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July 20, 2021

Town of Wareham Planning Board

Memorial Town Hall

54 Marion Road

Wareham, MA 02571

Re: Peer Review for

Fearing Hill Road Solar Project

Attention: Board Members:

I am in receipt of an application for Site Plan Review, a plan set consisting of seven sheets and a Stormwater Report all prepared by Atlantic Design Engineers, Inc. and dated May 17, 2021. The following is a summary of the review conducted for the information received.

General:

1. The project consists of the clearing and grubbing of approximately 26 acres of a 44-acre site for the purposed of installing 7,330 solar panels and related equipment located on the northerly side of Fearing Hill Road. The site is densely wooded and has a grade change of approximately 20 feet from elevation 70 at the proposed entrance on Fearing Hill Road to elevation 90 in the center of the site.
2. The land has been the site of several attempts to develop in past years but which have not been successful due to limiting site conditions of soils that are not well drained.
3. The project area is located on the easterly side of an old railroad bed that crosses Fearing Hill Road at the southwest corner of the subject property. The railbed is not currently used but was the main rail access to a sand mining operation in years past.
4. The project involves the construction of an access from Fearing Hill Road, and the erection of 4 new utility poles along the northerly side of Fearing Hill Road as a connection between the existing overhead electric line and the facility.
5. It is proposed to strip and stockpile topsoil from the site once trees and stumps in the construction area have been removed. This topsoil is to be later spread and reseeded.
6. Two stormwater collection areas are proposed; one at the southwest corner of the site near the railbed and the other on the easterly side approximately halfway between the north and south extensions of the project. Runoff is piped through a constructed embankment and allowed to flow through a stone rip rap area prior to discharge onto the ground surface.
7. A security fence is proposed to surround the site and with an adjacent 20- foot wide service road that extends around the site perimeter.

Re: Peer Review for

Fearing Hill Road Solar Project

Page two

Plans:

Sheet 2 of 7

1. Identify which parts of the site plan were prepared from field survey information and which parts were done using GIS data. No ties are shown to property monuments or the layout of Fearing Hill Road which is a Plymouth County layout.
2. Confirm that portion of the old Fearing Hill Road that was discontinued.
3. The frontage for Lot 1000 appears to be based on the proposed cul-de-sac and short street layout that connects Fearing Hill Road to the site. Until a subdivision plan is approved by the Planning Board this frontage does not exist.
4. Who is the owner of the lot between the cul-de-sac and the old railbed along Fearing Hill Road? If an abutter, it should be noted. If part of the project it should be so noted.

Sheet 3 of 7

1. The proposed limits of clearing are 50 feet from the property line except for along the northeasterly boundary where the limits are shown as 25 feet, more or less. This is not consistent with the requirement for vegetated buffers as required by the Wareham Zoning By-Law, Section 594.1.
2. Minimum buffers of 50 feet must be maintained around the perimeter at all points and may be increased as necessary by the Planning Board as noted in Section 594.1 (subsections 3, 4 and 5). The Planning Board does not have the authority to waive the minimum buffer, but which can only be done by the granting of a variance by the Board of Appeals.
3. The 20-foot wide perimeter access road on the northeasterly side of the project cannot easily be negotiated at the cul-de-sac and has extremely tight corners at the southeast side and appears to extend into the runoff area on the longest northeast side. At the extreme northwest corner of the site there is no radius for the inside and no turn around.
4. There are four utility poles (narrative suggests as many as 6) that are proposed as a connection from the existing overhead electric line on the southerly side of Fearing Hill Road and which would be located on the northerly side of the road. It would require additional clearing of trees and vegetation along the road for these poles to be erected and have clearance to the wires.

Sheet 4 of 7

1. Clearing limits on the northeast side are shown as 14 feet and 15 feet from the property boundary. The same minimum buffer is required at this location and may be increased by action of the Planning Board. See Item 2 for Sheet 3 of 7 above.
2. It may not be necessary to clear the entire cul-se-sac of vegetation as shown on the plan. Much will depend on the timing of any approval that is granted for the solar project. It is assumed that if the project approval is received by the applicant prior to the expiration of an approved subdivision plan, that the solar project would take precedence.
3. A reconfiguration of the clearing limits at the cul-de-sac may eliminate the need to have the four new utility poles along Fearing Hill Road. One County Road solar project only has one pole before going underground to pad mounted panels.

Re: Peer Review for

Fearing Hill Road Solar Project

Page three

Sheet 5 of 7

1. The flow from the detention basin at the southwest corner of the project extends through pipe to a riprap basin and which then spills over ground toward the old railbed. As noted on the site plan a portion of this bed has been delineated with wetlands flags. This confirms the presence of water close to the ground surface in this area. In winter months portions of the railbed close to Fearing Hill Road have been observed as flooded due to standing water. This condition must not be made worse by the addition of concentrated flow emanating from the site.
2. The emergency spillway elevation is wrong at 60.5.
3. The land clearing on the southwest side of the site is extensive and does not need to go beyond the fence line. It extends into the adjacent lot by 60 feet. If this front lot is part of the project there is no need for the property line separation.
4. The stripping of topsoil from the site and the removal of stumps will result in finish grades being much closer to the underlying soils that have low permeability. There is a possibility of permanent standing water in the lower portions of the detention basins.
5. A similar wet condition may result from cutting swales 18” into the grade. Most soils on the site have perched ground water from 12” to 37” below the surface. This is borne out by the descriptions of each of the soil types encountered in the project area.

Sheet 6 of 7

1. Clearing limits are within 17 feet of the lot line at the southeast side of the project. The minimum clearing limit is 50 feet which may be made greater if conditions support it.
2. The northerly corner of the array clearing is 140 feet from the nearest panel and is on a downward slope. There is no need to clear this area as panel exposure to sunlight is from the southeast to southwest. There is a 25-foot difference in elevation which would allow clearing to be reduced while retaining ample sunlight for the array. Also, panels could be pulled back to reduce the steep grading at the corner for the service road.
3. The 20-foot access road at the northwest corner of the site will be impossible to negotiate by emergency vehicles. The corner of the array needs to be pulled back to allow for a better swing.
4. As mentioned above, water may be trapped in the detention area below the elevation of the 6-inch pipe. Unless ample protection is provided for the pipe there could be sediment buildup that would eventually clog the pipe and reduce its capacity to drain.
5. Two infiltration trench notations are shown to the east of the equipment pads. Only one trench is shown. The purpose is questionable given the indications of perched ground water at very shallow depths.
6. What do the heavy short dashed lines represent? Regrading?

Sheet 7 of 7

1. Several of the details rely on swales and excavation that may intercept the perched water table. The potential for erosion, especially during the construction phase is high, especially on the steeper slopes of 8% or more.

Re: Peer Review for

Fearing Hill Road Solar Project

Page four

1. The access road cross section shows only 6-inches of gravel over a natural base. It is unlikely that this thin layer of gravel will be sufficient to maintain a dry driving surface that will not be muddy or that will not deteriorate over time.

Site Impact Report

1. There should be a discussion included in the report as to the natural conditions that are on the site. Reference is made to Section 1543.1 (3) of the Site Plan Review requirements with respect to reporting on the ecology of the site as well as significant off-site impacts. The current description of existing conditions does not go into depth as to the current site environment.
2. The Planning Board does not have the authority to waive the minimum requirements of the Zoning By-Law. Only the Board of Appeals can grant a variance for that purpose.

Solar Decommissioning Evaluation and Cost Estimates

1. The description of restoration requirements suggests that areas of the site will be re-seeded if needed. There is no doubt but what re-seeding will be necessary as equipment will be required to remove fencing, support posts, remove underground wiring, remove concrete pads and the loading of materials to be removed. All disturbed areas need to be re-vegetated to the extent necessary for stabilization and growth.
2. The cost estimate does not include any mention of the removal of utility poles, concrete pads, fencing or the re-vegetation of disturbed areas. Each item should be listed with the unit cost and total cost shown.
3. Whether there is salvage value or not, this should not be included to reduce the net amount of security to be submitted to the town.
4. The total amount to be secured by a cash bond, performance bond or other method to be approved by the Town of Wareham should be increased by 25% to cover the cost of inflation.
5. The bond amount should be reviewed and adjusted accordingly every 5 years.

Stormwater Report

The stormwater report has provided data according to the Stormwater Regulations of DEP for the 2-year, 10-year and 100-year storm events. There is no issue with the delineation of the watersheds as noted on the two plans that accompany the report. However, the amount of soil cover that is identified as Group B throughout the site is significant and causes concern.

The Plymouth County Soils Survey has identified the project area as having moderately to poorly drained soils. A significant portion of the upper central part of the site is labeled as within hydrologic soil group B. However, this moderately well drained soil also has groundwater depths ranging from 18 inches to 37 inches according to the soil descriptions. This is an indication that even if rainfall permeates the ground surface and is absorbed quickly, it also meets a much denser soil barrier that causes the water to travel laterally across slopes.

The soil classification for the central portion of the site is 301B (Montauk). Due to its range of low transmissibility, it is recommended that this soil be tested on site to determine the potential for runoff.

Re: Peer Review for

Fearing Hill Road Solar Project

Page five

Similarly, soil types 321B (Birchwood) and 69A (Mattapoisett) have very low transmissibility ranges from 0.0 inches/hr. to 0.20 inches/hr. and have very shallow depths to groundwater.

Opening up these soil types to direct rainfall will have a significant impact on total runoff. Currently the site is well vegetated with natural cover of pine and oak. These trees intercept runoff directly, along with decaying matter and leaf litter reducing the amount of rainfall that directly falls on the surface. In addition, there is a natural uptake of water as it is absorbed into the root systems for the vegetation. Removing this vegetation will allow a greater portion of rainfall to hit the ground directly and increase the runoff rate.

The project proposes to revegetate the disturbed ground with loam and seed but the hydrologic conditions of re-seeding will not protect the area from the increase in runoff. Along with the removal of topsoil is the disturbance caused by the removal of tree stumps and roots. This action will alter the overall condition of the ground surface soils.

It is assumed that the surface will be covered with a minimum of 75% good cover. Given that the surface will be open to the sun for the purpose of panel exposure, it is also conceivable that the surface will be easily dried out to the extent that good grass cover would not occur.

Recommendations

1. Absent the documentation of actual transmissibility for the soils found on the site, it is recommended that on-site testing be conducted to establish the depth to ground water and the capacity of the soil to absorb runoff.
2. The applicant should consider reducing the size and scope of the project which will automatically reduce the site impacts.
3. The natural buffers around the east and west portions of the site should be increased substantially to retain the natural capacity to absorb runoff, especially on the steeper slopes.
4. Move the detention areas to within the reduced site area and allow for the discharge of runoff to occur over larger portions of the natural cover contained within the buffers.
5. Reduce the opening to the site so as to minimize visual impacts from Fearing Hill Road and surrounding area.
6. Revise the curve number for 75% or better for good grass cover to a higher curve number for fair grass cover and compute runoff accordingly.

This concludes a review of the materials as submitted. Please feel free to contact me if you have any questions.

Very truly yours,

Charles L. Rowley

Charles L. Rowley, PE, PLS

Cc Ken Buckland, Town Planner

David Pichette, Conservation Agent

Jim Munise, BOS Liaison to Planning Board

Richard Tabaczynski, PE, Atlantic Design Engineers, Inc.