



**MILLENNIUM ENGINEERING, INC.**  
*Land Surveyors and Civil Engineers*

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June 17, 2021

Town of Salisbury  
Planning Department  
5 Beach Road  
Salisbury, MA 01952

Attn: Lisa Pearson, Planner

Re: 6 Forest Road  
Comprehensive Permit Application and Plan Review

Dear Ms. Pearson:

In response to design review comments provided by the Board's consulting engineer, Joseph Serwatka, dated January 18, 2021 we have prepared the following responses and revised Site Plans for the Board's consideration.

**Cover Sheet C-1**

1. A Zoning Table is provided with Existing and Proposed dimensions. It may be helpful to also have a table to compare the Subdivision Rules and Regulations requirements to what is being proposed, similar to what is presented in Exhibit O of the application. It should be noted that Exhibit O references sections 7A.4, 7A.10 and 7B.1 only. It may be necessary to include sections 7A.7, 7A.9, 7A.11, 7A.25.3, 7B.3 in the list of requested exceptions, or provide discussion on each.  
**The response appears to address these issues.**

*Response: No response required.*

**Existing Conditions C-2**

1. The plan depicts several resource areas (e.g. wetlands, riverfront, floodplain) that would normally be reviewed and approved by the conservation commission prior to the submission of plans. The reason is obvious as any revisions brought about as part of the resource areas review could severely impact the layout of any potential development of the site. In this case, the plan depicts several hundred wetland flags spread over several wetland systems, riverfront setbacks, and a floodplain delineation which, to the best of my knowledge, have not yet been reviewed/approved by the commission. The guidelines for 40B reviews recommends that "if there is an indication of a wetland on the site... ask whether such a determination has been officially made and have it shown on the submitted plans with the date of determination". I would recommend that the plans be revised to depict resource areas (i.e. wetlands, riverfront, floodplain) that have been reviewed and approved by the conservation commission.  
**The response states that "the wetland lines shown on the revised plans are the updated lines approved by the Conservation Commission".**

*Response: An ANRAD was submitted to the Town and approved on March 30, 2021 (see sheet C-2).*

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2. Existing topography should be depicted on abutting lots 88-90 to determine whether they contribute runoff to the site, and if this runoff may be blocked by the proposed site grading.  
**Additional topography has been added.**

*Response: No response required.*

3. The plan should show the extents of the remaining 6" AC watermain (200 feet +/-) in Forest Road. My recommendation, and perhaps DPWs as well, would be to replace this with a new section of 8" D.I. watermain.  
**This issue appears to be addressed.**

*Response: No response required.*

4. Existing cross culverts in Forest Road should be described completely, with pipe size and inverts to indicate flow direction. This will be important relative to the design for a sidewalk along Forest Road.  
**This issue appears to be addressed.**

*Response: No response required.*

**Typical Sections/Legend/General Notes C-3**

1. The roadway cross-sections appear to depict sloped granite curbing, but a vertical granite curb and Cape Cod berm detail appear on the plan. Bituminous curb is not approved by DPW which looks for vertical granite curbing. A sloped granite curb detail should be added if such a waiver is proposed, but a grass/landscape strip must be provided between the curb and sidewalk.  
**The detail has been revised to show vertical granite curbing wherever a sidewalk is proposed.**

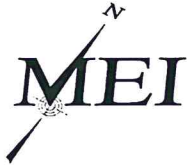
*Response: No response required.*

2. The sewer forcemain depicted in the cross sections should contain a label with minimum/maximum amount of cover, typically 3-5 feet. The sewer detail sheet labels 4' of cover. The forcemain depicted in the profile sheets, up to 10 feet deep in a paved roadway, is not recommended by me, and likely not by the DPW/sewer department.  
**The response states that the sewer forcemain has been revised to maintain approximately 4 feet of cover the entire length, but this should be specified in the details.**

*Response: The detail shows 4' of cover over the forcemain (see Typical E-One Lateral Installation Detail, sheet C-12).*

3. Note 7 leaves tree removal up to the discretion of the "owner". All trees greater than 20" should be tagged and any designated for removal must be shown on the plan. Typically a proposed tree cutting line is staked in the field based on the approved plans, and reviewed/approved by the planning board/conservation commission. The board may want the note revised to require town, rather than owner, approval.





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**Contrary to what is stated in the response, note 7 has not been revised to require Town approval instead of owner approval.**

*Response: Note 7 has been updated. All trees outside the depicted treeline/limit of work will remain. It is anticipated due to the extent of site grading that all trees within the limit of work will need to be removed. Should a waiver from this requirement be requested, it will be added accordingly to the list presented in our application.*

4. Note 13 makes individual building (condo) owners responsible for the maintenance of their sewer service from the building to the sewer main (in this case the forcemain). It is not advisable, and likely economically infeasible, for condo owners to be responsible for the service under the paved roadway. The condo owner could be responsible for the sewer service from the building to the lateral assembly (shutoff) at the edge of pavement, while the association would be responsible for the remainder as well as the forcemain.

**Contrary to what is stated in the response, note 13 has not been revised.**

*Response: The note has now been revised accordingly. The condo owners will be responsible for the service up to the pumps. The Homeowner's Association will be responsible for all the e-one pumps and the forcemain within the roadway. Treating all E-One pumps as common ownership elements will improve maintenance and repairs as needed.*

**Grading Plan C-4 through C-6**

1. The plan should be revised to show the proximity of Schoolhouse Lane. The subdivision regulations, section 7A.7, require street intersections to be offset a minimum of 200 feet from centerline to centerline. The separation to Schoolhouse Lane appears to be only about 150 feet. At a minimum, this should be added to the list of requested waivers.  
**Schoolhouse Lane has been added to the plan, approximately 150' to the north.**

*Response: No response required.*

2. As mentioned previously, additional topography should be provided on abutting lot 88 to determine the direction of runoff. Also, additional contours and/or spot grades should be provided in Forest Road, as would be typical. Finally, the cross culverts under Forest Road should be fully described with pipe size(s) and inverts.  
**Additional topography has been added.**

*Response: No response required.*

3. The flow of runoff from the existing catchbasin and pipe in front of lot 88 will likely be blocked by the construction of the proposed roadway and sidewalk over the existing roadside swale. The engineer should present a plan to allow for the continued conveyance of this runoff.  
**The response states that runoff from the catchbasin will not be blocked by the grading. The proposed roadway is being installed at a low point in Forest Road, which relies on country drainage. A culvert would still be needed across the entrance to maintain flow in the roadside swale.**



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*Response: The reviewer is correct. A culvert has been added in this area across the front of the proposed roadway to connect the wetlands on both sides (see sheet C-5).*

4. The subdivision regulations require streets to be laid out to intersect as nearly as possible at right angles, and not less than 60 degrees. The proposed roadway appears to intersect Forest Road at about 65 degrees. There would appear to be ample space and opportunity to align the proposed roadway at a right angle, or much closer to it.  
**The response appears to address the issues.**

*Response: No response required.*

5. A walking path is proposed from Forest Road, through the site, to town-owned land at the rear. The path appears to be an integral part of the expressed benefits of the project. The plans show 250 s.f. of wetland filling associated with the path, but this is likely based on wetland delineations that have not yet been reviewed/approved by the conservation commission. Should the wetland delineations be revised during the conservation review process, the wetland impact could easily be ten-fold, and make the path unfeasible. This is another reason why I would recommend that the wetland delineations be reviewed and approved prior to the submission of plans.  
**As stated previously, the plans depict approved wetland lines.**

*Response: No response required.*

6. Two proposed community gardens are depicted within the project, but proposed water services and meter locations are not shown to the gardens. It would appear that water service would be required to make these gardens feasible. The engineer should address this.  
**One community garden is now depicted, and an extra water shutoff is shown between units S and T.**

*Response: No response required.*

7. The plans depict double-wide (20') driveways in front of each unit to park two cars side-by-side. The schematic floor plans, however, depict a single-width (10') driveway in front of each unit, due to proposed porches at the front of each unit, which are not depicted on the grading plans. The engineer should depict the proposed porches on the plans, and adjust the driveways accordingly.  
**The plans have been revised accordingly.**

*Response: No response required.*

8. Typical residential parking space size requirements are 10' wide by 20' long. The bylaws do allow for spaces that are 9' by 18' in some overlay districts. The plans appear to use a variety of sizes. For instance, the driveways are 20' wide, allowing for 2 ten foot spaces, but the visitor parking spaces appear to be only 9' wide by 18' long. The parking spaces on the first unit, however, at station 1+50 are only about 15' long, which does not meet either standard. Other spaces, such as at the unit at station 13+00, measure only 12 feet long to the back of the sidewalk. The engineer should provide the





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required parking space lengths without infringing upon the sidewalk, as such would force pedestrians to walk in the roadway. All these parking issues should be addressed by the engineer.

**These issues appear to be addressed with the revisions.**

*Response: No response required.*

9. The proposed visitor parking spaces at stations 15+00 and 19+00 are located on tight curves that do not meet subdivision standards. Combine that with snow storage and landscaping, and the potential exists for a hazardous situation. The engineer should relocate these spaces to safer locations.  
**The plans have been revised.**

*Response: No response required.*

10. The two proposed constructed wetlands are required to have access for maintenance, with a minimum width of 15 feet and a maximum slope of 15% through public or private rights-of-way. Neither constructed wetland appears to satisfy this requirement. The engineer should revise the designs accordingly.  
**These issues appear to be addressed.**

*Response: No response required.*

11. The layout/geometry of the proposed roadway does not come close to meeting subdivision requirements, and I would be inclined to recommend that it not be approved in its current form. Subdivision regulations require minimum 150-200 foot centerline radius and a 150 foot tangent between reverse curves. The plans appear to have centerline radii (they are not labelled) as small as 75 feet, and reverse curves with no tangents, resulting in likely unsafe travel at design speeds. The guidelines for reviewing 40B projects state that "parking and circulation should be designed to provide for the maximum pedestrian safety, ease in traffic flow, and access/egress on the property, while minimizing the need for impervious surfaces which increases stormwater runoff". The project, as designed, does none of that in my professional opinion.

There is a relationship between design speed and geometric design criteria. AASHTO (American Association of State Highway and Transportation Officials) 2011 has a radius of curvature equation which is:

$$R_{min} = V^2 / 15(0.01e_{max} + f_{max})$$

where:  $R_{min}$  = minimum radius of curvature (ft)

$V$  = design speed (mph)

$e_{max}$  = maximum rate of roadway superelevation (percent)

$f_{max}$  = maximum side friction factor

The town's 150-200 foot minimum centerline radius requirement corresponds to a design speed of about 25 mph. The radii provided on the plans would correspond to a design speed below 20 mph which, in my



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professional opinion, is impractical and unenforceable. At the very least, I would recommend that this issue be reviewed by the applicant's traffic engineer and the town's traffic consultant.

**The roadway geometry has been revised to address these issues.**

*Response: No response required.*

12. As mentioned above, the guidelines recommend "minimizing the need for impervious surfaces". I believe that the roadway geometry issue could be addressed while also substantially reducing impervious surfaces by essentially straightening the roadway alignment between stations 6+00 and 17+00. This would eliminate approximately 500 feet of the proposed roadway, six horizontal curves that do not meet subdivision regulations, and two reverse curves without adequate tangents. The southern portion of the development, now occupied by the roadway between stations 8+00 and 13+00, could be redesigned with a small cul-de-sac, or a series of common driveways serving 4 units as is currently employed on the plan. The Board may want the engineer to present a plan showing this option for discussion.

**The entire roadway geometry has been revised.**

*Response: No response required.*

13. Headlight intrusion could be an issue for the existing homes on Forest Road from vehicles on the proposed roadway. The engineer should consider whether there may be an issue, and how it may be addressed.

**The response states that "the owner hasn't raised any issues", relative to potential affected abutters. The board may want to condition that the applicant/association provide suitable remedies (e.g. fence, landscape screen) as needed should headlights become an issue.**

*Response: The applicant has met with some of these neighbors on numerous occasions and has offered additional screening. Additional screening has been added to the entrance driveway, providing a fence and plantings along the north side of the driveway. He also met with neighbors of properties across the site entrance and is willing to provide additional screening as needed. Permission is needed from two property owners and he is waiting on a response from one of them. As mentioned previously, he has shown in the past that he is always open to listening to neighbors' concerns and acting accordingly.*

14. The 1-2 foot drop across the width of the 6' gravel path will not work adjacent to station 1+00.

*Response: The grading has been revised in this area accordingly.*

15. All erosion control lines should be depicted outside the treeline, not inside.

*Response: The lines have been revised accordingly.*

16. A proposed 6' stockade fence is depicted along the northerly property line inside treeline, and outside the erosion control line. It may not be possible to install the fence in the woods, and all work should be depicted inside of the erosion controls.

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*Response: The location of the stockade fence has been revised accordingly.*

17. Many of the proposed patios, which are typically flat, are drawn with multiple contour lines through them. The engineer should revise the grading to accommodate flat patios.

*Response: The grading has been revised accordingly.*

18. The architectural plans that were originally submitted appear to depict one step down to the proposed patios from the dwelling. The grading plans depict some patios that are 3-4 feet lower in grade than the dwelling elevations. The engineer should address how this will occur.

*Response: The grading has been revised accordingly.*

19. Many of the dwelling sites, (e.g. F, N, P, V, X, DD) have 3:1 sloped backyards, leaving them virtually unusable. The board may want the applicant/engineer to ensure that all backyard areas have usable space.

*Response: Each unit has usable space (deck/patio, back yard, side yard, front yard, common areas).*

**Utility Plan & Profile C-7 through C-10**

1. The plan shows the proposed 8" watermain connecting to an existing 6" section of watermain in Forest Road, which is not advisable. As noted previously, there is about a 200 foot section of 6" A.C. watermain left in Forest Road that was never replaced. The watermain that was replaced is 8" D.I. as is typical. I would recommend, and I believe that the DPW would concur, that the 200 foot section of remaining 6" A.C. watermain should be replaced with 8" D.I. watermain as part of the project. The engineer should show this work on the plan if required.  
**The plans now call for the existing 6" watermain to be replaced with 8" as recommended. The limits of this work will need to be shown on final plans.**

*Response: The limits of the proposed watermain have been added to sheet C-5.*

2. The sewer system design has the first four units being serviced by a gravity 8" sewer main, but the remaining 72 units are each served by individual E-one sewer pump pits, each connecting to a common 2/3" sewer forcemain under the roadway. Based on discussions with the DPW and sewer department, it is my/our opinion that the 72 sewer pump pits and forcemain are the least desirable option for the development. The most viable design would include extending the 8" gravity sewer as far as possible into the site at minimum slope (0.004ft/ft) to serve as many homes as possible via gravity sewer. If the engineer were to redesign the roadway as mentioned above to eliminate tight horizontal curves, it would appear that gravity sewer could extend some 1000 feet into the site. The remainder of the site would typically be serviced by a gravity sewer system to a low point at the rear of the site where a single pump station would pump sewage to the front sewer system. This single pump station could also have a backup generator in the event of a power outage. A single, shallow forcemain would be installed, rather than a forcemain at depths approaching 10 feet as shown on the current plans.



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**The response states that the “E-one pumps will remain”.**

*Response: The applicant has had conversations with Lisa DeMeo. As long as the sewer is privately maintained the Town is fine with it.*

3. Based on discussions with the DPW, it is preferable to have a hydrant at the end of the watermain for flushing, rather than the blowoff as shown.  
**The watermain has been revised to show a hydrant at the end.**

*Response: No response required.*

4. It may be prudent to show double gate valves at the watermain intersections of Meadow Land and Clover Circle. This would allow portions of the system could be isolated, rather than shutting down the entire main, in the event of a break.

*Response: The water main connections have been updated accordingly.*

#### **Erosion Control Details C-14**

1. The General Erosion Control Notes appear to be generic and likely will not work with such a large site. Note 13 states “no more than 3 acres shall be disturbed at one time”, and “all area shall be stabilized within 45 days of initial disturbance”. With an upland area of almost 18 acres, this would appear to limit the site contractor to clearing, grubbing and stripping topsoil from no more than 3 acres at one time, meaning the site would have to be constructed in phases. Also, stabilizing areas within 45 days is impractical in my professional opinion, especially considering that it appears some 20,000 cubic yards of fill are need to raise site grades. The engineer should address these issues.  
**Contrary to the response, note 13 has not been revised/removed.**

*Response: The note has now been removed from the plans.*

2. The Construction Sequence appears to imply that the entire site will be worked at one time, rather than 3 acres at a time as noted above. It also does not address the thousands of yards of fill that will be required to accomplish site grading, and whether this will be phased.  
**The response states that the project will not be phased.**

*Response: No response required.*

#### **Schematic Floor Plans A1**

1. It would be helpful if the plan could depict a mechanical room or other area in each unit where the water meter would be located. Otherwise, the engineer should address whether outside meter pits will be used.  
**The response states that final architectural drawings will address this issue.**

*Response: No response required.*





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**Comprehensive Permit Application**

1. Page 9 states that the applicant is proposing to construct a new public sidewalk from the entrance to the site, along the length of Forest Road and to connect it to the new sidewalk being built by the State of Massachusetts along Lafayette Road. The task would be much more involved than simply the installation of a sidewalk. Forest Road currently has "country drainage" meaning that roadway runoff sheds off the pavement into roadside ditches. Installing a curb and sidewalk would block this flow of runoff, likely making it necessary to install a series of catchbasins, manholes and piping to collect the runoff. Substantial excavation would be required for the work and, when done, the length of Forest Road from the project to Lafayette Road may have to be repaved. The Board may want the applicant to address whether they are committing to additional work necessary to install a new sidewalk.  
**The response states that "the applicant has committed to any additional work necessary to install this new sidewalk".**

*Response: The town of Salisbury has received a \$250,000 grant for the design and construction of sidewalk improvements throughout the neighborhood area. The extent and location of the sidewalk construction completed by the applicant will be confirmed after consulting with the Planning Department.*

2. Section D on page 10 addresses wetland impacts. As noted above, the wetland delineation has not yet been reviewed/approved by the conservation commission, making any discussion on wetland impacts premature.  
**The wetland lines have been approved.**

*Response: No response required.*

3. Exhibit L, Traffic Report, appears to show that the stopping sight distance for vehicles travelling on Forest Road at 30 mph have 235 feet and 245 feet of sight distance, where 200 feet is required at the site driveway. It goes on to show that the available intersection sight distance for vehicles exiting the site driveway is 235 feet looking south, and 245 feet looking north, where the required minimum is 287-331 feet for right and left turn, respectively. The report appears to conclude that this apparent insufficiency is allowable as long as the vehicle on the major road (i.e. Forest Road) has adequate stopping sight distance to stop or slow to accommodate the maneuver by a minor road (i.e. Meadowview Lane) vehicle. The Board may want to have their third party traffic consultant review these conclusions, and the entire report.  
**The response states that the updated plans have been reviewed and accepted by the traffic consultant.**

*Response: No response required.*

4. The plans should contain adequate information to comply with section 7A.25.3 of the regulations "to allow sight distance evaluation" by the board's technical consultant.  
**See above comment.**

*Response: No response required.*

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**Stormwater Management Report**

1. Page 2 of the maintenance plan states that the party responsible for operations and maintenance of the stormwater system is Steve Paquette, but page 5 lists the homeowner's association as the responsible party "post-construction". The term post-construction" should be more well-defined since, as we have seen, it can take many years between project completion (i.e 100% occupancy) and the resolution of outstanding construction items, as-built submittal, and certificates of compliance/completion.  
**The engineer has not addressed the issue of similar projects being "completed" relative to construction, yet taking several more years before as-builts are submitted and final compliance is issued.**

*Response: Forest Salisbury, LLC will be responsible for operation and maintenance of the site until such time as the Homeowner's Association can take over responsibility of the site post construction.*

2. The report should contain the calculations demonstrating the proper sizing (i.e surface area and volume) of the sediment forebays, as required.  
**The response states that the forebay calculations appear on sheet C-13, but the areas may not be correct. The engineer should review this.**

*Response: The areas have been updated accordingly. The areas listed are the impervious areas draining to each forebay.*

3. The engineer is not proposing any runoff recharge as required by standard #3 stating that "the test pits indicated silt loam and silty clay loam soils, which will prevent any underground infiltration system from being properly designed". The Policy requires that for sites comprised solely of C and D soils, proponents are required to infiltrate the required recharge volume only to the maximum extent practicable. For the purposes of standard 3, "to the maximum extent possible" means that:
  - (1) The applicant has made all reasonable efforts to meet the Standard;
  - (2) The applicant has made a complete evaluation of all possible applicable infiltration measures, including environmentally site design that minimizes land disturbance and impervious surfaces, low impact development techniques, and structural stormwater best management practices; and
  - (3) If the post-development recharge does not at least approximate the annual recharge from pre-development conditions, the applicant has demonstrated that s/he is implementing the highest practicable method for infiltrating stormwater.The required minimum infiltration rate is 0.17 inches per hour. The majority of site soils indicated in the test pits are silt loam, which has a Rawls infiltration rate of 0.27 inches per hour. This would appear to allow the engineer to design some amount of recharge volume. The board may want the engineer to address this.  
**Infiltration trenches have been added where feasible.**

*Response: No response required.*

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4. Additional topography and spot grades should be provided on abutting lot 88 to verify that it does not, in fact, contribute runoff to the site, as delineated in the pre-development watershed map.  
**This issue has been addressed.**

*Response: No response required.*

5. The rear of the site appears to shed runoff onto abutting lot 73 in the pre-developed condition. The engineer should account for this and verify that runoff does not increase in the post-development condition.  
**This issue appears to be addressed.**

*Response: No response required.*

We trust the above information provides the necessary details required for the Board's review and ultimate approval. If you have any questions or comments on the above information, please feel free to contact our office.

Sincerely,

Millennium Engineering, Inc.

Christopher M. York, P.E.  
Project Manager