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October 24, 2014

Carlisle Zoning Board of Appeals
c/o Lisa Davis Lewis
Zoning Board of Appeals, Chair
66 Westford Street
Carlisle, MA 01741

RE: Nitsch Project #10399
Peer Review
Comprehensive Permit – 40B
100 Long Ridge Road
Carlisle, MA

Dear Ms. Lewis,

Nitsch Engineering has reviewed the project known as the "Brem Property – 40B" located at 100 Long Ridge Road in Carlisle, Massachusetts for soundness of methodology, calculation, and conformity to standard engineering practice as requested. Nitsch Engineering's comments are intended to assist the Zoning Board of Appeals (ZBA) in understanding the proposed project, identify technical issues related to the site development, and to make recommendations to the ZBA of possible technical improvements to the proposed design.

Nitsch Engineering has received and reviewed the following plans and documents:

1. Plan entitled, "Existing Conditions with Septic and Wells within 200 feet of Subject Property," prepared by Meisner Brem Corporation, dated September 15, 2014.

2. Plan entitled, "Residential Site Plan for Comprehensive Permit – MGL. Ch. 40B," prepared by Meisner Brem Corporation, dated June 30, 2014.

3. Plan entitled, "Notice of Intent, Site Plan C – Grading Plan," prepared by Meisner Brem Corporation, dated July 17, 2014.

4. Application to Carlisle Board of Appeals for Comprehensive Permit per MGL Ch. 40B, prepared by Meisner Brem Corporation, dated July 2, 2014.

5. Preliminary Stormwater Management Report with Operation and Maintenance Plan, Volume 1 of 2, prepared by Meisner Brem Corporation, revised July 3, 2014.

6. Preliminary Stormwater Management Report with Operation and Maintenance Plan, Volume 2 of 2, prepared by Meisner Brem Corporation, dated July 1, 2014.

7. Letter with attachments including list of waivers from Deschenes & Farrell, P.C., dated September 26, 2014.

Nitsch Engineering and their sub consultant GeoHydroCycle, Inc. (GHC) have also reviewed the proposed septic systems and drinking water supply wells for feasibility and potential impacts to local groundwater quantity and quality. GHC issued their comments in a letter, dated October 17, 2014. The septic system and drinking water supply wells will be permitted through the Board of Health (BOH).

Nitsch Engineering understands that the Applicant has filed a Notice of Intent (NOI) (DEP file No. 125-0974) with the Carlisle Conservation Commission on August 1, 2014. The hearing was opened by the Commission on August 28, 2014 and was continued to September 25, 2014, and then again to November 6, 2014.

Nitsch Engineering reviewed the proposed project under the Wetlands Protection Act (WPA), the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, and the Town of Carlisle (the Town) Rules and Regulations where appropriate, as summarized in the comments below.

Nitsch Engineering understands that the Applicant is planning to submit a traffic study as supplemental information. A traffic peer review will be issued under separate cover once the Applicant submits the traffic study to the ZBA and it can be reviewed by Nitsch Engineering.

SITE AND PROJECT DESCRIPTIONS

1. Summary of Existing Conditions

   The 9.84-acre project site is located at 100 Long Ridge Road and consists of one (1) lot. The site currently contains one (1) residential home and a horse farm. Approximately 4.5 acres of the site are cleared/developed and the remainder is woods or wetlands. An intermittent stream and associated Bordering Vegetated Wetland (BVW) cross through the eastern portion of the site. The BVW has been flagged and shown on the overall site plan. The project site is located east of the Blood Farm Trail, which is part of the extensive Carlisle trail system and leads to the Davis Corridor and Estabrook Woods.

   The topography in the developed portion of the site along the existing driveway and near the home and barn is relatively flat. Moving eastward from the developed area, the topography slopes down, steeply in places, to the intermittent stream and associated BVW.

   There is an existing private water supply well and septic system that service the existing residential home. Electric service is provided to the existing home by NStar through the underground wiring and the transformer located in the southwest corner of the site near Long Ridge Road. There is also underground cable service provided by Comcast.

2. Summary of Proposed Conditions

   The Applicant is seeking a Comprehensive Permit from the Carlisle ZBA, pursuant to Massachusetts General Law Chapter 40B, to construct 19 new housing units on a 1,160± linear foot dead-end roadway. There will be 20 units in total, including the existing home that will remain, for a density of 2.03 units per acre. In General Residence District B, the Carlisle Zoning Bylaw requires a lot size of 2 acres with one (1) unit per lot (or a density 0.5 units per acre). The proposed 20-foot wide private roadway will be located approximately 110 feet east of the intersection of Long Ridge Road and Garnet Rock Lane. The roadway ends in a cul-de-sac that provides access for four (4) of the proposed units.

   Domestic water service will be provided by eight new drinking water supply wells in addition to the existing well. Water supply for fire suppression will be provided by a 45,000-gallon fire cistern located in the southeast corner of the site on Long Ridge Road. The Applicant is proposing three (3) new "alternative technology" septic systems to provide sewage treatment for the new units. The Applicant proposes to manage stormwater generated by the proposed project through a combination of Low Impact Development (LID) techniques and conventional stormwater strategies.

PERMITTING

3. The project does not appear to require review under the Massachusetts Environmental Policy Act (MEPA). Nitsch Engineering recommends that the Applicant confirm whether or not this certificate will be required.

4. Nitsch Engineering recommends that the Applicant verify with the Army Corps of Engineers that a Category one or two permit is not required for the proposed work within jurisdictional wetland resource areas. Also, Nitsch Engineering recommends that the Applicant verify with MassDEP whether a Water Quality Certificate is required for this project.

5. The Existing Conditions Plan indicates an intermittent stream and associated Bordering Vegetated Wetland in the eastern portion of the project site. The 100-foot Buffer Zone extends into the proposed development resulting in permanent impacts through the creation of impervious area. It appears that the proposed project will require grading immediately adjacent to the flagged BVW line (an offset of less than 5 feet in some areas) and may potentially result in disturbance within the BVW. Nitsch Engineering recommends that the Applicant confirm whether the proposed grading will impact the jurisdictional wetland resource areas and clearly indicate a limit of work on the plans.

6. The existing topographic contours in the eastern portion of the site are incomplete and, therefore, it is not possible to determine if the proposed grading will require work within the BVW. Nitsch Engineering recommends that the Applicant provide complete existing topographic information for the entire project site.

7. The Applicant should confirm if the area located east of the intermittent stream and BVW is to be designated as Open Space and if it will be under a Conservation Restriction.

8. It does not appear that the project site is located within a Flood Zone or within protected areas designated by the Natural Heritage and Endangered Species Program (NHESP). The Applicant has indicated that a vernal pool may be located in a wetland in the southeastern portion of the project site. Nitsch Engineering recommends that the Applicant confirm the location of the vernal pool and provide it on the Existing Conditions Plan.

9. The project includes the construction of eight (8) new drinking water supply wells to be shared by the proposed units. Nitsch Engineering understands that MassDEP will be making a determination on if the proposed wells will be classified public or private. If the wells are considered public, the Applicant will be required to permit the proposed water supply wells through the MassDEP permitting process; otherwise they will be permitted through the Carlisle BOH. Nitsch Engineering is working with GHC to review the proposed wells for feasibility and potential impacts to local groundwater quantity and quality.

10. The Plans indicate three (3) proposed onsite septic systems that will be permitted through the BOH; however, there is limited information regarding the design of the systems within the reviewed plan set and documents. Nitsch Engineering recommends that the Applicant submit design calculations and site specific plans and details for the proposed septic systems to the ZBA, the BOH, and the Conservation Commission.

11. Nitsch Engineering recommends that the Applicant submit Operation and Maintenance (O&M) documents to the ZBA at the appropriate time that detail responsibilities for maintenance of the Public Water System, roadway, and septic systems. A separate O&M Plan for the proposed stormwater management system was submitted as part of the Stormwater Report (comments provided below). Nitsch Engineering recommends that the Applicant confirm if a Homeowners Association (HOA) will oversee and administer required on-going maintenance for the project and provide the HOA agreement to the ZBA for review.

12. Due to the fact that the project will disturb greater than 1 acre of land, Nitsch Engineering understands that an Environmental Protection Agency (EPA) and National Pollutant Discharge Elimination Systems (NPDES) permit will be required. In the Stormwater Report, the Owner indicates that this permit will be obtained prior to construction and that a Stormwater Pollution Prevention Plan will be submitted to the ZBA and Conservation Commission. Nitsch Engineering recommends that the ZBA include a Condition to require that the Applicant submit the SWPPP for review at least 30 days prior to construction.

13. Nitsch Engineering recommends that the Applicant update the ZBA on the status of the above permits and any other required permits, including the interests of the Conservation Commission, Building Inspector, and BOH.

PROJECT LAYOUT AND SITE FEATURES

14. The Applicant is proposing a 20-foot wide, 1,160± linear foot private roadway to provide access to the 20 units. The proposed cul-de-sac has an outer diameter of 120 feet and an inner diameter of 80 feet. Nitsch Engineering understands that the Applicant is preparing a traffic study that will be submitted as supplemental information. Upon receipt and review of the traffic study, Nitsch will provide additional comments on the roadway design, project density, and site circulation.

15. Due to the length and reduced width of the proposed roadway, Nitsch Engineering recommends that the Applicant provide turnouts every 300 feet in order to allow vehicles to pass.

16. Nitsch Engineering did not receive construction details as part of the plan set. Nitsch Engineering recommends that the Applicant submit detail sheets for the proposed site and roadway components, erosion and sedimentation controls, and utility infrastructure, including site specific details for the proposed septic systems, wells, and stormwater management system.

17. Nitsch Engineering recommends the Applicant provide a typical cross section of the driveway that indicates curb type, shoulder width, sidewalk location and width, and proposed treatments at the shoulder slopes.

18. Nitsch Engineering recommends that the Applicant provide the locations of the easements for maintenance of the drainage and septic utilities and trail access on the plan set.

19. The Applicant indicates that there will be a pedestrian path provided to connect the project site with the Blood Farm Trail. The Applicant also proposes to construct a trail and bridge over the intermittent stream and BVW located to the east of the proposed development. Nitsch Engineering recommends that the Applicant confer with the Conservation Commission and Carlisle Trails Committee on the proposed trails and connections. In particular, the proposed wetland crossing will potentially require additional work within jurisdictional wetland resource areas.

20. Nitsch Engineering recommends that the Applicant review the proposed project with the Fire Department. Specifically, the Applicant should confirm that there is sufficient access provided for emergency vehicles within the proposed roadway and cul-de-sac. Nitsch Engineering recommends that the Applicant provide turning movements at the entrance, along the proposed drive and around the cul-de-sac based on the largest Carlisle Fire Department vehicle.

21. Nitsch Engineering recommends that the Applicant review the proposed project with the Police Department.

22. The Residential Site Plan for Comprehensive Permit indicates that the project will be constructed in two (2) phases. Nitsch Engineering recommends that the Applicant provide additional information on the proposed phasing, including the timeline for Phases 1 and 2 and the proposed phasing plan for the units, roadway, and utilities.

23. Signage within the site is not indicated on the plans. Will there be an entrance sign for the development? Nitsch Engineering recommends that the Applicant indicate locations and types of proposed signage on the plans.

24. Snow storage areas are not designated for the proposed project. Nitsch Engineering recommends that the Applicant describe the locations and indicate the locations of snow storage areas on the plans. The snow storage areas should be located outside of the jurisdictional wetland resource areas and Buffer Zone and the stormwater management system, and should not interfere with emergency access to the project site. Additionally, they should be coordinated with the proposed landscape a plans.

25. Does the Applicant anticipate ledge removal? Nitsch Engineering recommends the Applicant indicate whether ledge will be removed as part of this project. If ledge removal is anticipated, the Applicant should coordinate with the ZBA on the appropriate methods and times of removal.

26. Nitsch Engineering recommends that the Applicant submit a Landscaping Plan for the project site that includes the proposed plantings within the drainage swales and bioretention basin and the vegetative screening around the site perimeter and between units. Nitsch Engineering recommends the use of native plant materials in the project site.

27. Nitsch Engineering recommends that the Applicant submit a Lighting and Photometric Plan to provide the proposed light locations for the roadway and housing units and to indicate the amount of light that will project onto the ground and surrounding area from the unit and site lighting.

GRADING

28. In general, the proposed roadway and housing units will require minor cuts within the existing topography, with more substantial earthwork (both cuts and fills) in the easternmost portion of the site near the proposed cul-de-sac. Nitsch Engineering recommends the Applicant indicate the general cut and fill volumes for the proposed development and the net increase or decrease of fill being brought to the site.

UTILITIES – GENERAL

29. Nitsch Engineering recommends that the Applicant provide rim and invert information for the proposed sewer and drainage utilities.

30. The Applicant is proposing water lines, fire protection lines, electric service, and cable service within the project site. Nitsch Engineering recommends the Applicant indicate all utilities on the plan including size, pipe material type and length. Nitsch Engineering recommends the Applicant demonstrate that any drain, sewer, and water line crossings do not conflict and meet adequate vertical and horizontal separation.

31. Nitsch Engineering recommends the Applicant provide the necessary details for the fire cistern tank. Nitsch Engineering notes that the Fire Department typically requires turnouts at the locations of fire cistern tanks.

WATER AND SANITARY

32. Design calculations, construction details, test pit data, and a groundwater mounding analysis for the proposed septic systems were not submitted with the Application materials. Nitsch Engineering recommends this information be submitted to the BOH and ZBA for review, if it has not been submitted.

33. Nitsch Engineering recommends that the Applicant provide the 100-foot radius around each proposed drinking water supply well on the plan set to confirm that there is at least 100 feet of separation between the wells and existing and proposed septic systems.

DRAINAGE/STORMWATER MANAGEMENT

To support the design of the stormwater management system, the Applicant used HydroCAD software to analyze the existing and proposed hydrologic conditions on the project site. Nitsch Engineering generally agrees with this methodology, however additional information is needed to confirm that the proposed design is appropriate for the site and technically feasible. There appears to be inconsistencies between the existing and proposed drainage maps and their respective HydroCAD models. Nitsch Engineering recommends that the Applicant review and revise the maps and HydroCAD models to be consistent and update the model based on the following comments:

34. The Applicant is proposing to implement Low Impact Development (LID) techniques for a portion of the site, including roadway draining to roadside swales and providing treatment and infiltration with a bioretention basin. Nitsch Engineering recommends that the Applicant evaluate additional opportunities to implement LID throughout the site, rather than using a traditional closed drainage system.

35. Nitsch Engineering recommends that the Applicant provide the soil test pit logs for review.

36. There does not appear to be soil testing in areas of proposed stormwater infiltration. MassDEP requires testing to confirm the soil texture, groundwater elevation, and ledge conditions within the footprint of bioretention basin and subsurface infiltration system.

37. Based on the NRCS Soil Map, a hydrologic soil group (HSG) of "C" was used by the Applicant in the HydroCAD model for land cover types and for the recharge calculation. However, an infiltration rate of 8.27 inches per hour was used when modeling the basins in the HydroCAD model, which is the Rawl's Rate for sand (HSG "A"). Nitsch Engineering recommends that the Applicant provide additional soils information to support the design parameters for the proposed basins.

38. The northern portion of the roadway drains towards the catch basins located within the cul-de-sac, a length of approximately 450 feet. Nitsch Engineering recommends that the Applicant provide additional structures within the roadway every 250-300 feet to reduce the volume of gutter flow.

39. Nitsch Engineering recommends that the Applicant provide closed drainage calculations for the stormwater management system.

MASSDEP STORMWATER MANAGEMENT STANDARDS

Standard 1: No new untreated storm water conveyances to wetland resources area.

This standard allows the direct discharge of stormwater to waters and wetlands provided the discharge is adequately treated to protect groundwater, surface waters and wetlands in accordance with the Massachusetts Stormwater Handbook. The southern portion of the proposed roadway is minimally treated using catch basins prior to discharging towards the BVW and does not meet the requirements of Standards 1 or 4 for water quality treatment. Based on the information provided, it does not appear that this Standard has been met.

Standard 2: Storm water management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

As previously noted, there appear to be inconsistencies between the existing and proposed drainage maps and their respective HydroCAD models, and the HydroCAD model should be updated revised on the in-situ soils information. Additional information is required to determine if Standard 2 is being met by the proposed design.

Standard 3: Annual recharge to groundwater.

As previously noted, additional soil test pit information is needed to verify the soil texture, infiltrative capacity, and groundwater conditions within the proposed infiltration Best Management Practices (BMP). Therefore, additional information is needed to determine if Standard 3 is being met by the proposed design.

Nitsch Engineering recommends that the Applicant explore other alternatives for infiltration throughout the project site, including the use of dry wells for infiltration of roof runoff.

Standard 4: For new development, storm water management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS).

The proposed stormwater treatment in the northern and southern portions of the proposed roadway does not appear to meet the pretreatment or treatment requirements of Standard 4. Nitsch Engineering notes that the Town requires 80% TSS removal prior to discharge to an infiltration practice and recommends that the Applicant complies with this requirement to maintain the longevity of the drainage system.

Nitsch Engineering also recommends that the Applicant confirm whether the project is subject to a 0.5-inch or 1.0 inch water quality volume related to discharge to critical areas (vernal pools within the receiving wetland) or infiltration within highly permeable soils (permeability rate of 2.41 inches per hour or greater). At this time, it does not appear that this Standard has been met.

Standard 5: Storm water discharges from areas with higher potential pollutant loads require the use of specific storm water management BMPs. The use of infiltration practices without pretreatment is prohibited.

Not applicable.

Standard 6: Storm water discharges to critical areas must utilize certain storm water management BMPs approved for critical areas.

The Applicant should confirm that there are no resources identified as critical areas by MassDEP (i.e., vernal pools, wellhead protection areas, etc.) associated with the wetland resource area receiving the project's stormwater.

Standard 7: Redevelopment of previously developed sites

Not applicable.

Standard 8: Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

Minimal erosion controls are provided on the plans. The Applicant does not show adequate perimeter erosion controls, inlet protection, stabilized construction entrances, or the details associated with these practices. Nitsch Engineering recommends the erosion control be shown on the plan and coordinated with the Conservation Commission Agent prior to construction. The Applicant indicated a Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to construction. Based on the information provided, it does not appear that this Standard has been met.

Standard 9: All storm water management systems must have an Operations and Maintenance Plan to ensure that systems function as designed.

A schedule for the operation and maintenance of the proposed stormwater management system was included in the Stormwater Report. While Nitsch Engineering does not take exception to the submitted material, there may be additional changes to the O&M Plan based on previous comments. This Standard has not been met.

Standard 10: Prohibition of Illicit Discharges.

The Stormwater Report provided by the Applicant indicates that an Illicit Discharge Statement will be provided prior to construction. Nitsch Engineering recommends that the ZBA include a Condition to require the submittal of the Illicit Discharge Compliance Statement for review at least 30 days prior to the start of construction.

WAIVERS

Nitsch Engineering offers the following comments on the technical waivers requested by the Applicant:

Zoning Bylaw

1. The Applicant is seeking a waiver to allow development of 20-unit housing development on a single lot in the Residence District B. Nitsch Engineering notes that the resulting density is 2.03 units per acre. The plan indicates that the proposed units are separated by a minimum of 25 feet. Nitsch Engineering understands that the Building Inspector and Fire Department will review the proposed project and may provide additional comments on the project density and spacing between units.

2. The Applicant is seeking a waiver to allow for reduced setback from street of 33 feet (40 feet required). Nitsch Engineering notes that this waiver appears to reference the offset of Unit 1 from Long Ridge Road. The plan provided by the Applicant provides 20-30 feet between the proposed units and the proposed roadway. Nitsch Engineering recommends that the Applicant provide a Landscaping Plan to the ZBA that includes vegetative screening in the reduced setback area if the waiver is approved by the ZBA.

3. The Applicant is seeking a waiver to allow for reduced front, side, and rear setbacks (proposed: 33 feet front, 10 feet side, 10 feet rear, required: 40 feet). Given the proximity of the homes on abutting lots to the east and west of the project site, Nitsch Engineering recommends that the Applicant provide the required side setback of 40 feet from the property line or provide a Landscape Plan that addresses screening based on the reduced setback. Nitsch Engineering recommends that the Applicant coordinate any screening methods with abutters and the ZBA.

4. The Applicant is seeking a waiver to allow for twenty units on a Private Driveway as shown on the plan. Section 5.4.4 allows for a maximum of six (6) "lots" to share a Private Driveways. Although the project proposes the use of a Private Driveway which will only service one "Lot" in the event the Board interprets the bylaw to apply to "units" the Applicant is seeking a waiver to allow for use of the Private Driveway to serve 20 units. Nitsch Engineering understands that a traffic study is being performed by the Applicant and will be submitted as supplemental information. Upon receipt of the traffic study, Nitsch Engineering will provide additional comments related to the proposed roadway. Additionally, Nitsch Engineering recommends that the Applicant review the project with the Police and Fire Departments for issues related to public safety and site access for emergency vehicles.

Subdivision Rules and Regulations

5. The Applicant is seeking a waiver from providing a landscape plan prepared by a registered landscape architect with the Comprehensive Permit Application. Nitsch Engineering recommends that the Applicant submit a Landscape Plan for the project site that includes the proposed plantings within the drainage swales and bioretention basin and the vegetative screening around the site perimeter including between units. Nitsch Engineering recommends the use of native plant materials in the project site.

6. The Applicant is seeking a waiver from the requirements that a subdivision containing more than 11 "lots" having legal frontage on a single dead-end street is required to have no less than two (2) noncontiguous accesses with existing Town Roads. Nitsch Engineering recommends that the Applicant demonstrate how the proposed project will satisfy any life safety concerns from the Police and Fire Departments. Nitsch Engineering recommends that the Applicant explain whether the project can be re-designed to provide additional access points within the project.

7. The Applicant is seeking a waiver from the requirements that a subdivision roadway "shall be laid out such that the closure of any single road will deny access to no more than ten (10) building lots." Nitsch Engineering recommends that the Applicant demonstrate to the ZBA whether it is feasible to layout a roadway to achieve the regulation. Nitsch Engineering will provide additional comments on this waiver once the traffic study is submitted and reviewed. Nitsch Engineering also recommends that the Applicant satisfy any life safety concerns with the Carlisle Police and Fire Departments.

8. The Applicant is seeking a waiver from minimum centerline offset requirement of 125 feet. It is proposed to provide an offset of 75 feet. Nitsch Engineering recommends that the Applicant explain to the ZBA why this offset cannot be achieved. Nitsch Engineering understands that a traffic study is being prepared by the Applicant and will be submitted as supplemental information. Upon receipt of the traffic study, Nitsch Engineering will provide additional comments related to the proposed roadway and this waiver.

9. The Applicant is seeking a waiver from meeting minimum centerline radius as shown on "Exhibit E" of the Subdivision Rules and Regulations. Please note Exhibit E shows a minimum radius requirement of 125 feet. It is proposed to provide a radius of 80 feet. Nitsch Engineering recommends that the Applicant provide turning movements to confirm that fire apparatus will be able to access the proposed roadway especially during the winter when snow may be placed along the side of the roadway and may narrow the effective roadway width. Nitsch Engineering recommends that the Applicant explain to the ZBA why the 125 minimum radius is not achievable. Nitsch Engineering will provide additional comments to the ZBA on this waiver after review of the Applicant's traffic report.

10. The Applicant is seeking a waiver from meeting maximum street grade as shown on "Exhibit E" of the Subdivision Rules and Regulations. Please note Exhibit E, footnote B, shows a maximum street grade of 6% when the centerline street radius is less than 200 feet. (Also note that the project's proposed centerline street radius is 80 feet.) It is proposed to provide a maximum street grade of 8%. Nitsch Engineering recommends that the Applicant provide a street centerline grade of 6% and explain to the ZBA if there are any impacts to providing the street centerline at 6%.

11. The Applicant is seeking a waiver from meeting Sag Vertical Curve requirement as shown on "Exhibit E" of the Subdivision Rules and Regulations. Please note Exhibit E shows a Sag Vertical Curve requirement of K=24. The Applicant proposes to provide a Sag Vertical Curve of K=15. Nitsch Engineering recommends that the Applicant revise the plans to include a Vertical Sag Curve with a K of 24.and explain to the ZBA why the minimum Sag Vertical Curve cannot be achieved.

12. The Applicant is seeking a waiver from Subdivision Dead-End Street Requirement that "no Dead-End Street shall provide legal frontage for more than 10 building lots." Nitsch Engineering understands that a traffic study is being performed by the Applicant and will be submitted as supplemental information. Upon receipt of the traffic study, Nitsch Engineering will provide additional comments related to the proposed roadway. Additionally, Nitsch Engineering recommends that the Applicant review the project with the Police and Fire Departments for issues related to public safety and site access for emergency vehicles.

13. The Applicant is seeking a waiver from Subdivision Dead-end Street geometry requirements for the cul-de-sac turnaround of: 140-foot outside diameter of the paved surface and a 100-foot diameter center island. The proposed geometry is as follows: 120-foot outside diameter of the paved surface and an 80-foot diameter center island. Nitsch Engineering recommends that the Applicant provide turning movements to confirm that fire apparatus will be able to access the proposed roadway. Nitsch Engineering understands that a traffic study is being performed by the Applicant and will be submitted as supplemental information. Upon receipt of the traffic study, Nitsch Engineering will provide additional comments related to the proposed roadway. Additionally, Nitsch Engineering recommends that the Applicant review the project with the Police and Fire Departments for issues related to public safety and site access for emergency vehicles.

14. The Applicant is seeking a waiver from Subdivision Dead-end Requirement that "no more than three (3) lots can be accessed on a cul-de-sac." The project proposes four (4) units to access on the cul-de-sac. Nitsch Engineering recommends that the Applicant explain to the ZBA whether this layout will satisfy any life safety concerns including any concerns from the Police and Fire Departments.

15. The Applicant is seeking a waiver from the requirement of sloped/vertical granite curbing on subdivision roadways. The project proposes to use Cape Cod Berm on the Private Driveway. Nitsch Engineering does not recommend granting the waiver and notes that granite curbing is more durable than Cape Cod Berm.

16. The Applicant is seeking a waiver from requirement that "Infiltration of runoff from impervious surfaces (other than roof runoff) shall only be allowed where pretreatment of runoff for sediment removal of eighty percent TSS (total suspended solids) is provided." Nitsch Engineering notes that the Town of Carlisle requires 80% total suspended solids (TSS) removal prior to discharging to an infiltration practice and recommends that the Applicant comply with this requirement to maintain the longevity of the drainage system.

Carlisle Non-Zoning Wetland Bylaw

17. The Applicant is seeking a waiver from the local Conservation Commission filing fees. Nitsch Engineering recommends that the ZBA follow the recommendations presented by Conservation Commission.

Zoning Board of Appeals Rules and Regulations

18. The Applicant is seeking a waiver to allow for reduced front, side and rear setbacks (proposed: 33 feet front, 10 feet side, 10 feet rear, required: 40 feet). Also to allow for buildings closer than 100 feet from the boundary of the property, closer than 50 feet from any Open Space and closer than 30 feet from any other residential unit. The project proposes to locate a unit within 15 feet of the boundary line, 35 feet from the Open Space, and 16 feet from each other at their closest points. Nitsch Engineering recommends that the Applicant provide additional screening in the reduced setback area if the waiver is approved by the ZBA. Nitsch Engineering recommends that the Applicant provide a detailed Landscape Plan for review.

19. The Applicant is seeking a waiver to allow for twenty units on a Private Driveway as shown on the plan. Section A. Zoning Bylaw 5, limits the number of units on a common drive to six (6). The proposed project has 20 units on a Private Driveway not a Common Driveway as defined in the Carlisle Zoning Bylaw. Nitsch Engineering notes that this is a dense development for the site. Nitsch Engineering recommends that the Applicant address any life safety concerns including emergency access, snow removal, emergency access for multiple vehicles, and space for suppressing fires.

20. The Applicant is seeking a waiver from the requirement that a "Common Drive" exceeding 300 feet must have turnouts "at reasonable intervals along the driveway, but at least every 300 feet to allow vehicles to pass." The project proposes no turnouts. Nitsch Engineering recommends that the Applicant provide turnouts every 300 feet as required as it appears that there is sufficient space for the turnouts along the proposed roadway.

21. The Applicant is seeking a waiver from the requirement that dead-ends will provide at the closed end cul-de-sac turnaround... "with an outside diameter of the paved surface of 140 feet. A landscaped island having a diameter of 100 feet shall be provided in the center of the turn-around..." The project proposes an outside diameter of the paving of 120 feet and a landscape island having a diameter of 75 feet. Nitsch Engineering recommends that the Applicant provide turning movements to confirm that fire apparatus will be able to access the proposed roadway and address any life safety concerns presented by the Police and Fire Departments. Nitsch Engineering recommends that the Applicant explain to the ZBA why the project is not able to meet the Town minimum requirements for the proposed cul-de-sac.

22. The Applicant is seeking a waiver from the requirements that: "No more than three (3) dwelling units shall be accessed directly from a cul-de-sac." The project proposes four (4) units to access on the cul-de-sac. Nitsch Engineering recommends that the Applicant explain to the ZBA whether this layout will satisfy any life safety concerns including emergency access, snow removal, emergency access for multiple vehicles, and any other concerns noted from the Police and Fire Departments.

23. The Applicant is seeking a waiver from the requirements that "A development shall not have fewer than two (2) noncontiguous accesses within existing Town roads except in a development of 10 or fewer homes or units having legal frontage on a single dead end street." The proposed project will have 20 units on a Private Driveway with only one (1) access within an existing Town roadway. Nitsch Engineering recommends that the Applicant address any life safety concerns within the development based on one (1) entrance off Long Ridge Road and explain why a the project cannot have two (2) entrances. Nitsch Engineering will provide additional comments after review of the Applicant's traffic report.

Comprehensive Permit Fee Waivers

24. The Applicant is seeking a waiver to reduce total filing fee to $4,000. Nitsch Engineering defers to the ZBA on the required filing fee.

Board of Health Regulation Waivers – Supplemental Regulations for Sewage Disposal Systems

25. The Applicant is seeking a waiver from the well setback requirement of 150 feet to allow for a setback of 100 feet. Nitsch Engineering defers to the comments provided by GHC and the BOH on the minimum allowable well offset from the existing and proposed septic systems required to protect the drinking water supply.

26. The Applicant is seeking a waiver from the requirement of total gallons per day/bedroom (GPD/BR) to allow for design standard of 110 GPD/BR. Nitsch Engineering notes that design calculations have not been provided for the proposed septic systems and defers to the Board of Health on this waiver request.

27. The Applicant is seeking a waiver from the required minimum design flow standard of 165 GPD/BR to allow for a design flow standard of 110 GPD/BR. Nitsch Engineering notes that design calculations have not been provided for the proposed septic systems and defers to the BOH on this waiver request.

Town of Carlisle Water Supply Regulations

28. The Applicant is seeking a waiver from the requirement that "all private wells shall be located a minimum of 25 feet from the normal driving surface of any public roadway or a minimum of 15 from the road right-of-way, whichever is greater." The Applicant is seeking this waiver to allow the well to be within less than f5 feet from the Private Driveway. Nitsch Engineering notes that this waiver appears to refer to the existing drinking water well that would be located adjacent to the proposed driveway. Nitsch Engineering defers to the comments provided by GHC and the BOH regarding the minimum allowable well offset from pavement required to protect the drinking water supply.

SUMMARY

Based on the information submitted for the proposed project at 100 Long Ridge Road, Nitsch Engineering is unable to determine if the project is technically feasible, particularly with respect to site access and sewer, water, and drainage utility systems. Nitsch Engineering recommends that the Applicant revise the plans and calculations as outlined in the comments above.

We look forward to meeting with the ZBA at the hearing scheduled for Monday, October 27, 2014 to further discuss the project. Please contact us should you have any questions prior to the hearing.

Very truly yours,

Nitsch Engineering, Inc.

Steven Ventresca

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