

20.0 BLASTING

20.1 INTRODUCTION

It is anticipated that blasting will be required in some locations during construction to provide road grades that will accommodate oversized loads, allow for construction of the turbine foundations, and create the path for the underground electrical collector lines. This blasting and other areas of excavated cuts will provide material that can be used elsewhere on-site for road, turbine pad, and turbine crane pad fill. When designing the access road and crane path for this project, the project cut/fill balance attempted to minimize the net import or export of material to or from the site.

20.2 SOILS

The predominant mapped soils are Elliotsville, Lyman, Monson, Thorndike, and Tunbridge on ridgetops and upper sideslopes, with Chesuncook, Colonel, Dixfield, Dixmont, Monarda, and Telos, at lower elevations (Soil Narrative Reports, Section 11). Depths to bedrock for these soils are generally as shown in the following table.

| Soil Type | Approximate Depth to Bedrock (in inches) |
|---|---|
| Lyman | 8-20 |
| Monson | 10-20 |
| Thorndike | 10-20 |
| Elliotsville | 20-40 |
| Tunbridge | 20-40 |
| Colonel | 40+ |
| Chesuncook Dixfield Dixmont Monarda Telos | 60-65 |

The shallow depth to bedrock, especially in Monson, Lyman, and Thorndike soil areas, suggests that more blasting may be required in areas that include these soils.

Geotechnical investigations at each turbine site will be performed prior to construction. The Applicants will submit the geotechnical investigation report to the Maine Department of Environmental Protection (MDEP) for review prior to construction. This information will be used to determine turbine foundation types. Preliminary indications suggest that many of the turbine foundations will be a rock anchor type but there may be spread footing foundations, or similar, as well.

Delineated natural resources within the project area are shown on the figures in Exhibit 7A.

20.3 BLASTING PLAN

General

Blasting operations shall follow all local, state, and federal regulations related to transportation and use of explosives, including Title 38 MRSA § 490-Z (14).

Pre-Blast Surveys/Notifications

Pre-blast surveys will be offered to all property owners with structures, wells, etc. within a 2,000-foot radius of the blast site. Appropriate notices will be given and appointments arranged for those owners who desire a survey. Results of those surveys will be documented through video or still photographs and appropriate narration or written reports.

Prior to blasting, the owner or operator shall develop and implement a plan that provides an opportunity for prior notification of a planned blast for all persons located within 1,000 feet of the blast site. Notification may be by telephone, in writing, by public notice in a newspaper of general circulation in the area affected, or by other means identified in the plan. The plan must be in writing and available for inspection by the MDEP.

Blast Monitoring

All blasts will be monitored by a representative who has been properly trained in the setup and use of seismic monitoring equipment. At least one seismograph will be in use at all times. Placement of monitoring equipment will be at the nearest structure to the blast site.

Sequence of Blasting

All blasting operations will be strictly coordinated with all appropriate parties including the Fire Department. Emphasis will be on the safe and efficient removal of the rock existing on this project without impact to surrounding structures. Blasts will be developed so as to create adequate relief which will minimize ground vibrations and offer the greatest protection possible to the surrounding structures.

Blasting Procedures

1. Blasting operations shall commence after 7:00 AM and cease at 7:00 PM, Monday through Friday.
2. Blasting cannot be conducted at times different from those announced in the blasting schedule except in emergency situations, such as electrical storms or public safety required unscheduled detonation.
3. Warning and all-clear signals of different character that are audible within a range of one-half mile from the point of the blast shall be given. All persons within the permit area shall be notified of the meaning of the signals through appropriate instructions and signs posted.
4. Access to blasting area shall be regulated to protect the public from the effects of blasting. Access to the blasting area shall be controlled to prevent unauthorized entry before each blast and until the perimeter's authorized representative has determined

SECTION 20: BLASTING

that no unusual circumstances exist after the blast. Access to and travel in or through the area can then safely resume.

5. Areas in which charged holes are awaiting firing shall be guarded, barricaded and posted, or flagged against unauthorized entry.
6. All blasts shall be made in the direction of the stress relieved face.
7. All stemming shall be minimum as specified using clean, dry 3/8" crushed stone.

Blast Security and Warning Whistles

Each blast will be preceded by a security check of the affected area and then a series of warning whistles. Communications will be made with job site supervisors and local officials as required to ensure the safest possible operation. All personnel in the vicinity closest to the blast area will be warned. The warning whistles will follow the following sequence:

- 3 Whistles – 5 Minutes to Blast
- 2 Whistles – 1 Minute to Blast
- 1 Whistle – All Clear

The blast site will be examined by the blaster prior to the all-clear signal to determine that it is safe to resume work. No blast will be fired until the area has been secured and determined safe.

Explosives

All explosives may be delivered to the job site on a daily basis or may be stored in a secured bulk tank at the project site per applicable regulations.

Blasting Personnel

All blasting operations shall be conducted by experienced, trained, and competent persons who understand the hazards involved. Persons working with explosive materials shall:

1. Have demonstrated a knowledge of, and willingness to comply with, safety and security requirements.
2. Be capable of using mature judgment in all situations.
3. Be of good physical condition and not addicted to intoxicants, narcotics, or other similar type of drugs.
4. The person(s) responsible for the explosives shall possess current knowledge of the local, State and Federal laws and regulations applicable to his work.
5. The person(s) responsible for the explosives shall have obtained a Certificate of Competency or a license as required by State law.

Licenses and Permits

Blasting operations to be performed by a blaster who is fully licensed and insured for the transportation, use, and handling of explosives. Blasting permits will be applied for as required from local authorities.

Blast Vibration

Blast vibration will be monitored at the blast site, typically at the structure(s) closest to the blast site. Ground vibration at structures not owned or controlled by the developer may not exceed the limits shown in Figure B-1 of Appendix B, U.S. Bureau of Mines Report of Investigations 8507. Vibration limits will closely follow limits described in the State Regulations. Blast designs will be modified as required to stay within the guidelines. Blasting operations will be modified accordingly when approaching buildings and utilities.

Flyrock

Flyrock must be controlled so as to remain on the site and may not enter a protected resource unless the Department has previously approved alteration of that resource in the impacted area.

Blast Sound

Sound from blasting will comply with Title 38 MRSA §490-Z (14)(H).

Record Keeping

Records of individual blasts will comply with Title 38 MRSA §490-Z (14)(L).

20.4 ACID ROCK MITIGATION

As part of the preliminary geotechnical investigation for the project, the underlying bedrock will be analyzed for issues associated with the potential presence of acid rock drainage (ARD). The evaluation will analyze rock samples from the project and identify rock samples that may be acid (based on sulfur content). The evaluation will also analyze rock samples that may generate a buffering alkaline drainage. If acid rock is identified during pre-construction engineering, soils will be amended appropriately to mitigate for pH levels in general accord with the mitigation techniques described below. These techniques are based on mitigation plans prepared for recent wind projects.

Mitigation measures have been outlined to deal with acid generation potential associated with sulfuric rock should this material be discovered during construction activities for the project. A variety of handling techniques and treatment methodologies are available for acid-producing rock. In summary, these techniques include:

- Avoiding or minimizing the disturbance/excavation of acid-producing rock;
- Disposal of the material above the water table;
- Surface and groundwater management to divert water away from acid-producing rock and management areas;
- Blending or alkaline addition to maintain the pH at near-neutral levels;
- Identifying potential borrow sites for cover material;
- Identifying potential borrow sites for the isolation or temporary storage of potential acid-producing material;
- Using low permeability and impermeable barriers to limit infiltration into the potentially acid-producing rock from rainwater or groundwater;
- Preparation of a logistics plan including sources for alkaline material and locations for the stockpiling of such material;

SECTION 20: BLASTING

- Identification of monitoring methods and locations to evaluate the effectiveness of the mitigation; and
- Contingency plans should initial mitigation require modification

The construction plan will be reviewed and adapted to allow initial construction activities to begin if further ARD evaluation of any specific locations of concern is in progress.

Sources of crushed limestone and agricultural lime to be used to neutralize potential ARD producing rocks will be investigated. The limestone will be analyzed in accordance with appropriate procedures to evaluate its neutralization potential. In addition, borrow (deep till) areas will be identified on-site as necessary as a possible source of low permeability cover.