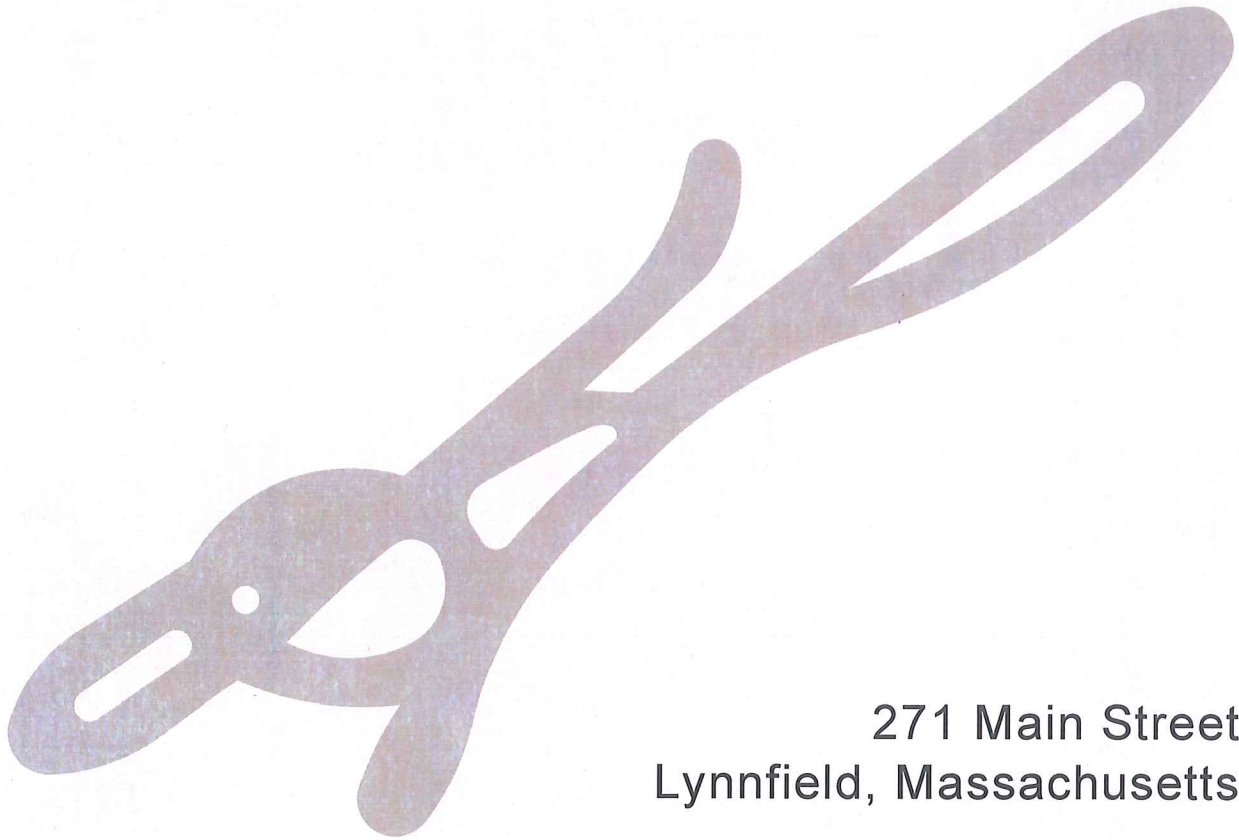
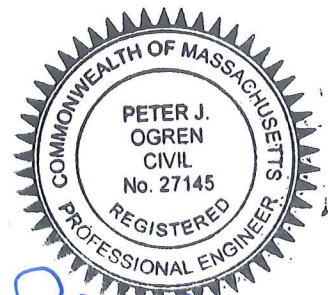


RESPONSE TO REVIEW

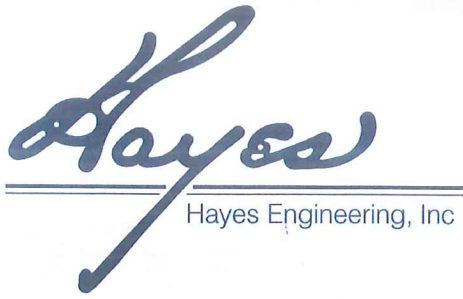


271 Main Street
Lynnfield, Massachusetts



Peter J. Ogren PE
3/24/21

March 24, 2021



603 Salem Street
Wakefield, MA 01880
Tel: (781) 246-2800
Fax: (781) 246-7596

Nantucket, MA 02554
Tel: (508) 228-7909

Refer to File No. LYF-1382

March 2, 2021

Planning Board
55 Summer Street
Lynnfield, MA 01940

RE: 271 Main Street / Hickman

Dear Members,

The following is in response to the letter from Linden Engineering Partners dated January 26, 2021 which reviewed the Definitive Subdivision at 271 Main Street in Lynnfield, Massachusetts.

GENERAL ISSUES:

1. *We note that the garage on the abutting land of Howard to the southwest of the new roadway appears to be less than the required setback from the new roadway. We recommend that an opinion be obtained from the Building Inspector as to whether the approval of the new roadway in this location will create any future issues for the abutter if they wish to make any changes to this garage?*

Requires a response by the applicant's Counsel.

2. *Has the Planning Board received letters from the Board of Health, the Wiring Inspector (may not be necessary if the Street Lighting Waiver is granted), the Gas Utility, Other Public Utilities (such as telephone and cable TV), and the Division of Zoning Enforcement and Inspection? as the Planning Board received an "Opinion of Board of Health as to Suitability of the Land" as required?*

To the best of the undersigned's knowledge, a response has only been received from Reading Electric.

3. *The proposed roadway is simply listed as "Road A" with no proposed road name. Since the road is being used as frontage the roadway should have a name and that the name should be included in the subdivision name as required or there should be agreement with the DPW and the Planning Board that the road will remain unnamed. If the road is to remain unnamed the Applicant should present evidence from the U.S. Postal Service as to what addresses they will assign to Lot 2. Then the Board could consider a waiver of the road name requirement (if this waiver is requested).*

The applicant is in agreement that a Main Street address can be given to the new structure, and that the road should not require a street name.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

4. *The required street sign (375-6.11) is not shown (and no detail is provided) and no waiver has been requested.*

If a street name is not provided, no street sign should be required and a waiver need not be requested.

5. *All sheets of the plan need to be signed and stamped by the Massachusetts professional land surveyor and professional engineer who is responsible for designing the subdivision as required by 375-6.3.A.5 of the Subdivision Regulations.*

All sheets of the plan will be signed and stamped by a Massachusetts Registered Surveyor and Professional Engineer responsible for the subdivision.

6. *The Regulations (375-6.C.2.k) require that the wetland boundary shown on the plans be a current, approved and a nonappealed wetlands boundary. To our knowledge the wetland delineation has not been submitted to the Lynnfield Conservation as part of a Notice of Intent, a Request for Determination of Applicability or an Abbreviated Notice of Resource Area Delineation and therefore has not been "approved". Our proposal did not include a field verification of the location of wetland boundaries on and adjacent to the property as the proposed subdivision work is located away from the wetlands shown on the plan. We did review the locations of the wetland boundary shown on the plans using the topographic survey included with the subdivision plans, aerial photographs of the site and MassGIS data. Using this information, it is our conclusion that the wetland boundary depicted on the subdivision plans appears reasonable, however, the criteria in the Regulations has not been met.*

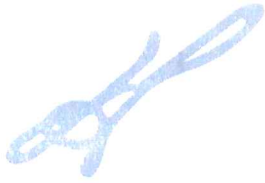
The wetland boundary has been flagged, and it is determined that a filing with the Conservation Commission will be required for this project. It is the undersigned's opinion that the request to do a Determination of Applicability or an Abbreviated Notice of Resource Area Delineation is overly burdensome at this time in the proceeding, and it is my understanding that the Town Planner is in agreement that the subdivision can be approved subject to the actions of the Conservation Commission.

7. *The Regulations s (375-6.C.2.k) also require that the 25 foot buffer zone be shown on the plans.*

The 25-foot buffer zone has been added to the plan.

8. *The filing of a Request for Determination of Applicability or a Notice of Intent with the Town of Lynnfield Conservation Commission will be required for any work proposed within 100 feet of the wetland boundary.*

The applicant is in agreement that a Notice of Intent is required for this project.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

9. *The Lynnfield DPW will need to determine if the easements for the bioretention area and the roadway infiltration system need to be extended (either by plan or wording in the document that creates the easement) to provide for the overflow from these structures to the wetland.*

Where this is a one-lot subdivision and cannot be expanded without further action, it seems easements are unnecessary as long as there is a requirement for the maintenance of the stormwater management areas, including the bioretention area.

10. *A DRAFT of the proposed Homeowners Agreement needs to be provided for review and approval by Town Counsel and DPW.*

The Draft HOA needs to be provided by the applicant's attorney.

11. *Since the proposed roadway has been designed to be and remain a private way, we recommend that a note be placed on all the plans and a statement be made in the Homeowners Agreement stating that Town Acceptance of the Roadway will not be requested at any time and that the roadway is to remain a private way with the homeowners responsible for all maintenance of the roadway, drainage, and utility systems.*

A statement requiring the roadway to be maintained as a private way, as well as the drainage and utility systems, has been added to the plan.

PLAN REVIEW:

Our firm has conducted a review of the definitive plans for the subdivision by Hayes Engineering, Inc., Wakefield, MA dated August 13, 2020 (sheets 1 to 6) to assess compliance of the plans with from the requirements of the Town of Lynnfield, MA Rules and Regulations Chapter 375, Subdivision Regulations. The following are our comments and observations on the plans with respect to the requirements of the regulations and standard engineering practice:

SHEET 1 of 6 – LOTTING PLAN:

Waiver Requests:

The following are the waiver requests listed on sheet 1 of the plans and our opinion regarding the waivers:

PLAN WAIVERS:

SECTION 375-6.4.A(6) TO NOT SHOW TWO BENCHMARKS ON THIS SHEET – *We see no reason for this waiver and do not recommend the waiver be granted. The plan contains a list of three benchmarks. These should be shown on the plan and a waiver regarding the character/type of the benchmarks should be added to the plans.*

Two benchmarks will be added to the plan sheet.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

SECTION 375-6.4.A(9) TO NOT SHOW BUILDING SETBACKS ON THIS SHEET – We see no reason why this requirement cannot be complied with and we do not recommend the waiver be granted.

We have shown setbacks on plan sheet.

SECTION 375-6.4.A(13) TO HAVE A LOCUS AT A SCALE OF 1"=40' – We believe that this requirement is a typographical error in the regulations (it should be 1"=400'). The plans do have a locus at a scale of 1"=300' which we believe is adequate for the purpose. Therefore, we see no issues in granting this waiver.

Requires no further comment.

SHEET WAIVERS:

375-6.4.E TO NOT HAVE A STREET LIGHTING PLAN – Assuming that the Planning Board grants the waiver regarding the requirement for street lighting we see no need for a street lighting plan.

Requires no further comment.

375-6.4.F TO NOT HAVE AN EROSION CONTROL PLAN (SHOWN ON TOPOGRAPHIC PLAN – We see no need for a separate erosion control plan provided all the requirements for the erosion control plan are met by the Topographic Plan.

Requires no further comment.

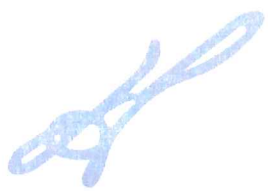
DESIGN WAIVERS:

375-7.1.A(10) TO HAVE AN ENTRANCE ROUNDING LESS THAN 25 FEET – Given that this is more of a driveway than a roadway we see no issues with waiving the 20 foot requirement. We do, however, believe that the 8 foot curb radius shown is too small. The Applicant's Engineer should provide a SWEPT Path Analysis for an SU30 vehicle (box type truck like an appliance delivery truck) entering the driveway to show that the proposed configuration is adequate. If not, then the curb radius should be increased to accommodate the SU30 vehicle.

The entrance rounding will be increased to 15 feet.

375-8.2.B.(1) TO REDUCE PAVEMENT WIDTH TO 20 FEET AND TO ALLOW THE PAVEMENT CENTERLINE TO NOT COINCIDE WITH THE CENTERLINE OF THE ROADWAY - Given that this is more of a driveway than a roadway we see no issues with waiving the pavement width and alignment criteria.

Requires no further comment.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

375-8.2.B.(6) TO NOT HAVE CURBING BEYOND THE CATCH BASINS SINCE THE DRAINAGE IS TO FLOW OFF OF THE PAVEMENT INTO A GRASS SWALE – We do not recommend that this waiver be granted. See other comments regarding the drainage in the cul-de-sac area.

The Cape Cod berm will be continued to accommodate flow to the bioretention area.

375-8.2.B.(11) REQUEST NO SIDEWALKS - Given that this is more of a driveway than a roadway we see no issues with waiving the requirement for sidewalks.

Requires no further comment.

375-8.3.B(1) TO ALLOW HDPE DRAIN PIPES IN PLACE OF RCP – We defer to the Town of Lynnfield Department of Public Works on this waiver. All the subdivisions we are familiar with have used Reinforced Concrete Drain Pipe within roadway areas.

If the waiver is not granted to allow HDPE drain pipes, reinforced concrete pipe will be utilized.

375-8.3.B(2) TO ALLOW A DIFFERENT CASTING. LEBARON WHICH IS REQUIRED IS NO LONGER IN BUSINESS – This waiver should be reworded to allow the use of the East Jordan Iron Works Model #0MS552000024..

The waiver request has been amended to require the East Jordan Iron Works model noted.

12. The plans do not contain a waiver request from the requirements of 375-8.2.B(2) regarding the configuration of the pavement in the cul-de-sac area.

A waiver has been added regarding the configuration of the pavement in the cul-de-sac area.

13. The Lotting plan should show the existing structures on the property with a notation as to whether they are to remain and for those to remain (that are within 60 feet of the new roadway) an offset distance to the new roadway should be shown.

The existing structures have been added to the Lotting plan, and a notation made that the carport is either to be removed or relocated to conform to zoning.

14. The locations of the benchmarks listed on the plan should be shown on the plan view. In addition, we recommend that benchmarks be established on the stone bound at the front of the site and the stone bound located 86 feet south of the site.

The locations of the benchmarks listed on the plan are shown on the plan view.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

15. *We suggest that one or two of the stone bounds with drill holes to be set along the new roadway be labeled on the plan view with the designation "Typical".*

I have selected the locations of five (5) bounds which I think would be important from a survey standpoint, and indicated stone bound to be set "typical". A waiver is requested to not bound all P.C.'s and P.T.'s.

16. *The Plan should show the Groundwater Protection Zone boundary.*

The Groundwater Protection Zone boundary has been added to the Lotting plan.

17. *In our opinion Massachusetts State Coordinates should be shown on at lease two of the property or lot corners on the plan.*

Massachusetts Plain State Coordinates have been shown on the plan for at least two property corners.

SHEET 2 of 6 – EXISTING CONDITIONS & DEMOLITION PLAN:

Waiver Requests:

The following are the waiver requests listed on sheet 2 of the plans and our opinion regarding the waivers:

PLAN WAIVERS:

375-6.4.B(8) TO NOT SHOW REGULATED RESOURCES WITHIN 150' FROM THE SUBDIVISION. RESOURCES ARE SHOWN ON THE SUBDIVISION PROPERTY – *Given the locations of the wetland resource areas on the site (which are shown on the plans) we see no issues with the granting of this request.*

Requires no further discussion.

18. *The Plan should show the Groundwater Protection Zone boundary.*

The Groundwater Protection District is shown on the plan.

19. *The Plan needs to show grades in Main Street (at least to the centerline) along with existing overhead wires and utilities in Main Street (especially to the point where connections are to be made).*

Grades to the centerline of Main Street have been added to the plan, and existing overhead wires and utilities in Main Street to the extent they are needed.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

20. *The plan does not indicate the items to be demolished as part of the project as required by 375-6.4.B(2).*

There are no items to be demolished as part of this project. The carport will either be removed or repositioned.

21. *It does not appear that all the trees to be removed for the construction of the project are so indicated on the plans. The Applicant's Engineer should carefully review the existing trees and all the proposed construction and all the trees to be removed should be indicated on the plans.*

Major trees to be removed have been indicated on the plan, and the new tree line on the southerly bound indicated.

22. *Existing contours are not shown for the entire property. There are no contours in the wetland area and in the wooded area along the southwestern property line. The contours in the wetland areas can be added from the Town of Lynnfield GIS (with an appropriate note) to give a sense of the topography. Other areas should have the topography filled in by survey methods.*

The existing contours taken on the ground have been augmented by Lidar survey.

SHEET 3 of 6 – PLAN AND PROFILE:

Waiver Requests:

The following are the waiver requests listed on sheet 3 of the plans and our opinion regarding the waivers:

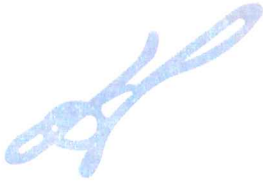
PLAN WAIVERS:

375-6.4.C(1)(d) SCALE OF THE PLAN IS 1"=20' HORIZONTAL AND 1"=2' VERTICAL – We see no issues with this waiver request as the larger scale shows more detail.

No further comment.

375-6.4.C(2)(d) TO NOT SHOW ABUTTING HOUSES – We do not recommend that this waiver be granted for the reason of the proximity of the abutting houses (and garage) to the proposed roadway.

We believe this is justified as the large scale of the plan allows for the house and barn to the south, but houses to the north are quite far away and we have provided a supplemental Google Earth plan with house locations and grades. The abutting house and garage to the south does not easily fit on the plan.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

23. *The Plan should show the Groundwater Protection Zone boundary if it appears in the plan view window.*

The Groundwater Protection Zone shows on the plan.

24. *The proposed pavement centerline is not located in the center of the right of way. The proposed roadway pavement centerline along with the centerline geometry needs to be shown on the plans (bearings, distances, radius, lengths, and angles) with ties to the sideline so that the centerline can be laid out in the field. The radius of all rounding curves and any curves not concentric with the roadway centerline also need to be shown.*

The proposed pavement centerline has been calculated and shown on Detail Sheet 2.

25. *The configuration of the pavement in the roadway cul-de-sac is different from the subdivision standard of a paved circle. The Lynnfield Fire Department review letter has indicated that the modified "T" configuration proposed is not acceptable to them. The Applicant's Engineer needs to provide a SWEPT Path Analysis for the Town of Lynnfield Fire Truck maneuvering into and out of the turnaround to show that the proposed configuration works and present this analysis to the Town of Lynnfield Fire Department to gain their approval. This issue needs to be resolved to the satisfaction of the Lynnfield Fire Department before the plan can be finalized approved.*

The undersigned has had a meeting with the Lynnfield Fire Department and they have agreed to the "T" configuration for the single house, with the following requirements.

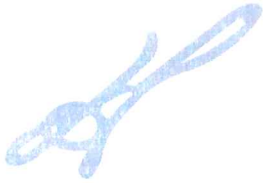
- a. A hydrant needs to be added to the entrance to the proposed minor street off Main Street. (Shown)
- b. The proposed dwelling will be sprinkled in accordance with the National Sprinkler Code for single-family residential structures. (Note on plan)

26. *Catch basin curb inlets and transition curbs should be shown on the plan view.*

The catch basin curb inlets and transition curbs have been indicated on the plan view.

27. *A waiver needs to be added to request a reduction in cover for drain pipes from 3 feet (375-8.3.B.1). If the waiver for the use of HDPE drain pipe is not approved, then we recommend that these drain pipes be changed to ductile iron pipe.*

A waiver is requested.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

28. *The proposed utility lines need to use a linotype with a symbol and have more labels to improve the readability of the plan.*

The utility lines are done with labels and linotype.

29. *There is no "street" water line and hydrant shown. The water line shown is a 2" line. The letter from the water company indicates that they do not do 2" taps but only 1" taps. How will this water line be connected to the water main in Main Street and have any pressure drop calculations been done to indicate that with a water connection of this length there will be sufficient flow and pressure in the proposed house?*

The hydrant is shown at the street consistent with the request of the Lynnfield Fire Department. Typically a 2-inch line is connected by two 1-inch taps to the main water line, although not hydraulically equal. It is the undersigned's belief that adequate pressure exists in this area of Lynnfield.

30. *The issue of fire protection for the proposed house needs to be addressed. Based on our observations there is an existing hydrant on the northeastern side of Partridge Lane (about 335 feet from the proposed roadway centerline) and a hydrant to the northeast of Village Row (about 445 feet from the proposed roadway centerline). The proposed dwelling is set back another 385± feet from Main Street. The review letter from the Lynnfield Fire Department requests a hydrant either at Main Street where the proposed roadway is located or on the proposed roadway. I understand that there has been some discussion of providing sprinklers in the dwelling as an alternative to adding a hydrant. Has this issue been resolved? If the home is to be sprinklered what size will the water line be to provide sufficient pressure and flow for the sprinkler system. This issue needs to be resolved to the satisfaction of the Lynnfield Fire Department before the plan can be finalized approved.*

A fire hydrant has been added at the entrance.

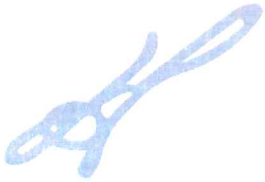
31. *Based on the letter from the Reading Municipal Light Company it appears that there are issues with the relocation of the existing pole as shown on the plan and the conduits connecting to the pole. These issues need to be resolved and the electrical design finalized before the plan can be finalized approved.*

The relocation of the pole has been discussed with Reading Municipal Light, and Verizon.

SHEET 4 of 6 – TOPOGRAPHIC PLAN AND EROSION CONTROL PLAN:

Waiver Requests:

The following are the waiver requests listed on sheet 4 of the plans and our opinion regarding the waivers:



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

PLAN WAIVERS:

375-6.4.D(2) TO SHOW TWO FOOT CONTOURS IN PLACE OF ONE FOOT CONTOURS – We do not recommend that this waiver be granted as the additional detail provided by one foot contours is necessary.

The plan has been refigured with one-foot contours.

375-6.4.D(8) TO NOT SHOW TOP AND BOTTOM OF CURB ELEVATIONS – We see no issues with this waiver being granted except that top and bottom of curb grades need to be shown on the entrance roundings at Main Street and at the turnaround area in the cul-de-sac.

Top and bottom curb grades have been added at the entrance. No curbing is being shown in the turn-around area so none has been added.

375-6.4.D(11) TO NOT SHOW STORMWATER DETAIL ON THIS SHEET – We see no issue with granting this waiver as this information is shown on other sheets in the plan set (see separate comments on these details). It would be helpful if a note were added to this sheet referring to the sheets where the stormwater detail can be found.

Requires no further comment.

375-6.4.D(12) TO NOT SHOW SIGHT DISTANCES - Given that this is more of a driveway for 1 or 2 homes we see no issue with the granting of this waiver.

Requires no further comment.

32. The Plan should show the Groundwater Protection Zone boundary.

The Groundwater Protection Zone boundary is shown on the plan.

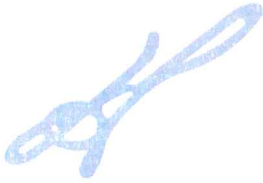
33. The proposed roadway needs detailed grading (spot grades and contours) in the cul-de-sac turnout area and adjacent to the southwestern edge of the roadway.

Spot grades in more detail have been added to the turn-around in the cul-de-sac area.

34. The erosion control line should be labeled as a limit of work line and a limit of work line should be added in all locations where there are no erosion controls.

The limit-of-work line has been added as requested.

35. The erosion controls at the northeastern property line should be run up about 30 feet parallel with the property line and the 4 ft. post and wire fence toward the 42" deciduous tree. The erosion controls should also be extended northwesterly along the southern property line to Main Street to prevent any soil and sediment migration onto the abutting property.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

The erosion controls have been extended as requested.

36. *The vehicle and equipment service and storage areas (375-6.F.7) need to be shown on the plan.*

The vehicle and equipment service and storage areas have been shown on the plan.

37. *The plans need to provide for the installation of silt sacks in the new catch basins upon installation and a detail of the silt sacks needs to be provided.*

The detail of the new catch basin includes the installation of a silt sack at the time of its construction.

38. *Sheet 4 of the plans is lacking any of the typical erosion control plan notes regarding duration of disturbed ground without temporary seeding or stabilization, street sweeping, erosion control maintenance, etc. These need to be added to the plan.*

The notes have been added to the plan.

39. *The size and species of the proposed street trees is not shown on the plan. Either the size and species need to be shown on the plan (after approval by the Tree Warden) or a note should be added to the plan (and to the detail on sheet 5) indicating that the tree size and species shall be approved by the Tree Warden prior to the trees being purchased and installed.*

Typically, the requirement for street trees is handled after construction. We have added a note that the requirement for street trees will be reviewed by the Tree Warden after the driveway is constructed.

SHEET 5 and 6 of 6 – DETAIL SHEETS:

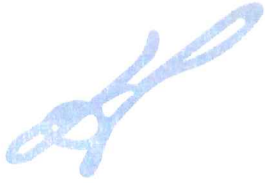
Waiver Requests:

The following are the waiver requests listed on sheet 3 of the plans and our opinion regarding the waivers:

PLAN WAIVERS:

375-6.4.G.(1) TO NOT SHOW DETAILS NOT APPLICABLE TO THE SUBDIVISION – While we have no issue with granting a waiver that states that the plans do not need to show details that are not relevant to the proposed subdivision, the Engineer should provide a list to the Town Engineer and our firm of the details that he is not including so that we can concur that they are not relevant.

The list of details is shown on Sheet 5 of 6.



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

40. *The curb inlets and transition curbs should be added to the catch basin detail.*

Curb inlet details and transition curb details have been added to the plan.

41. *The catch basin grate should be labeled as EJIW Model #oMA552000025.*

The catch basin grate has been labeled EJIW Model #oMA552000025.

42. *The detail for the siltation barrier shown is for a 12" straw wattle staked at 10 foot intervals. The Lynnfield Conservation Commission typically does not approve straw wattles as the sole erosion control barrier near a wetland. Typically, they require a siltation control fence dug into the ground and staked with a straw wattle staked at 4 to 6 foot intervals placed in front of the silt fence. The detail shown should be revised.*

Silt fence has been removed and details added.

STORMWATER DESIGN:

The following are our firm's comments on the stormwater design and calculations for the proposed subdivision:

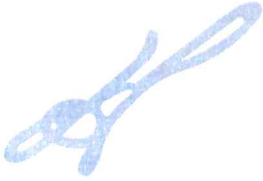
43. *The configuration of the watershed boundary between EX-1 and EX-2 does not seem to follow the path the runoff will take to get to the discharge point. The Engineer needs to re-evaluate this and revise or explain his reasoning as to why this boundary is configured this way. It would also be preferred if the watersheds considered water flow from the abutting property to two common points in the wetland and intermittent stream on the edge of the site.*

Ex-1 and Ex-2 are coincident with land use i.e. house lot developed vs. open field flow from abutting property would not change with revised water shed. (See attached).

44. *There are no test pits by a Massachusetts Licensed Soil Evaluator at the locations of the proposed underground roadway drainage infiltration structure, the bioretention area or the roof drainage infiltration systems. These test pits are necessary to confirm the soil type at the receiving elevation (sand vs loamy sand) and thereby the exfiltration rate used in the calculations (8.27 vs 2.41) as well as the elevation of the Estimated Seasonal High Ground Water Table to confirm the required separation between these systems and the ESHGWT. The test pit locations and data need to be added to the stormwater details on sheet 6.*

Test pits were conducted on the site on February 25, 2021. The test pits confirmed both the soil type a mounding calculation is provided.

45. *The proposed roof drainage piping around the house and the division between which portion of the home drains to each system need to be shown on the plans.*



To: Lynnfield Planning Board
RE: 271 Main Street / Hickman
Date: March 2, 2021

The roof drainage exact piping system cannot be determined at this time. Typically, we have been allowed to provide a detailed infiltration systems at the time of house construction.

46. *A detail of the underground roadway drainage infiltration system needs to be provided. The overflow outlet pipe should be relocated so that any overflow water can only flow on the subdivision property prior to entering the wetlands.*

The undersigned believes the details provided for the roadway drainage infiltration system are adequate for its construction. The overflow outlet pipe has been redirected to ensure that it flows to the wetlands within the subject property.

47. *How is the grading along the northeastern edge of the roadway configured to channel the water from past the catch basins to the filter strip? Shouldn't the curbing be continued to the beginning of the filter strip? The pre-treatment strip for the bioretention area seems to be sloping at a 2,5:1± slope. It is our understanding that these filter strips should be sloped at <2% not as steep as this. The filter strip needs to be redesigned.*

The cross slope has been reduced to < 2%.

48. *A cross section detail of the spillway from the bioretention area needs to be provided. The plans say that it will be riprap. How will the riprap be placed to prevent flow through the stone prior to elevation 87.50 and be level for 30 feet at elevation 87.50?*

A cross section of the spillway detail is provided and, a granite curb weir has been provided.

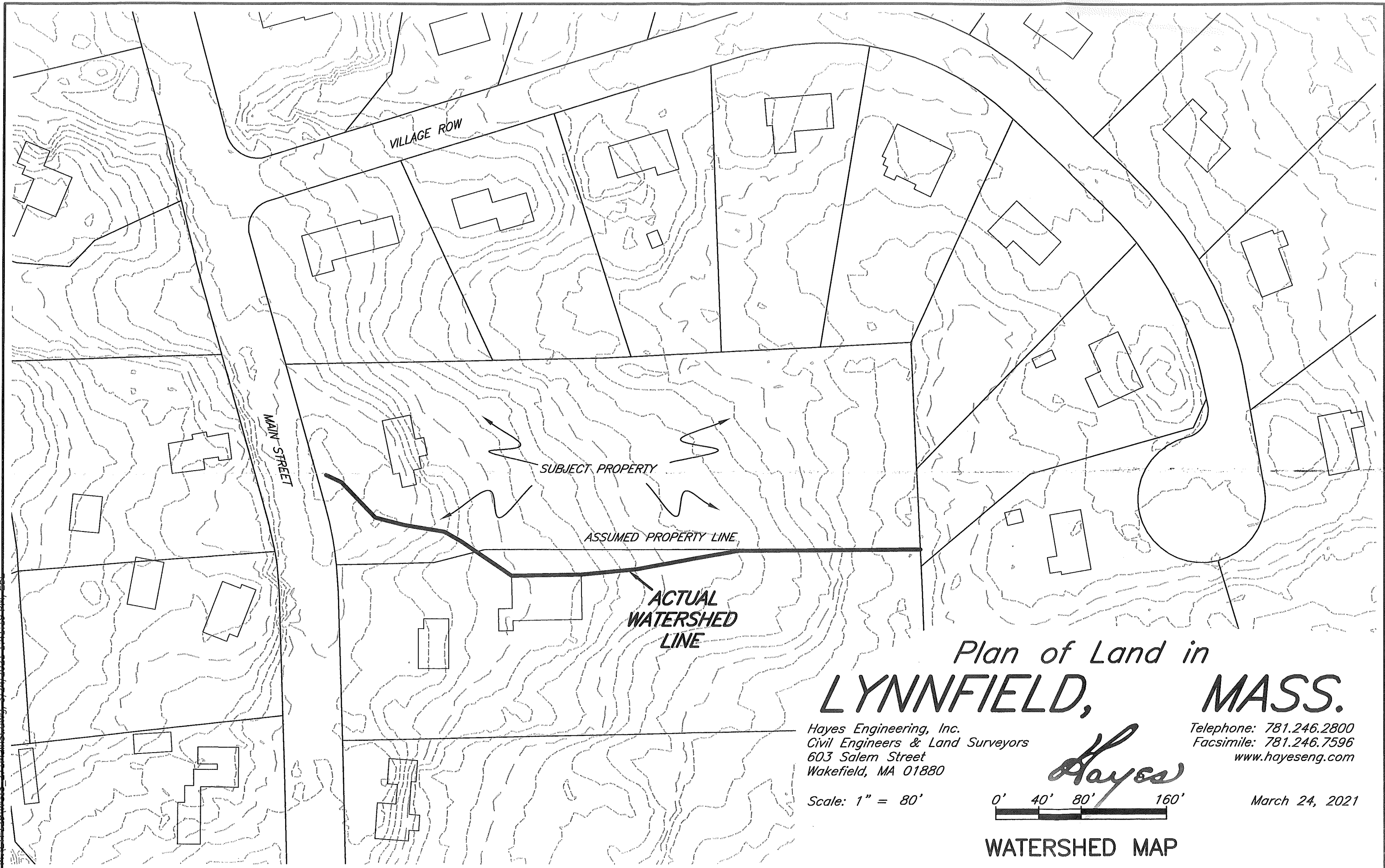
49. *Monitoring wells are required at each of the underground structures per the MADEP Stormwater Handbook. The location and construction detail for these wells need to be shown on the plans.*

Monitoring wells will be added to the infiltration chambers. They are not typically included with a downspout drywells for houses, or bioretention areas.

50. *The Engineer needs to explain why the design is not based on a more conventional system of locating catch basins at the end of the cul-de-sac, piping the runoff through a treatment system and depositing the runoff in an underground infiltration system.*

The proposed configuration of the drainage is such to be able to maintain the depth to groundwater for the infiltration chambers.

M:\LYE1201\wGIS_274MainSt.dwg_3/24/2021 1:41:10 PM_EBI



Plan of Land in **LYNNFIELD,** MASS.

Hayes Engineering, Inc.
Civil Engineers & Land Surveyors
603 Salem Street
Wakefield, MA 01880

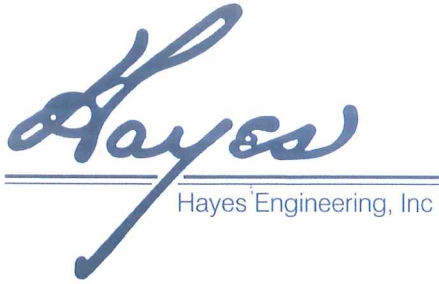
Telephone: 781.246.2800
Facsimile: 781.246.7596
www.hayeseng.com

Scale: 1" = 80'



March 24, 2021

WATERSHED MAP



603 Salem Street
Wakefield, MA 01880
Tel: (781) 246-2800
Fax: (781) 246-7596

Memorandum

Nantucket, MA 02554
Tel: (508) 228-7909

Refer to File No. LYF-1382

TO: Town Lynnfield Planning Board

FROM: Peter J. Ogren, PE, PLS

DATE: March 24, 2021

SUBJECT: Groundwater Mounding Calculations
271 Main Street
Lynnfield, MA

Cc:

In accordance with Volume 3, Chapter 1 of the Massachusetts DEP Stormwater Standards a mounding analysis was conducted for the proposed subsurface infiltration system (PSIS) at the above referenced project. Mounding analysis is required for exfiltration systems that have less than four (4) feet separation to seasonal high groundwater *and* proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm event. The mounding analysis must demonstrate:

1. the *Required Recharge Volume* is fully dewatered within 72-hours; and
2. the groundwater mound that forms under the recharge system will not break out above the land within the 72-hour period.

The accompanying groundwater mounding calculations were performed using Glover's Solution for the Hantush Method and modelled with the HANTUSH software package developed by GeoHydroCycle, Inc. The following model parameters were used in the analysis:

- Application Rate – The application rate is equivalent to the total 100-year storm infiltration volume (2,223 cf) divided by the surface area of the infiltration system (575.6 sf) over the duration of the design storm (1 day) or 3.9 feet per day;
- Duration of Application – The duration of application is 24-hours, equivalent to the duration of the design storm event;
- Total Simulation Time – The total simulation time is 72-hours, the period of analysis;
- Fillable Porosity – The fillable porosity is the specific yield of an aquifer. The attached graph from Walton's *Analytical Groundwater Modeling* indicates an average porosity in fine sands of 0.35;



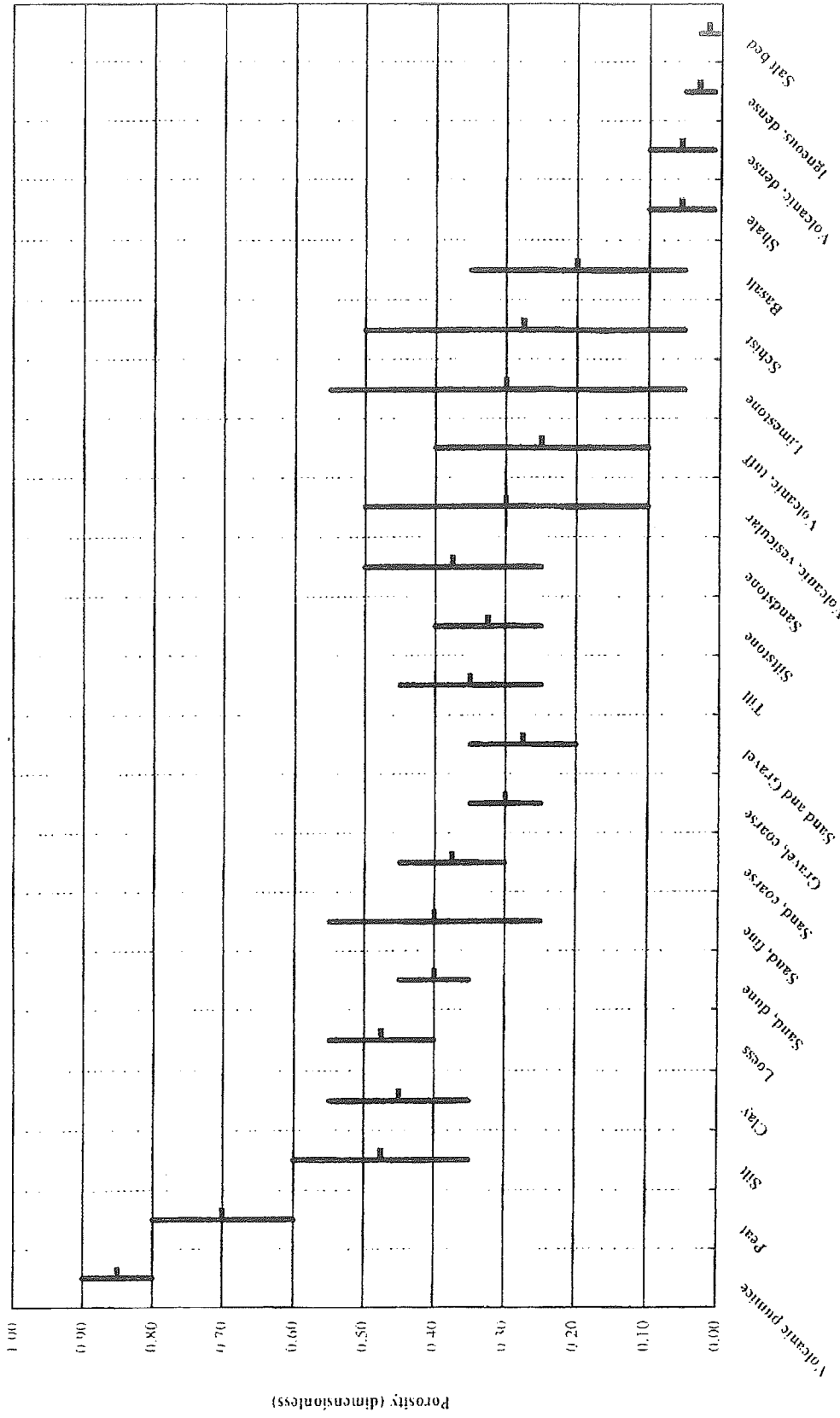
MEMORANDUM

To: Lynnfield Planning Board
From: Peter J. Ogren, PE, PLS
RE: Groundwater Mounding Analysis
March 24, 2021

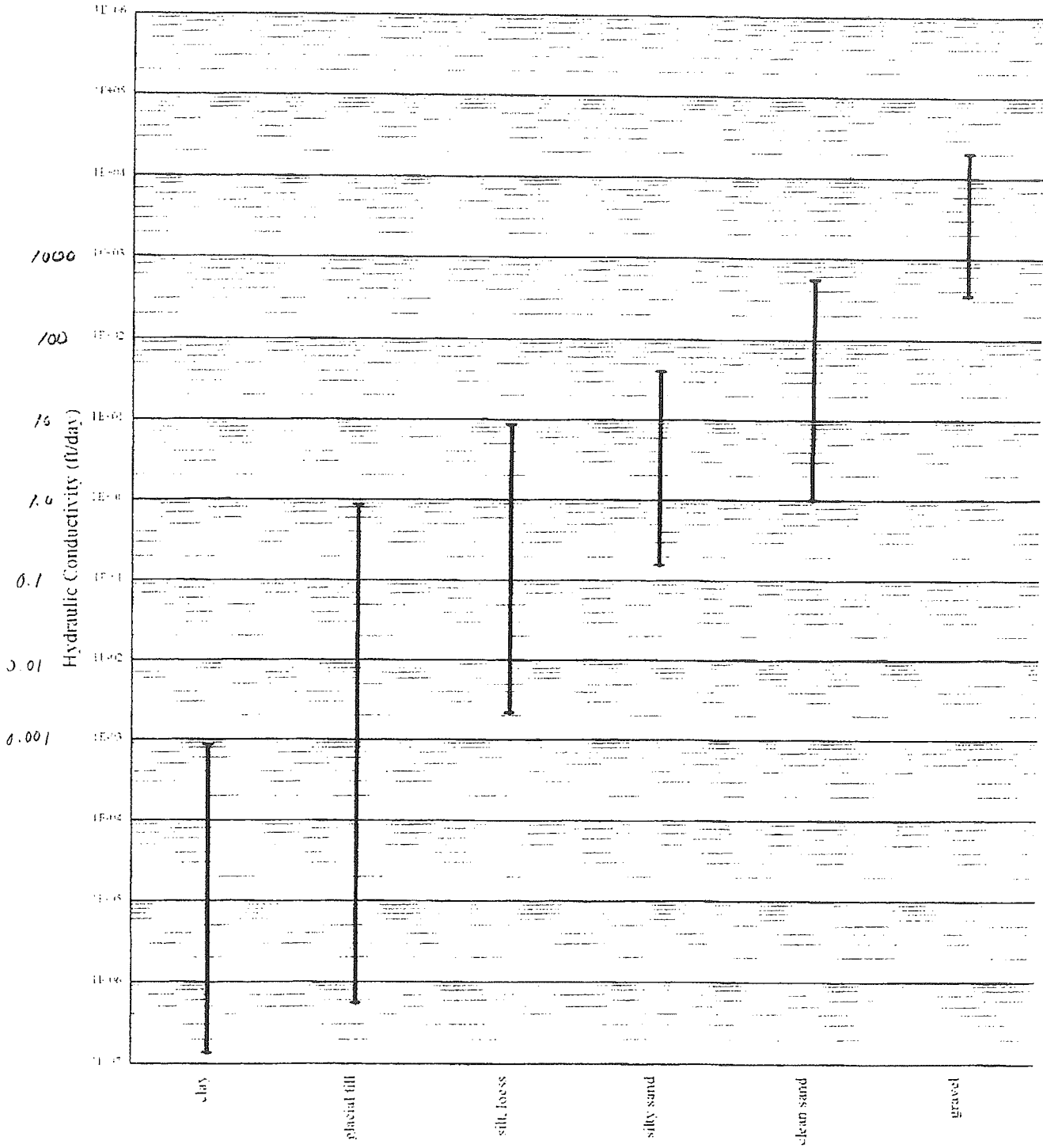
- Hydraulic Conductivity – The hydraulic conductivity of fine sand was estimated to be 5 feet per day using the estimated range of rates for silty sand on the accompanying Anderson & Woessner graph indicating Ranges of Hydraulic Conductivity for Unconsolidated Materials;
- Initial Saturated Thickness – The initial saturated thickness of the aquifer is the difference between the seasonal high water table elevation and bedrock. Several wells are located in the area and catalogued by the Massachusetts Department of Environmental Protection's (MaDEP's) Well Search database. Depth to bedrock in the project vicinity is approximately 35-feet. The average saturated thickness in the project vicinity is 30-feet;
- Length and width of application area are based on the dimensions of the PSIS. The equivalent system for the model was 575.6 sf. based on system dimensions of 31.68-feet in length by 18.17-feet in width;

The resultant groundwater mound peaked at 3.11 feet above the average, estimated seasonal high water table elevation in the system (ESHWT=86.0) to an elevation of 89.1 feet. The bottom of the stone below the infiltration system is proposed at elevation 88.4 feet and the top of stone above the infiltration system is proposed at elevation 90.7. The finished grade over the system is proposed to be at elevation 92.0±. The groundwater elevation does not break out above the land in accordance with Volume 3, Chapter 1 of the Stormwater Standards. Additionally, the mound recedes back below the bottom of the system in 1.1-days, indicating the proposed infiltration system is fully dewatered within 72-hours (bottom of stone elevation = 88.4).

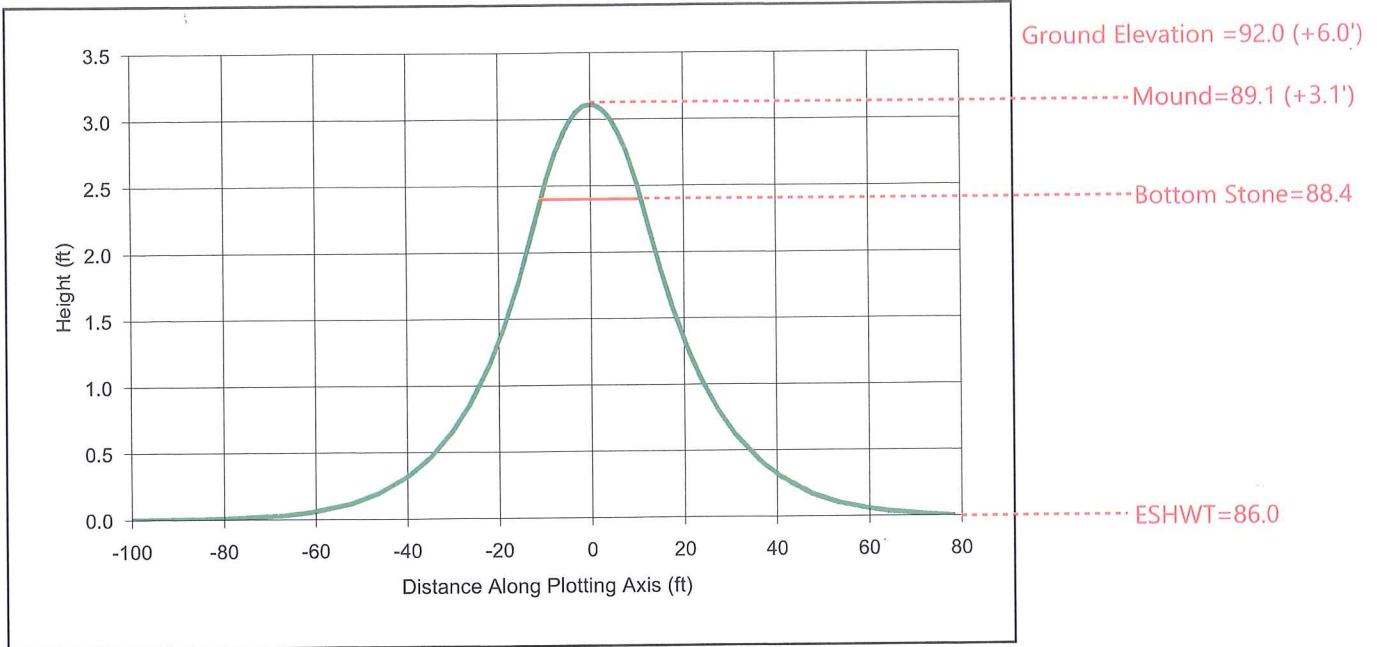
Porosity
 Walton, William C., 1989, Analytical Groundwater Modeling, p. 141.



Ranges of Hydraulic Conductivity - Unconsolidated Materials
Anderson & Woessner, 1992 p. 40



Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Hayes Engineering, Inc.

PROJECT: LYF-1382: 271 Main Street

ANALYST: AMC

DATE: 3/24/2021 TIME: 9:03:16 AM

INPUT PARAMETERS

Application rate: 3.9 c.ft/day/sq. ft

Duration of application: 1 days

Fillable porosity: 0.35

Hydraulic conductivity: 5 ft/day

Initial saturated thickness: 30 ft

Length of application area: 31.68 ft

Width of application area: 18.17 ft

Constant head boundary used at: 78 ft

Plotting axis from Y-Axis: 50 degrees

Edge of recharge area:

positive X: 9.1 ft

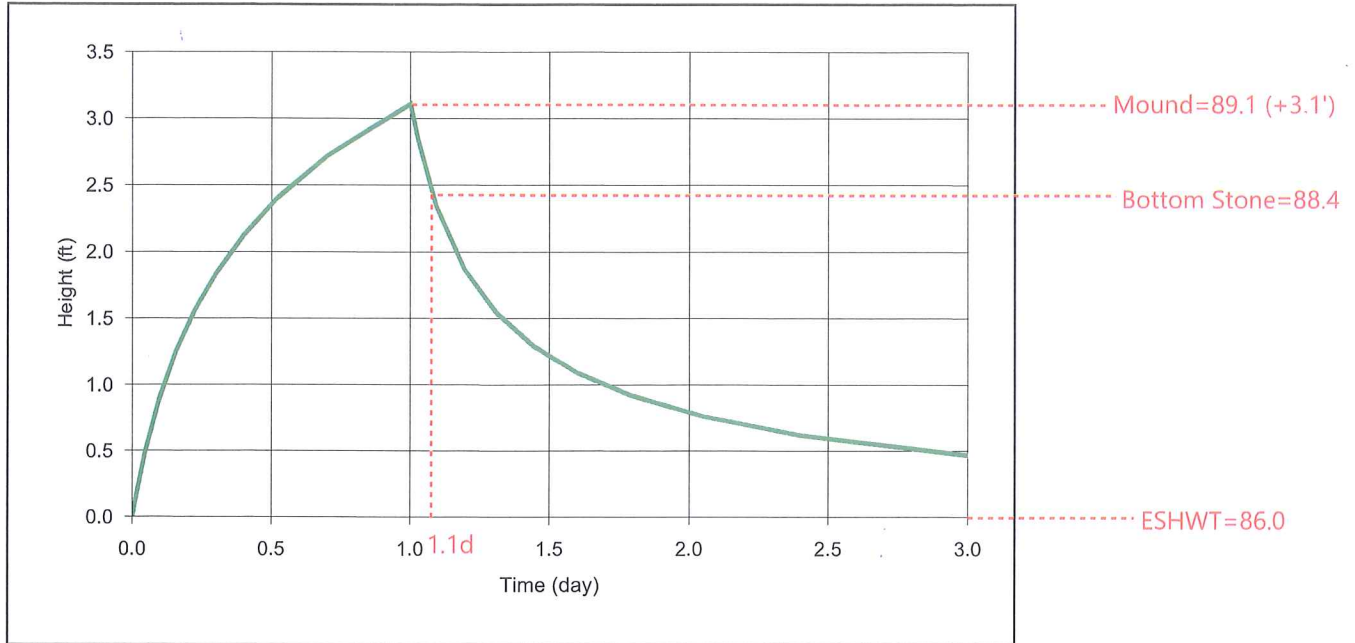
positive Y: 7.6 ft

Total volume applied: 2244.94 c.ft

MODEL RESULTS

X (ft)	Y (ft)	Plot Axis (ft)	Mound Height (ft)
-76.6	-64.3	-100	0
-64.4	-54.1	-84	0
-52.2	-43.8	-68	0.03
-40.1	-33.6	-52	0.12
-30.5	-25.6	-40	0.32
-23.1	-19.3	-30	0.66
-17	-14.3	-22	1.15
-11.9	-10	-15	1.8
-7.4	-6.2	-10	2.54
-4.4	-3.7	-6	2.9
-2.4	-2	-3	3.05
0	0	0	3.11
1.9	1.6	2	3.07
3.5	2.9	5	2.98
5.8	4.9	8	2.76
9.3	7.8	12	2.24
13.3	11.1	17	1.6
18	15.1	23	1.05
23.8	19.9	31	0.62
31.2	26.2	41	0.3
40.7	34.2	53	0.11
50.3	42.2	66	0.03
59.8	50.1	78	0

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: Hayes Engineering, Inc.
 PROJECT: LYF-1382: 271 Main Street
 ANALYST: AMC
 DATE: 3/24/2021 TIME: 9:18:55 AM

INPUT PARAMETERS

Application rate: 3.9 c.ft/day/sq. ft
 Duration of application: 1 day
 Total simulation time: 3 day
 Fillable porosity: 0.35
 Hydraulic conductivity: 5 ft/day
 Initial saturated thickness: 30 ft
 Length of application area: 31.68 ft
 Width of application area: 18.17 ft
 Constant head boundary used at: 78 ft
 Groundwater mounding @
 X coordinate: 0 ft
 Y coordinate: 0 ft
 Total volume applied: 2244.94 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.15
0	0.48
0.1	0.9
0.2	1.25
0.2	1.56
0.3	1.84
0.4	2.12
0.5	2.4
0.7	2.72
1	3.11
1	2.85
1.1	2.35
1.2	1.87
1.3	1.54
1.4	1.29
1.6	1.09
1.8	0.92
2	0.76
2.4	0.62
3	0.47





JOHN M. TOMASZ
DIRECTOR

CHARLES L. RICHTER, P.E.
TOWN ENGINEER

55 SUMMER STREET

LYNNFIELD, MA 01940

TEL: 781-334-9500

FAX: 781-334-9509

WWW.TOWN.LYNNFIELD.MA.US

TOWN OF LYNNFIELD MEMORANDUM

DATE: January 25, 2021
TO: Brian Charville, Planning Board Chairman
FROM: Charles Richter, P.E., Town Engineer
CC: John Tomasz, Director of Public Works
Peter Ogren, Hayes Engineering
Jay Kimball
RE: Definitive Plan for 271 Main Street

After reviewing the "Definitive Plan, Road A, Lynnfield, MA" dated August 13, 2020, there are several issues the Department of Public Works would like the applicant's engineer to address. The following is a list of those issues:

Design Waiver Requests

Please see comments in the Public Works memo to the board dated December 11, 2020.

March 24, 2021: Peter Ogren's responses in blue.

Definitive Plan Contents

The following is a review of the completeness of the subdivision plan sheets as required and outlined under section 375-6.4 of the Planning Board's Rules and Regulations:

1. Lotting Plan(Section 375-6.4.1)
 - a. Requested plan waivers by applicant
 - i. **Section 375-6.4.A(6) – To not show two bench marks on this sheet.** It's unclear why this waiver is requested. The Department does not recommend this waiver. **We believe this has been complied with.**
 - ii. **Section 375-6.4.A(9) – To not show building setbacks on this sheet.** It's unclear why this waiver is requested. The Department does not recommend this waiver. **We believe this has been complied with.**
 - iii. **Section 375-6.4.A(13) – To have a locus at a scale of 1"=40'.** The Department recommends this waiver. **No further comment required.**
2. Existing conditions and demolition plan(Section 375-6.4.2)
 - a. Requested plan waivers by applicant

property. The Department recommends this waiver request. **No further comment required.**

3. Plan and profile(Section 375-6.4.3)

a. Requested plan waivers by applicant

- i. **Section 375-6.4.C(1)(d) –Scale of the plan is 1”=20’ horizontal and 1”=2’ vertical.** The Department recommends the waiver of this sheet requirement. **No further comment required.**
- ii. **Section 375-6.4.C(2)(d) – To not show abutting houses.** The Department does not recommend this waiver. It is important for discussion purposes to provide a context where abutting houses are located in relation to the subdivision. **We provided a Google Map which had the requested information and more and included grades on adjoining lots. We feel this provided the necessary information for discussion purposes and there is not space for it on the Plan & Profile Plan.**

4. Topographic Plan(Section 375-6.4.4)

a. Requested plan waivers by applicant

- i. **Section 375-6.4.D(2) – Waiver requirement to show two foot contours in place of one foot contours.** The Department recommends that the waiver be denied as one foot contours will provide additional grading detail. **We believe this has been complied with.**
- ii. **Section 375-6.4.D(8) - To not show top and bottom of curb elevations.** The Department recommends this waiver request. **No further comment required.**
- iii. **Section 375-6.4.D(11) – To not show stormwater detail on this sheet.** The road infiltration and bio-retention area is shown in more detail on the detail sheet. More detail should be added to these details including more grading information. **We believe this has been complied with.**
- iv. **Section 375-6.4.D(12) – To not show sight distances.** The Department feels that the subdivision is for only one house lot and therefore should not require sight distances to be shown on the plan. **No further comment required.**

b. Benchmark is located on proposed road infiltration system. This benchmark will be unusable once the infiltration system is excavated. Please relocate to a permanent monument. **We believe this has been complied with.**

c. Remove centerline stationing to improve clarity. **We believe this has been complied with.**

5. Street Lighting Plan(Section 375-6.4.5)

a. Requested sheet waiver by applicant

- i. **Section 375-6.4(e) – To not have a street lighting plan in its entirety** The Department recommends this waiver if the Planning Board approves the applicant’s request for a waiver on street lights for the subdivision. **No further comment required.**

6. Erosion and Sediment Control Plan(Section 375-6.4.6)
 - a. Requested sheet waiver by applicant
 - i. **Section 375-6.4(f) – To not have an Erosion Control Plan(shown on the Topographic Plan)** The Department recommends this waiver if the applicant’s engineer provides all the requirements of this on the Topographic Plan. **No further comment required.**
7. Detail Sheet(Section 375-6.4.7)
 - a. Requested plan waivers by applicant
 - i. **Section 375-6.4.G.(1) – To not show details not applicable to the subdivision.** Before approval the Department recommends that applicant’s engineer list the details they feel are not applicable. **We believe this has been complied with.**
 - b. The casting and grate shown on the catchbasin needs to be identified as EJIW# 0MA552000024. **We believe this has been complied with.**
 - c. Detail for gutter inlet and transition stone for catchbasin is missing. This will need to be added. **We believe this has been complied with.**

Drainage

1. Additional test pits need to be done accordance to the DEP Stormwater Handbook. Per the Stormwater Handbook, test pits need to be dug for the road infiltration system, the bio-retention system, and both roof runoff recharge systems. **We believe this has been complied with.**
2. Drainage analysis needs to look beyond the property lines of the subdivision. Water runoff from adjacent lots needs to be taken into account so the drainage system can be adequately designed. **We believe this has been complied with.**
3. It’s unclear the path of water being shed from catchment area EX1. It appears to just end at the property line. This needs to be looked at in relation to the proposed runoff to determine if adjacent land will be affected from the flow of water. **We believe this has been complied with, a LIDAR topography map is included. Changing the watershed line would not change the areas.**

Miscellaneous

1. The dimensions of the proposed roadway need to have Fire Department input. It’s unclear whether the paved road will meet the requirements of the Department. Any significant changes may require changes to the proposed drainage system. **The configuration as shown has been approved by the Fire Department.**
2. A draft of the Homeowner’s Association agreement should be provided to understand who the parties are that are responsible for maintaining certain aspects of the subdivision. The road infiltration basin, Stormceptor unit, bio-retention system, and the roof runoff

recharge systems are aspects of the system that needs to be maintained. Annual reporting requirements for the inspection and maintenance activities need to be included in the Homeowner's Association agreement. Annual reporting should be provided to the DPW. **Jay Kimball, the projects lawyer, should provide this information.**

3. It should be made clear in the Planning Board's decision that the road was not built according to Town standards therefore the Board does not ever intend to recommend the street for acceptance at Town Meeting. **OK.**
4. It is recommended that right of way remain unnamed. This right-of-way is for all intent and purposes a long driveway. It is also recommended that the house to the rear be given a Main Street address to avoid any confusion that the right-of-way is a public way. **OK**