

Appendix 9.13 SEQR Rock Excavation Concept

Silo Ridge Resort Community **SEQR Rock Excavation Concept**

Town of Amenia
Dutchess County, New York

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Prepared for:

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PROJECT DESCRIPTION

The Applicant, Higher Ground Country Club, LLC, is proposing the development of a luxury resort community on approximately 668 acres of land in the Town of Amenia, Dutchess County, New York. The proposed site is located on the west side of NYS Route 22 and contains five tax parcels identified as parcel numbers 7066-00-732810, 7066-00-860725, 7066-00-742300, 7066-00-670717, and 7066-00-709177 on the Town of Amenia Tax Map. The site presently contains a golf course, clubhouse, support structures and parking areas. The remainder of the site is vacant and predominantly wooded. Several wetland areas are also present onsite.

The proposed development will consist of a maximum of 369 homes, consisting of a mix of townhouses and single-family units, in addition to a resort hotel, banquet space, restaurants, conference space, and a spa and wellness center. The existing golf course will also be upgraded and improved.

According to a geotechnical report prepared by The Chazen Companies for the proposed hotel location, blasting is not expected to be necessary in that area. An initial geotechnical investigation is currently underway to document subsurface conditions on the rest of the project site; based on existing knowledge of soil and bedrock conditions in the remaining development locations, blasting is not expected to be necessary in those areas. Nevertheless, since the results of the geotechnical investigation are not yet available, the following blasting program has been developed for the proposed project, should blasting be necessary at any location onsite.

EARTHWORK OPERATIONS

In order for the development to be economically feasible, earthwork will be necessary to manage cut grade areas with fill grade areas. Based on limited knowledge of the site, rock excavation is anticipated in some areas of the site to establish proposed grades for roadways, utilities, structures and other infrastructure components. As part of the design development, a subsurface investigation will be conducted to define the in-place soil and rock characteristics, which will allow the designers to tailor the development to the site conditions. By limiting rock excavation operations and reusing soils across the site, costs to construct the development will be reduced.

Various methods of rock excavation will be utilized during site construction depending on the type and condition of the bedrock at a particular area. In soft weathered rock, standard construction equipment is typically sufficient to excavate or “rip” the bedrock. If the rock is less weathered and stronger,

additional mechanical devices may be required to break the rock down into removable size pieces for excavation. As a last resort, to break apart massive, strong and fresh (non-weathered) bedrock, drill and blast operations will be utilized if required to fragment the rock so that it can be excavated. By utilizing combinations of these techniques, rock excavation can be performed in a responsible and economical manner.

ROCK EXCAVATION OPERATIONS

At this time, drill and blast operations, hereinafter referred to as blasting, to fragment rock into workable size pieces for excavation are not anticipated at the site. However, it is not possible to accurately gauge where blasting will be required. In areas where grade reductions are necessary, there is an increased probability of encountering bedrock that may require blasting.

Since rock excavation is expensive, especially when blasting is required, the amount of rock excavation will be minimized as much as possible by developing engineering alternatives to avoid rock wherever possible. Rock excavation and blasting is not anticipated for the following development components:

- Single family residential structures,
- Golf course areas, and
- Open areas.

Therefore, potential rock excavation will be limited to areas where roadways, utilities, multiple family structures and other infrastructure components are proposed.

Additional rock excavation may be necessary to accommodate subbase and utility installation. However, it is unlikely that it will require blasting. Typically, rock can be mechanically excavated through the weathered zones until fresh rock is encountered. If excavation to such a depth is insufficient, then other methods may be required for excavation. Depending on factors such as the size of an area, design flexibility, rock characteristics and others, the decision to excavate the rock or not will be made at the earliest possible time during the design and construction phases.

POTENTIAL USES OF EXCAVATED ROCK

The primary purpose of blasting operations at the site is to facilitate excavation of rock to proposed site grades and not to develop stockpiles of usable aggregate. However, excavated rock, whether a result of blasting

operations or mechanical excavation methods, could potentially be used on site for a variety of purposes including, but not limited to:

- Rip-Rap,
- Slope reinforcement,
- Erosion control and more.

The rock can typically be left in its excavated state (i.e., size and shape) for the functions listed above.

BLASTING OPERATIONS

If blasting is required for the Silo Ridge Development, a comprehensive plan will be developed based on site specific information and will be submitted for approval to the regulatory agencies/authorities. The owner will retain an Engineer experienced in blasting design and monitoring to verify that the defined standards contained are implemented.

Modern blasting operations are conducted routinely without damage or inconvenience to those people or properties located nearby. A controlled blast is performed by:

- Drilling holes into the bedrock to design depth, diameter and spacing,
- Placement of a charge, carefully designed for optimal breakage, into the drilled hole, and
- Timed detonation of the charges in an optimal sequence to fragment the rock while minimizing vibration and noise.

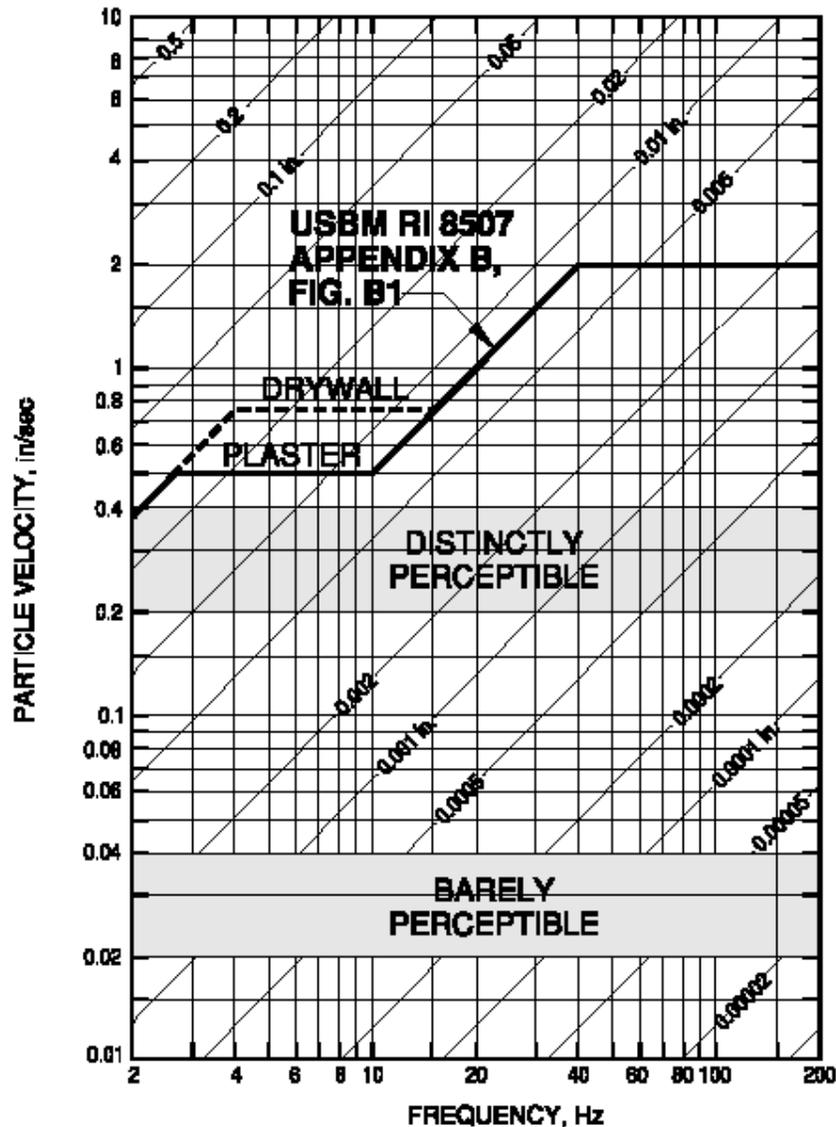
Rock blasting creates three effects of concern:

- Flyrock – Rock pieces propelled into the air
- Ground Motion – Ground vibrations from the blast, and
- Airblast – Air pressure created by the blast.

These effects can be controlled and quantified by proper application of preventative measures, monitoring and proper design of the blast by a qualified explosive engineer. Prior to any blasting operations, it is essential to monitor and record the existing conditions of structures and areas adjacent to the site. This is typically performed through a combination of background vibration monitoring and pre-blast site surveys. During the blast, ground vibration and air blast pressure are monitored and recorded at various intervals from the blast and at nearby structures. Flyrock is minimized by

using blast mats over the surface. Included at the end of this document is Figure 1, a chart that compares limits of human perception to ground vibrations.

FIGURE 1 – HUMAN PERCEPTION LIMITS VS. VIBRATION LIMITS



REFERENCES

The following documents will be used in conjunction with the safety and protection procedures that will be incorporated into the final blasting program.

- U.S. Army Corps of Engineers Safety Manual EM 385-1-1

- USBM (U.S. Bureau of Mines) RI 8507
- Institute of Makers of Explosives (IME) Safety Library Publications:
 - No. 2: The American Table of Distances
 - No. 3: Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials
 - No. 4: "Do's and Don'ts" Instructions and Warnings
 - No. 12: Glossary of Industry Terms
 - No. 17: Safety in the Transportation, Storage, Handling and Use of Explosives
 - No. 20: Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electrical Blasting Caps
 - No. 22: IME Standard for the Safe Transportation of Class C Detonators (Blasting Caps) in a Vehicle with Certain Other Explosives

CONCLUSION

The Silo Ridge Development will require extensive earthwork operations that may require rock excavation and perhaps blasting operations. However, as part of the overall development, rock excavation will be minimized to the extent possible and blasting operations will only be resorted to if necessary.

When a subsurface investigation is completed, engineers will be able to tailor the proposed design to the site conditions and limit the impacts and costs associated with rock excavation and the earthwork in general.