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March 31, 2016

Town of Mansfield Inland Wetland Agency
Town of Mansfield Planning & Zoning Commission
Attention: Ms. Linda Painter
Director of Planning and Development – Town of Mansfield
Audrey P. Beck Municipal Building
4 South Eagleville Road
Mansfield, CT 06268

RE: Peer Review
Meadowbrook Gardens
Special Permit Application and Inland Wetlands License

Dear Planning & Zoning Commission and Inland Wetland Agency Members and Ms. Painter:

BSC has completed its review of the applications for a Special Permit and Inland Wetlands license for the proposed 36 unit apartment complex known as Meadowbrook Gardens located at 91-93 Meadowbrook Lane in Mansfield, Connecticut. This letter report summarizes our findings and presents comments and questions that we have formed as a result of the review. This review encompasses the Project's compliance with the Town of Mansfield Zoning Regulations, Town of Mansfield Inland Wetlands & Watercourses Regulations, Town of Mansfield Engineering Standards and Specifications, 2004 Connecticut Stormwater Quality Manual and the 2002 Connecticut Guidelines for Soil Erosion & Sediment Control, and general engineering and best development practices.

Project Summary and Information Reviewed

The proposed project includes an expansion of the existing 50-unit development apartment complex, currently under construction at 73 Meadowbrook Lane, by an additional 36-units. The development will include four (4) buildings with associated bituminous parking and drive areas, as well as associated sidewalks, landscaping, and utilities. The main access to the site is off Meadowbrook Lane, with a secondary connection to the adjacent development. The site is approximately 4.6 acres and is a combination of wooded and grass areas with several small structures. The portion of the site to be developed, which is located on the northern half of the site, is relatively flat and generally slopes from east to west. The southern half of the site, as well as the portion along the western border, slopes down to an existing unnamed brook, which also helps define the limits of on-site wetlands. Portions of the slope exhibit a gradient of 40% and a change in vertical elevation of up to 28 feet.

This reports was generated based on our review of the following:

- The plan set "Meadowbrook Gardens, 91-93 Meadowbrook Lane, Mansfield Center, CT 06250," Uniglobe Investments, LLC, 73 Meadowbrook Lane, Mansfield Center, CT 06250, January 8, 2016.

- "Design Statement Drainage Calculations & Hydraulic Analysis, Uniglobe Investments, LLC," by Civil Engineering Services, LLC, 203 Boston Hill Road, Andover, CT 06232, February 5, 2016.
- "Traffic Impact Report, Meadowbrook Gardens, Meadowbrook Lane, Mansfield, CT, Draft 3" by F.A. Hesketh & Associates, Inc., August 14, 2015.
- "On-Site Investigation Report, 91 & 93 Meadowbrook Lane, Mansfield, CT," by Connecticut Ecosystems, LLC, August 11, 2015.
- Meadowbrook Gardens "Special Permit Application", dated 2-9-16.

Additionally, we made several site visits to observe field conditions, and had conversations with Bob Magi (Uniglobe) and Gerald Hardisty, PE (Civil Engineering Services).

Stormwater Review

The site generally consists of sand, gravel and loam which, as defined by the National Resources Conservation Service (NRCS), are "well drained." The applicant had soil samples tested for permeability by Connecticut-certified materials testing laboratory and the results verified the soils depicted by NRCS and observed by us on the site. The stormwater design intent was to take advantage of the existing soils and maximize percolation by utilizing a combination of dry wells (18), underground leaching galleys (27 4'x4'x4' units) and two (2) shallow above-ground detention basins. The design intent was to infiltrate all stormwater generated within the development footprint for storms up to the 25-year storm, and thereby reduce the peak flow as required by the Town of Mansfield Zoning Regulations.

Our stormwater review comments are as follows:

1. We concur with the Applicant's hydrologic design assumptions and computations, as well as the resulting intent to infiltrate stormwater utilizing the previously mentioned drainage facilities. We concur that the site peak flows will be reduced for storms up to the 50-Year storm, which satisfies the Town zoning requirements.

2. Based upon the specific site characteristics, the 2004 CT DEEP Stormwater Quality Manual requires a Water Quality Volume (WQV) storage of approximately 6,800 cubic feet. The applicant, through the use of dry wells, leaching galleys, and above-ground detention, has provided a water quality volume of approximately 11,100 cubic feet, which exceeds the required WQV.

3. Based upon the specific site characteristics, the 2004 CT DEEP Stormwater Quality Manual requires a Groundwater Recharge Volume (GRV) storage of approximately 1,670 cubic feet. The applicant, through the use of dry wells, leaching galleys, and above-ground detention, has provided a water quality volume of approximately 11,100 cubic feet, which exceeds the GRV.

4. The horizontal roof leaders that connect the roof drainage to the dry wells are designed to be four (4) inch diameter. We recommend the diameter be increased from four (4) inches to eight (8) inches.

5. The pipe connections between the two (2) sets of leaching galleys located on the southern end of the development are designed to be four (4) inches. We recommend

the diameter be increased to 12 inches.

6. A large percentage of drainage piping between dry wells and connected to catch basins are designed to be a diameter of six (6) inches. We recommend piping between dry wells and any piping connected to a catch basin and/or leaching basin be a minimum of 12 inch diameter.

7. Catch Basin – 4 is designed to have a TF = 236.7. Based upon the design contours at CB-4, the proposed grade is approximately 240. We recommend this be reviewed and the top of frame grade revised as appropriate.

8. We recommend that a detail, or at the least some more spot grading, be provided for the outlet of the detention basin located on the west side of the paved area.

9. We recommend that a detail of the emergency spillway at the small basin located west of the main entrance drive be provided.

10. Catch Basin – 7 has been designed to be at the low point of the paved area and it has been designed with a modified rip rap overflow to prevent erosion of the hill during large storm events, during which the leaching galleys/existing soil do not have the volume/percolation to prevent runoff from leaving the site. By our computations, the large storm events (50-year and up) will overflow and, during those events, the entire paved drive to the "238" contour will be ponded. We recommend, as a safety measure in lieu of the rip rap overflow down the entirety of the slope, that CB-7 be designed with a 12" outlet pipe at elevation 236. The outlet pipe would extend approximately 30' to the bottom of the slope and be fitted with a concrete flared end and rip rap outlet control. We recommend this be designed per the 2000 ConnDOT Drainage Manual standards and a detail be provided.

Erosion & Sedimentation Control Review

11. Based on the fifth paragraph of the General Erosion and Sedimentation Control Notes, dust control seems to be left up to the contractor. We recommend that the notes be revised to indicated it is the contractor's responsibility to provide dust control as necessary, and as required by the Town, to prevent fugitive emissions from leaving the site.

12. Based on the sixth paragraph of the General Erosion and Sedimentation Control Notes, an anti-tracking pad seems to be recommended but not required. Although there is an anti-tracking pad detail, we recommend revising the notes to indicate that an anti-tracking pad is required.

13. Although the plan calls for the use of temporary sediment traps, we do not see a detail of one. We recommend placing a temporary sediment trap detail, as shown on page 5-11-25 of the 2002 Connecticut Guidelines for Erosion & Sediment Control, on the plans.

14. We recommend a detail for a concrete washout area be provided on the plans, to ensure chemicals associated with concrete do not get washed towards the resource areas as concrete trucks and other equipment, are washed on-site after use. We also

recommend a note be added to the general notes requiring the contractor to utilize the concrete washout area detail during any operations that involve washing concrete off concrete trucks or other equipment.

15. Erosion and sedimentation controls should be extended along the southwest edge of the construction envelope, so that a continuous line of erosion and sedimentation controls extends along the undeveloped perimeter of the construction envelope.

16. We recommend that as an extra layer of protection for the resource area, along the southern and western borders of the developed area, a double row of silt fence or a hay bale-reinforced row of silt fence be used in lieu of the single row of silt fence that is currently shown.

Sanitary Review

In accordance with the Connecticut Department of Public Health Code On-Site Sewage Disposal Regulations, and Technical Standards for Subsurface Sewage Disposal Systems, Section IV, Design Flows, the peak design flow for a residential building is 150 gallons per day per bedroom. Assuming two (2) bedrooms per unit, the peak design flow is 300 gallons per day (gpd). Based on 18 units, the total peak flow for the development is 5,400 gallons per day.

17. Sanitary laterals are shown on the Site Plan; however, their material, diameter, inverts, and slopes are not shown. In accordance with Section V.A.1 – Utilities, of the Town of Mansfield Department of Public Works Engineering Standards and Specifications, we recommend the plans be revised to show the following:

    - Diameter (minimum 4”).
    - Inverts and slopes, to ensure the laterals do not conflict with storm drain pipes.
    - Material (recommend PVC to match the same material as the sanitary collector pipes, which are designed to be PVC.)

18. We recommend that reference on the plans be made to require the construction of all sanitary facilities to be constructed to the Mansfield Department of Public Works Engineering Standards and Specifications, specifically:

    - Sanitary Drop Manhole.
    - Sanitary Manhole Invert.
    - Sanitary Service Connection to Sanitary Main.
    - Typical Trench Section.

19. Based on a conversation on March 28, 2016 with David Garand, Windham Water Pollution Control Authority (WPCA), he has received a set of plans and performed a review. He indicated that the WPCA facility has the capacity to accept the proposed design flow. He indicated that the WPCA had several minor comments that were sent back to the applicant but that he has not received any revised plans yet.

Wetlands Review

On Thursday, March 24th, BSC conducted a site visit to evaluate proposed potential impacts to regulated wetland/watercourse resources and the associated 150' Upland Review Area (URA). BSC reviewed the project site in accordance with Connecticut Public Act No 155 of 1972 and associated amendments, Connecticut General Statutes Sections 22a-36 to 22a-45 inclusive, and with Bylaws for the Mansfield Inland Wetlands Agency and associated "Inland Wetlands & Watercourses Regulations". BSC reviewed project documents listed above, and the Natural Resources Conservation Service soils mapping (Web Soil Survey) for the project site. It should be noted that BSC was not requested to review the placement of wetland boundary flagging on the site, but has been requested to evaluate the proposed project for potential impacts to wetland resource areas. In this regard, BSC provides the following comments.

20. Although not specifically requested to review wetland flag locations, BSC did walk the flagged wetland boundary, and concurs that flagging is generally correctly located. The flagged wetland borders the stream that flows along the western edge and through the southern portion of the property. Land slopes steeply upwards from the wetland and stream, with forested upland occurring on the slopes. Most of the level land at the top of the slope is mowed grass and yard associated with existing houses and buildings on the property.

21. No direct impacts to wetlands or stream are proposed. Maintenance of naturally vegetated areas that buffer these resources, particularly where slopes are steep, will help protect wetland resources from impacts. Greater protection of regulated wetland/watercourse resources would be achieved if proposed development were removed from forested areas within the 150' URA Portions of the URA are already altered and maintained as mowed grass/yard. These altered URA areas provide fewer of the buffering services that the undisturbed URA provides, and thus are more suited to development. BSC recommends that the Applicant evaluate opportunities to move development out of the forested portion of the 150' URA.

22. On the western side of the property, near Meadowbrook Lane, a stormwater basin is proposed within approximately 15 feet of the wetland boundary. BSC recommends that this feature be moved as far as possible from the wetland boundary.

23. On the southwest side of the development, another stormwater basin is located within approximately 45 feet of the wetland boundary. BSC recommends that the Applicant consider moving this feature as far as possible from the wetland boundary.

24. In the southeast portion of the development footprint, forested land is proposed to be cut within the URA, and a paved drive and parking area are proposed in this area. BSC recommends that the Applicant consider reducing or moving the footprint for the paved area so that impacts to the naturally vegetated URA area are reduced.

25. Maintaining erosion and sedimentation controls during the construction phase will be essential for protecting the stream, wetlands and associated naturally vegetated URA,

given the steep grade on the slopes above the regulated wetland/waterway resources. BSC recommends at least weekly construction phase environmental inspections to ensure that erosion and sedimentation controls are maintained, and an inspection of erosion and sedimentation controls prior to the start of construction.

Traffic Impact Study

In general, we concur with the design approach and methodology of the applicant's traffic impact study. We concur that the report demonstrates that the existing roadway infrastructure has sufficient capacity to accommodate the proposed site generated traffic and should not require off-site mitigation with the exceptions and requested clarifications as outlined below.

26. Traffic Counts - The traffic turning movement counts were collected in late June and early July of 2015. Eastern Connecticut State University is located approximately one mile from the project site and the University of Connecticut is located approximately six miles from the project site. Both of these universities significantly affect the traffic volumes in the area which would not have been reflected in the traffic data that was collected since the academic year had ended. We would recommend that the traffic information at a minimum be seasonally adjusted to account for this condition or new data be collected and analyzed.

27. The report does not include any discussion or analysis of the intersection of Meadowbrook Lane and Mansfield City Road. All traffic heading to or from the west and south of the project site will travel through this intersection and therefore we recommend it should be studied.

28. Sight Distance - We concur that the proposed site driveway location appears to have sufficient sight distance to allow ingress and egress to the site. Please confirm that any proposed driveway landscaping or signing does not block the required sight lines. No sight distance triangle diagrams were provided.

29. Turning Movements - The report states that an SU-30 design vehicle was used to determine the layout of the proposed site driveway which is in concurrence with the ConnDOT Highway Design Manual for a minor commercial drive. However, no turning movement graphics we provided for review. Additionally, we would recommend that the Town of Mansfield emergency personnel be given the opportunity to comment regarding emergency vehicles access into as well as circulation throughout the entire proposed site.

30. Trip Generation – It is discussed that the two Meadowbrook Garden developments will have separate access points onto Meadowbrook Lane as well as the proposed internal connection. We would suggest that the two developments be analyzed separately as there will not likely be many trips that cross the developments to utilize another driveway. The trip distribution showing 134% instead of 100% is not standard. As noted in the report, this could account for some variation in the distribution and given the small volumes would not likely have a large impact on the analysis.

31. The site location referenced as Figure 1 was not provided. Please provide.

32. Description of the Area – the 3rd paragraph states "Conantville Road originates at an un-signalized intersection with S.R. 632 (North Frontage Road)." This intersection appears to be signalized. Please clarify.

33. Table 2 indicates that the traffic data is for EB only but the data provided in the appendix appears to indicate it is for both directions. Please clarify.

34. Capacity Analysis and Traffic Impact

    a. The LOS for the intersection of Route 195 and Conantville Road will be reduced to LOS D in the future condition. Although there is a decrease in the LOS, as noted in the report the increase in the delay is minor.

    b. Intersection Analysis does not include discussion or analysis of the intersection of Meadowbrook Lane and Mansfield City Road.

35. Crosswalk – a proposed midblock crosswalk is shown on the submitted plans but lack proposed signing. Please provide appropriate signing and pavement markings that meet Town, ConnDOT, and MUTCD standards.

Please do not hesitate to contact our office with any inquiries you may have.

Very truly yours,
BSC Group-Connecticut, Inc.

Will Walter, PE, LEED AP
Manager of Civil Engineering