LINDEN Engineering Partners, LLC

100 TradeCenter, Suite G700
Woburn, MA 01801-1851
Tel: (781) 933-3711 Fax: (781) 287-1277
Email:lep@lindeneng.com

February 8, 2021

Town of Lynnfield Conservation Commission
c/o Ms. Emilie Cademartori, Director of Planning and Conservation
Town Hall, 55 Summer Street
Lynnfield, MA 01940

Re: Review of Stormwater Permit Application and design plans, calculations, and report
160 Moulton Drive, Lynnfield, MA

Dear Commission Members:

This correspondence is submitted to you in accordance with our proposal dated Monday, February 1, 2021. Authorization to proceed with the work outlined in our proposal was verbally received by our firm on February 1, 2021. Hard copy of all the materials necessary for our review was picked up by our firm from the Lynnfield Conservation Commission (LCC) Office on Monday, February 1, 2021. Electronic files for our review were downloaded from the Planning Board web site and others were received from the Applicant's Engineer on Monday, February 1, 2021.

The purpose of our review of Site Design Plans, Stormwater Design, Calculations, Report and Management Plan proposed for the project is to assess compliance with the Lynnfield Stormwater Bylaw and Regulations and by reference the Massachusetts Department of Environmental Protection (DEP) 2008 Stormwater Regulations and Handbook (to the extent applicable) and to assess impact of the drainage from the property on the area in general including the town drainage systems in the adjacent Oak Street and Newhall Park..

PROJECT REVIEW

The following are our comments and observations on the Site Design Plans, Stormwater Design, Calculations, Report and Management Plan with respect to the requirements of the regulations and standard engineering practice. The numbered comments listed below are comments that require a response from the Applicant and/or his Engineer.

GENERAL ISSUES:

Since the proposed project will be disturbing more than one acre of land any Stormwater Permit issued for the project should contain a condition requiring that the Applicant obtain a NPDES Permit from the USEPA prior to any work being done on the project and provide evidence of that permit to the LCC prior to conducting any work on the site.

1. Was the $ 2,500.00 fee required for projects of 1 to 2 acres under the Stormwater Permit Regulations paid (the copy of the check included with the filing was not readable)? Was the required Inspection Fee of $ 1,500.00 been paid?

2. The Owner's name listed on the Stormwater Permit Application is "160 Moulton LLC". The deed indicates that the proper name for the Owner is "160 Moulton Drive, LLC". The Application should be corrected. Also, the filing did not include page 2 of the Stormwater Permit Application (which should be included).

3. In the Stormwater Permit filing materials provided to us we did not find any evidence or indication that all abutting land owners within 100 feet of the property have been notified that a Stormwater Permit has been filed for as required by the Regulations. Have these abutters (including MassDOT Highway Division) been notified? Was the notification based on the most recent tax list? Has evidence of the notification been provided to the LCC (white slips or green cards from certified mail or certificates of mailing)?

4. The plans for the project show a new drainage discharge pipe from the site to be constructed through the existing retaining wall in Suntaug Street. What is the status of Suntaug Street and does the land owner have the rights necessary to do the work proposed? Will an ordinary street opening permit be sufficient for this work to be done or are any other Town approvals (such as an easement) necessary? Has the Town of Lynnfield Department of Public Works reviewed and approved this work?

5. The plans list the area of the property as 81,000± s.f. while the Stormwater Permit Application lists the area as 78,000± s.f. Using the AutoCAD file provided to us by the Applicant's Engineer, it appears the area of the property is actually 73,225± s.f. This discrepancy in the land areas needs to be reconciled and the plans, documents and reports corrected accordingly.

6. The book and page for the deed on the Stormwater Permit Application was completed in the wrong location. The space used is for Registered Land (which this land is not). A corrected form with the deed listed in the correct location should be provided.

7. The plans provided do not contain an erosion control plan with erosion control details and erosion control notes. A Construction Period Pollution Prevention Plan (written narrative description) is provided but no actual plan is provided. Our understanding of the Regulations is that a separate Erosion Control Plan is required with the Stormwater Permit Application (see page 2 item 1 of the Application Form). This plan should show erosion controls, a limit of work line, a construction entrance, erosion control details and erosion control notes.

8. Though not specifically required by the Stormwater Regulations, a separate Demolition plan delineating the existing site element to be removed would be helpful.

PLAN REVIEW:

Our firm has conducted a review of the plans provided to us. The following are our comments and observations on the plans with respect to the requirements of the regulations and standard engineering practice:

SHEET C1 (1 of 4) – SITE PLAN:

9. The plan does not show any test pits (2016 tests or original tests).

10. The plan does not show any information on the existing drainage piping in Suntaug Street and Newhall Park.

11. No erosion controls (perimeter controls, silt sacks in surrounding roadways and Suntaug Street) are shown on the plan.

12. What, if any, trees along the northern property line and the Oak Street line are being removed as part of the project. Will the 24" and 18" trees near the VortSentry Unit and drainage outlet pipe be able to remain?

13. More detail on the components of and the dimensions of the proposed septic system should be provided along with dimensions of the proposed underground infiltration system and dimensioned from that system to the septic system, building and property line.

SHEET C2 (2 of 4) – EXISTING CONDITIONS PLAN:

14. The plan does not show any test pits (2016 tests or original tests).

15. The plan does not show any pipes or pipe information on the existing drainage piping in Suntaug Street and Newhall Park.

16. The plan does not show many of the existing site utilities (septic system, gas lines, telephone/catv lines and electric lines).

SHEET C3 (3 of 4) – PHOTOMETERICS PLAN:

No Comments

SHEET C4 (4 of 4) – DETAIL SHEETS:

17. The detail sheet provided did not contain any details for the proposed catch basin, the proposed VortSentry, drain pipe trench, roof drain pipe trench or siltation controls (construction entrance, silt sacks and perimeter erosion controls).

18. The details provided for the roof drain subsurface infiltration system are very generic. The details need to show the actual elevations of the bottom of stone under the system, the bottom of chamber elevation, the top of chamber elevation and the top of stone elevation along with a plan of the observation ports and the monitoring well (with a detail of the monitoring well).

19. Some detail should be provided for the hole through the retaining wall where the 12" pips is to cut through the wall. What size hole and how will the hole be made. What type of grout will be provided?

STORMWATER REPORT & CHECKLIST, CALCULATIONS & BMP DESIGN

The following are our firm's observations, comments and concerns specifically regarding the stormwater aspects of the proposed project. We have generally ordered the list to follow the MADEP Checklist for Stormwater Report. A revised Stormwater Report, Checklist for Stormwater Report, Stormwater Calculations and HydroCAD Model (and revised plans as necessary) addressing all the comments should be filed with the LCC for review.

Standard #1: No New Untreated Discharges:

20. While we agree that the proposed discharge from the site meets the "No New Untreated Discharges" standard, we do not necessarily agree that the discharge meets the "cause erosion in wetlands or waters of the Commonwealth" standard. The major stormwater discharge from the site is proposed to

be by means of a new 12" pipe with a 2% slope. The Applicant's Engineer needs to provide an analysis of the discharge velocity from this pipe and the ability of the receiving ground to standup against this velocity without any erosion. If additional measures such as heavy stone riprap at the outfall are necessary to prevent this erosion then these measures should be proposed as part of the plan. Any erosion created here will wind up in Suntaug Lake which is a "water of the Commonwealth".

Standard #2: Peak Rate Attenuation:

The Applicant submitted runoff calculations as part of the Stormwater Report. The methodology (HydroCAD based on NRCS TR-20), soils data (NRCS Soil Survey) used for modeling the runoff in the stormwater calculations are generally in accordance with accepted engineering practice and MADEP requirements subject to the comments listed below.

In reviewing the runoff calculations and design provided with the stormwater report we have the following questions and/or comments:

21. From a review of the Existing Conditions Plan (drawing C2) it appears that the watershed boundaries shown on drawing WSE are incorrect. It appears that runoff from a larger portion of the front parking lot (roughly from the corner of Oak Street and Moulton Drive to the middle of the existing building entry) flows to the eastern discharge to the fields. From our site visit it appears that a portion of the building roof discharges onto the ground and flows southeast and east to the eastern discharge to the ball fields. Also, from aerial photos it appears that the front portion of the roof is a flat roof. Where do the roof drains from this portion of the roof discharge? There is also a portion of the land to the east of the project site that is not included in the watershed area. Runoff from this slope flows onto the site and discharges to the eastern discharge to the ball fields along with the site runoff. The existing conditions watersheds need to be adjusted to reflect the above concerns and the calculations adjusted appropriately.

22. The calculations for the roof drain subsurface infiltration structures are based on an exfiltration rate of 8.27 which is for sand. The soils in the area (from the NECS Soil Maps) appear to be Merrimac which ranges from fine sandy loam to stratified gravel to gravelly loamy sand. From the data we received it appears that no test pits and no infiltrometer tests have been performed by a Massachusetts Licensed Soil Evaluator in the location of this system to determine the elevation of the Estimated Seasonal High Ground Water Table (ESHGWT) or the properties and exact characterization of the soil. We are concerned that the exact character of the receiving soil be determined along with the ESHGWT. If the actual exfiltration rate for the soil is below about 3.75 in/hr then the system is not large enough. It also must be shown that the system is located a minimum of 4 feet above the ESHGWT.

23. We do not see any runoff treatment unit or any type of sump on the roof drain pipe from the building to the subsurface infiltration system. Incorporating some type of sump or treatment unit is advisable since it will greatly improve the long term viability of the system by removing the fine particles that can be in roof runoff. Such a device will also provide a cleanout access point to the roof drain piping. Replacement of this system in the future will be expensive so getting as many years as possible from the system is in the Owner's interest.

24. The plans for the infiltration system need to include a monitoring well and the number of inspection ports on the system should be specified.

25. The entirety of the roof drainage piping system needs to be shown on the plans with pipe sizes, slopes and inverts along with calculations to support the pipe sizes selected.

26. We note that the 10 year storm flow from watershed P2 is 2.54 cfs, the 25 year flow is 3.38 cfs and the 100 year flow is 4.57 cfs. This flow is routed to a single catch basin located on the northerly edge of the parking area. The Applicant's Engineer needs to provide inlet capacity calculations that indicate a single catch basin is adequate to handle this flow without runoff spilling over the curbing and running down the slope over the retaining wall and causing erosion.

27. The calculations for the site runoff contained in the report show an overall decrease in the total peak runoff from the site when the site developed conditions are compared to the existing conditions. This is due to the reduction in impervious area and the routing of the runoff from the new building roof to the proposed infiltration system. While this meets the overall goal of the Regulations it does not address the fact that there is a change in where and how the runoff from the site is being discharged. Presently runoff from the site is split in two distinct directions. A portion of the runoff flows to the northeast to the ball fields in Newhall Park and the remainder flows to the northwest to Oak Street and the parking/tennis court area in Newhall Park. Presently there are no pipe discharges onto Suntaug Street or Newhall Park. The runoff to the northeast is somewhat more concentrated opposite the low point on the north side of the existing parking area but flows off the site as overland flow over a wide area. The proposed site design drastically reduces the runoff leaving the site in the northeasterly direction to Newhall Park but both the peak rate and volume of runoff being discharged in the northwesterly direction to Oak Street and the parking/tennis court area in Newhall Park is being increased and the runoff is being concentrated for the most part in a single 12" pipe discharge through the retaining wall to Suntaug Street. This point discharge will be a hazard to pedestrians using the gravel path in Suntaug Street to access the ball fields in Newhall Park. In our opinion the Applicant's Engineer needs to address this by incorporating additional runoff mitigation measures to reduce the peak rate of runoff to Oak Street and Newhall Park and to design a method of discharge to spread the discharge out over a larger area and/or to directly connect the discharge to the drainage system in Suntaug Street (which will only move the problem to the drywell in the parking area, but it will remove/reduce the immediate pedestrian hazard).

28. Pipe calculations for the 12" pipe from the catch basin to the VortSentry Unit and from the VortSentry Unit to the discharge through the wall need to be provided as part of the Stormwater Report.

29. Given the fact that a large part of the stormwater management system for the site is a subsurface structure which is costly and disruptive to replace, we suggest that consideration be given to including a condition such as the following in the Stormwater Permit for the project: "Any issues which arise at any time affecting the function of any components of the Stormwater Management system on the site, including the subsurface systems must be addressed immediately by the party responsible for the maintenance of the system at their sole expense".

Standard #3: Recharge:

See other comments in this report regarding test pit requirements for the proposed recharge system and details for the system. In reviewing the recharge calculations and design provided with the stormwater report we have the following questions and/or comments:

30. The Stormwater Report states that the recharge standard is presumed to be met and the project is a redevelopment project. If the standard is not being fully met for a redevelopment project the report should contain an explanation as to why the standard cannot be met. Why can the parking lot runoff not be infiltrated in a second new infiltration system constructed under the parking lot to the north of the roof drain infiltration system or an infiltration trench to the north of the proposed building? If recharge cannot be provided for 100% of the impervious area then a 65% rule calculation should be provided.

31. A monitoring well is required for all infiltration system(s).

Standard #4: Water Quality:

We have the following comments (in addition to the comments under Standard 2 above and 4 below) regarding Standard #4:

32. The box on the Checklist for Stormwater Report indicating that 44% pretreatment and a 1"{ water quality volume is required as the discharge is near a critical area (see comments under Standard 6 below) is not checked. The last box on page 5 of the Checklist should be checked as should the first 2 boxes on sheet 6. If the proprietary BMP is continued to be used then the 4th box on sheet 6 should be checked and the required documentation needs to be provided.

33. The proposed drainage design shows the roof drain from the proposed building roof flowing to a subsurface system. Pretreatment for the roof runoff is not required and the subsurface system will meet the 80% TSS removal standard, however, no TSS removal calculations were provided in the Stormwater Report. These calculations should be provided.

34. The Stormwater Report included calculations for the sizing for the proprietary BMP's based on the MADEP Methodology and a 1" water quality volume, however, we did not see a TSS calculation sheet for the discharge pipe from the VortSentry Unit.

35. We suggest that any Stormwater Permit issued for the project contain the following condition, "The approved plans show proprietary separators by one manufacturer. If there is a substitution for any of the approved water quality structures, the Applicant and their Engineer shall submit the proposed substitution to the LCC for approval prior to ordering and installing the structures. The submission shall include all necessary design data, calculations, and documentation of the proposed structure's performance to demonstrate that the performance of the proposed structure is equal to or superior to the approved structures along with a revised LTPPP including maintenance instructions for the proposed units. The Applicant shall also pay for the LCC's peer review consultant to review the proposed substitution and make a recommendation to the Commission. Upon receipt of the peer review, the Commission may reject the proposed substitution or approve the substitution as an insignificant change".

Standard #5: LUHPPL:

The Checklist and the Stormwater Report identifies that the proposed project and use does not constitute a Land Use of Higher Potential Pollutant Loading and we agree with that conclusion.

Standard #6: Critical areas:

36. The Checklist and the Stormwater Report state that the Critical Areas section is "NOT APPLICABLE". Our research has identified on the MassGIS web site that the north 50%± of the site is in Zone A of a public water supply and the entire site is in Zone B of a public water supply. The site is further identified as being tributary to an "Outstanding Resource Water" of the Commonwealth. For these reasons we believe that the "Critical Area" standards apply to the proposed site design. Therefore, the water quality design needs to be based on a 1" water quality volume and the treatment systems used should be limited to those approved for critical areas unless it can be shown under redevelopment that this is not practicable. We note that proprietary separators are not approved as terminal treatment for critical areas..

Standard #7: Redevelopment:

The Checklist and the Stormwater Report identifies that the proposed project as a Redevelopment which we agree with.

Standard #8: Construction Period Pollution Prevention Plan:

In reviewing the Construction Period Pollution Prevention Plan (CPPPP) included in the Stormwater Report we have the following questions and comments (also other comments regarding an actual Erosion and Sediment Control Plan):

37. The Owner's and Applicant's names on the CPPPP are different that listed on the Stormwater Permit Application. The difference needs to be reconciled.

38. The CPPPP refers to erosion controls shown on the plans, but the plans do not show and erosion controls.

39. The maintenance/inspection frequency in the CPPPP needs to be revised to match the EPA requirement (7 days or ¼" of rain) for critical areas.

40. We suggest that the CPPPP be revised to require a spill containment kit on site during the construction period.

41. The project will require a NPDES Permit and that a SWPPP be prepared under the required NPDES Permit. We recommend that the Stormwater Permit for the property contain a condition requiring that a SWPPP addressing all the items listed under Section 8 on page 7 of the Checklist for Stormwater Report be provided to the LCC for their review and approval at least 45 days prior to any construction work or land disturbance at the site.

Standard #9: Operation and Long Term Maintenance Plan:

In reviewing the Operation and Long Term Maintenance Plan (LTPPP) we have the following questions and/or comments:

42. The only BMP listed in the LTPPP is Subsurface Infiltration Chambers. The catch basin and Proprietary separator are not listed (though maintenance directions for the separator are included). The LTPPP needs to be revised so that the instructions and reporting forms include all the BMPs being used at the site.

43. A Stormwater Maintenance Plan showing all the Stormwater BMPs and the snow storage areas should be provided with the LTPPP.

44. The O & M Plan should include street sweeping on at least an annual basis.

45. We suggest that the Stormwater Permit issued for the project including the following condition, 'The use of de-icing chemicals (such as sodium chloride, potassium chloride, calcium chloride or any other chemicals) are to be limited to the minimum amount necessary to maintain public safety. The Applicant shall assume the responsibility of informing any snow removal contractors working on the property of this requirement".

Standard #10: Prohibition of Illicit Discharges:

46. The box stating that NO Illicit Discharge Statement was attached to the Stormwater Checklist was checked. Therefore, we suggest that any Stormwater Permit issued for the project should include a condition requiring the submission of a signed illicit discharge statement prior to the discharge of any stormwater from the post-construction BMP's.

We look forward to discussing the project, this report, and any questions that the LCC may have at the public hearing. We are available to discuss the project with the Applicant, the Town Engineer, the Applicant's Engineer and/or the Applicant's representatives, as necessary. If you have any questions regarding this matter, or should you require any additional information, please do not hesitate to contact our firm.

Very truly yours,

LINDEN ENGINEERING PARTNERS, LLC

William A. Jones, Sr. Partner Richard G. Cutts, P.E., President

Cc: Mr. Charles L. Richter, P.E., Lynnfield Town Engineer

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