



Town of Nottingham

P.O. Box 114, 139 Stage Road, Nottingham NH 03290 Office 603-734-4881, Fax 603-679-1013

Web: <http://www.nottingham-nh.gov> Email: plan.zone@nottingham-nh.gov

SUBDIVISION APPLICATION – PLANNING BOARD

Subdivision Type: Conventional ___ Open Space LLA ___

Concurrent- Subdivision / Site Plan Review: Y/N? N

Amendment to Approval: Y/N? N

| | | |
|---|--|---------------------------|
| Total Acreage: 102.77 | Current Use Acreage: Unknown at this time | # of Proposed Lots: 25 |
| Project Address: Smoke Street & Fort Hill Road | | |
| Zoning District(s): Residential Agricultural | | |
| Overlay District(s): Aquifer & Wetlands | Map(s): 23 | Lot (s): 11 |
| Project Narrative: (<i>Please attach a separate sheet with the project description of pre- and post-conditions</i>) | | |

DOCUMENTS TO SUBMIT: (All documents shall be provided in Adobe PDF format as well)

| |
|---|
| <p>Y-N/A</p> <p><input checked="" type="checkbox"/> () Project Narrative</p> <p><input checked="" type="checkbox"/> () Form A “Abutters List” (filed no earlier than 5 days within submittal of this application with 3 labels per address on address labels - same size as Avery 5160/8160)</p> <p><input checked="" type="checkbox"/> () Form B “Authorization to Enter Upon Subject Property”</p> <p><input checked="" type="checkbox"/> () Form C “Owner’s Authorization for Representation”</p> <p><input checked="" type="checkbox"/> () Form D “Request For Waiver(s)”</p> <p>() () Form E “Certification of Monument Installation”</p> <p><input checked="" type="checkbox"/> () Form F “Application Checklist”</p> <p><input checked="" type="checkbox"/> () Two (2) sets of 24”x36” plans</p> <p><input checked="" type="checkbox"/> () Ten (10) sets of 11”x17” plans</p> <p>Note: Applicant must submit fee at time of submission – see “Application Fee Schedule” form</p> <p>Note: All documents shall be provided in Adobe PDF format as well</p> |
|---|

INTERNAL USE ONLY:

| | | |
|--------|--|----------------|
| Case#: | Project Name: Residences at Fort Hill | Date Received: |
|--------|--|----------------|



Town of Nottingham

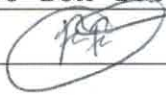
P.O. Box 114, 139 Stage Road, Nottingham NH 03290 Office 603-734-4881, Fax 603-679-1013
 Web: <http://www.nottingham-nh.gov> Email: plan.zone@nottingham-nh.gov

OWNER'S AUTHORIZATION FOR REPRESENTATION

I, the undersigned owner(s) of the property listed above, hereby verify that I have authorized:
Christopher Berry & BS&E to represent me/us and apply for the required
 approval(s) from the Planning Board in the Town of Nottingham, New Hampshire for the following:

Property Address: Smoke Street & Fort Hill Road

Property Map/Lot: Tax Map 23, Lot 11

| | | |
|-----------------|---|--------------|
| Name of Owner 1 | Frederick Fernald | |
| Address | PO Box 1805, Wolfeboro, NH 03894 | |
| Signature |  | Date 3-20-23 |

| | | |
|-----------------|--|------|
| Name of Owner 2 | | |
| Address | | |
| Signature | | Date |

| | | |
|-----------------|--|------|
| Name of Owner 3 | | |
| Address | | |
| Signature | | Date |

| | | |
|-----------------|--|------|
| Name of Owner 4 | | |
| Address | | |
| Signature | | Date |

Case#

Project Name

Date

SUBDIVISION APPLICATION – Continued

The property owner shall designate an agent for the project. This person (the applicant) shall attend pre-application conferences and public hearings, will receive the agenda, recommendations, and case reports, and will communicate all case information to other parties as required.

All contacts for this project will be made through the Applicant listed below.

| | | |
|---|------|------------------------------------|
| Owner 1: Frederick Fernald | | |
| Company: | | |
| Phone: 1-207-337-4320 | Fax: | E-mail: Owlridgebuilders@gmail.com |
| Address: PO Box 1805, Wolfeboro, NH 03894 | | |

Owner 1 Signature

Date

| | | |
|-----------------|------|---------|
| Owner 2: | | |
| Company: | | |
| Phone: | Fax: | E-mail: |
| Address: | | |

Owner 2 Signature

Date

| | | |
|-----------------|------|---------|
| Owner 3: | | |
| Company: | | |
| Phone: | Fax: | E-mail: |
| Address: | | |

Owner 3 Signature

Date

| | | |
|--|------|------------------------------------|
| Applicant (if different from owner): Joe and Dawn Fernald | | |
| Company: Owl Ridge Builders | | |
| Phone: 1-207-337-4320 | Fax: | E-mail: owlridgebuilders@gmail.com |
| Address: 104 Raymond Road, Nottingham, NH 03290 | | |

| | | |
|-------------------|------|---------|
| Developer: | | |
| Company: Same | | |
| Phone: | Fax: | E-mail: |
| Address: | | |

| | | |
|---|------|-------------------------------|
| Surveyor/Engineer: Kenneth A. Berry PE, LLS Christopher R. Berry Project Manager | | |
| Company: Berry Surveying & Engineering | | |
| Phone: 603-332-2863 | Fax: | E-mail: crberry@metrocast.net |
| Address: 335 Second Crown Point Road, Barrington, NH 03825 | | |



Town of Nottingham

P.O. Box 114, 139 Stage Road, Nottingham NH 03290 Office 603-734-4881, Fax 603-679-1013
Web: <http://www.nottingham-nh.gov> Email: plan.zone@nottingham-nh.gov

AUTHORIZATION TO ENTER UPON SUBJECT PROPERTY

The property owner(s), by the filing of this application, hereby give permission for the members of the Nottingham Planning Board and such agents or employees of the Town as the Nottingham Planning Board may authorize, to enter upon the property which is the subject of this application at any reasonable time for the purpose of such examinations, surveys, tests and/or inspections as may be appropriate to enable this application to be processed.

I/We hereby waive and release any claim or right I/we may now or hereafter possess against any of the above individuals as a result of any examinations, surveys, tests, and/or inspections conducted on my/our property in connection with this application. This authorization expires in one year from date of signature.

Property Owner 1

Signature

3-20-23

Date

Property Owner 2

Signature

Date

Property Owner 3

Signature

Date

Property Owner 4

Signature

Date

ABUTTERS LIST

* APPLICANT MUST PRINT THREE (3) ADDRESS LABELS PER ABUTTER INCLUDING THE APPLICANT, OWNER, AND PROFESSIONAL(S)*

1. OWNER 1 INFORMATION:

Printed Name: _____ Telephone: _____

Address: _____

2. APPLICANT INFORMATION:

Printed Name: _____ Telephone: _____

Address: _____

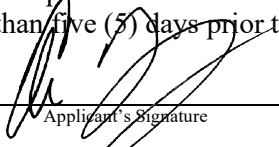
3. PROFESSIONAL(S) INFORMATION:

Printed Name: _____ Telephone: _____

Address: _____

| Abutter Information | | | | | |
|---------------------|------|------|----------|----------------------------------|----------|
| | Map: | Lot: | Sub lot: | Name: | Address: |
| 1. | | | | Separate abutters list submitted | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |
| 10. | | | | | |
| 11. | | | | | |
| 12. | | | | | |
| 13. | | | | | |

I, Christopher Berry, the undersigned, certify that to the best of my knowledge, the above is an accurate and complete abutters list and that the information was obtained from the Nottingham Assessing Office no more than five (5) days prior to the date of this application.


Applicant's Signature

3-20-23
Date

Please attach a separate sheet with additional abutters, if necessary



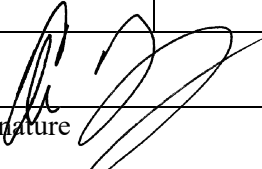
REQUEST FOR WAIVER(S)

If there is more than one waiver requested, each waiver request is to be individually listed and described, as each waiver is considered individually by the Town of Nottingham Planning Board. A petition for waiver shall be submitted in writing by the applicant with the application for review. The request shall fully state the grounds for which the waiver is requested and all facts supporting this request with reference to the applicable Nottingham Subdivision Regulations article, section and paragraph. **Each waiver granted shall be listed on the approved subdivision plan which is to be recorded at the Rockingham County Registry of Deeds.**

| <i>OWNER</i> | | |
|--|-----------------------------------|----------|
| Tax Map: 23 | Lot: 11 | Sub-Lot: |
| Property Address: Smoke Street and Fort Hill Road | | |
| Zoning District(s): Residential-Agricultural District | | |
| Name of Owner 1: Frederick Fernald | | |
| Address of Owner 1: PO Box 1805, Wolfeboro, NH 03894 | | |
| <i>APPLICANT</i> | | |
| Name (if different from owner): Joe and Dawn Fernald, Owl Ridge Builders | | |
| Phone Number: 1-207-337-4320 | Email: Owlridgebuilders@gmail.com | |

I, Christopher R. Berry, Applicants Agent, request the following waiver(s) to the Town of Nottingham Subdivision Regulations for the above application:

| REQUEST FOR WAIVER(S) | | | |
|-----------------------|---------|---------------|--------------------------------------|
| Article | Section | Title/Heading | Reason for Waiver |
| | | | Please find waiver request narrative |
| | | | |
| | | | |
| | | | |
| | | | |

Applicant Signature  Date 3-20-23

Please attach a separate sheet with additional waiver requests, if necessary

APPLICATION CHECKLIST

This checklist is intended to assist applicants in preparing a complete application for subdivision as required by the Nottingham Subdivision Regulations and must be submitted along with all application documents. Applicant shall be responsible for all requirements specified in the Nottingham Subdivision Regulations even if said requirements are omitted from this checklist.

Applicant shall be responsible for providing all the information listed in the column below entitled "Subdivision". Applicant should place an "x" in each box to indicate that this information has been provided. If an item is considered not applicable, the "N/A" box should be marked. Only certain checklist items are required for lot line adjustments, as noted by the applicable check boxes below.

| Application Requirements | Subdivision | | Office Use | |
|---|--------------------|-----|-------------------|-----|
| | Provided | N/A | Provided | N/A |
| Check the Appropriate Box or Boxes Below: <input type="checkbox"/> Lot Line Adjustment <input type="checkbox"/> Conventional or Open Space See Sections I & II See Sections I & II, III, IV, & V | Provided | N/A | Provided | N/A |
| Section I. General Requirements | | | | |
| 1. Completed application form | x | | | |
| 2. Completed abutters list | x | | | |
| 3. Payment of all required fees | x | | | |
| 4. Two (2) sets of plans 24"x36" and ten (10) sets of plans 11"x 17" submitted with all required information in accordance with the regulations and this checklist | x | | | |
| 5. Copies of any proposed easement deeds, protective covenants, or other legal documents | | | | |
| 6. Project narrative on a separate sheet | x | | | |
| 7. Any requested waiver(s) submitted with reason in writing | x | | | |
| 8. Technical reports and supporting documents (see Section IX & X of this checklist) | x | | | |
| 9. Completed application checklist | x | | | |
| Section II. General Plan Information | | | | |
| 1. Size and presentation of sheet(s) per registry requirements and the subdivision regulations | x | | | |
| 2. Title block information: | x | | | |
| a) Drawing title | x | | | |
| b) Name of subdivision | x | | | |
| c) Location of subdivision | x | | | |
| d) Tax map & lot numbers of subject parcel(s) | x | | | |
| e) Name & address of owner(s) | x | | | |
| f) Date of plan | x | | | |
| g) Scale of plan | x | | | |
| h) Sheet number | x | | | |
| i) Name, address, & telephone number of design firm | x | | | |
| j) Name & address of applicant | x | | | |
| 3. Revision block with provision for amendment dates | x | | | |
| 4. Planning Board approval block provided on each sheet to be recorded | x | | | |
| 5. Certification block (for engineer or surveyor) | x | | | |

To Be
Provided

Case#

Project Name

Date

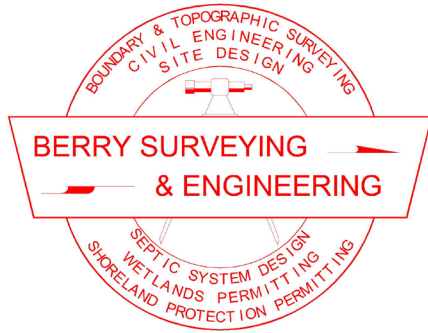
| | | | | |
|---|-------------------------------------|-------------------------------------|--|--|
| 6. Match lines (if any) | <input checked="" type="checkbox"/> | | | |
| 7. Zoning designation of subject parcel(s) including overlay districts | <input checked="" type="checkbox"/> | | | |
| 8. Minimum lot area, frontages & setback dimensions | <input checked="" type="checkbox"/> | | | |
| 9. List Federal Emergency Management Agency (FEMA) sheet(s) used to identify 100-year flood elevation, locate the elevation | <input checked="" type="checkbox"/> | | | |
| 10. Note the following: "If, during construction, it becomes apparent that deficiencies exist in the approved design drawings, the Contractor shall be required to correct the deficiencies to meet the requirements of the regulations at no expense to the Town." | <input checked="" type="checkbox"/> | | | |
| 11. Note the following: "Required erosion control measures shall be installed prior to any disturbance of the site's surface area and shall be maintained through the completion of all construction activities, If, during construction, it becomes apparent that additional erosion control measures are required to stop any erosion on the construction site due to actual site conditions, the Owner shall be required to install the necessary erosion protection at no expense to the Town." | <input checked="" type="checkbox"/> | | | |
| 12. Note identifying which plans are to be recorded and which are on file at the Town. | <input checked="" type="checkbox"/> | | | |
| 13. Note the following: "All materials and methods of construction shall conform to Town of Nottingham Subdivision Regulations and the latest edition of New Hampshire Department of Transportation's Standard Specifications for Road & Bridge Construction." | <input checked="" type="checkbox"/> | | | |
| 14. North arrow | <input checked="" type="checkbox"/> | | | |
| 15. Location & elevation(s) of 100-year flood zone per FEMA Flood Insurance Study | <input checked="" type="checkbox"/> | | | |
| 16. Plan and deed references | <input checked="" type="checkbox"/> | | | |
| 17. The following notes shall be provided: | <input checked="" type="checkbox"/> | | | |
| a) Purpose of plan | <input checked="" type="checkbox"/> | | | |
| b) Existing and proposed use | <input checked="" type="checkbox"/> | | | |
| c) Water supply source (name of provider (company) if offsite) | <input checked="" type="checkbox"/> | | | |
| d) Zoning variances/special exceptions with conditions | | <input checked="" type="checkbox"/> | | |
| e) List of required permits and permit approval numbers | <input checked="" type="checkbox"/> | | | |
| f) Vicinity sketch showing 1,000 feet surrounding the site | <input checked="" type="checkbox"/> | | | |
| g) Plan index indicating all sheets | <input checked="" type="checkbox"/> | | | |
| 18. Boundary of entire property to be subdivided | <input checked="" type="checkbox"/> | | | |
| 19. Boundary monuments | <input checked="" type="checkbox"/> | | | |
| a) Monuments found | <input checked="" type="checkbox"/> | | | |
| b) Map number and lot number, name, addresses, and zoning of all abutting land owners | <input checked="" type="checkbox"/> | | | |
| c) Monuments to be set | <input checked="" type="checkbox"/> | | | |
| 20. Existing streets: | <input checked="" type="checkbox"/> | | | |
| a) Name labeled | <input checked="" type="checkbox"/> | | | |
| b) Status noted or labeled | <input checked="" type="checkbox"/> | | | |
| c) Right-of-way dimensioned | <input checked="" type="checkbox"/> | | | |
| d) Pavement width dimensioned | <input checked="" type="checkbox"/> | | | |
| 21. Municipal boundaries (if any) | <input checked="" type="checkbox"/> | | | |
| 22. Existing easements (identified by type) | <input checked="" type="checkbox"/> | | | |
| A. Drainage easement(s) | | <input checked="" type="checkbox"/> | | |
| B. Slope easement(s) | | <input checked="" type="checkbox"/> | | |
| C. Utility easement(s) | <input checked="" type="checkbox"/> | | | |
| D. Temporary easement(s) (Such as temporary turnaround) | | <input checked="" type="checkbox"/> | | |
| E. No-cut zone(s) along streams & wetlands (as may be requested by the Conservation Commission) | <input checked="" type="checkbox"/> | | | |
| F. Vehicular & pedestrian access easement(s) | <input checked="" type="checkbox"/> | | | |
| G. Visibility easement(s) | <input checked="" type="checkbox"/> | | | |
| H. Fire pond/cistern(s) | <input checked="" type="checkbox"/> | | | |
| I. Roadway widening easement(s) | | <input checked="" type="checkbox"/> | | |

| | | | | |
|---|---|---|--|--|
| J. Walking trail easement(S) | | X | | |
| K. Other easement(s) Note type(s) | X | | | |
| 23. Designation of each proposed lot (by map & lot numbers as provided by the assessor) | X | | | |
| 24. Area of each lot (in acres & square feet): | X | | | |
| a) Existing lot(s) | X | | | |
| b) Contiguous upland(s) | X | | | |
| 25. Wetland delineation (including Prime Wetlands): | X | | | |
| a) Limits of wetlands | X | | | |
| b) Wetland delineation criteria | X | | | |
| c) Wetland Scientist certification | X | | | |
| 26. Owner(s) signature(s) | X | | | |
| 27. All required setbacks | X | | | |
| 28. Physical features | X | | | |
| a) Buildings | X | | | |
| b) Wells | X | | | |
| c) Septic systems | X | | | |
| d) Stone walls | X | | | |
| e) Paved drives | X | | | |
| f) Gravel drives | X | | | |
| 29. Location & name (if any) of any streams or water bodies | X | | | |
| 30. Location of existing overhead utility lines, poles, towers, etc. | X | | | |
| 31. Two-foot contour interval topography shown over all subject parcels | X | | | |
| 32. Map & lot numbers, name, addresses, and zoning of all abutting land owners | X | | | |
| Section III. | | | | |
| Proposed Site Conditions Plan | | | | |
| (Use Sections I General Requirements & Section II General Plan Information) | | | | |
| 1. Surveyor's stamp and signature by Licensed Land Surveyor | X | | | |
| 2. Proposed lot configuration defined by metes & bounds | X | | | |
| 3. Proposed easements defined by metes & bounds. Check each type of proposed easement applicable to this application: | X | | | |
| a) Drainage easement(s) | X | | | |
| b) Slope easement(S) | X | | | |
| c) Utility easement(s) | X | | | |
| d) Temporary easement(s) (such as temporary turnaround) | X | | | |
| e) Roadway widening easement(s) | X | | | |
| f) Walking trail easement(s) | X | | | |
| g) Other easement(s) Note type(s) | X | | | |
| 4. Area of each lot (in acres & square feet): | X | | | |
| a) Total upland(s) | X | | | |
| b) Contiguous upland(s) | X | | | |
| 5) Proposed streets: | X | | | |
| a) Name(s) labeled | X | | | |
| b) Width of right-of-way dimensioned | X | | | |
| c) Pavement width dimensioned | X | | | |
| 6. Source and datum of topographic information (USGS required) | X | | | |
| 7. Show at least one benchmark per sheet (min.) and per 5 acres (min.) of total site area | X | | | |
| 8. Soil Conservation Service (SCS) soil survey information | X | | | |
| 9. Location, type, size & inverts of the following (as applicable): | X | | | |
| a) Existing water systems | | X | | |

| | | | | |
|--|---|---|--|--|
| b) Existing drainage systems | x | | | |
| c) Existing utilities | x | | | |
| 10. 4K affluent areas with 2 test pit locations shown with suitable leaching areas | x | | | |
| 11. Location of all water wells with protective radii as required by the NH Department of Environmental Services (meeting Town and NHDES setback requirements) | x | | | |
| 12. Existing tree lines | x | | | |
| 13. Existing ledge outcroppings & other significant natural features | x | | | |
| 14. Drainage, Erosion and Sediment Control Plan(s) containing all of the requirements specified in Article 16 of the Subdivision Regulations | x | | | |
| Section IV. | | | | |
| Construction Detail Drawings | | | | |
| Note: Construction details to conform with NHDOT Standards & Specifications for Roads & Bridges, Town of Nottingham Highway Department requirements, and Article 15 of the Subdivision Regulations | x | | | |
| 1. Typical cross-section of roadway | x | | | |
| 2. Typical driveway apron detail | x | | | |
| 3. Curbing detail | x | | | |
| 4. Guardrail detail | | x | | |
| 5. Sidewalk detail | | x | | |
| 6. Traffic signs and pavement markings | x | | | |
| 7. Drainage structure(s) | x | | | |
| 8. Outlet protection riprap apron | x | | | |
| 9. Level spreader | x | | | |
| 10. Treatments swale | x | | | |
| 11. Typical section at detention basin | x | | | |
| 12. Typical pipe trench | x | | | |
| 13. Fire protection details | x | | | |
| 14. Erosion control details | x | | | |
| 15. Construction Notes | x | | | |
| a) Construction sequence | x | | | |
| b) Erosion control notes | x | | | |
| c) Landscaping notes | x | | | |
| d) Water system construction notes | | x | | |
| e) Sewage system construction notes | | x | | |
| f) Existing & finish centerline grades | x | | | |
| g) Proposed pavement – Typical cross-section | x | | | |
| h) Right-of-way and easement limits | x | | | |
| i) Embankment slopes | x | | | |
| j) Utilities | x | | | |
| Section V. | | | | |
| Supporting Documentation If Required | | | | |
| 1. Stormwater management report | x | | | |
| 2. Traffic impact analysis | x | | | |
| 3. Environmental impact assessment | | x | | |
| 4. Hydrogeological study | | x | | |
| 5. Fiscal impact. study provided | | | | |
| 6. Site Inventory and Conceptual Development Plan (from preliminary Open Space Subdivision review only) | x | | | |
| 7. Calculation of permitted housing density (for Open Space Subdivisions only as required in the Nottingham Zoning Ordinance) | x | | | |

To Be
Provided

Note: This checklist shall be completed and returned as part of the original application packet.



BERRY SURVEYING & ENGINEERING

335 Second Crown Point Road

Barrington, NH 03825

Phone: (603) 332-2863

Fax: (603) 335-4623

www.BerrySurveying.Com

Town of Nottingham
Planning & Development
Attn: Town of Nottingham Planning Board
139 Stage Road
Nottingham, NH 03290

December 11, 2023

Re: 25 Lot Subdivision & Open Space Development
Owner: Fredrick Fernald
Applicant: Owl Ridge Builders
Smoke Street
Tax Map 23, Lot 11
Project Revision Narrative

Mr. Chairman and Members of the Nottingham Planning Board,

On behalf of the land owner Fredrick Fernald and the applicant, Owl Ridge Builders, Berry Surveying & Engineering (BS&E) is submitting a 25 Lot Subdivision & Open Space Development Application for Tax Map 23, Lot 11, on Smoke Street. The project has taken into account the review comments of CMA Engineers, Inc, in addition to Planning Board Members Ed Viel and Ian MacKinnon. A response to the CMA Engineers review letter is provided in a separate document, responding to each comment. This document will contain a narrative of major project revisions and discussion of the Planning Board member comments.

Summary of Major Project Revisions:

Peekaboo Drive

- Peekaboo Drive from station 3+60-9+70 has been widened to 11' lanes with S.G.C. curbing. A roadside swale is still provided, with a waiver requested. Swale side slopes have been modified to 4:1 foreslope and 3:1 back slope. A swale capacity analysis is provided within the Drainage Binder. Catch Basins and a Drain Manhole have been added to appropriate locations on the roadway.
- Peekaboo Drive from station 1+88-3+60 contains S.G.C. on the right side of the roadway, with the right traveled lane at 11' wide and the left 10' without curbing. A Rain Guardian Turret has been added at the right side entrance sag to convey runoff to the swale without eroding the roadway shoulder.

- Lots 11-7, 11-16, 11-17 were modified for either 4K areas or to remove the lot from the Aquifer Protection Zone.
- The limit of excavation and tree lines have been revised to show 4K areas outside of the excavation and to ensure that the Drainage Analysis accounts for additional tree removal. Plans showing tree lines, test pits, 4K areas, well radii, and site grading are the Topographic Subdivision Plans, sheet #43. All 4k areas shown now contain 2 performing test pits, located no closer than 50' apart. Additional test pits performed are located on the topographic subdivision plans with test pit data located on sheets #30-32.
- The inlet sump on the left side of Peekaboo Drive (Sta 3+75) has been modified for 4:1 for slopes.
- Several sample driveways designs are now provided as sheets #82-85.
- U.G.E. and transformer locations have been updated based on the new swale lines.
- Roadway under drain has been lowered to comply with Subdivision regulations with the exception of the Peekaboo entrance, where a waiver is requested for underdrain depth.
- Driveway widths have been reduced to 12' at the roadway connections and widen as necessary closer to the home locations.

Frederick Lane

- Swale lines have been revised to provide a 4:1 foreslope and a 3:1 back slope.
- Subsurface Gravel Wetland #108 has been modified to provide a 4:1 foreslope.
- Lot 11-23 was modified to be removed from the Aquifer Protection Zone.
- Lot 11-24 was modified to contain 100' of frontage.
- U.G.E. and transformer locations have been updated based on the new swale lines.



- Roadway under drain has been lowered to comply with Subdivision regulations with the exception of the Frederick entrance, where a waiver is requested for underdrain depth.
- Driveway widths have been reduced to 12' at the roadway connections and widen as necessary closer to the home locations.
- Plans showing tree lines, test pits, 4K areas, well radii, and site grading are the Topographic Subdivision Plans, sheet #44. All 4k areas shown now contain 2 performing test pits, located no closer than 50' apart. Additional test pits performed are located on the topographic subdivision plans with test pit data located on sheets #30-32

Fort Hill Road Lots

- Sight distance plan is provided as sheet #71. This plan includes a driveway profile and culvert grading. The driveway is graded to station 2+00, where it can be seen that driveway grades of +/-1% are necessary once the entrance culvert is crossed.
- The lot line between lots 11-18 and 11-19 was modified to move the shared driveway further away from the abutting property.
- Plans showing tree lines, test pits, 4K areas, well radii, and site grading are the Topographic Subdivision Plans, sheet #45. All 4k areas shown now contain 2 performing test pits, located no closer than 50' apart. Additional test pits performed are located on the topographic subdivision plans with test pit data located on sheets #30-32.

General Revisions

- A note has been added to the Overview Subdivision Plan, sheet #36 discussing the Open Space Calculation. The area requirements and the provided areas are noted on this. Drainage areas are not included within the Designated Open Space area calculation. A total open space area of 71.61 Ac. is provided, with a Designated Open Space area of 69.19 Ac. provided for the project.
- All lots, with the exception of the two Fort Hill Road lots, have been removed from containing area within the Aquifer Protection Zone.



- The fire cistern apron has been extended from 60' long to 120' long per Fire Chief request. An Easement has been added around the cistern, shown on sheet #42.
- Waiver requests, CUP requests, and Variance requests have been added to the Project notes sheet, sheet #2 and the Overview Subdivision Plan, sheet #36.
- Phasing Plans have been updated per revised disturbance area.
- Cross sections have been revised as necessary.
- WB40 turning movements and fire truck cistern turning movements are provided as sheets #86-88.
- White spruces have been added for screening between lots in the excavation area of Peekaboo Drive.

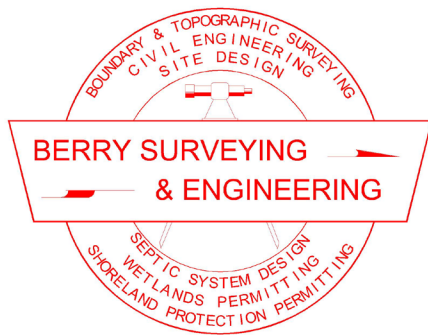
BERRY SURVEYING & ENGINEERING

Christopher R. Berry
Principal, President



BERRY SURVEYING & ENGINEERING

335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com



BERRY SURVEYING & ENGINEERING

335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

December 11, 2023

Town of Nottingham
Planning Office
Attn: Alana Kenney, Land Use Clerk
PO Box 114
Nottingham, NH 03290

Re: CMA Engineers, Inc Review Letter Response
Berry Surveying & Engineering
Owl Ridge Builders
Tax Map 23, Lot 11
Peekaboo Drive & Frederick Lane

Based on comments from CMA Engineers, Inc. dated June 9, 2023, we respectfully submit the following comments and revisions. Our comments are in **bold**. Items that are highlighted in **magenta**, the applicant respectfully asks be a condition of approval.

COMMENTS

SUBDIVISION REGULATIONS

Article 9 – Procedures for Review and Action on Applications

9.7.1 Road Layout

9.7.1.1(b) The applicant proposes two cul-de-sacs to be constructed within the subdivision, and the regulation requires cul-de-sacs to receive a waiver. Has a waiver been granted by the Board?

A waiver request for the two cul-de-sacs has been approved by the Planning Board.

Article 13 – Open Space Development

13.5 Protection and Management of Open Space

How is the Open Space being managed, protected, and maintained?

The Open Space will be managed, protected, and maintained as Common Area via the protective covenants of the Homeowners' Association.

13.6 Development Restrictions

What development restrictions are being placed on the proposed Open Space?

Per Subdivision Regulation 12.6, the common open space shall be restricted in perpetuity from further subdivision or land development by deed restriction.

Article 14 – General Design Standards

14.10 Names of Subdivisions and Streets

Have the subdivision's proposed road names been approved by the Select board?

The road names have not been approved by the Select Board at this time. The applicant requests that this is a condition of approval.

Article 15 – Road & Driveway Design & Construction Standards

15.2.1 Road Design Standards

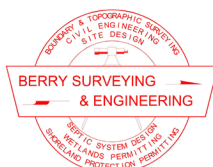
The regulation requires the pavement width to be increased by two feet in curbed areas, and the Applicant has submitted a waiver request from this requirement. As additional information to the Applicant's justification, the roadway width is also increased for plowing operations, so the wing plow does not hit the curbing. The Road Agent should be consulted on this request.

This waiver request is no longer required, as the road has been widened in areas of curbing.

15.2.1 Table 1: Road and Driveway Design and Construction Standards

The table requires a 100-ft minimum tangent length between reverse curves; however, Frederick Lane has a tangent length of 24.2 ft and Peekaboo Drive has a tangent length of 54.81 ft, both do not meet this requirement. The Applicant submitted a waiver request for the Peekaboo Drive tangent but did not include the Frederick Lane tangent.

The table requires vertical curves to have a minimum length of 80 ft; however, the first vertical curve on Peekaboo Lane has a length of 75 ft and the first vertical curve on Frederick Lane has a length of 65 ft, so both curves do not meet this requirement. The Applicant submitted



a waiver request for the Peekaboo Drive vertical curve length, and since the curve is near an intersection, vehicle speeds are lower, so granting the waiver request is reasonable. The Applicant should submit a waiver request for the Frederick Lane vertical curve. Alternatively, the Applicant could design the roadway geometry, so this requirement is met on both roads. For Frederick Lane, it appears the current proposed roadway design could accommodate some level of changes to the vertical geometry; however, on Peekaboo Drive, this would be harder to accomplish.

The table requires horizontal curves to be navigable by a WB-40 design vehicle. With the number of short tangents and short length horizontal curves, the Applicant should provide WB- 40 vehicle turning motions through the development showing the design vehicle requirement is met.

These waiver requests have been approved by the Planning Board at this time. WB-40 vehicle templates have been provided in the plan set as sheets #86 & 87.

15.3.1 Number of Access Points to Roads

15.3.1(5) Have the subdivision's proposed road names been approved by the Select board?

See response above.

15.3.2 Driveway Design

15.3.2(1) Residential driveways shall be 12 ft to 18 ft wide, but the proposed driveways scale as much as 36 ft wide. This should be corrected.

Residential driveways are now 12' at the taper of the 15' curve radii and widen as they approach the garages as necessary.

15.3.2(3) Driveways shall have 15-ft curb radii, but the plans do not show this information. The plans and/or Driveway Detail should be updated.

Dimensions have been added to the driveway cuts for the 15' curb radii as shown on the detail grading plans.



15.3.2(4) Driveways are limited to an eight percent max longitudinal grade, but the Typical Rural Driveway Cross-Section does not show this requirement. Also, in reviewing the grading plans, it does not appear that all driveways can meet this requirement. i.e. Lots 4 through 7 and Lot 25. The driveway detail should be updated and driveway grading confirmed for all proposed driveways.

The typical rural driveway cross section detail has been updated, sheet #77 of 88 (C-101 / C10). Several driveway designs are now provided at the rear of the plan set demonstrating compliance with the maximum 8% driveway grade. With the drive under style home, the majority of the driveway slopes do not exceed 5.5%.

15.3.2(7) A 12-in minimum diameter driveway culvert shall be installed under driveways at the right-of- way. The plans should be updated to show the culverts and the culverts should be appropriately sized.

Several notes on the Grading Plans indicate the need for culverts and this is shown on the typical rural driveway cross section found on sheet #77 of 88 (C-101/C10). The designer has chosen to not show driveway culverts on the Grading Plans, as the house and driveway locations shown are non-exclusive. However, several sample driveway designs are included at the rear of the plan set showing driveway culverts and cover requirements.

15.6.7 Roadside Drainage

15.6.7(2) Culverts shall be at least 12 inches in diameter, but the culvert on Frederick Lane at approximately STA 0+40 is 6 inches because it is an outlet pipe for Gravel Wetland #108. What will prevent this culvert pipe from clogging?

The outlet pipe from Gravel Wetland #108 has been revised to 12".

15.6.7(4) Ditches are not permitted at grades greater than eight percent. These sections shall be curbed and include closed drainage to collect and



transmit stormwater to the treatment devices.

A waiver request is now included for swales at a grade of greater than 8%. Peekaboo Drive has been modified to be curbed with catch basins in areas of greater than 6% for 250'. The designer has modified the road designs to provide swales at the rear of the curbing to prevent acres of residential yard from sheeting onto the roadway. Please find waiver request.

15.6.7(6) Headwalls are required at the inlet end of all culverts; however, the Applicant is proposing to use flared end sections. The Applicant submitted a waiver request from this requirement on the basis that flared end sections are standard practice and have lower maintenance costs. The Road Agent should review the waiver request.

Comment acknowledged.

15.6.7(7) Underdrain is required in cut sections and where the seasonal high-water table is within three feet of the sub-base elevation. Underdrain is shown in these sections; however, the underdrain should extend until it daylights from the cut section.

Underdrain has been revised on Peekaboo Drive and Frederick Lane. Please find Grading Plans, Sheets #50-56 of 88. A waiver has been requested for underdrain depth in one location on Peekaboo Drive and one location on Frederick Lane.

15.6.8 Curbing

15.6.8(1) Curbing is required on roadway grades that exceed eight percent, is required on both sides of the roadway, and requires basins and culverts for drainage. The Applicant has submitted a waiver from this requirement on the basis that stone lined swales provide comparable benefit at a lower maintenance cost. Approximately 500 feet (<20%) of the development's roadway grade exceeds eight percent, so it would not be a hardship for the Applicant to meet the curbing



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

requirement. However, the Road Agent should review it. We do not recommend granting the waiver because the standard is justified and reasonable, and future maintenance would be an issue with shoulders and swales washing out. If the Town does consider this waiver, we recommend the proposed curbing limits be extended. See Plan Comments for more information. Additionally, the Applicant could consider designing the roadway to eight percent, so curbing would not be required.

Peekaboo Drive has been widened with curbing added and catch basins where applicable. Waiver request is no longer required.

Article 17 – Utility Design Standards

17.1 Utility Structures

Has the location of the proposed underground utilities been coordinated with the utility companies and are necessary infrastructure easements shown?

The applicant has started coordination with the utility company. The utility company enters into easement agreements at the time service is line extensions are requested and take the form of blanked easement documents.

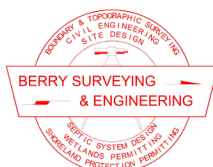
Article 18 – Subsurface Sewage System Design Standards

18.2 Test Pits

This regulation requires that each site or lot proposed for development shall have at least two test pits, separated by at least fifty (50) feet. The test pits shall establish the existence of a contiguous area of 4,000 square feet, or larger per Env-Wq 1014.01, as amended, suitable as a receiving layer for a leaching system. Both test pits and the percolation test area must be located within this area.

- a. For each lot, a building envelope should be shown to show the proposed house in relation to the leaching area and well.

Please find Topographic Subdivision Plans, Sheets #43-45



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

of 88 Please new test pit data located on Sheets #30-32 of 88.

- b. For Lot 11-20, there is only one test pit within the leaching area and the proposed leaching area is well within the property's protective well radius.

Please find Topographic Subdivision Plans, Sheets #43-45 of 88 Please new test pit data located on Sheets #30-32 of 88

- c. For Lot 11-21, there are no test pits within the leaching area, although one is just outside of the leaching area. Also, a portion of the leaching area is within the property line setback.

Please find Topographic Subdivision Plans, Sheets #43-45 of 88

Please new test pit data located on Sheets #30-32 of 88

Article 19 – Water System Design Standards

19.3 Well Radius Placement

- 19.3.2 Well radius easements covering neighboring parcels is not permitted in new subdivisions; however, for Lots 11-1 through 11-17, the well radii are shown to extend beyond their respective property lines. The Applicant has submitted a waiver request from meeting this requirement on the basis that this is an Open Space Development, and due to allowable Open Space lot dimensions, having the entire well radius within its respective lot is challenging and cannot always be met. This is a reasonable waiver request.

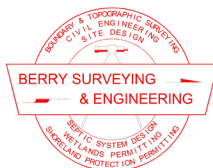
Comment acknowledged.

Article 20 – Landscaping, Recreation, and Open Space Standards

20.2 Recreation and Open Space Requirements

20.2.2 Ownership of Recreation Facilities and Open Space

- 20.2.2(1) If owned and maintained privately, said recreation or open space



BERRY SURVEYING & ENGINEERING

335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

areas may have access restricted to residents of the proposed subdivision. Provisions shall be made to ensure sufficient funding for ongoing maintenance of said facilities, payment of property taxes, and other such expenses, if deemed appropriate by the Board. If this is the intent of the open space, is this requirement met?

As is common with this style project, an HOA will be developed to manage the open space and drainage systems. A budget will be prepared at the onset of the project to ensure all of the liabilities can be funded moving forward.

20.2.2(2) If such areas are offered to and are accepted by the Town, they shall be open to the general public, and there shall be sufficient nearby on-street parking. If this is the intent of the open space, is this requirement met?

The applicant is not proposing to open the space to the public.

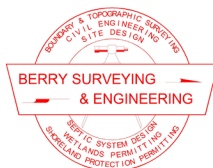
20.2.4 Conservation Natural Features

The development of all subdivisions shall, to the greatest extent possible, preserve in their natural condition important natural features of the site. Examples of such areas include, but are not limited to, watercourses, wetland areas, steep slopes, large or unique trees and woodlands, or other unique habitat areas. To construct a portion of Peekaboo Drive roadway and building lots, the applicant is proposing a 35-ft deep cut to remove a hilltop. Has the Town's Conservation Commission been consulted?

The Nottingham Conservation Commission has been consulted with approval received for the project. Multiple design review hearings were held to key out the important areas of the site to determine the best form of development with the Planning Board.

Appendix 4 – Fire Cistern Specifications

3) Confirm the required suction capacity of 1,000 gpm for three-quarters of the cistern capacity is met. If so, include a note on the



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

plan to this effect.

The fire chief has reviewed this detail and found this to be acceptable. This has been added as note #10 on detail C11, Sheet #78 of 88.

- 6) The cistern design and siting shall be stamped by a registered engineer and approved by the Fire Chief. Has this requirement been met?

The fire chief has reviewed this detail and found this to be acceptable.

- 8) The regulation requires all fill and suction piping to be Schedule 40 steel pipe and fittings. What materials are proposed?

This detail has been updated, please find C11, on Sheet #78 of 88 (C-102).

- 9) The final suction connection shall be a six-inch female swivel suction port with a cap. The filler pipe shall be properly braced and 24 inches above the vehicle pad. Please update the details accordingly.

This detail has been updated, please find C11, Sheet #78 of 88 (C-102).

- 10)The filler pipe shall be six-inch Schedule 40 pipe and fittings with a 4-inch male steel storz fitting. The filler pipe shall be properly braced and 24 inches above the vehicle pad. Please update the details accordingly.

This detail has been updated, please find C11, Sheet #78 of 88 (C-102).

- 13)Have tank buoyancy calculations been completed, and if so, are there provisions in place to prevent the tank from floating?

A note has been added to Detail C12, Sheet #78 of 88 (C-102) stating that anti-flotation calculations are to be



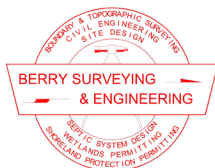
performed by the pre-caster. Additionally we would note that the cistern requires 2' of cover and provides an under drain approximately 5' down on the wall.

14) Bedding for the cistern shall consist of a minimum of fifteen inches of three-eighths pea stone, compacted. Current detail shows 12 inches of 1 1/2-inch crushed stone. An alternative to the Town requirement would be to install 15 inches minimum of 3/4-inch crushed stone, top dressed with 3/8-inch pea stone for ease of levelling the bedding pad. Please update the details accordingly.
This detail has been updated, please find C11, Sheet #78 of 88 (C-102).

16) The top and highest two feet of sides of cistern shall be insulated with vermin resistant foam insulation and two feet of backfill with a minimum of 120 pet, compacted. Foam used for this installation shall be closed cell polyurethane foam an insulation factor of R=5 per inch. No insulation is shown on the details. Please update the details accordingly.
This detail has been updated, please find C12, Sheet #78 of 88 (C-102).

19) The pitch of the shoulder and vehicle pad from the edge of the pavement to the pumper suction connection shall be three percent downgrade away from the road. Please update the details accordingly.
This detail has been updated, please find C12, Sheet #78 of 88 (C-102).

20) The shoulder and vehicle pad shall be of sufficient length to allow convenient access to the suction connection when the pumper is set at 45 degrees to the road. Provide vehicle turning motions showing this requirement is met.
The fire cistern has been lengthened and turning movement is shown as Sheet #88 of 88.



- 21)The suction fitting shall be located between 22 and 24 feet from the nearest running edge of road pavement. The current layout shows approximately 17 ft. Please update the details accordingly.
This detail has been updated, please find C12, Sheet #78 of 88 (C-102).

Appendix 5 – Road Design Cross-Section:

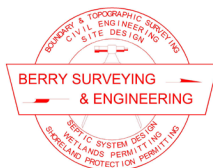
- a. Drainage swales shall be a minimum of 2-ft deep. Please update the details accordingly.
The details on Sheet #78 of 88 (C-102) have been updated.
- b. Drainage swale fore slopes shall be 4:1. Please update the details accordingly.
The details on Sheet #78 of 88 (C-102) have been updated.

REVIEW OF ZONING ORDINANCE

Article III –Overlay Districts

- A. Aquifer Protection District
- A.4 Use Regulations
- A.4.a The minimum lot size within the Aquifer Protection District for each dwelling unit if a residential use, shall be three acres. Proposed Lot 11-18 (2.934 acre) does not meet the three 3-acre minimum requirement. Potentially, proposed Lots 11-16, 11-17, 11-23, and 11-24 are partially within the APD and are all around 1 acre in size; however, in Article IV, Section S.8 Table 1, the minimum lot size in an Open Space development is 30,000 square feet. Which ordinance takes precedence? Adding the APD limits to the proposed development plans would be helpful in determining which lots are within the APD and which aren't.

The limits of the APD have been added to the plans. It has been determined by the Planning Board that the Open Space Subdivision takes precedence. Any lot that previously had



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

portions within the APD have been revised to remove the areas. The two lots on Fort Hill Road are the only two building lots within the zone.

- A.4.b Within the Aquifer Protection District, no more than ten percent (10%) of a single lot, including the portion of any new street abutting the lot, may be rendered impervious for any uses. Provide calculations for the individual lots showing this requirement is met.

Based upon lot revisions, only the two lots off of Fort Hill Road are within the APD.

Lot 11-18: 126,629 Sq. Ft. -> impervious shown on Grading Plan = 6,545 Sq. Ft. - > 5.2% impervious

Lot 11-19: 131,491 Sq. Ft. -> impervious shown on Grading Plan = 5,206 Sq. Ft. - > 4.0% impervious

- A.4.c This ordinance requires four feet of vertical separation between the bottom of the stormwater treatment practice and the seasonal high water table. It appears that Treatment Swale #1, Gravel Wetland #102, and Infiltration Pond #106 are within the APD, and they do not meet the separation requirement. Which ordinance takes precedence? Adding the APD limits to the proposed development plans would be helpful in determining which lots are within the APD and which aren't.

The Nottingham Planning Board has determined that this standard is not applicable for this development due to the fact that a CUP is not required to this section.

- A.5 Hydrogeological Study

Within the Aquifer Protection District (APD), a hydrogeologic study shall be required for a subdivision of three lots or greater, and a portion of Lot 11 is within the ADP. The Applicant proposes a 25-lot subdivision, so a hydro geologic study is required.

Based upon the revised layout, the subdivision does not have three lots contained within the APD, the Nottingham Planning Board has agreed that this study is not required.

- A.6 Design Performance Standards



- A.6.d Where the premises are partially outside of the Aquifer Protection Overlay Zone, potential pollution sources such as on-site waste disposal systems should be located outside and down gradient of the Zone to the extent feasible. Potentially, proposed Lots 11-16, 11-17, 11-23, and 11-24 are partially within the APD, so the proposed leaching area shall be relocated outside of the APD.

Based upon the revised layout, Lots 11-18 & 11-19 are the only lots within the APD. All remaining leaching areas are located outside of the APD.

- A.6.f All new or reconstructed on-lot wastewater disposal systems constructed in the Aquifer Protection District shall be designed by a Sanitary Engineer licensed in New Hampshire; however, A.7.A exempts private residences from meeting all Performance Standards. It is unclear which ordinance applies.

It would appear that private residents are exempt from this standard for the two lots contained within the APD.

Article IV – General Provisions

- S. Open Space development (amended March 9, 2010)
- S.5 Permitted Uses
- S.5.c The total number of dwelling units allowed in an Open Space Subdivision shall not exceed the number of dwelling units that would be allowed under a conventional subdivision for the zoning district in which the site is located. The Applicant submitted a yield plan for a conventional subdivision to form the basis for the Open Space Subdivision; however, it is unclear what portions are developable under the Zoning Ordinance. Yield plan calculations should be submitted.

The Yield Plan has been accepted by the Nottingham Planning Board at this time.

- S.8 Standards and Conditions
- S.8.a Single-family residential lots within an Open Space Development are required to have 100 ft of frontage; however proposed Lots 11-18, 11-19, and 11-24 do not meet this requirement. Lots 11-18 and 11-19



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

are proposed with 37.51 ft of frontage when 100 ft is required. For, the Applicant submitted a Conditional Use Request from meeting the 100-ft frontage requirement. If these two lots were to be considered as a stand-alone subdivision, it would be considered a back lot subdivision and Article IV, Section T – Back lot Subdivisions of Single-Family Homes would apply. However, these two lots are proposed under an Open Space subdivision, so is the Town willing to accept a significant reduction in the road frontage requirement. Alternatively, would a single lot having 75.02 ft of frontage be more appropriate? Additionally, the proposed frontage of Lot 11-24 is 99.98 ft, so technically, this lot should also be included in the request.

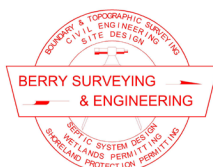
Additionally, maximum lot size is limited to 150% of the 30,000 s.f. minimum lot size (45,000 s.f.). Proposed Lots 11-3, 11-9, 11-10, 11-17, 11-24, and 11-25 exceed this amount; however, the Applicant submitted a Conditional Use Request for proposed Lots 11-18, 11-19, 11-24, and 11-25. Due to the proposed layout of Lots 24 and 25, it is reasonable for this request to be considered, and what is the Town's position of this request on Lots 18 and 19. Additionally, the Applicant should include Lots 11-3, 11-9, and 11-10 in their request.

Variances have been received for greater than 45,000 Sq. Ft. for lots 11-3, 11-9, 11-10, 11-17, 11-24, & 11-25. A variance has been received for reduced frontage on lots 11-18 & 11-19. Lot 11-24 Frontage has been revised to be 100'.

- S.8.g This ordinance requires a 100-ft buffer minimum between abutting land uses and the development. The Applicant submitted a Conditional Use Request from meeting the 100-ft buffer requirement because the locations of Frederick Lane, Gravel Wetland #108, and Infiltration Rain Garden #103 are dictated by site constraints. For the reasons stated in the request, it is reasonable for it to be considered.

The Planning Board has approved the Conditional Use Permits requested to date.

- S.9 Permissible Uses of Open Space
- S.9.a The total area of Designated Open Space shall equal at least 50 percent of the Open Space development's gross tract area. Not more than 50 percent of the Designated Open Space may consist of



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

otherwise non-buildable areas. A minimum of sixty (60) percent of such Designated Open Space shall be contiguous and should, when practical, connect with existing conservation easements, parks and other types of open space. Furthermore, any such contiguous area shall not have a horizontal dimension of less than seventy-five (75) feet. Please provide calculations to show this requirement is met.

Calculations are now shown demonstrating this compliance on the Overview Subdivision Plan.

- S.8 Protection and Management of Open Space
How is the Open Space being managed, protected, and maintained?
As noted above the HOA will manage the open space as permitted within the Subdivision Regulations.

REVIEW OF DRAINAGE ANALYSIS

Based on our review, we offer the following comments for consideration:

1. What is the impervious area per lot?
Whereas this application is a for a subdivision to create lots and not a site review, the homes shown on the project plans are schematic only. These are the best and most likely places for development but may not be the only layout chosen by the owners or builders in the future. The schematics shown were used in the stormwater / drainage analysis to estimate the flows from each site.
2. How is the proposed development likely to impact downstream surface waters and properties?
The project is designed in compliance with the standards of Env-Wq 1500 and therefore there is no anticipated impact on surface water or downstream properties.
3. How is groundwater recharge met in accordance with Env-Wq 1507.04?
Please find previously submitted NHDES best management practices work sheet within the drainage binder demonstrating this compliance as well as previously submitted infiltration feasibility analysis. Infiltration Pond #106 and Infiltration Rain Garden #103 provide the required GRV component of the requirement.



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

4. What is the percent effective impervious cover (%EIC)?

This percentage is not applicable to the drainage analysis and not required in the Nottingham Subdivision Regulations. EIC is not required to be considered within the AoT rules / regulations.

5. What is the percent undisturbed cover (%UDC)?

6. **This percentage is not applicable to the drainage analysis and not required in the Nottingham Subdivision Regulations. EIC is not required to be considered within the AoT rules / regulations.**

7. Treatment Swales

- a. On Sheets 66/67, there are callouts that specify 2-ft Tall Rip-Rap check dams spaced every 20 ft.

- i. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the overflow elevation of the downstream dam.

The check dams have been designed in this manner intentionally to provide an additional factor of safety in the swale line. The checkdam spacing provided meets this standard in the 10% section of the roadway and provides a more conservative measure in the flatter roadside swale areas.

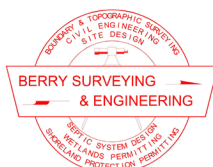
- b. Treatment Swale #1 lies within the 50-ft poorly drained wetland setback along Peekaboo Drive. Is this permitted?

This is not prohibited by Env-Wq 1500 and the applicant has received a Conditional Use Permit from the Nottingham Conservation Commission for this BMP.

8. General Comments:

- a. Stormwater treatment practices shall be constructed with 3:1 side slopes.

NHDES AoT has approved steeper slopes in the past and will ultimately review the application for compliance and consideration of their rules. The primary concern of Alteration of Terrain is the maintenance of the steeper slopes. Added into the Inspection and Maintenance manual is the requirement of using



a weed whacker on 2:1 side slopes.

- b. Stormwater treatment practices shall be able to store the 50-year storm event without overtopping and have at least one foot of freeboard. This information should be shown on the plans.

This is not a requirement of Env-Wq 1500. Information is provided within the AoT Best management Practices worksheets.

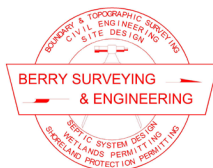
- c. The constructability of a narrow vertical core of low permeable materials that are compacted with a sheepsfoot roller is questionable. Suggest finding an alternative compaction method. **Low permeability material with a high percentage of silt and clay (Sieve size less than #200), typically utilize a sheep's foot roll to create a kneading motion, which provides the shear for compaction. This callout remains in place for the berm core. However, the callout has been modified for the placement of the low permeability liner along the subbase and forebay to be compacted with a plate compactor. This has been determined after conversation with Thomas Ballestero, PhD, PE of the UNH Stormwater center during the other applications of similar style.**

9. Sediment forebays shall be constructed with 3:1 side slopes. Please update the applicable details.

AoT has permitted slopes steeper than 3:1 in the past and will review this application, and consider the designs appropriateness See comment above.

10. Gravel Wetlands

- a. Both gravel wetlands are proposed to be constructed well within the SHWT, so the wetlands will at least be seasonally submerged as a pond. The lowest discharge orifice is set to the same elevation as the dividing berm, so when the wetland is a pond, the stormwater will not be down through the treatment layers, but it will be across the pond.



Ultimately the pond will be reviewed by NHDES AoT for comment and approval. The low permeability line prevents groundwater intrusion. The hydrostatic pressure of the ponded water forces the stormwater into the primary hydraulic inlet (cell #1) and through the system to the gooseneck orifice provided in the outlet structure. This subbase remains permanently saturated, creating the anaerobic environment for treatment, with the low permeability material preventing ground water intrusion.

- b. For both gravel wetlands, it is unclear what the groundwater elevation is, and since they are both below the SHWT, it is unclear for how much of the year the wetlands will be a pond.
See above. The subsurface gravel wetland is lined with a low perm material that allows the system to operate during all periods during the year.
- c. UNHSC Subsurface Gravel Wetland Design specifies using 24 inches of 3/4-in crushed stone as the active treatment layer. The proposed design uses 1 1/2-in washed stone. Please explain.
AoT has permitted the use of 1 1/2 -in stone in the past. This will be reviewed by AoT for compliance.
- d. Show inverts of the primary outlet for gravel wetlands, which shall be located 4 to 8-in below the elevation of the wetland soil surface.
All orifices are called out on the Gravel Wetland Plan Views and on the associated detail sheets.
- e. Gravel Wetlands constructed in hydrologic group A and B soils needs to be lined. Confirm this requirement is met.
The subsurface gravel wetlands are proposed to be lined. Please find profile views.

11. Detention Pond #105

- a. On Sheet 61, Detention Pond #105 is called out as both a detention pond and a rain garden. Please clarify.



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

**Reference to "rain garden" have been removed from the plan.
Please find P-105.**

12. Rain Garden #107

- a. The bottom of pond is at El. = 239.25 ft, and the Outlet Structure's 4-in orifice is also at El. 239.25 ft. Confirm the elevations are correct.

This has been corrected to 239.50. Please find P-107.

- b. 1-ft of separation is required from the bottom of the filter media to the SHWT. This requirement is not met.

Per Env-Wq 1508.08(g), the infiltration rate of Woodbridge is less than 0.5in/hr, prior to a factor of safety, in the C horizon, so an underdrain is required. This design is compliant with this standard.

13. For Level Spreader #109, a detail(s) should be included in the plan set.
A level spreader detail is provided as Detail E2, Sheet E-101.

14. What is the hydraulic conductivity for TP's #100 - 103. Confirm it is less than 0.03 ft/day.

Amoozometer testing will be done for the Alteration of Terrain submission where infiltration occurs in Deerfield soil if requested.

15. Env-Wq 1508.19 Stormwater Control and Conveyance Practices:
Conveyance Swales (c): "The swale shall be sized to convey the 50-year, 24-hour storm"

- a. The drainage analysis submitted states, "A conveyance swale will be designed so that there is the capacity to convey the 25-year 24-hour storm event." Please provide calculations and design for a 50-year 24-hour storm event.

The original language was taken from the NH Stormwater Manual and has been revised with 50YR for Env-Wq 1500 compliance. Please find swale capacity calculations as section 3.4 within the Drainage Narrative.

16. Env-Wq 1504.14 Calculation of the Design Infiltration Rate

- a. From the submitted Infiltration Feasibility Report, "Amoozometer testing was not conducted on site and the alternate method of



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

using the USDA / NRCS published values was employed.” The Amoozometer testing method is a direct method of calculating infiltration rates, and the USDA / NRCS values are approximations at best. Does AoT accept this alternative method?

The subsequent line in the paragraph states that reference is made to K Sat Values for New Hampshire Soils, which is the origin of the infiltration rates used. Per Env-Wq 1504.14(c), this is an accepted method for the design infiltration rate. Per previous comments regarding infiltration in Deerfield Soil, Amoozometer testing will be performed for the Alteration of Terrain submission if requested.

17. Env-Wq 1504.14 (b) states if water infiltrates into soil classified as.....Deerfield....the applicant shall use the results from the field measurement method” Ksat values shall be measured by a CPESC using one of the methods shown in Env-Wq 1504.14 (e) not using published values.

See above response.

REVIEW OF TRAFFIC ANALYSIS

The Traffic Impact Analysis was reviewed and the following comments are noted:

1. The Applicant shows stopping sight distance at the Peekaboo Drive and Frederick Lane intersections; however, intersection sight distance for a 35mph road should be confirmed.

The provided information is compliant with the required standard put forth by the Town of Nottingham, Road and Driveway Design Construction Standards whereas intersection sight distance is not required by the Town of Nottingham.

2. What is the sight distance for the shared driveway entering Fort Hill Rd?
Please find Sight Distance Plan for Fort Hill Road shared driveway as sheet #71.

3. To achieve the required sight distances at the intersections, clearing is required. Are easements needed to maintain sight distances in the future?
Easements over the Open Space are now provided to maintain sight distance in the future for Peekaboo Drive. Please find Sheet #42 of 88



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

4. The proposed roadway width does not support on-street parking, so this should be removed from the Traffic Analysis.

This portion has been removed from the traffic analysis.

PLAN SET:

The Plan Set was reviewed for general engineering practice, and the following comments are noted:

1. General Comments

- a. On Peekaboo Drive, the Applicant is proposing significant excavations (almost 40 feet) to construct the development. Boring information was not included in the application materials, but it is likely that most of this excavation will be in ledge. The Applicant has not described how this will be determined, and what construction details are necessary to address road and building construction founded on ledge. Approximately 400 feet of Peekaboo Lane and six or seven house lots are within these limits.

The applicant has provided test pitting on all sides of the excavation with no ledge found. Ledge removal is not anticipated based on the test pits conducted.

- b. What is the intent of the existing Summer Street right-of-way that runs through the property? Is it being abandoned, and if not, how does it affect the Open Space and proposed development?

There is no intent to this existing right-of-way, which is an original Range Road in Nottingham. This is an underlying right-of-way that the municipality has rights to. It has no impact of the Open Space and proposed development whereas it was un-built and the owner has ownership on both sides and therefore to the centerline.

- c. On Sheet 54, the roadway profile includes test pit data. For Test Pit #7, the ESHWT and Termination elevations appear to be incorrect. Please address and confirm the information shown in the other test pits is accurate.

Test pit #7 and others along Frederick Lane have been corrected.



d. Underdrain

- i. Underdrain limits should be extended, so it daylights from the existing ground.

Underdrain has been revised for both roadways.

- ii. As required in Regulation 15.6.7.7, underdrain is required anywhere the E.S.H.W.T is within 36 inches of the proposed road subbase elevation. With the proposed roadway section being almost 24 inches thick, the bottom of the underdrain should be set approximate 60 inches below finished grade. On profile views where underdrain is shown, the proposed depth should be updated.

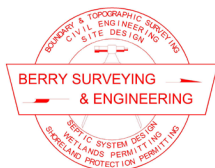
Underdrain has been revised for both roadways. A wavier has been requested in two locations for underdrain depth due to site constraints.

- iii. Sheet 78, Underdrain Details, shows the underdrain pipe being installed with 1-ft of cover. The detail should be updated to show the appropriate cover as noted above.

Underdrain has been revised for both roadways.

- e. The roadway profiles show multiple sag vertical curves. How is stormwater being collected, and removed from the roadway, to prevent ponding, particularly in the winter when there's snow curb?

Given the primarily open drainage configuration at the sag vertical curves along Peekaboo Drive and Frederick Lane, BS&E feels that the road cross slope and roadside swales provide sufficient opportunity to drain stormwater away from the roadway. At the sag vertical curve of the entrance of Peekaboo, a rain guardian turret is proposed at the right side of the roadway, with open drainage along the left side of the roadway through the sag curve.



2. Sheet 43 – Open Space Development – Topography Page 1
 - a. The start of the proposed gravel access trail for pond maintenance does not start at the edge of the proposed roadway. Please correct.
The proposed pavement was not shown originally. The pavement is shown now and the trail connects properly. Please find Sheet #43 of 88.

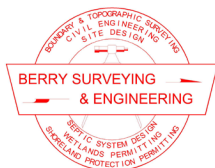
3. Sheet 49 – Overview Grading & Drainage Plan
 - a. It does not appear the site grading considers driveway and house lot grading. This could present an issue with proposed driveways meeting the Town’s driveway requirements. See comments in Regulation 15.3.2.
See response for Regulation 15.3.2.

 - b. Driveway culverts are not shown and sized, and this could become an issue with larger culverts being necessary as more stormwater is collected in roadside swales further downgradient. Roadside swales may need to be shifted further out to accommodate the larger culverts. Plans should be updated to include driveway culverts.
See response for Regulation 15.3.2.

 - c. The end of the proposed gravel access trail for pond maintenance should include a hammerhead, so equipment/vehicles can turn around.
A hammerhead has been added to the gravel access trail.

4. Sheet 50 – Plan & Profile Peekaboo Drive
 - a. The first curve is super elevated, and typically super elevation’s, and their transitions, are shown on the profile view. Please update.
The superelevation transition is now called out where necessary on Sheet #50 of 88.

 - b. The roadway profile design shows a ten percent maximum grade. Per Regulation 15.6.8, curbing (both sides) is required on roads with a grade greater than eight percent, and roadside ditches are not permitted.
Curbing has been added to both sides of Peekaboo Drive where required.



- c. To avoid runoff flowing around the downstream end of the curb and eroding the gravel shoulder/slope, we recommend the curbing be extended beyond the roadway's low point (STA 190+00) and install drainage catch basins at the low point to transmit the stormwater into the ditch line.

This curbing has been extended with a rain guardian turret placed at the low point off of the roadway to convey stormwater into the swale line.

5. Sheets 58 through 68 – Stormwater BMP's and Erosion Control
 - a. Stormwater BMP's and Erosion & Sediment Control shall be designed/constructed to meet the requirements of CHAPTER Env-Wq 1500 Alteration of Terrain, with this taking precedence over the NH Stormwater Manual and UNH Stormwater Center.

Comment acknowledged.

6. Sheets 71 through 73 – Cross-Sections
 - a. As applicable, cross-section widths should be expanded to show the entire width of the road construction to the slope limits, so impacts/intent can be fully evaluated.

The cross sections have been revised for the changes that has occurred to the roadway cross sections for Peekaboo and Frederick. Cross section widths have not been expanded in the mentioned areas because the excavation of the earth materials on Peekaboo Drive will occur before the road construction occurs.

7. Sheet 77- Construction Details
 - a. Typical Roadway Section Peekaboo Drive & Frederick Lane
 - i. The detail calls out 20-ft lanes when the lane width should be 10-ft.
 - ii. For the Peekaboo Drive typical sections, there are conflicts in the station ranges between the three details.

Typical roadway sections have been revised.




b. Fire Cistern Details


- i. The fire cistern extends beyond the Town's right-of-way on Smoke Street, so a permanent easement should be included on the easement plans.

Please find Easement around Fire Cistern on Sheet #42 of 88


Very truly yours,
BERRY SURVEYING & ENGINEERING



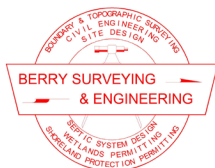
Christopher R. Berry
Principal, President



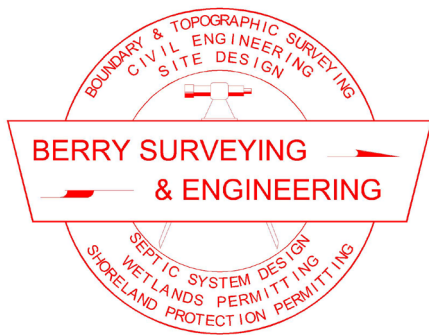
Kenneth A. Berry, PE, LLS
VP – Technical Operations



Kevin R. Poulin, PE
Project Engineer



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com



BERRY SURVEYING & ENGINEERING

335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

April 19, 2023/Revised: December 11, 2023

Town of Nottingham Planning Board
Attention: Board Chair, Ed Viel
139 Stage Road
PO Box 114
Nottingham, NH 03290

RE: Owner: Frederick Fernald
Applicant: Owl Ridge Builders
Smoke Street and Fort Hill Road
Waiver Requests

Chairperson & Members of the Nottingham Planning Board:

In accordance with the Subdivision Regulations, the following waivers are hereby requested:

1. Identification of Waiver Request: Section 15.6.7 Road Side Drainage #4

- To permit Peekaboo Drive to be built with swale lines at 10% grade that exceed 250' in length.

Explanation:

The applicant is proposing a roadway that has a consistent profile slope of 10% for more than 250' and therefore the swales are the same slope for a similar distance. The road was re-designed to provided for curbing in areas of greater than 10% however due to the geometry of the road and lots a swale line is proposed at the back side of the curb.

Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The intent of this regulation is to ensure swale stability and the lowest velocities possible within a swale line. In this case the swales are proposed to be lined with rip-rap with an average size of 0.5'. This will ensure swale stability. Swales are designed to be 3' wide and 3' deep to ensure driveway culverts can fit with adequate cover and velocities are kept to a minimum. Check dams that are 2' tall are proposed in the swale lines during construction.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Strict conformity with the regulation would result in the several acres of residential yards, driveways, and homes to sheet to the roadway into the roadway catch basins. This contributing area without roadside swales poses an icing risk. The provided Swale Capacity Analysis demonstrates that the provided swale lines are adequately sized for the subcatchment areas and are rip-rap lined for stability and velocity reduction.

2. Identification of Waiver Request: Section 15.6.7 Road Side Drainage #6

- To permit the project to be built with flared end sections instead of head walls

Explanation:

The applicant is proposing to use flared end sections on the ends of culverts. The regulations require headwalls.

Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The use of flared end sections is a common acceptable alternative to head walls. In many cases flared ends can contour to the proposed slope better which improves the inlet capacity of the pipe.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Strict conformity would require the wasted installation of headwalls which will increase the future maintenance costs.

3. Identification of Waiver Request: Section 15.6.7 Road Side Drainage #7

- To permit underdrain with less than 4' of cover as shown in the Road Design Standard Appendix at the beginning of Peekaboo Drive and Frederick Lane.

Explanation:

The applicant is proposing to underdrain at the entrance of Peekaboo Drive and Frederick Lane that has less than 4' of cover due to discharge elevation constraints.

Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The intent of the waiver is to provide adequate provisions for the draining of the roadway select materials. In the reduced underdrain cover areas at the beginning of Peekaboo Drive and

Frederick Lane, the under drain is still located beneath the roadway select material elevations. The invert of the select materials is indicated in both roadway profiles shown on the Grading Plans.

b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Strict conformity would require the road profiles to be lifted in these areas, which would result in additional environmental impact that could be avoided by reducing the required underdrain cover. This would require reapproval for additional disturbance within 25' of wetlands from the Nottingham Conservation Commission.

4. Identification of Waiver Request: Appendix Road Design Cross Section

- To permit the entrance swale on the right side of Peekaboo Drive to have 3:1 fore slopes instead of the 4:1 fore slope required.

Explanation:

The applicant is proposing a 3:1 fore slope on the right-side entrance swale for the first 225 linear feet of Peekaboo Drive to minimize environmental impact.

Waiver Justification:

a. Granting the waiver will properly carry out the purpose and intent of the regulations.

The entrance of Peekaboo Drive is superelevated to the right side to only have a swale on the right side due to elevation constraints and to minimize environmental impact. As demonstrated in the swale capacity analysis, the swale has adequate capacity for the subcatchment area. The back berm of the conveyance swale is graded from the +/-7' off the of the wetland edge, with 2:1 on the outside to minimize environmental impact.

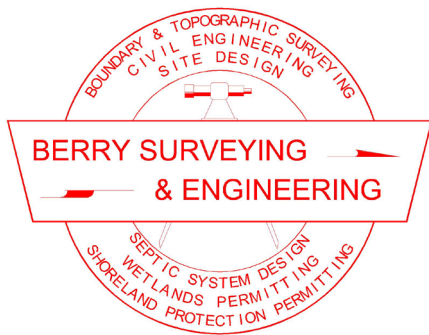
b. Strict conformity to the regulations would pose an unnecessary hardship to the applicant.

Strict conformity would require the applicant to return to the Nottingham Conservation Commission with a plan that disturbs additional area within 25' of a wetland than what was previously approved, that can be avoided by the modification of fore slopes from 4:1 to 3:1.

BERRY SURVEYING & ENGINEERING



Christopher R. Berry, SIT, Project Manager
Principal, President



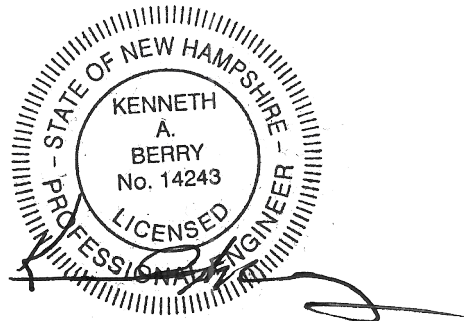
BERRY SURVEYING & ENGINEERING

335 Second Crown Point Road
Barrington, NH 03825
Phone: (603) 332-2863
Fax: (603) 335-4623
www.BerrySurveying.Com

Town of Nottingham Planning Office
Attention: Mr. Ed Viel, Chair
139 Stage Road
P.O. Box 114
Nottingham, NH 03290

February 15, 2023/Rev: December 11, 2023

RE: Traffic Impact Analysis & Distribution
Frederick Fernald
Smoke Street & Fort Hill Road
Tax Map 23, Lot 11
Nottingham, NH 03290



Mr. Chairman & Members of the Board,

Pursuant to the Town of Nottingham Subdivision Regulations, Berry Surveying & Engineering (BS&E), on behalf of Frederick Fernald, has prepared a Standard Traffic Impact Analysis for the development of twenty-five single family units on Tax Map 23, Lot 11. The three points of analysis are the intersections of Peekaboo Drive with Smoke Street, Frederick Lane with Smoke Street, and a shared driveway with Fort Hill Road.

The following conclusions were reached as a result Traffic Impact Analysis:

- A total of 15 vehicle trips (4 enter/11 exit) are predicted to occur at the AM peak hour and 19 vehicle trips (12 enter/7 exit) at the PM peak hour for Peekaboo Drive.
- A total of 6 vehicle trips (1 enter/5 exit) are predicted to occur at the AM peak hour and 7 vehicle trips (4 enter/3 exit) at the PM peak hour for Frederick Lane.
- A total of 2 vehicle trips (1 enter/1 exit) are predicted to occur at the AM peak hour and 3 vehicle trips (2 enter/1 exit) at the PM peak hour for the shared driveway off Fort Hill Road.
- A total of 23 vehicle trips (6 enter/17 exit) are predicted to occur at the AM peak hour and 29 vehicle trips (18 enter/11 exit) at the PM peak hour for the entire subdivision.
- It is recommended that the cross section of Smoke Street will be able to handle the minimal projected increase in vehicle trips and peak hour and all other hours.

Table of Contents

| | |
|---|----|
| <i>Table of Contents</i> | 2 |
| <i>List of Tables</i> | 3 |
| <i>List of Figures</i> | 4 |
| <i>Proposed Development & Introduction</i> | 5 |
| <i>Existing Conditions</i> | 5 |
| Existing Site Description | 5 |
| Smoke St, Fort Hill Rd, and Surrounding Roadway Descriptions..... | 5 |
| Existing Traffic Volumes | 7 |
| Existing Vehicle Speeds | 8 |
| <i>Proposed Trip Generation</i> | 8 |
| <i>Turning Analysis</i> | 9 |
| <i>Sight Distance and Safety Analysis</i> | 12 |
| <i>Conclusions and Recommendations</i> | 14 |
| <i>Appendix A</i> | 15 |
| Traffic Data..... | 15 |
| <i>Appendix B</i> | 18 |
| Trip Generation Derivation | 18 |
| <i>Appendix C</i> | 21 |
| Miscellaneous | 21 |



List of Tables

Table 1: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total 8

Table 2: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total 8

Table 3: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total 9

Table 4: Total Subdivision Trip Generation 9

Table 5: NH Route 125 & US Route 4 AADT Values 9

Table 6: Summary of AM build turning movements to and from Peekaboo Drive..... 10

Table 7: Summary of PM build turning movements to and from Peekaboo Drive..... 10

Table 8: Summary of AM build turning movements to and from Frederick Lane 11

Table 9: Summary of PM build turning movements to and from Frederick Lane 11

Table 10: Summary of AM build turning movements to and from shared driveway 11

Table 11: Summary of PM build turning movements to and from shared driveway 11

Table 12: Summary of total AM build turning movements..... 12

Table 13: Summary of total PM build turning movements 12



List of Figures

| | |
|--|----|
| Figure 1: Smoke Street with surrounding roadways (NHDOT) | 7 |
| Figure 2: Weekday AM & PM build projected traffic volumes and movements..... | 10 |
| Figure 3: Smoke Street Historical AADT | 15 |
| Figure 4: NH Route 125 Historical AADT | 16 |
| Figure 5: US Route 4 Historical AADT | 17 |
| Figure 6: ITE Trip Generation, 11 th Edition | 18 |
| Figure 7: ITE Trip Generation, 11 th Edition | 19 |
| Figure 8: ITE Trip Generation, 11 th Edition | 20 |
| Figure 9: Derivation of stopping sight distance requirements | 21 |



Proposed Development & Introduction

The proposal is to subdivide Tax Map 23, Lot 11 into twenty-five single family lots. Tax Map 23, Lot 11 is proposed to contain the following: Peekaboo Drive, a 1,564 LF cul-de-sac road accessed from Smoke Street for access to seventeen single family lots, Frederick Lane, a 1,177 LF cul-de-sac road accessed from Smoke Street providing access to six single family lots, and a shared driveway on Fort Hill Road, providing access to two single family lots. Peekaboo Drive and Frederick Lane are proposed to have 25-foot pavement entrance radii for emergency vehicle turning, 10-foot paved travel lanes (20 foot total paved width), and 2 foot gravel shoulders on both sides of the roadway. Off-street parking will consist of individual driveways, providing adequate parking for house lots. On street parking will not be permitted on Peekaboo Drive and Frederick Lane. The intersections of Peekaboo Drive and Smoke Street, Frederick Lane and Smoke Street, and the shared driveway with Fort Hill Road are the points of analysis. Peekaboo Drive and Frederick Lane are located 2,000 feet apart. The purpose of this analysis is to determine the maximum number of trips coming to and leaving Peekaboo Drive, Frederick Lane, and the shared driveway on Fort Hill Road during certain peak periods of the day. This information is then used in determining the impact on safety as it relates to the existing roadway infrastructure. The following components of the analysis are typical for a project of this size pursuant to the Institute of Traffic Engineers (ITE) manual.

Existing Conditions

Existing Site Description

The existing site consists of Tax Map 23, Lot 11 containing 4,477,048 Sq. Ft. (102.77 Ac.) of land. Tax Map 23, Lot 11 is a vacant lot that is primarily wooded. Tax Map 23, Lot 11 is in the Residential - Agricultural district. Little River Road is located approximately 400 feet from the northern edge of the subject parcel on Smoke Street. Cedar Way is located approximately 0.2 miles to the south of Little River Road. Located approximately 0.2 miles to the south of the subject parcel is the intersection of Smoke Street/Kelsey Road/Mill Pond Road/McCrillis Road.

Smoke St, Fort Hill Rd, and Surrounding Roadway Descriptions

Smoke Street is a two-lane paved local road. This road provides access to U.S. Route 4/Nottingham to the north and N.H. 125/Lee to the south. It has an Average Annual Daily Traffic (AADT) of approximately 845 (2021) divided between north and south, as shown in the traffic counts performed by the NHDOT. Smoke Street in the area of the project is composed of a paved twenty-two foot surface. There is no centerline delineation or fog/edge lines provided. The posted speed limit of the roadway is 25



miles per hour (MPH). The geometry of Smoke Street in the area of Peekaboo Drive is relatively flat (1% or less) to the north or south and the proposed roadway will be located near the point of tangency of a roadway curve. The geometry of Smoke Street in the area of Frederick Lane is relatively flat (1% or less) to the north and steeper to the south (3%) and is located on the apex of a curve. There are no existing sidewalks, crosswalks, or other pedestrian amenities in the area of the project.

Fort Hill Road is a two-lane paved local road. This road provides access to a series of single-family homes along Nottingham Lake. Fort Hill Road in the area of the project is composed of a paved eighteen-foot surface that changes to gravel and changes to Swan Drive at the proposed shared driveway location. There is no centerline delineation or fog/edge lines provided. The posted speed limit of the roadway is 25 miles per hour (MPH). The geometry of Fort Hill Road in the area of the shared driveway is relatively flat (1% or less) to the north and south, also is located on the apex of a curve. There are no existing sidewalks, crosswalks, or other pedestrian amenities in the area of the project.

NH Route 125 and US Route 4

NH Route 125/Calef Highway is classified as an "Other Principal Arterial" by the NHDOT at the location of the traffic count (ID #62266054). NH Route 125 provides access to Barrington/Rochester/NH Route 16 to the north and Lee/Epping/NH Route 152/NH Route 101 to the south. The 2021 AADT of NH Route 125 was found to be 18,604 vehicles. The subject parcel is accessed from NH Route 125 via West Mill Pond Road & Mill Pond Road (1.8 miles +/-) or Kelsey Road (1.7 miles +/-).

US Route 4/Old Concord Turnpike is classified as an "Other Principal Arterial" by the NHDOT at the location of the traffic count (ID #82351054). US Route 4 provides access to Nottingham/Northwood to the west and Madbury/ Durham/NH 16 to the south. The 2021 AADT of US Route was found to be 10,631 vehicles. The subject parcel is accessed from NH Route 125. The subject parcel is accessed from US Route 4 via Smoke Street (2.1 miles +/-). The following figure shows the proposed roadway/driveway locations in relation to the surrounding road network.



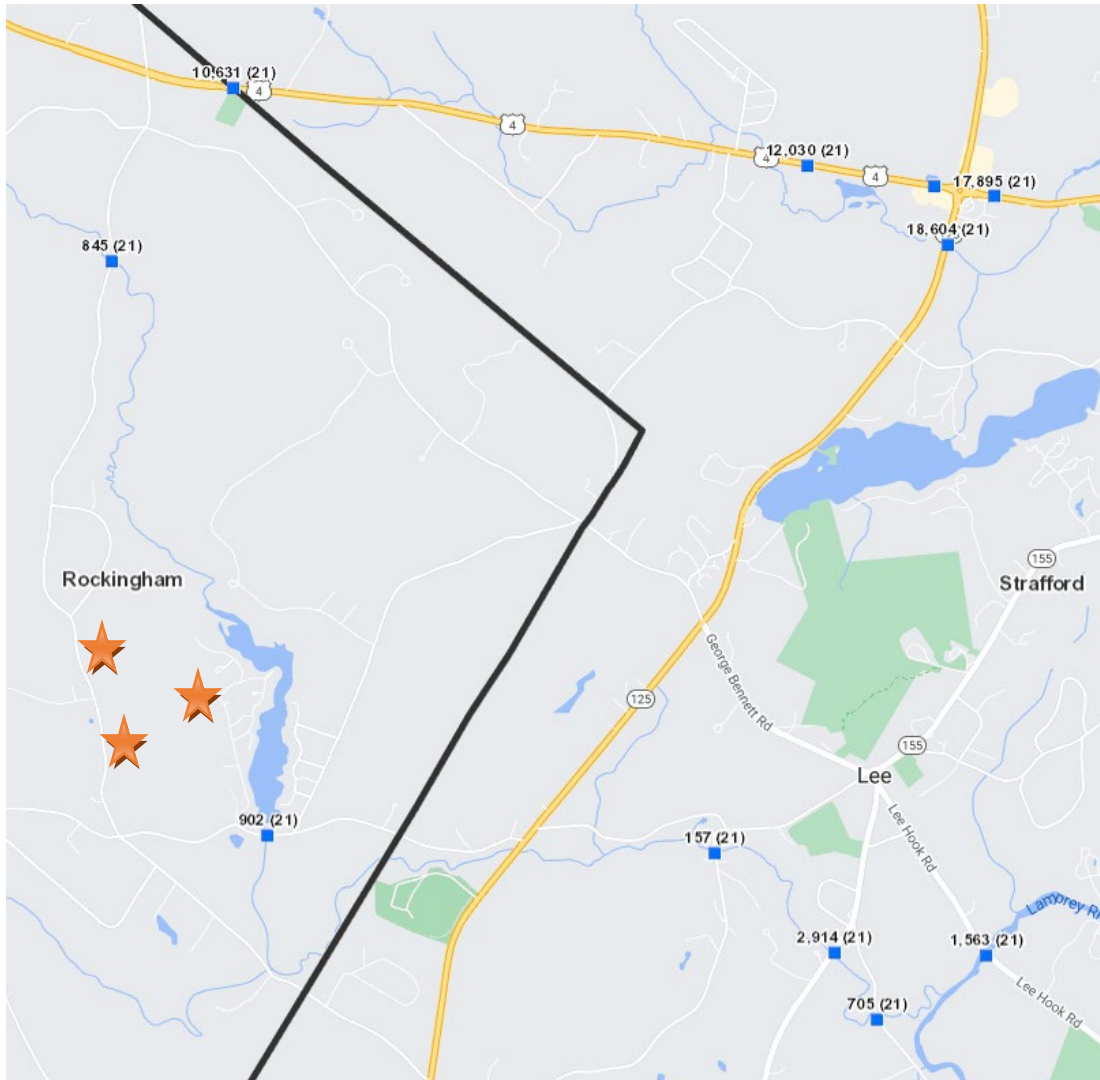


Figure 1: Smoke Street with surrounding roadways (NHDOT)

Existing Traffic Volumes

Traffic counts of Smoke Street have not been performed by BS&E. From the NHDOT MS2 Transportation Data Management System (NHDOT), the Average Annual Daily Traffic (AADT) of Smoke Street was found to be 845 vehicles. The 2021 observed AADT is similar to prior years of 2017 (830), 2018 (847), and 2019 (857). It is assumed that the reduction in AADT in 2020 (762), is due to the COVID-19 pandemic.



Existing Vehicle Speeds

As previously mentioned, the posted speed limit of Smoke Street is 25 MPH. For the purposes of the safety analysis, the 85th percentile of speed is required. This section of Smoke Street was observed by BS&E to analyze the pass by traffic, reviewing pass-by speed. Excessive speeds were observed on occasion, and most operators obeyed the posted speed limits within a deviation of 10 MPH. The 85th percentile derived by observation was estimated to be 35 MPH.

Proposed Trip Generation

The 11th Edition ITE Trip Generation Manual was used to determine the proposed volume of trips, as well as the percentage of entrance-to-exit traffic experienced at the AM & PM peak hours between 7 and 9 AM and 4 and 6 PM, and the weekday total volume. Single Family Detached Housing (210) was used in deriving the proposed trip generation for the Peekaboo Drive, Frederick Lane, and the shared driveway. Tables 2-3 provide average trip rate, total trips generated, enter to exit ratio, and the enter to exit distribution for Peekaboo Drive, Frederick Lane, and the shared driveway. Table 4 shows the combined proposed trip generation. As the use of the site will be single family residences, the primary vehicle trips generated will be two axel cars and trucks.

Single Family Detached Housing Trip Generation Peekaboo Drive:

| Time Method | Weekday Total (Page 2) Dwelling Units | | | Time Method | AM Peak Adj. Street (Page 3) Dwelling Units | | | Time Method | PM Peak Adj. Street (Page 4) Dwelling Units | | |
|------------------|--|-------------|----|------------------|--|-------------|----|------------------|--|-------------|----|
| # Units | 17 | | | # Units | 17 | | | # Units | 17 | | |
| Fitted Curve Eq. | Ln(T)=0.92Ln(X)+2.68 | | | Fitted Curve Eq. | Ln(T)=0.91Ln(X)+0.12 | | | Fitted Curve Eq. | Ln(T)=0.94Ln(X)+0.27 | | |
| Total Trips | 198 | | | Total Trips | 15 | | | Total Trips | 19 | | |
| % Enter | 50 | Total Enter | 99 | % Enter | 25 | Total Enter | 4 | % Enter | 63 | Total Enter | 12 |
| % Exit | 50 | Total Exit | 99 | % Exit | 75 | Total Exit | 11 | % Exit | 37 | Total Exit | 7 |

Table 1: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total

Single Family Detached Housing Trip Generation Frederick Lane:

| Time Method | Weekday Total (Page 2) Dwelling Units | | | Time Method | AM Peak Adj. Street (Page 3) Dwelling Units | | | Time Method | PM Peak Adj. Street (Page 4) Dwelling Units | | |
|------------------|--|-------------|----|------------------|--|-------------|---|------------------|--|-------------|---|
| # Units | 6 | | | # Units | 6 | | | # Units | 6 | | |
| Fitted Curve Eq. | Ln(T)=0.92Ln(X)+2.68 | | | Fitted Curve Eq. | Ln(T)=0.91Ln(X)+0.12 | | | Fitted Curve Eq. | Ln(T)=0.94Ln(X)+0.27 | | |
| Total Trips | 76 | | | Total Trips | 6 | | | Total Trips | 7 | | |
| % Enter | 50 | Total Enter | 38 | % Enter | 25 | Total Enter | 1 | % Enter | 63 | Total Enter | 4 |
| % Exit | 50 | Total Exit | 38 | % Exit | 75 | Total Exit | 5 | % Exit | 37 | Total Exit | 3 |

Table 2: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total



Single Family Detached Housing Trip Generation Shared Driveway:

| Time Method | Weekday Total (Page 2) Dwelling Units | | | Time Method | AM Peak Adj. Street (Page 3) Dwelling Units | | | Time Method | PM Peak Adj. Street (Page 4) Dwelling Units | | |
|------------------|--|-------------|----|------------------|--|-------------|---|------------------|--|-------------|---|
| # Units | 2 | | | # Units | 2 | | | # Units | 2 | | |
| Fitted Curve Eq. | Ln(T)=0.92Ln(X)+2.68 | | | Fitted Curve Eq. | Ln(T)=0.91Ln(X)+0.12 | | | Fitted Curve Eq. | Ln(T)=0.94Ln(X)+0.27 | | |
| Total Trips | 28 | | | Total Trips | 2 | | | Total Trips | 3 | | |
| % Enter | 50 | Total Enter | 14 | % Enter | 25 | Total Enter | 1 | % Enter | 63 | Total Enter | 2 |
| % Exit | 50 | Total Exit | 14 | % Exit | 75 | Total Exit | 1 | % Exit | 37 | Total Exit | 1 |

Table 3: (Single Family Detached) Peak hour of adjacent street traffic weekdays AM, PM, weekday total

Total Proposed Trip Generation Total Subdivision

| Time Method | Weekday Total (Page 2) Dwelling Units | | | Time Method | AM Peak Adj. Street (Page 3) Dwelling Units | | | Time Method | PM Peak Adj. Street (Page 4) Dwelling Units | | |
|-------------|--|-------------|-----|-------------|--|-------------|----|-------------|--|-------------|----|
| Total Trips | 302 | | | Total Trips | 23 | | | Total Trips | 29 | | |
| % Enter | 50 | Total Enter | 151 | % Enter | 25 | Total Enter | 6 | % Enter | 63 | Total Enter | 18 |
| % Exit | 50 | Total Exit | 151 | % Exit | 75 | Total Exit | 17 | % Exit | 37 | Total Exit | 11 |

Table 4: Total Subdivision Trip Generation

Turning Analysis

To determine the directional distribution of proposed generated trips, a ratio of the Average Annual Daily Traffic (AADT) is taken between the two receiving principal arterial roadways (NH Route 125 & US Route 4). As previously mentioned in data obtained from the NHDOT, the 2021 NH Route 125 AADT at location ID 62266054 was found to be 18,604. The 2021 US Route 4 AADT at location ID 82351054 was found to be 10,631. Using this ratio of AADT's results in the following percentage.

| | |
|--|--------------------------|
| N.H. Route 125 AADT (2021) | NHDOT Location ID |
| 18,604 | 62266054 |
| US Route 4 AADT (2021) | NHDOT Location ID |
| 10,631 | 82351054 |
| Trip Generation % to and From NH Route 125 | 63.6 |
| Trip Generation % to and From US Route 4 | 36.4 |

Table 5: NH Route 125 & US Route 4 AADT Values

The ratio of AADTs results in a trip distribution of 63.6% of generated trips (to the south or from the north) for NH Route 125 and 36.4% of generated trips (to the north or from the south) from US Route 4. Figure 2 shows the build turning movements to and from Peekaboo Drive, Frederick Lane, and a shared driveway off Fort Hill Road during AM and PM peak hours. This data is used to provide a visualization of trips project to occur to and from the project site.



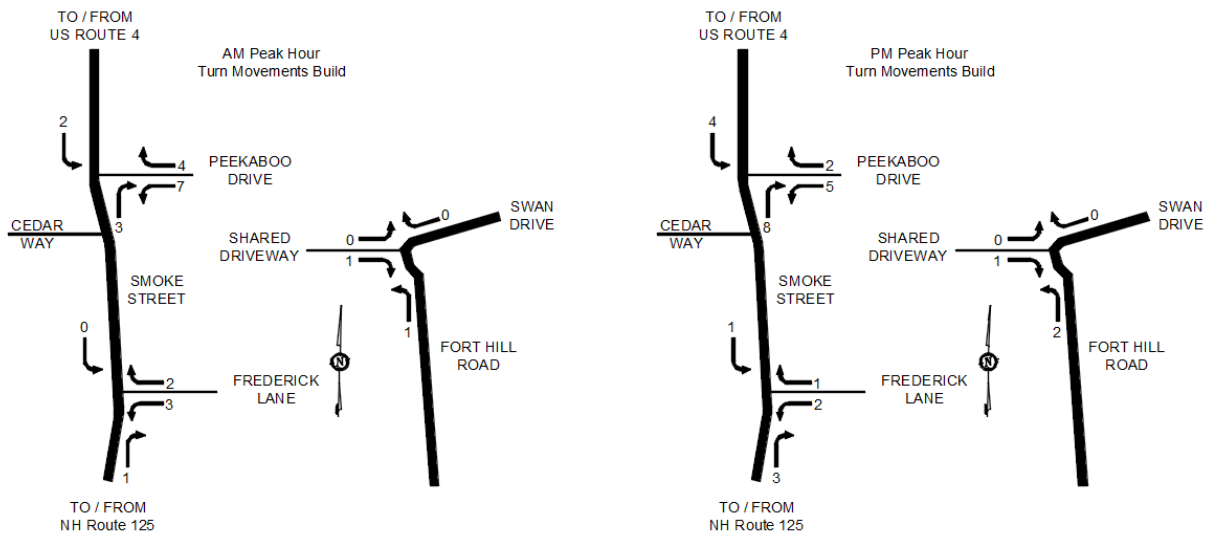


Figure 2: Weekday AM & PM build projected traffic volumes and movements

Tables 6-11 show in a tabular format the total trips that are calculated to occur to and from Peekaboo Drive, Frederick Lane, and the shared driveway are shown at AM and PM weekday peak hours in a build situation. These trips are further broken down into enter and exit to and from the site as well as percentage of left and right turns. Tables 12 and 13 show total directional breakdown of trips generated by the subdivision.

| Time | AM Peak Hour Peakaboo Drive | # Trips | Turn Type | % Distribution |
|--|-----------------------------|---------|-----------|----------------|
| Total Trips | 15 | | | |
| Trips Enter from Smoke Street Northbound | | 2.5 | Right | 17.0 |
| Trips Enter from Smoke Street Southbound | | 1.5 | Left | 9.7 |
| Trips Exit to Smoke Street Northbound | | 4.0 | Right | 26.7 |
| Trips Exit to Smoke Street Southbound | | 7.0 | Left | 46.7 |

Table 6: Summary of AM build turning movements to and from Peekaboo Drive

| Time | PM Peak Hour Peakaboo Drive | # Trips | Turn Type | % Distribution |
|--|-----------------------------|---------|-----------|----------------|
| Total Trips | 19 | | | |
| Trips Enter from Smoke Street Northbound | | 7.6 | Right | 40.2 |
| Trips Enter from Smoke Street Southbound | | 4.4 | Left | 23.0 |
| Trips Exit to Smoke Street Northbound | | 2.5 | Right | 13.4 |
| Trips Exit to Smoke Street Southbound | | 4.5 | Left | 23.4 |

Table 7: Summary of PM build turning movements to and from Peekaboo Drive



| Time | AM Peak Hour Frederick Lane | # Trips | Turn Type | % Distribution |
|--|-----------------------------|---------|-----------|----------------|
| Total Trips | 6 | | | |
| Trips Enter from Smoke Street Northbound | | 0.6 | Right | 10.6 |
| Trips Enter from Smoke Street Southbound | | 0.4 | Left | 6.1 |
| Trips Exit to Smoke Street Northbound | | 1.8 | Right | 30.3 |
| Trips Exit to Smoke Street Southbound | | 3.2 | Left | 53.0 |

Table 8: Summary of AM build turning movements to and from Frederick Lane

| Time | PM Peak Hour Frederick Lane | # Trips | Turn Type | % Distribution |
|--|-----------------------------|---------|-----------|----------------|
| Total Trips | 7 | | | |
| Trips Enter from Smoke Street Northbound | | 2.5 | Right | 36.4 |
| Trips Enter from Smoke Street Southbound | | 1.5 | Left | 20.8 |
| Trips Exit to Smoke Street Northbound | | 1.1 | Right | 15.6 |
| Trips Exit to Smoke Street Southbound | | 1.9 | Left | 27.3 |

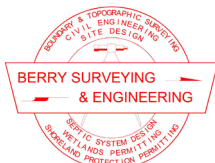
Table 9: Summary of PM build turning movements to and from Frederick Lane

| Time | AM Peak Hour Shared DW Fort Hill RD | # Trips | Turn Type | % Distribution |
|--|-------------------------------------|---------|-----------|----------------|
| Total Trips | 2 | | | |
| Trips Enter from Fort Hill Road Northbound | | 1.0 | Left | 50.0 |
| Trips Enter from Fort Hill Road Southbound | | 0.0 | Right | 0.0 |
| Trips Exit to Fort Hill Road Northbound | | 0.0 | Left | 0.0 |
| Trips Exit to Fort Hill Road Southbound | | 1.0 | Right | 50.0 |

Table 10: Summary of AM build turning movements to and from shared driveway

| Time | PM Peak Hour Shared DW Fort Hill RD | # Trips | Turn Type | % Distribution |
|--|-------------------------------------|---------|-----------|----------------|
| Total Trips | 3 | | | |
| Trips Enter from Fort Hill Road Northbound | | 2.0 | Left | 66.7 |
| Trips Enter from Fort Hill Road Southbound | | 0.0 | Right | 0.0 |
| Trips Exit to Fort Hill Road Northbound | | 0.0 | Left | 0.0 |
| Trips Exit to Fort Hill Road Southbound | | 1.0 | Right | 33.3 |

Table 11: Summary of PM build turning movements to and from shared driveway



| Time | AM Peak Hour Total Project Generation | # Trips |
|-------------|---------------------------------------|---------|
| Total Trips | 23 | |
| | Trips Enter from NH Route 125 | 3.8 |
| | Trips Enter from US Route 4 | 2.2 |
| | Trips Exit to NH Route 125 | 10.8 |
| | Trips Exit to US Route 4 | 6.2 |

Table 12: Summary of total AM build turning movements

| Time | PM Peak Hour Total Project Generation | # Trips |
|-------------|---------------------------------------|---------|
| Total Trips | 29 | |
| | Trips Enter from NH Route 125 | 11.5 |
| | Trips Enter from US Route 4 | 6.5 |
| | Trips Exit to NH Route 125 | 4.0 |
| | Trips Exit to US Route 4 | 7.0 |

Table 13: Summary of total PM build turning movements

Sight Distance and Safety Analysis

Sight distance on Peekaboo Drive and Frederick Lane to the north and south, as well as roadway alignment are the two determining factors of safety. For a conservative measurement of sight distance, an 85th percentile speed of 35 MPH will be used. For Peekaboo Drive, sight distance to the north un-obstructed for well over 250 feet (measured), while sight distance to the south is un-obstructed for well over 250 feet (measured). Using Exhibit 3-1 (Stopping Sight Distance) (Figure 9) in the Geometric Design Manual and the Nottingham Subdivision Regulations, and a 35 mph 85th percentile speed, requires a stopping sight distance of 250 feet for northbound and southbound traffic. Vegetation along Smoke Street in the vicinity of Peekaboo will need to be cleared to allow for adequate sight distance. An Easement has been added to the Open Space to allow for the clearing of vegetation for Sight Distance.

For Frederick Lane, sight distance to the north is un-obstructed for well over 250 feet (measured), while sight distance to the south is un-obstructed for well over 250 feet (measured). Using Exhibit 3-1 (Stopping Sight Distance) (Figure 9) in the Geometric Design Manual, and a 35 mph 85th percentile speed, requires a stopping sight distance of 250 feet for northbound and southbound traffic. There are no improvements required to obtain this sight distance.



For the shared driveway, sight distance to the south and east is unobstructed for over 1500 feet (measured). This meets the requirements put forth in the Nottingham requirements of 100 feet for a driveway without any additional improvements required.

With respect to general safety of Smoke Street in relation to the peak hour trip generation and AADT, it is our assessment that the cross section of Smoke Street is adequate for the proposed increase in vehicle trips during the weekday AM/PM peak hour and all other time frames.

*AASHTO Geometric Design of Highways and Streets 7th Edition (2018)





Conclusions and Recommendations

- 1.) A total of 15 vehicle trips (4 enter/11 exit) are predicted to occur at the AM peak hour and 19 vehicle trips (12 enter/7 exit) at the PM peak hour for Peekaboo Drive.
- 2.) A total of 6 vehicle trips (1 enter/5 exit) are predicted to occur at the AM peak hour and 7 vehicle trips (4 enter/3 exit) at the PM peak hour for Frederick Lane.
- 3.) A total of 2 vehicle trips (1 enter/1 exit) are predicted to occur at the AM peak hour and 3 vehicle trips (2 enter/1 exit) at the PM peak hour for the shared driveway off Fort Hill Road.
- 4.) A total of 23 vehicle trips (6 enter/17 exit) are predicted to occur at the AM peak hour and 29 vehicle trips (18 enter/11 exit) at the PM peak hour for the entire subdivision.
- 5.) It is recommended that the cross section of Smoke Street will be able to handle the minimal projected increase in vehicle trips and peak hour and all other hours.

Respectfully Submitted,

BERRY SURVEYING & ENGINEERING


Christopher R. Berry, SIT
Principal, President


Kenneth A. Berry, PE, LLS,
CPSWQ, CPESC, CESSWI
Principal, VP-Technical Operations



Kevin R. Poulin, PE
Project Engineer



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com

Appendix A

Traffic Data

[Home](#) [Login](#) [+ Locate](#) [+ Locate All](#) [Email This](#)
[Auto-Locate OFF](#)

[List View](#) [All DIRs](#)

| Record | | 1 of 1 | | Goto Record | | go | |
|---------------------|----------------------------|-------------|-----|-------------|--|----|--|
| Location ID | 82351059 | MPO ID | | | | | |
| Type | SPOT | HPMS ID | | | | | |
| On NHS | No | On HPMS | No | | | | |
| LRS ID | L3510068__ | LRS Loc Pt. | | | | | |
| SF Group | 04 | Route Type | | | | | |
| AF Group | 04 | Route | | | | | |
| GF Group | E | Active | Yes | | | | |
| Class Dist Grp | Default | Category | 3 | | | | |
| Seas Clss Grp | Default | | | | | | |
| WIM Group | Default | | | | | | |
| QC Group | Default | | | | | | |
| Funct'l Class | Local | Milepost | | | | | |
| Located On | Smoke St | | | | | | |
| Loc On Alias | SMOKE ST OVER LITTLE RIVER | | | | | | |
| More Detail ▶ | | | | | | | |
| STATION DATA | | | | | | | |

Directions: **2-WAY** ?

| AADT ? | | | | | | | | |
|--------|------------------|--------|-----|-----|-----------|---------|-----------------|--|
| Year | AADT | DHV-30 | K % | D % | PA | BC | Src | |
| 2021 | 845 ³ | | 11 | | 767 (91%) | 78 (9%) | Grown from 2020 | |
| 2020 | 762 | 87 | 11 | | 692 (91%) | 70 (9%) | | |
| 2019 | 857 ³ | | 13 | | 785 (92%) | 72 (8%) | Grown from 2018 | |
| 2018 | 847 ³ | | 13 | | 780 (92%) | 67 (8%) | Grown from 2017 | |
| 2017 | 830 | 107 | 13 | | 770 (93%) | 60 (7%) | | |

Figure 3: Smoke Street Historical AADT





Transportation Data Management System

[Home](#)
[Login](#)
[+ Locate](#)
[+ Locate All](#)
[Email This](#)

[Auto-Locate OFF](#)

[List View](#)
[All DIRs](#)

| Record | | 1 of 1 | | Goto Record | | go | |
|----------------|---|-------------|--------|-------------|--|----|--|
| Location ID | 62255054 | MPO ID | | | | | |
| Type | SPOT | HPMS ID | | | | | |
| On NHS | Yes | On HPMS | Yes | | | | |
| LRS ID | S0000125__ | LRS Loc Pt. | | | | | |
| SF Group | 04 | Route Type | | | | | |
| AF Group | 04 | Route | NH 125 | | | | |
| GF Group | E | Active | Yes | | | | |
| Class Dist Grp | Default | Category | 2 | | | | |
| Seas Class Grp | Default | | | | | | |
| WIM Group | Default | | | | | | |
| QC Group | Default | | | | | | |
| Funct'l Class | Other Principal Arterial | Milepost | | | | | |
| Located On | Calef Hwy | | | | | | |
| Loc On Alias | NH 125 (CALEF HWY) SOUTH OF US 4 TRAFFIC CIRCLE (SB-NB) (61255012-61255013) | | | | | | |
| More Detail ▶ | | | | | | | |
| STATION DATA | | | | | | | |

Directions: **2-WAY** [NB](#) [SB](#) [?](#)

| AADT ? | | | | | | | | |
|------------------------|------|---------------------|--------|-----|-----|--------------|------------|-----------------|
| | Year | AADT | DHV-30 | K % | D % | PA | BC | Src |
| | 2021 | 18,604 | 1,723 | 9 | 51 | 16,912 (91%) | 1,692 (9%) | |
| | 2020 | 17,315 ³ | | 10 | 54 | 15,756 (91%) | 1,559 (9%) | Grown from 2019 |
| | 2019 | 20,515 ³ | | 10 | 54 | 18,792 (92%) | 1,723 (8%) | Grown from 2018 |
| | 2018 | 20,272 | 2,031 | 10 | 54 | 18,690 (92%) | 1,582 (8%) | |
| | 2017 | 19,768 ³ | | | | 18,345 (93%) | 1,423 (7%) | Grown from 2016 |

Figure 4: NH Route 125 Historical AADT



BERRY SURVEYING & ENGINEERING
335 Second Crown Pt. Rd., Barrington, NH 03825
(603) 332-2863 / (603) 335-4623 FAX
www.BerrySurveying.Com



Transportation Data Management System

[Home](#) [Login](#) [+ Locate](#) [+ Locate All](#) [Email This](#)
[Auto-Locate OFF](#)

[List View](#) [All DIRs](#)

| Record 1 of 1 Goto Record <input type="text"/> go | | | |
|---|---|-------------|------|
| Location ID | 82351054 | MPO ID | |
| Type | SPOT | HPMS ID | |
| On NHS | Yes | On HPMS | No |
| LRS ID | U0000004__ | LRS Loc Pt. | |
| SF Group | 02 | Route Type | |
| AF Group | 02 | Route | US 4 |
| GF Group | E | Active | Yes |
| Class Dist Grp | Default | Category | 3 |
| Seas Class Grp | Default | | |
| WIM Group | Default | | |
| QC Group | Default | | |
| Funct'l Class | Other Principal Arterial | Milepost | |
| Located On | Old Turnpike Rd | | |
| Loc On Alias | US 4 (OLD TURNPIKE RD) AT BARRINGTON TL | | |
| More Detail | | | |
| STATION DATA | | | |

Directions: **2-WAY** **EB** **WB** ?

| AADT ? | | | | | | | | |
|--------|------|---------------------|--------|-----|-----|--------------|----------|-----------------|
| | Year | AADT | DHV-30 | K % | D % | PA | BC | Src |
| | 2021 | 10,631 ³ | | 11 | 61 | 9,664 (91%) | 967 (9%) | Grown from 2020 |
| | 2020 | 9,586 | 1,019 | 11 | 61 | 8,723 (91%) | 863 (9%) | |
| | 2019 | 11,689 ³ | | 10 | 64 | 10,708 (92%) | 981 (8%) | Grown from 2018 |
| | 2018 | 11,550 ³ | | 10 | 64 | 10,650 (92%) | 900 (8%) | Grown from 2017 |
| | 2017 | 11,324 | 1,166 | 10 | 64 | 10,509 (93%) | 815 (7%) | |

Figure 5: US Route 4 Historical AADT



Appendix B

Trip Generation Derivation

Single-Family Detached Housing (210)

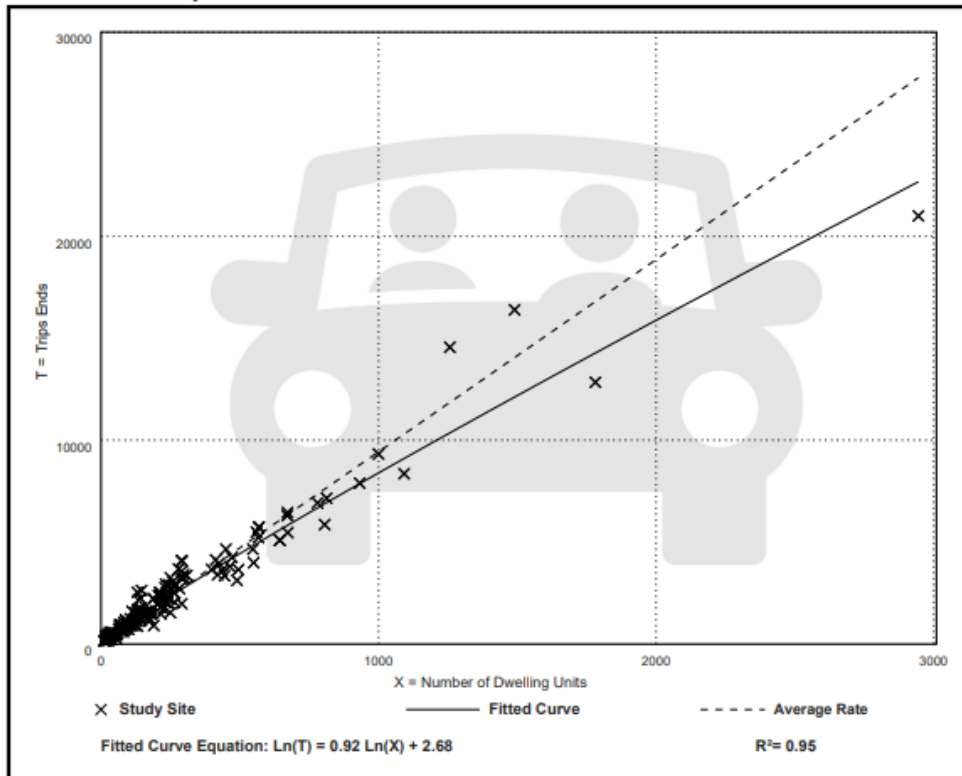
Vehicle Trip Ends vs: Dwelling Units
 On a: Weekday

Setting/Location: General Urban/Suburban
 Number of Studies: 174
 Avg. Num. of Dwelling Units: 246
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 9.43 | 4.45 - 22.61 | 2.13 |

Data Plot and Equation



General Urban/Suburban and Rural (Land Uses 000-399) 219

Figure 6: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING

335 Second Crown Pt. Rd., Barrington, NH 03825

(603) 332-2863 / (603) 335-4623 FAX

www.BerrySurveying.Com



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

Avg. Num. of Dwelling Units: 226

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 0.70 | 0.27 - 2.27 | 0.24 |

Data Plot and Equation

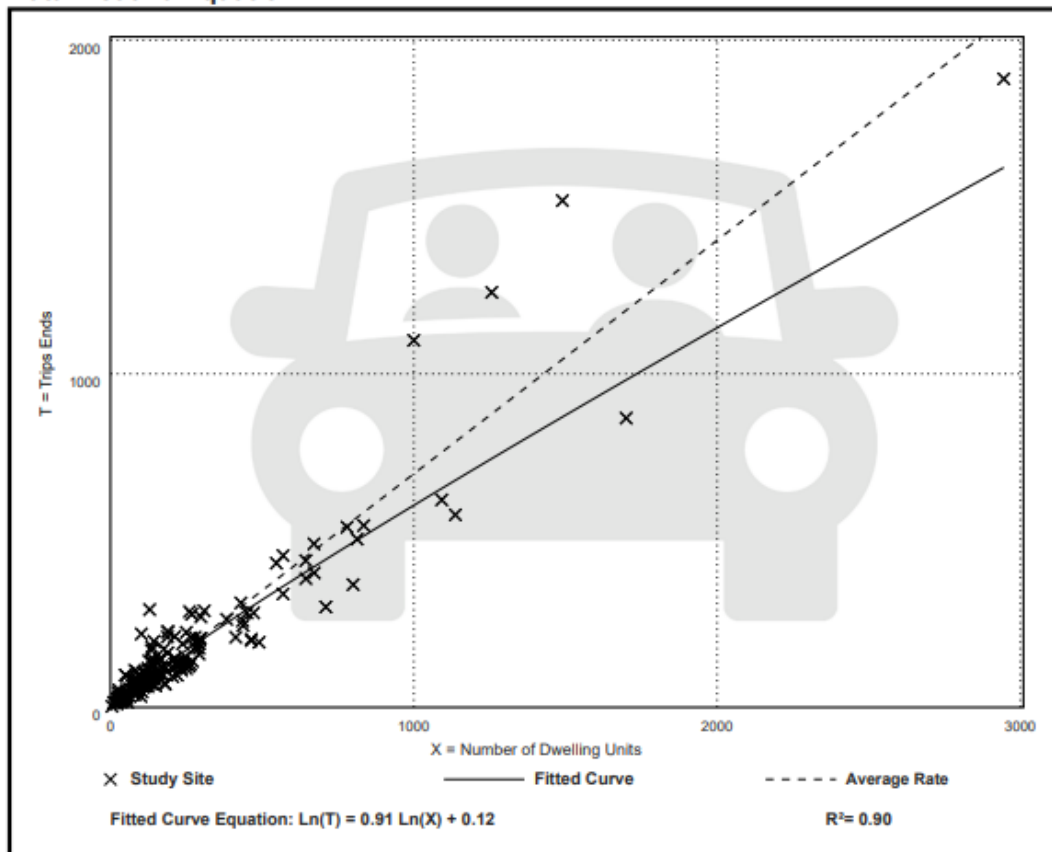


Figure 7: ITE Trip Generation, 11th Edition

BERRY SURVEYING & ENGINEERING

335 Second Crown Pt. Rd., Barrington, NH 03825

(603) 332-2863 / (603) 335-4623 FAX

www.BerrySurveying.Com



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

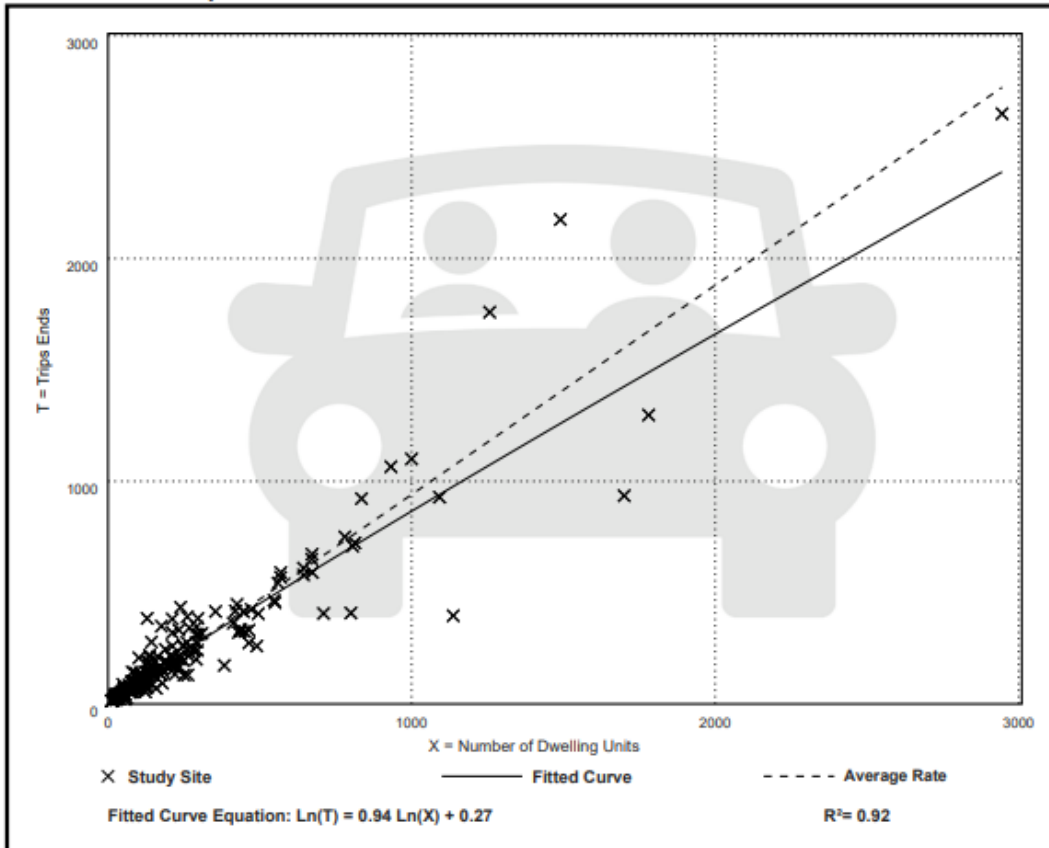
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 0.94 | 0.35 - 2.98 | 0.31 |

Data Plot and Equation



General Urban/Suburban and Rural (Land Uses 000-399) **221**

Figure 8: ITE Trip Generation, 11th Edition



BERRY SURVEYING & ENGINEERING

335 Second Crown Pt. Rd., Barrington, NH 03825

(603) 332-2863 / (603) 335-4623 FAX

www.BerrySurveying.Com

Appendix C

Miscellaneous

Table 3-1. Stopping Sight Distance on Level Roadways

| U.S. Customary | | | | | Metric | | | | |
|--------------------|------------------------------|--------------------------------|-------------------------|-------------|---------------------|-----------------------------|-------------------------------|-------------------------|------------|
| Design Speed (mph) | Brake Reaction Distance (ft) | Braking Distance on Level (ft) | Stopping Sight Distance | | Design Speed (km/h) | Brake Reaction Distance (m) | Braking Distance on Level (m) | Stopping Sight Distance | |
| | | | Calculated (ft) | Design (ft) | | | | Calculated (m) | Design (m) |
| 15 | 55.1 | 21.6 | 76.7 | 80 | 20 | 13.9 | 4.6 | 18.5 | 20 |
| 20 | 73.5 | 38.4 | 111.9 | 115 | 30 | 20.9 | 10.3 | 31.2 | 35 |
| 25 | 91.9 | 60.0 | 151.9 | 155 | 40 | 27.8 | 18.4 | 46.2 | 50 |
| 30 | 110.3 | 86.4 | 196.7 | 200 | 50 | 34.8 | 28.7 | 63.5 | 65 |
| 35 | 128.6 | 117.6 | 246.2 | 250 | 60 | 41.7 | 41.3 | 83.0 | 85 |
| 40 | 147.0 | 153.6 | 300.6 | 305 | 70 | 48.7 | 56.2 | 104.9 | 105 |
| 45 | 165.4 | 194.4 | 359.8 | 360 | 80 | 55.6 | 73.4 | 129.0 | 130 |
| 50 | 183.8 | 240.0 | 423.8 | 425 | 90 | 62.6 | 92.9 | 155.5 | 160 |
| 55 | 202.1 | 290.3 | 492.4 | 495 | 100 | 69.5 | 114.7 | 184.2 | 185 |
| 60 | 220.5 | 345.5 | 566.0 | 570 | 110 | 76.5 | 138.8 | 215.3 | 220 |
| 65 | 238.9 | 405.5 | 644.4 | 645 | 120 | 83.4 | 165.2 | 248.6 | 250 |
| 70 | 257.3 | 470.3 | 727.6 | 730 | 130 | 90.4 | 193.8 | 284.2 | 285 |
| 75 | 275.6 | 539.9 | 815.5 | 820 | 140 | 97.3 | 224.8 | 322.1 | 325 |
| 80 | 294.0 | 614.3 | 908.3 | 910 | | | | | |
| 85 | 313.5 | 693.5 | 1007.0 | 1010 | | | | | |

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 11.2 ft/s² [3.4 m/s²] used to determine calculated sight distance.

Figure 9: Derivation of stopping sight distance requirements

