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September 2, 2022

Town of Barrington Planning Board
333 Calef Highway
Barrington, NH 03825
RE: Gibb Subdivision
Waiver Request
Scruton Pond Road
Tax Map 223, Lot 9

Dear Chairman and Members of the Barrington Planning Board,

In accordance with the subdivision standards Article 8, 8.1 General Waiver Provision, the following waiver is hereby requested:

1. Identification of Waiver Request:

- Definition of Sight Distance to be consistent with common practice, NHDOT Standards and AASHTO Standards.
- Intersection Design Figure 4A.
- Definitions – Sight Distance

2. Explanation:

The requirements found in the definitions and in Figure 4A are misapplied for driveway applications and deviates from standard use and practice of the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 7th Edition (2018) (aka Green Book). The regulations also differ from the requirements of New Hampshire Department of Transportation (NHDOT) Driveway Policy.

The driveway section 12.3 points to Figure 4A which is found in the Road Design section of the regulations when describing regulations for a residential driveway. Figure 4A is of a vehicle sitting at a functional intersection with a stop bar and stop sign, implying its purpose is for a new road or similar, not a residential driveway. Figure 4A being found in the Road Design section has the same implication. The definition supplied in the subdivision regulations for stopping sight distance states that it is a calculated requirement from the driver's eye of 3.5' looking at an object 0.5' which is misapplied from the AASHTO manual for the purposes of calculating sight distance. In the 2018 revision, section 3.2.6 "Criteria for Measuring Sight Distance", stopping sight

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distance is calculated with a driver assumed to be at 3.5' looking at an object 2.0' tall along the alignment of the roadway. *The revision here is that prior, now outdated, manuals calculated this as 3.5' looking at 0.5' tall.*

The misapplication comes in the form of a clarifying paragraph entitled "Intersection Sight Distance" which states that, when calculating intersection sight distance heights, Passing Sight Distance which uses the same object height function of 3.5' looking at 3.5' should be utilized. The pages from the AASHTO Green Book are included at the end of this document on pages 3 and 4. In all applications to the NHDOT, as found in the NHDOT driveway policy, the requirement is an object traveling at 3.75' tall looking at an object of the same height, 3.75'. The page from the NHDOT policy detailing this is included at the end of this document on page 5.

3. Waiver Justification:


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

The purpose and intent of requiring sight distances to a certain standard is to ensure the safety of drivers and future occupants of the residential homes on the Town roadway system. We submit that the proposed design carries out this purpose and intent through the proper use of the NHDOT driveway policy along with the proper use of the AASHTO Green Book.

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

Strict conformity would place a burden on the applicant by way of additional excavation on a roadway that would not ordinarily be required and would change the look of the entrance and Scruton Pond Road. It is unnecessary in that the standard required by the regulations is misapplied and far exceeds the standard regulations imposed by higher government agencies on more highly traveled roads.

Respectfully Submitted,
BERRY SURVEYING & ENGINEERING



Christopher R. Berry
Project Engineer
Principal, President



Daniel O'Lone
Project Manager

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3.2.6 Criteria for Measuring Sight Distance

Sight distance is the distance along a roadway throughout which an object of specified height is continuously visible to the driver. This distance is dependent on the height of the driver's eye above the road surface, the specified object height above the road surface, and the height and lateral position of sight obstructions within the driver's line of sight.

3.2.6.1 Height of Driver's Eye

For all sight distance calculations for passenger vehicles, the height of the driver's eye is considered to be 3.50 ft [1.08 m] above the road surface. This value is based on a study (19) that found average vehicle heights have decreased to 4.25 ft [1.30 m] with a comparable decrease in average eye heights to 3.50 ft [1.08 m]. Because of various factors that appear to place practical limits on further decreases in passenger car heights and the relatively small increases in the lengths of vertical curves that would result from further changes that do occur, 3.50 ft [1.08 m] is considered to be the appropriate height of driver's eye for measuring both stopping and passing sight distances. For large trucks, the driver eye height ranges from 3.50 to 7.90 ft [1.80 to 2.40 m]. The recommended value of truck driver eye height for design is 7.60 ft [2.33 m] above the road surface.

3.2.6.2 Height of Object

For stopping sight distance and decision sight distance calculations, the height of object is considered to be 2.00 ft [0.60 m] above the road surface. For passing sight distance calculations, the height of object is considered to be 3.50 ft [1.08 m] above the road surface.

Stopping sight distance object—The selection of a 2.00-ft [0.60-m] object height was based on research indicating that objects with heights less than 2.00 ft [0.60 m] are seldom involved in crashes (19). Therefore, it is considered that an object 2.00 ft [0.60 m] in height is representative of the smallest object that involves risk to drivers. An object height of 2.00 ft [0.60 m] is representative of the height of automobile headlights and taillights. Using object heights of less than 2.00 ft [0.60 m] for stopping sight distance calculations would result in longer crest vertical curves without a documented decrease in the frequency or severity of crashes (19). Object height of less than 2.00 ft [0.60 m] could substantially increase construction costs because additional excavation would be needed to provide the longer crest vertical curves. It is also doubtful that the driver's ability to perceive situations involving risk of collisions would be increased because recommended stopping sight distances for high-speed design are beyond most drivers' capabilities to detect objects less than 2.00 ft [0.60 m] in height (19).

Passing sight distance object—An object height of 3.50 ft [1.08 m] is adopted for passing sight distance. This object height is based on a vehicle height of 4.35 ft [1.33 m], which represents the 15th percentile of vehicle heights in the current passenger car population, less an allowance of 0.85 ft [0.25 m], which represents a near-maximum value for the portion of the vehicle height that needs to be visible for another driver to recognize a vehicle as such (35). Passing sight dis-

ances calculated on this basis are also considered adequate for night conditions because headlight beams of an opposing vehicle generally can be seen from a greater distance than a vehicle can be recognized in the daytime. The choice of an object height equal to the driver eye height makes passing sight distance design reciprocal (i.e., when the driver of the passing vehicle can see the opposing vehicle, the driver of the opposing vehicle can also see the passing vehicle).

Intersection sight distance object—As in the case of passing sight distance, the object to be seen by the driver in an intersection sight distance situation is another vehicle. Therefore, design for intersection sight distance is based on the same object height used in design for passing sight distance, 3.50 ft [1.08 m].

Decision sight distance object—The 2.00-ft [0.60-m] object-height criterion adopted for stopping sight distance is also used for decision sight distance. The rationale for applying this object height for decision sight distance is the same as for stopping sight distance.

3.2.6.3 Sight Obstructions

On a tangent roadway, the obstruction that limits the driver's sight distance is the road surface at some point on a crest vertical curve. On horizontal curves, the obstruction that limits the driver's sight distance may be the road surface at some point on a crest vertical curve or it may be some physical feature outside of the traveled way, such as a longitudinal barrier, a bridge-approach fill slope, a tree, foliage, or the backslope of a cut section. Accordingly, all highway construction plans should be checked in both the vertical and horizontal plane for sight distance obstructions.

3.2.6.4 Measuring Sight Distance

The design of horizontal alignment and vertical profile using sight distance and other criteria is addressed in Sections 3.3 through 3.5, including the detailed design of horizontal and vertical curves. Sight distance should be considered in the preliminary stages of design when both the horizontal and vertical alignment are still subject to adjustment. Stopping sight distance can easily be determined where plans and profiles are drawn using computer-aided design and drafting (CADD) systems. The line-of-sight that must be clear of obstructions is a straight line for the driver's eye position to an object on the road ahead, with the height of the driver's eye and the object as given above. The vertical component of sight distance is generally measured along the centerline of the roadway. The horizontal component of sight distance is normally measured along the centerline of the inside lane on a horizontal curve. By determining the available sight distances graphically on the plans and recording them at frequent intervals, the designer can review the overall layout and produce a more balanced design by minor adjustments in the plan or profile.

Because the view of the highway ahead may change rapidly in a short travel distance, it is desirable to measure and record sight distance for both directions of travel at each station. Both horizontal and vertical sight distances should be measured and the shorter lengths recorded.

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(d) In cases where a permit is requested for a limited access highway as defined in RSA 230:44 and 45, the number of permanent points of access as specified in the acquisition documents on file at the bureau of right-of-way shall not be exceeded.

(e) In cases where an applicant is seeking a permit for a simple residential driveway, the applicant may shorten the permit process in accordance with section 5.

(f) Where entrances to state highways have been constructed after July 1, 1971 without benefit of a permit, or not constructed according to the permit issued, the entrances shall be considered non-conforming. Upon notification by the district engineer, the owner shall apply for a permit and make the necessary alterations as required by this policy.

(g) Compliance with this policy shall not relieve the applicant from the responsibility to comply with other federal, state or local ordinances, rules or regulations.

(h) In cases where a permit has been denied, the applicant may initiate the appeals process by submitting in writing a request for a hearing.

(i) Appendix I contains a list of highway districts and locations from which permit applications may be requested. Appendix II contains figures of typical driveway design standards for illustrative purposes, and standard conditions applicable to all permits. Appendix III contains a copy of the driveway statute, RSA 236:13 and Appendix IV contains a sample of a request for a wetland permit from the Department of Environmental Services.

3. Definitions.

(a) "Algebraic difference" means the absolute value of the arithmetic difference between 2 grades in a driveway. For example, a driveway with one grade of +2% and a second grade of -3% would have an algebraic difference of 5%. The algebraic difference provides a numerical guideline for establishing maximum safe grade differentials.

(b) "All-season safe sight distance" means a line that encounters no visual obstruction between 2 points, each at a height of 1.14 meters or 3 feet 9 inches above the pavement, allowing for a snow windrow and/or seasonal changes. The line represents the line of sight between the operator of a vehicle using the driveway (point 1) and the operator of a vehicle approaching from either direction (point 2).

(c) "Alteration" means any work on a driveway including, but not limited to:

- (1) Paving and repaving;
- (2) Regrading;
- (3) Widening;
- (4) Changing its use;
- (5) Changes in existing drainage affecting the highway; and

