**BERRY SURVEYING & ENGINEERING**
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#2

October 23, 2015
Town of Barrington
Attention: Marcia Gasses
P.O. Box 660
Barrington, NH 03825

RE: Engineering Review dated October 22, 2015
International Brotherhood of Electrical Workers
22 Old Concord Turnpike
Barrington, NH 03825
Map 271, Lot 23
Engineering Review

Planner Gasses,

Based on comments from an engineering review by DuBois & King, dated October 22, 2015, we respectfully submit the following comments and revisions. Our comments are in **bold.**

**PLANS**

1. Pursuant to Article 3.5.1(1) existing and proposed spot elevations should be added to the plans. We recommend that, at a minimum, spot elevations be added to the corners of pavement, driveway apron, and accessible parking spaces to provide additional information for review and to facilitate proper construction. In accordance with Article 4.3.2, we recommend that spot elevations be shown at not more than 100 foot intervals along all drainage facilities and adjacent streets, and pursuant to Article 3.5.2(3) that spot elevations be added to the proposed swales.

   **Proposed spot grades have been added to the Grading Plan. A note has been added to the Grading Plan that handicapped spaces are to be ADA compliant.**

2. Pursuant to Article 3.5.2(1), we recommend that proposed pipes should be labeled as having flat slopes to facilitate proper construction. Outlet erosion protection should be dimensioned in the detail. The supporting calculations should be added to the Drainage Analysis pursuant to Article 4.7.2(11).

   **Proposed pipes with flat slopes have been labeled as such on the Rain Garden Detail Plan R101 (Sheet 6 of 16.)**

11. The sign table on Sheet 1 of 16 does not match the signs in Detail C25 on Sheet 15 of 16. We recommend that the signs be coordinated between these locations, and that the signs shown on Detail C4 of Sheet 15 of 16 be updated to reflect the requirements of Article 4.9.4(2).

    **Both the sign table and Detail C25 have been revised.**

12. We recommend that the Engineer define the hatched area at the top of the underdrain trench detail.

    **The hatched area has been removed.**

13. The Grass Treatment Swale detail indicates that the width of the swale is noted on the plans. We recommend that this information be added to the Grading Plan.

    **The width of the swale (2') has been added to the Grading Plan.**

14. Note 2 of the construction sequence on Sheet 12 of 16 appears to be incomplete.

    **Note 2 is now complete.**

15. We recommend that the State approval number for the sewage disposal system be added to the plat prior to final approval, in accordance with Article 4.6.

    **The State approval number for the sewage disposal system will be added to the plans upon approval by DES.**

16. In accordance with Article 4.8.2(2), we recommend that the minimum driveway radii be upsized to a 25' radius. Note also that Article 4.9.5(1) requires a 30' maximum width for driveways, and an 11' minimum lane width. The design calls for two 10' wide exit lanes and a 12' entry lane, for a total width of 32'.

    **In order to install 25' driveway radii, grading would be required on the abutting property. We feel 15' radii are more appropriate for the proposed use. Driveway radii will also be covered during the NHDOT driveway permitting process.**

17. Article 4.8.2(3) requires a 150' separation between driveways on the same side of the street. However, it is noted that the proposed driveway is proposed to coincide with the existing driveway location.

    **The proposed driveway will coincide with the existing driveway location.**

18. Pursuant to Article 4.9.13(1), off-street parking facilities shall be limited to no more than 10% above the amount required. The limit in this case would be 21 spaces, and 62 spaces are proposed. We recommend that the applicant discuss the need for the additional parking with the Planning Board.

    **The need for additional parking will be discussed with the Planning Board.**

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19. The surface covering in the rain garden is proposed to be 3" rounded river stone. The NH Stormwater Manual specifies 2-3" well-aged shredded bark mulch.

    **The rain garden detail now calls out 3" well-aged shredded bark mulch.**

20. We recommend that the Engineer review Detail L9 on Sheet 16 of 16. Based on the 150 contour, it appears that the area is proposed to be slightly mounded, not depressed as illustrated in Detail L8, and as noted on the Grading Plan Sheet 5 of 20.

    **The contour has been adjusted to show a depression instead of a mound.**

21. We recommend that the engineer review the constructability of the 4' wide berm of low permeability material shown in Detail R1 on Sheet 6 of 16. It appears that the lower portion of this berm will be constructed below the SHWT, which would necessitate dewatering for proper installation. We recommend that dewatering notes and other construction notes such as thickness of lifts be added to the detail.

    **A note has been added to Detail R1 on Sheet 6 of 16 instructing the contractor to install a dewatering sump as required, and to discharge toward the Filtrexx Siltsoxx.**

22. Detail R3 on Sheet 6 of 16 shows a 15' wide spillway along the For-Bay, however the rock hatch and contours suggest the spillway is actually 30' +/- to the west. We recommend that the Engineer clarify the location of the spillway to facilitate proper construction.

    **Detail R3 has been revised to reflect the proper proposed location of the spillway.**

23. We recommend a cutoff swale be added to the grading design upgradient of the rain garden to convey surface runoff into the For-Bay.

    **A cutoff swale has been added to the Grading Plan to convey surface runoff into the forebay.**

**DRAINAGE ANALYSIS**

24. The drainage calculations assume that all non-wetland soils are HSG A. However, Whitman very stony fine sandy loam (Wa) is HSG C. No NRCS backup was provided for Windsor loamy sand (WdA).

    **The drainage calculations have been revised to properly take into account the curve numbers associated with C soils in areas of Whitman very stony fine sandy loam. NRCS backup is now included for Windsor loamy sand.**

25. Test pit information was not provided for the rain garden.

    **Test pit information is now shown on the Grading Plan.**

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26. In accordance with the design requirements in the NH Stormwater Manual, we recommend that the elevations of the rain garden be raised in order to provide either 1' of separation between the bottom of the practice and the Seasonal High Water Table (SHWT). Or alternatively, provide 1' of separation between the bottom of filter course material and SHWT, and twice the depth of filter course material recommended.

    **The elevation of the 6" underdrain has been lowered by 6" to add depth to the stone course.**

27. The rain garden spillway crest length is input as 20' in the drainage calculations, but is shown as 15' on the plans. This does not alter the calculations in that the stormwater does not reach the spillway elevation for the design storms analyzed.

    **The spillway crest length has been revised in the drainage calculations to be 15'.**

Respectfully submitted,

BERRY SURVEYING & ENGINEERING

Christopher Berry
Principal and President

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