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2 Center Plaza, Suite 430
Boston, MA 02108-1928
T: 617-338-0063
F: 617-338-6472
www.nitscheng.com

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TOWN CLERK'S OFFICE
CARLISLE, MASS.

TRAFFIC MEMORANDUM

FROM: Jeffrey T. Bandini, P.E., PTOE, LEED Green Associate

DATE: November 3, 2014

RE: Long Ridge Road Traffic Peer Review Nitsch Project #10399

Nitsch Engineering has been retained by the Town of Carlisle Zoning Board of Appeals ("the Town") to peer review the following with regards to transportation impacts against transportation engineering industry standards (e.g. MassDOT guidelines, AASHTO, etc.), Town regulations ("the regulations"), and to address the Applicant's proposed waiver requests.

- "Traffic Impact Assessment (TIA), Proposed 40B Residential Development, Long Ridge Road, Carlisle, MA", dated October 2014 and prepared for Lifetime Green Homes, LLC ("the Applicant") and prepared by MDM Transportation Consultants, Inc.
- "Notice of Intent – Site Plan C – Grading Plan" ("the plan"), dated July 17, 2014 and prepared for Lifetime Green Homes, LLC and prepared by Meisner Brem Corporation

TRAFFIC STUDY

Nitsch Engineering generally agrees with the methodology included in the TIA and that the study generally complies with transportation engineering industry standards. However, we offer the following comments and recommendations:

1. Page 1/Figure 2: Page 1 mentions the existence of a detached barn on the proposed site, and it is indicated in Figure 2 with a proposed residence in the location of the existing barn. The plan indicates the existing barn will be razed. We recommend the report also mention that the existing barn will be razed as part of the project.

2. Page 6-7: The descriptions of Long Ridge Road states, "Long Ridge Road is a dead-end road with a single travel lane in direction that connects Nowell Farme Road and Garnet Rock Lane". This implies Long Ridge Road is one-way, however this is not the case and we recommend clarification.

3. Page 8: The description of Bedford Street at River Road states that the location is a four-way un-signalized intersection with River Road under "STOP"-sign control. We presume that Bedford Road (Route 225) operates freely with no control, but we recommend stating the control type of the commercial driveways to 887 Bedford Road and 1 River Road, the former of which is included in the intersection and the latter is located in immediate proximity to the intersection.

4. Page 8: River Road intersects Bedford Road an acute angle, we recommend this be noted in the description of the intersection and whether this affects the proposed project in any way.

5. Page 17: We recommend noting the location of the proposed Skelton Road Subdivision (Elliot Farms) within Section 3.1.2 Background Development-Related Growth.

6. Page 22: The intersection of Bedford Road (Route 225) at River Road is expected to experience level-of-service "F" during both the 2019 No-Build and 2019 Build Conditions, conveying that the project will have minimal impact on the operations at the intersection. River Road currently intersects Bedford Road (Route 225) at an acute angle, which is not a recommended condition. Though no safety issue was noted in the crash data, this geometry coupled with the future operations may pose

a concern to the Town. Does the Applicant have any recommendations on what can be done to improve the condition?

WAIVER REQUESTS

1. The Applicant is seeking a waiver to allow for twenty (20) units on a Private Driveway as shown on the plan. Section 5.4.4 of the regulations allows for a maximum of six (6) "lots" to share a Private Driveway. Nitsch Engineering believes that in order for the waiver to be granted, the Applicant should provide secondary means of access to the Nowell Farm Road neighborhood for emergency vehicles, as recommended in Page 26 of the study and review the project with Police and Fire Departments for issues related to public safety.

2. The Applicant is seeking a waiver that a subdivision containing more than 11 lots having legal frontage on a single dead-end street is required to have no less than two (2) noncontiguous accesses with existing Town Roads. Again, Nitsch Engineering concurs with the study that the Applicant should provide secondary means of access to the Nowell Farm Road neighborhood for emergency vehicles, as recommended in Page 26 of the study and review the project with Police and Fire Departments for issues related to public safety.

3. The Applicant is seeking a waiver that a subdivision roadway "shall be laid out such that the closure of any single road will deny access to no more than ten (10) building lots". If a secondary means of access to the Nowell Farm Road neighborhood is included, Nitsch Engineering recommends that the Applicant review the revised layout with the Fire and Police Department for potential life safety concerns.

4. The Applicant is seeking a waiver from the minimum centerline offset requirement of 125 feet and is proposed at approximately 110 feet according to the plan and as addressed in the study. As the study states, the regulation is most likely in place to eliminate potential conflicts between back-to-back left-turning vehicles and that these may not frequently occur due to the quantity of traffic between the roadways. Nitsch Engineering recommends the Applicant explain to the Town why the offset cannot be achieved.

5. The Applicant is seeking a waiver from meeting the minimum centerline radius of 125 feet in favor of a radius of 80 feet. While the study includes a Fire Truck AutoTurn Analysis in the TAIS Appendix as Exhibit 1 and conveys that the truck can properly execute the necessary maneuvers, careful consideration must be given to roadway design speed, roadway superelevation and side friction factors with respect to establishing the desired radius. Furthermore, the proposed 80-foot radius curve is proposed from station 5+00 +/- to station 6+85 +/-. A crest vertical curve is proposed from station 4+75 to station 7+25 with a proposed exiting grade of -8%, which will increase the necessary braking distance along the curve. Nitsch Engineering recommends the Applicant should furnish all plans, calculations and assumptions to justify not achieving the minimum 125-foot radius and how the proposed -8% grade may affect vehicle operations.

6. The Applicant is seeking a waiver from meeting maximum street grade of 6% when the centerline street radius is less than 200 feet. The proposed roadway grade is 8% and the street radius is well below the 200-foot requirement. Nitsch Engineering recommends the Applicant explain to the Town why the requirements cannot be met and propose ways to achieve the 6% street grade.

7. The Applicant is seeking a waiver from the requirement that the Sag Vertical Curve "K" value (ratio of length of vertical curve to the algebraic difference between entering and exiting grades) of 24 be met. According to the plan, the "K" value of the Sag Vertical Curve from station 7+29.16 to station 8+70.84 is calculated at 20.1. Nitsch Engineering recommends the Applicant explain to the Town why the

minimum K value cannot be met and propose ways to achieve a minimum K-value of 24 for this Sag Vertical Curve.

8. The Applicant is seeking a waiver from the requirement that "no Dead-End Street shall provide legal frontage for more than 10 building lots." The report did not provide additional information on explaining this waiver request. Nitsch Engineering recommends that Applicant explain to the ZBA the waiver request and review the project with Police and Fire Departments for issues related to public safety and site access for emergency vehicles. This waiver is directly related to the recommendation that secondary means of access to the Nowell Farm Road neighborhood for emergency vehicles be provided.

9. The Applicant is seeking a waiver from the cul-de-sac turnaround of 140-foot outside diameter of the paved surface and 100-foot diameter center island in favor of a 120-foot outside diameter and 80-foot diameter center island. The study included a Fire Truck AutoTurn Analysis in the appendix as Exhibit 1 and the design vehicle (states as a Carlisle E-One Cyclone II 100') can properly execute the maneuver around the cul-de-sac. Nitsch Engineering, however, feels executing this maneuver may be difficult in the event that snow is stored along the inner and outer borders of the cul-de-sac. Nitsch Engineering recommends the Applicant explain to the Town why the requirements cannot be met and provide a plan that indicates how emergency vehicles will maneuver the proposed roadway with snow stored on either side of the proposed roadway.

10. The Applicant is seeking a waiver that "no more than three (3) lots can be accessed on a cul-de-sac", as the project proposes four (4) units to access the cul-de-sac. The Applicant should explain why this requirement cannot be met and review the project with Police and Fire Departments for issues related to public safety.

11. The Applicant is seeking a waiver from the requirement that a "Common Drive" exceeding 300 feet must have turnouts "at least every 300 feet to allow vehicles to pass." The project proposes no turnouts. Furthermore, according to the plan and the study, the interior roadway will be 20 feet wide. Nitsch Engineering believes this relatively narrow width presents an issue with regard to vehicles traveling in opposing directions at the proposed 80-foot radius curve and for snow storage. The Applicant should explain why this requirement cannot be met and review the project with Police and Fire Departments for issues related to public safety.

Nitsch Engineering recommends that the Applicant provide updated information to the ZBA for review based on the above comments.