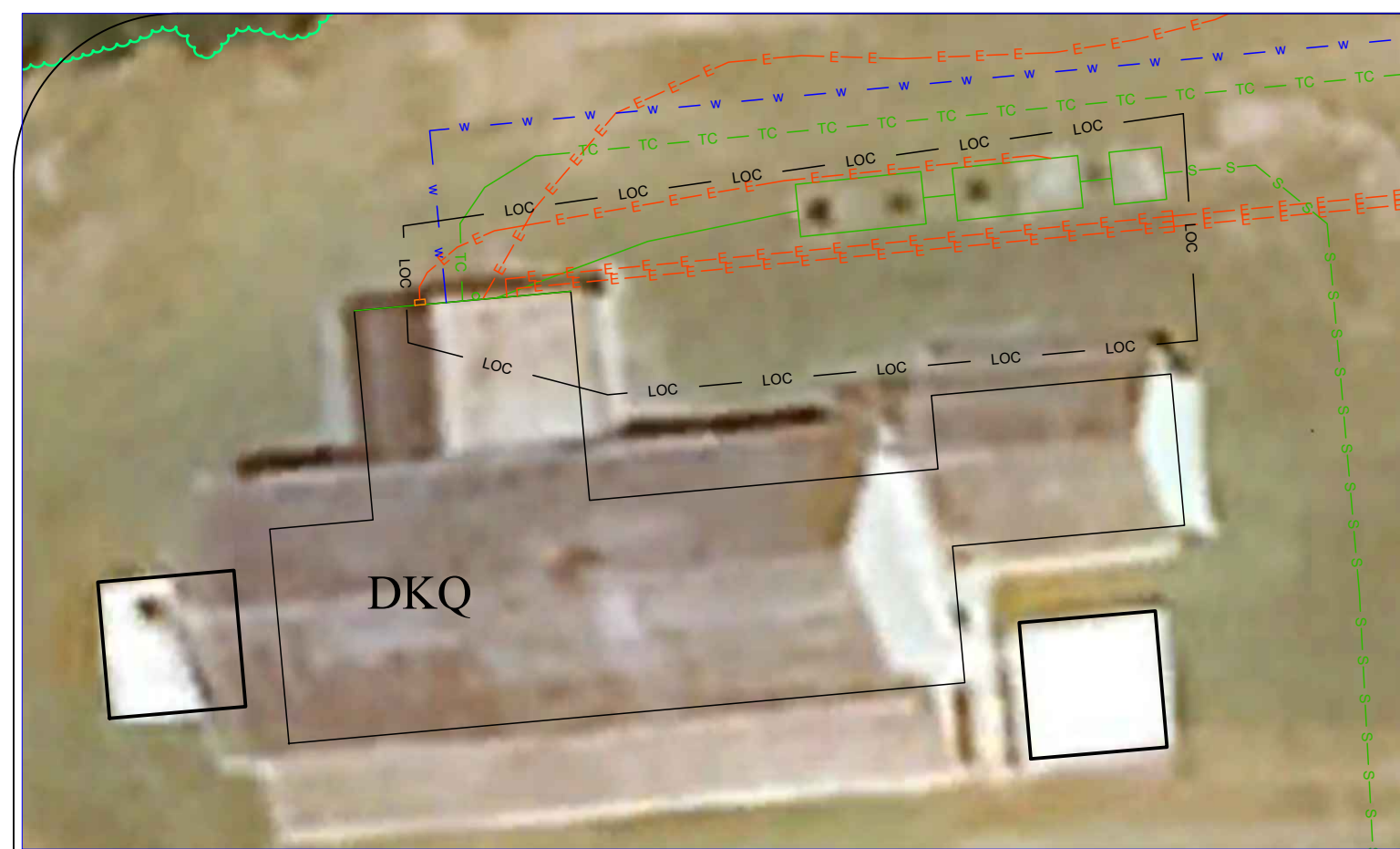
## **5.0     GOVERNMENT FURNISHED PROPERTY**

1. No Government property, materials, or equipment will be provided. Water and electricity on the exterior of the existing DKQ is available for Contractor use during this project. Contractor is responsible for lockout/tagout. Contractor is responsible for cleaning up site daily, and for repairing all ruts created in grass areas. Ruts shall be filled in and raked smooth and grass established before final acceptance of the project.

## **6.0     SUBMITTALS**

1. Work schedule: delineating the various stages of work by phase (milestones) prior to the preconstruction conference.
2. Safety Plan/Accident Prevention Plan prior to the preconstruction conference.
3. Product Data
  - a. Septic Tank
  - b. Septic Chambers
  - c. Connections, Fittings, Wyes, PVC pipe
  - d. Manhole Riser Data
  - e. Fill Material
  - f. Seed Mix
  - g. Operation and Maintenance Manuals
4. Product Samples. The Contractor shall submit written documentation or color/product samples for materials identified in the Scope of Work for selection by the CO/COR.
  - a. Fill Material
  - b. Seed Mix
5. As-built drawing. Provide a to-scale surveyed drawing of the new septic system showing the accurate location of the new tank, distribution box, and drain lines. Include the locations relative to the existing fence lines, buildings, water lines, electric lines, and pavement.





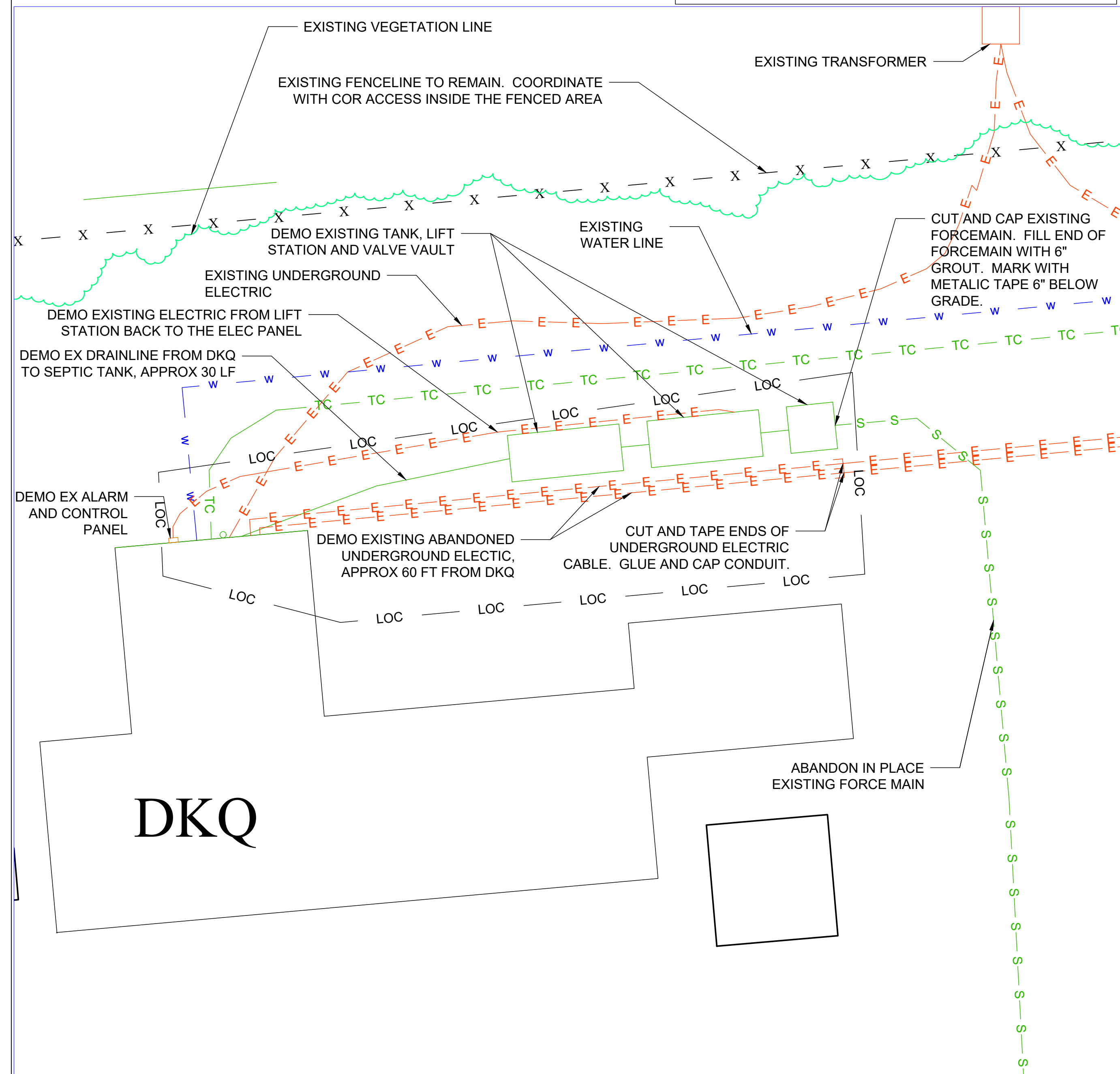
1 AERIAL PHOTO OF BUXTON DRQ

SCALE: 1:200

DEMOLITION NOTES:

1. PRIOR TO DIGGING, LOCATE EXISTING UTILITIES IN THE PROJECT AREA.
2. CAREFULLY EXCAVATE SOIL OR HAND DIG TO AVOID DAMAGE TO THE EXISTING ELECTRIC, WATER, SEPTIC, AND COMMUNICATIONS LINES.
3. DO NOT TRAVERSE OVER UTILITY LINES WITH HEAVY MACHINERY OR OTHER VEHICLES WHICH WOULD DAMAGE EXISTING UTILITY LINES WITHOUT SPREADER PLATES.

TOTAL NEW DISTURBANCE: 0 SF  
TOTAL AREA WITHIN LOC: 1,400 SF  
TREES REMOVED: NONE

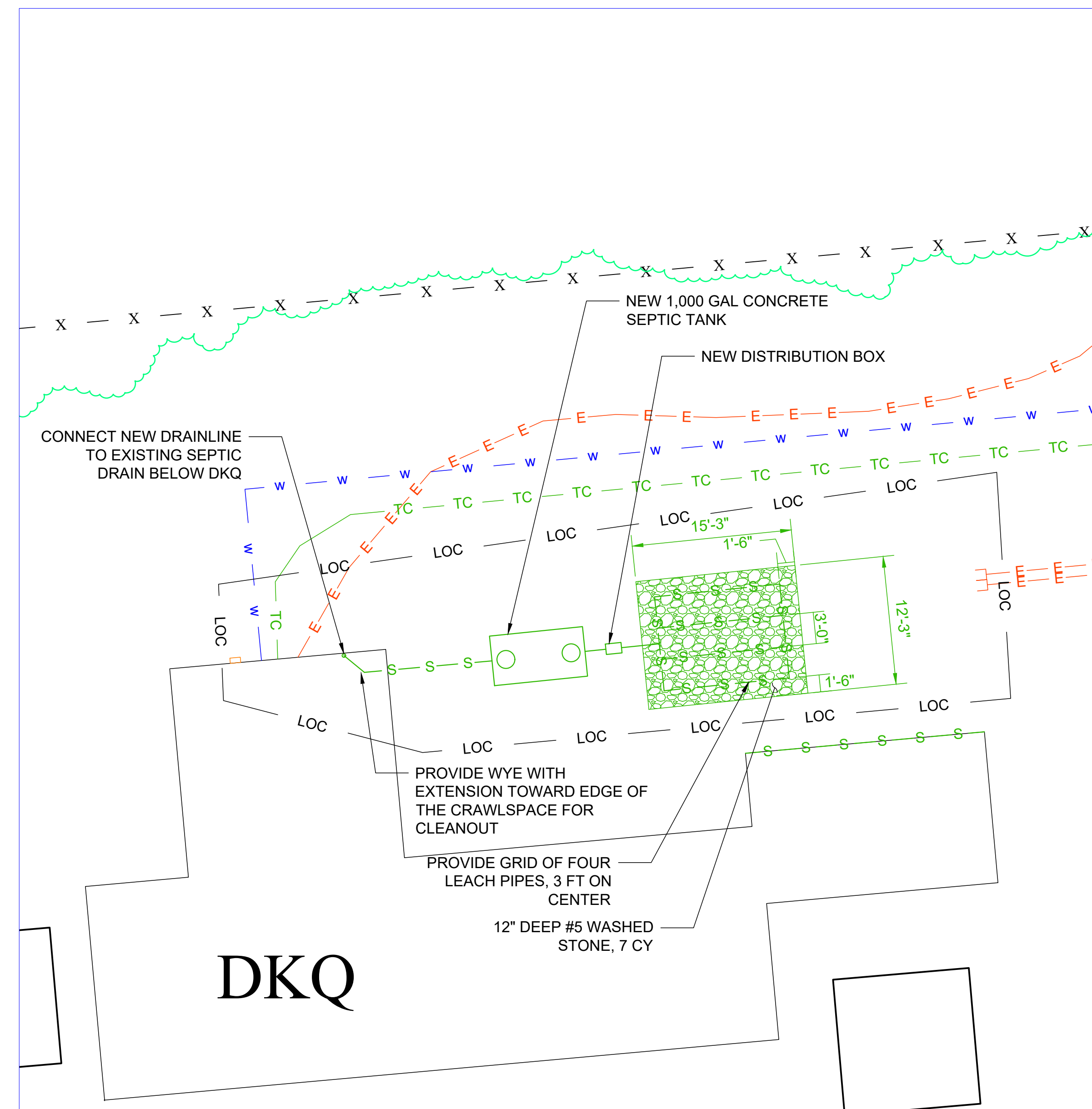


## EXISTING SEPTIC SYSTEM AT DKQ

SCALE: 1:100

### INSTALLATION NOTES:

1. INSTALL NEW SEPTIC DRAINLINES WITH POSITIVE SLOPE TOWARD SEPTIC TANK AND DISTRIBUTION BOX (MINIMUM  $\frac{1}{8}$  INCH PER FOOT). DO NOT INSTALL DRAINLINES AT 0 PERCENT OR UPHILL SLOPE. SET TANK, DISTRIBUTION BOX, AND TRENCHES AT ELEVATION TO ENSURE DOWNHILL SLOPE OF ALL DRAINLINES.
2. SANITARY TEE CONNECTIONS SHALL NOT BE PERMITTED FOR HORIZONTAL TO HORIZONTAL PIPE FITTING CONNECTIONS.
3. BACKFILL, RAKE SMOOTH, AND GRADE RUTS, EXCAVATIONS, AND DISTURBANCE PRIOR TO SEEDING.



## 2 PROPOSED BED SYSTEM AT DKQ

SCALE: 1:60



### GRAPHIC SCALE

### General Notes

No.	Revision/Issue	Date

Firm Name and Address

Project Name and Address

REPLACE SEPTIC SYSTEM  
AT Q326  
46214 LOGGERHEAD LANE  
BUXTON, NC 27920

Project PMIS 326604	Sheet
Date 12/11/2024	C1
Scale As Noted	