CMA ENGINEERS

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January 9, 2023

Vanessa Price, Town Planner
P.O. Box 660
4 Signature Drive
Barrington, NH 03825

Re: Bending Brook Residential Development Review #1
Mallego Road
Map 239, Lots 34 & 35
Owner: Paul Guptill
CMA # 1205 Task 23

Dear Vanessa:

At the Town's request, and in accordance with Task Order 23 of our engineering services agreement, CMA Engineers reviewed materials supporting the development of a 17-unit conservation residential subdivision on Mallego Road.

BACKGROUND

The proposed residential subdivision plan was presented to the Barrington Planning Board by Beals Associates, PLLC on behalf of Paul Guptill. The project includes 17 single-family home lots and 26.7 acres of open space. Site access is via a proposed roadway from Mallego Road; however, two of the lots have their frontage on Mallego Road and are accessed via private drives from Mallego Road. Individual water supply wells and septic systems are proposed for each lot. There is a proposed cistern for fire suppression. The site is in the Village District.

There are wetlands on site, and there are no proposed wetland impacts. Stormwater treatment includes drainage swales and closed piping that discharge to sediment forebays and a bioretention pond. There are also proposed piping and drainage structures to allow for future Town tie-ins to the stormwater system.

For this evaluation, we reviewed the following materials:

1) Subdivision Application.
2) Stamped Test Pit Logs.
3) Subdivision Waiver Request – Waiver from max. road grade - Approved
4) Plan set entitled Bending Brook Residential Development, Tax Map 239, Lots 75, Mallego Road, Prepared by Beals Associates, PLLC (There is no date on the title sheet but the date on subsequent plan sheets is November 15, 2022.)
5) Stormwater Management and Sediment Erosion Control Plan, prepared by Beals Associates, PLLC, dated November 14, 2022.
6) Watershed plans prepared by Beals Associates, PLLC, dated November 2022.
7) Stormwater Management/BMP Operation & Maintenance Plan. Author unknown. Date on internal pages is November 14, 2022.

We reviewed the submitted information listed above for conformance with the Town of Barrington, NH Site Plan Review Regulations, which reference guidance documents that have been superseded by the New Hampshire Stormwater Manual including Best Management Practices (BMP), which in turn reference the NHDES Administrative Rule Chapter Env-Wq 1500 Alteration of Terrain (AoT) Regulations.

PROJECT APPLICATION:

1. The project application is incomplete. Email addresses for the owner, applicant and engineer are missing. The owner's phone number is missing.
2. The spelling of Guptil in the project name is different than the spelling of the owner's name, Guptill.
3. The application has not been signed by the owner, applicant or staff and has not been dated.
4. The Lot is listed as Lot 35, but the plans refer to Lots 34 & 35, which appears to apply. The corresponding area is for Lot 35 only, but the plans include areas for Lots 34 & 35.

ZONING ORDINANCE

This lot is in the Village District and Stratified Drift Aquifer Overlay. Due to jurisdictional wetlands on the site, the Wetlands Protection District Overlay also applies. The project is proposed as a Conservation Subdivision, so these standards apply.

Article 4. Dimensional Requirements – Village District

4.1.1 The max building height is listed as 30 feet in Note 4 on Sheet 1. The maximum building height for the Village District is 35 feet.

Article 6. Conservation Subdivision

6.2.6 On the Subdivision Plan, the 100-ft perimeter buffer is shown; however, it does not appear the two lots accessed off Mallego Road meet this requirement. Please address.

6.3.5 The applicant shall provide details of the Homeowner's Association.

SITE PLAN REVIEW REGULATIONS

Article 3 Site Plan Specifications & Documents

3.2.10 Notes

This section requires a General Notes sheet be included in the plan set and include the information required in Sections 3.2.10(1) through 3.2.10(20).

3.5 Improvement Plans

3.5.1 All existing features shall be presented as lightly shaded or gray scale but shall be legible to provide contrast to the proposed features. Please update.

3.5.4 Existing and Proposed Sanitary Sewer System

Existing and proposed on-site sewage disposal systems shall be shown on the plan. These are missing and need to be included.

3.5.5 Existing and Proposed Water System

Including pipes (type and size), dry hydrants (location approved by Fire Department), and services to each building. These are missing and need to be included.

3.5.10 Landscaping and Screening
The location, type and size, species and material type of all proposed landscaping and screening. These are missing and need to be included.

3.5.11(2) Parking and Circulation
Applicant shall show the Circulation Plan - for the interior of the lot showing provisions for both auto and pedestrian circulation. An access plan showing means of access to the site and proposed changes to any existing public streets including any traffic control devices, pedestrian and bicycle amenities, snow storage areas, directional signage, and other features necessary in conjunction with the site development plan. Please include.

Article 4 Design and Construction Standards

4.6 Sewage Disposal

4.6.1 The applicant needs to show location, size, and details of all wastewater disposal systems. Also, provide certifications from the Town and NHDES as required.

4.7 Drainage System

4.7.7(2) The maximum velocity shall be 10 feet per second or less, and we note that some of the proposed drainage is being installed with steep grades.

4.7.7(3) The minimum depth of cover for storm drain lines in the Typical Drainage Trench Detail shall be 36 inches.

4.7.2(5) The project location and watershed area shall be shown on a USGS quadrangle or as a figure in the report.

4.8 Intersection Site Distance

4.8.6(1) Height of sight distance measurements shall be 3.5' above the proposed surface. Please update Highway Access Plan.

4.8.6(2) The vertex of the sight triangle shall be set 20' from the edge of traveled way, or pavement, on the major street. Please update Highway Access Plan.

4.13 Environmental Protection Standards

4.13.4(1) The applicant has indicated that an Alteration of Terrain permit is required for this project. Please include the permit on the cover under required permits.

4.15 Additional Standards

4.15.1 The applicant should indicate where snow storage is located on the plan.

4.15.3(1) Has the applicant notified the police and fire chiefs of the project application?

SUBDIVISION REGULATIONS

Article 7. Additional Information and Studies

7.3 Stormwater Management Plan

The proposed stormwater management plan uses a combination of open swales, culverts, closed drainage and level spreaders to convey stormwater to a sediment forebay and bioretention pond.

7.3.4(3)(a) There are additional structures and piping from Mallego Road for the Town to tie into in the future to convey stormwater to the forebay and pond. The Town should have a maintenance easement for this infrastructure, and this should be shown on the plans and included in the HOA.

7.5. Traffic Impact Analysis

This section gives the Planning Board the purview to require a traffic impact analysis. Does the Board deem a traffic impact analysis necessary for this project?

Article 10. Conservation Subdivisions

10.6. Ownership and Maintenance of Common Facilities and Open Space

The applicant should provide the Town with information regarding the proposed Homeowner's Association in accordance with the Ordinances.

Article 11. General Design Standards

11.5. Fire Protection

11.5(2) The applicant is proposing the use of a cistern for fire protection. Has the Barrington Fire Department approved its proposed location and design?

Article 12. Road Design & Construction Standards

12.2.1 Road Design Standards

The proposed roadway should meet the design standards shown in Table 1 – Road Design Standards. Based on this table, the proposed roadway is considered a Major Access road, and it shall meet these requirements. Since dimensional information is not shown on the plans, it is not clear if these standards are met.

The proposed roadway length is approximately 1200 feet; however, Table 1 limits the maximum roadway length to 1000 feet. Please address.

We note that the applicant submitted a waiver requesting a waiver from the maximum grade standard of 7% to 8%. We understand this waiver was reviewed, and approved, by the Planning Board.

Additionally, roads located in the Village District should incorporate additional features such as trees, planting strips, buffer vegetation, shoulders/bike lanes, buffers/pathways, etc. in accordance with Figure 4C. These features are not proposed.

12.3.2 Driveway Design

From the information shown in the Site Plan drawings, and in the Typical Rural Driveway – Cross Section Detail, it is not clear the driveway requirements in this section are met. Please review this regulation and update the detail.

12.5 Sidewalks, Bikeways and Trails

12.5. Has the Board determined that sidewalks are required? None are shown on the plans. In accordance with 12.5.1(1)(b), the recreational land (open space), may deem sidewalk access appropriate.

12.7 Intersection Design Standards

The proposed intersection should meet the design standards shown in Table 2 – Intersection Design Standards for a Major Access Road. From the information provided, the vertical alignment landing distance, curb radius requirements are not met. It is unclear if the clear distances are met.

12.8 Road Construction Standards

12.8.1(3) On sheet 20, Typical Cross Section Detail, the base materials and pavement thicknesses shall be in accordance with Table 3 – Road Construction Standards for a Major Access Road.

12.8.2 Pavement
On sheet 20, Typical Cross Section Detail, the pavement mix design and installation shall meet the requirements of this section. Update detail accordingly.

12.8.6 Are street lights required by the Board?

12.8.9 For projects within the Village Distract, the Planning Board may require curbing, and it's at their discretion.

12.8.13 Date Requirements

12.8.13(2)(c) Slope and drainage easements should be shown. For the Mallego Road drainage system connection, the Town should have a maintenance easement shown on the plans and recorded with the Registry of Deeds.

12.8.13(2)(d) All centerline data (tangent lengths and bearings, curve data and stationing) should be shown.

12.8.13(2)(f), (g), &(h) Roadway cross sections should be provided.

12.8.13(2)(m) The ADT should be provided.

12.8.13(2)(n) Provide ADT Design Year.

12.8.13(2)(q) Provide utility locations and details.

12.8.13(2)(s) Provide a detailed engineer's estimate of construction cost.

12.8.13(2)(t) Provide a notarized letter fixing the legal responsibility for maintenance of the streets.

12.8.13(2)(v) Provide general notes for inspections.

Article 14. Utility Design Standards

All easements dedicating rights to the Town of Barrington shall be not less than 25 ft wide, have satisfactory access, and be shown on the plans.

Article 15. Subsurface Sewage System Design Standards

Each lot in the subdivision shall include a subsurface sewage disposal system. The plan set should show a 4,000 square foot leaching system reserve area and system details that comply with State/Town regulations. Update the plan set to show this information.

Article 16. Water System Design Standards

Each lot in the subdivision shall include a water supply well. The plan set should show entire well radius protection area. Update the plan set to show this information.

Article 17. Landscaping, Recreation and Open Space Standards

17.1. Landscape Objectives

17.1.2. Street trees are required for roads constructed in an open field. Trees shall be planted on both sides of the road at a spacing of 30 to 40 feet, have a caliper of at least 3 inches at a point 6 inches above the root ball, and be a hardwoods species.

17.2. Recreation and Open Space Requirements

17.2.3 Ownership of the open space should be defined, deeded, and the space made accessible to the public, if appropriate.

STORMWATER MANAGEMENT & SEDIMENT AND EROSION CONTROL PLAN:

We have the following comments that relate to the stormwater management plan:

1. The Stormwater Management Plan makes several references to ponds but only one pond is indicated on the plans.
2. The Stormwater Management Plan describes that a future tie-in by the Town is anticipated and provides structures and piping for this tie-in; however, it is not clear that the additional stormwater flows associated with the tie-in are accounted for in the stormwater model. Applicant should coordinate with Town's project engineer for additional flow information.
3. An Alteration of Terrain Permit is required for this project and should be provided to the Town.
4. The culverts should be labelled on the plans (culv 1, culv 3, etc.).
5. In the proposed stormwater modeling, culvert 1 has an invert in of 181.00 but an invert of 180.97' on the plans.
6. In the proposed stormwater modeling, there are two culvert 1s and the one from subcatchment 2B has no inverts shown on the plans (assumed to outlet into the same riprap as culvert 1).
7. In the Summary for Pond 2DP:Culv 4, the inverts do not match those shown on the plan.
8. The inverts and length for Pond 2FP:DMH1 are different in the stormwater modeling and on the plans.
9. There is no test pit log for the one test pit conducted in the area of the bioretention pond (TP-5D).
10. How was the infiltration rate for the pond (10.00 iph) derived?
11. The sizing of the western sediment forebay does not include the Town drainage from Mallego Road. Applicant should coordinate with the Town's project engineer for stormwater flow rates/volumes to update the size of the sediment forebay.
12. The sizing of the eastern sediment forebay is not included in the bioretention worksheet. Applicant should coordinate with the Town's project engineer for stormwater flow rates/volumes to size the sediment forebay.
13. On the Existing Watershed W1, it is not clear what the watershed/subcatchment limits are. Please update.
14. On the Overall Watershed Plan #2, remove the Density Calcs from the sheet.

TEST PIT EVALUATION REPORT

1. There are test pit numbers on the plans without corresponding test pit logs (TP-1A, TP-1B, TP-2A, TP-2B, etc.).
2. There is no test pit log for the test pit located in the bottom of the pond TP-5D.

PLAN SET:

1. General Comments
   a. The title of the plan set has Lots 35, while the Subdivision plans and Existing Conditions plan sheets list Lots 34 & 35.
   b. Proposed utilities shall be installed underground and shown on the plans.
   c. Landscaping and lighting plans/details/information shall be included in the drawing set.
   d. In the proposed drawings, it is difficult to read and differentiate between existing and proposed objects. See comment above on Site Plan Review Regulation Section 3.5.1.

2. Title Sheet
   a. Under "Record Owners" the Lot numbers (34 & 35) differ from the Lot number in the title (Lots 35).
   b. In the title, the Lot number is specified as Lots 35, when there is one lot listed.
   c. The names in the index do not correspond to names on the sheets. Please update.
   d. There are items in the Plan Set Legend that do not apply to this project.
3. Sheets 1 through 5 – Subdivision Plan
   a. There are items in the Legend that do not apply to the plan.
   b. The Owner of Record's address is different from that listed on the Title Sheet.
   c. Sheets shall include the Wetland Scientist's stamp.
4. Sheets 6 through 10 – Existing Conditions Plan
   a. There are items in the Legend that do not apply to the plan.
   b. The Owner of Record's address is different from that listed on the Title Sheet.
   c. Sheets shall include the Wetland Scientist's stamp.
5. Sheet 11 – Yield Site Plan
   a. The plan does not state the residential lot density yield calculations. These are located on Overall Watershed Plan W2.
6. Sheet 12 – Site Plan
   a. Sheet title should be changed to differentiate it from Sheet 13 and 14
   b. Note 6 is incomplete.
   c. Provide Rec. Trail Detail.
   d. The plan is difficult to read. See comment above on Site Plan Review Regulation Section 3.5.1.
7. Sheets 13 and 14 – Site Plan
   a. Note 6 is incomplete.
   b. Note 10 references requested waivers that have not been provided.
   c. Proposed features should be called out.
   d. The plan is difficult to read. See comment above on Site Plan Review Regulation Section 3.5.1.
   e. A matchline should be included to show its relation to Sheet 14.
8. Sheet 15 – Plan & Profile – P1
   a. Subdivision Regulations Section 12.7-Intersection Design Standards, Table 2, requires the first 100 ft of the roadway to have a 2% max slope, but the vertical curve starts at STA 0+75, so this requirement is not met. Please correct.
   b. Roadway drainage pipes should have 3 feet min. cover.
   c. The proposed culverts should be labeled to correspond to the stormwater analysis.
   d. Culverts should be labeled on the profile.
   e. Has the USPS approved the proposed location of the mail kiosk?
   f. The proposed roadway and open space parking are separated by 70 ft; however, Town standards require 150 feet of separation. The open space parking should be accessed off the proposed roadway and the parking area formalized.
   g. The proposed underdrain should be shown in the plan view.
   h. Drainage swales installed on road grades 6% and steeper should be stone-lined swales.
   i. Sheet H1 notes the existing drainage culvert under Mallego Road is to be discontinued. This note should be shown on Sheet P1. Since the pipe is being discontinued, it should be abandoned in-place and filled with flowable fill.

9. Sheet 16 - Plan & Profile – P2
   a. Roadway drainage pipes should have 3 feet min. cover.
   b. The proposed culverts should be labeled to correspond to the stormwater analysis.
   c. Culverts should be labeled on the profile.
   d. The locations of the access road and temporary sedimentation basin provided as details on the sheet are not shown on either the plan or profile.
   e. The roadway profile has a sag vertical curve with a low point at STA 8+83. How is stormwater being collected, and removed from the roadway, to prevent ponding?
10. Sheet 17- Plan & Profile P3
   a. Bioretention Basin Details.
      i. The Bioretention section contains an underdrain, which does not appear to apply to this project.
      ii. The bioretention details should be to scale and specific to the project.
      iii. What are the dimensions of the basins?
      iv. Provide Sediment Forebay and Riprap Weir Details.
   b. The pipe slope from DMH#4 to DMH#3 is over 19% and excessive for closed drainage, have any alternative configurations/layouts been considered? We note that this portion of drainage is for a future tie-in by the Town and has not been modeled. In addition, the slope of the pipe on the plan is incorrect.
   c. On the future Town drainage system, the town should be provided a drainage easement and it should be shown on the plans.
   d. DMH #5 should be a catch basin, so it can capture roadway stormwater.
11. Sheet 17- Plan & Profile P4
   a. The slope of the pipe from DMH#9 to DMH#8 is 18% and excessive for closed drainage, have any alternative configurations/layouts been considered? We note that this portion of drainage is for a future tie-in by the Town and has not been modeled.
   b. On the future Town drainage system, Town should be provided a drainage easement and it should be shown on the plans.
   c. DMH #9 should be a catch basin, so it can capture roadway stormwater.
12. Sheet 19 – Highway Access Plan – H1
   a. The stop bar should be shown on the plan (the leader does not point to anything) and should be located 20' from the edge of Mallego Road.
13. Sheet 20 – Construction Details D1
   a. Typical Drainage Trench Detail
      i. Drain pipe shall be installed with 3-ft of cover.
   b. Pipe Outlet Protection Detail
      i. In the Riprap Gradation Range tables, the required stone sizes are larger than the riprap layer thickness. Please adjust.
   c. Typical Rural Driveway Cross Section Detail
      i. See comments in Subdivision Regulation 12.3.2 above.
      ii. Town prefers a -4% grade on the driveway apron through the right-of-way, so the tip of the wing plow does not catch the driveway.
   d. Typical Cross Section Detail
      i. See comments in Subdivision Regulations 12.2.1 12.8 above.
      ii. The right-of-way should be dimensioned on the Typical Cross Section.

iii. The roadway underdrain locations should be specified by the design engineer, not the Town's consulting engineer as indicated on the Typical Cross Section. These locations should be shown on the plan.

e. Underdrain Trench Detail
   i. The detail shows the underdrain being installed with 1 ft of cover to the pipe crown. For underdrain to function properly, it needs to be deep enough to drain water from the road base plus some portion of the subgrade material to prevent water trapped under the roadway from freezing and heaving the road. Underdrain is typically installed 4 ft to 6 ft deep to accomplish this. We recommend the underdrain pipe depth be lowered.

14. Sheet 21 – Fire Cistern Details
    a. The Traffic Control Schedule and Street Sign Detail should be moved to another sheet since they do not relate to the fire cistern.
    b. Has the fire chief reviewed/approved the cistern details?

Should you have any questions, please do not hesitate to contact us.

Sincerely yours,
CMA ENGINEERS, INC.

Jodie Bray Strickland, P.E.
Senior Project Engineer

Josh Bouchard, P.E.
Project Manager

JWB:rol

Cc: Christian Smith, P.E., Beals Associate