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March 8, 2022

Ms. Jennifer Gannett  
Assistant Town Administrator  
8 Conway Street  
South Deerfield, MA  
Email: [ata@town.deerfield.ma.us](mailto:ata@town.deerfield.ma.us)

**Subject: Civil/Environmental Engineering and Permitting Peer Review Services  
Deerfield, Massachusetts**

Dear Ms. Gannett and Members of the Planning Board:

Wood Massachusetts, Inc., (Wood), has been retained by the Town of Deerfield (Town) to provide Peer Review Services to the Town of Deerfield Planning Board in their review of the Site Plan Review and Stormwater Applications for the construction of the North Main Street Park project (the Project) at 135 North Main Street in Deerfield, Massachusetts. Wood's peer review is provided in accordance with Wood's proposal to the Town of Deerfield, dated February 2, 2022. Wood reviewed the following documents in preparation of this letter:

- a) A set of drawings entitled, "Proposed Municipal Park & Fields, North Main Street, South Deerfield, MA," prepared by ProTerra Design Group, LLC, dated January 25, 2022.
- b) A report entitled, "Limited Stormwater Hydrology Report, Proposed Municipal Park & Fields, North Main Street, South Deerfield, MA," prepared by ProTerra Design Group, LLC, dated December 13, 2021.
- c) A Site Plan Review Application entitled, "Site Plan Review Application & Supporting Documents, Municipal Park & Fields, Town of Deerfield, North Main Street, Map 151 Lot 1, South Deerfield, Massachusetts," prepared by ProTerra Design Group, LLC, dated December 13, 2021.

The materials listed above have been reviewed for conformance with the Town of Deerfield Site Plan Review Bylaws dated June 12, 2021, Town of Deerfield Stormwater Bylaws, Massachusetts Stormwater Standards, and standard engineering practice. Below is a summary of Wood's comments in regards to the provided documents:

**Site Plan Review Application Comments:**

1. Will screening be provided for the residential property to the south of the site (Judith Rathbone, 158-24), as required by Bylaw 5474?
2. Please provide an additional explanation about the cut/fill quantities and how much of the existing soil will be reused and amended. How much soil will be imported to meet grades shown on proposed drawings? Since one of the reasons for raising the elevation of the site is the depth to groundwater, what will the new depth to groundwater be based on the proposed grades? A cut/fill diagram with quantities would be helpful when reviewing the drawings and Site Plan Review Application. Prior to construction the means and methods should be clarified, and the quantities further explained.
3. If we are correctly interpreting Bylaw 5481j to mean that the Applicant is only allowed to alter 40% of the site topography for commercial, industrial, or institutional uses, then the Applicant should be requesting a waiver for this

bylaw since they are proposing to alter approximately 84% of the topography (7.41 acres are proposed to be disturbed).

4. On drawing sheet LS-3 of the landscape plans, eight (8) trees are noted to be planted with a caliper of 4", is this correct or will these trees be 2.5" diameter?
5. There appears to be a discrepancy in the Site Plan Review Narrative regarding how many trees and shrubs, and perennials and herbaceous species will be planted. In response to Bylaw 5471, the Applicant states that 175 trees and shrubs plus over 200 perennials and herbaceous species will be planted, and an additional 90 trees and shrubs are proposed along the western border. In response to Bylaw 5482d, the Applicant states that 250 trees and shrubs, and 400 perennials and herbaceous species will be planted. Please clarify the number of trees and shrubs to be planted and the number of perennials and herbaceous species to be planted.
6. Please clarify how many trees with a diameter of 19" or greater are going to be removed. The Site Plan Review Narrative states six (6) trees under the response to Bylaw 5482c, however, on Drawing Sheet SR-1, eight (8) trees are noted to be removed with diameters 19" or greater. In addition, please clarify how many replacement trees will be planted to meet the replacement requirement of the 19" diameter trees. On drawing sheet LS-3, eight (8) trees are specified, however, the Site Plan Review Narrative states six (6) replacement trees will be planted.
7. The Applicant is formally requesting a waiver of Bylaw 5482d. The Applicant is proposing to replace the removed trees with a 19" diameter or greater, with 2.5" diameter trees in lieu of the required 4" diameter trees.
8. Applicant to confirm that although the bandshell, concession/bathroom, and pavilion are proposed to be completed under a different phase of construction, they are seeking approval for those features under this application submission as well.
9. Please provide additional information and detail on the erosion and sediment control plan (ES-1) required under Bylaw 5450l, regarding dust and silt control, during and after construction, temporary and permanent erosion control, and protection of water bodies.
10. Wood recommends making the height of the light poles clearer on the photometrics plan.

**Stormwater Comments:**

11. Wetland Basin 1 (pond 3P) receives runoff from the parking lot rain garden and is therefore part of a treatment chain. These BMPs should be listed sequentially on the same TSS Removal Calculation Worksheet to more accurately model TSS removal.
12. The constructed wetland south of the main athletic field, the stormwater detention area within the basketball court, and the constructed wetland basin south of the parking lot are all modelled in the HydroCAD analysis as one pond. Although each constructed wetland basin is connected to the detention area via pipe, we find it unlikely that these three components will function together as modelled. And with only a single outlet control structure in the eastern wetland basin, it is believed that any inflow from the rain garden will work to create a tailwater condition where runoff from the western wetland basin and the detention system will have difficulty flowing into the eastern wetland basin's outlet control structure. This could result in more runoff than anticipated flowing over the spillways and possibly breaching the basin's berms.
13. The 15" pipe connections to the stormwater detention system require a manhole or a detail for their connections.
14. The Stormwater Hydrology Report and Dry Swale detail note check dams every 50 feet; however, these are not shown in the plan view.
15. Within Standard 2 of the Checklist for Stormwater Report, the item "Runoff from all impervious areas at the site is not discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume" is checked off. Review of the drainage analysis seems to indicate that there are no infiltration BMPs proposed as part of this project. Please provide recharge volume calculations as indicated in the Stormwater Checklist.
16. Pages 6 through 8 of the Checklist for Stormwater Report are missing from the Stormwater Hydrology Report.
17. The Rain Garden detail on plan sheet D-4 indicates a 24" Nyloplast dome grate on an 8" inline drain with a 12" outlet. A 24" grate on an 8" drain creates a capacity restriction if flow calcs were based on the 24" drain. However, the Drainage

Structure / Pipe Data table on sheet GR-1 as well as the HydroCAD indicates a 48" x 48" grate. Furthermore, the grate outlet is modelled incorrectly in the HydroCAD analysis. The model assumes a 48" orifice, when the open area of a 48" square grate is likely substantially less than that of a 48" orifice.

18. The Rain Garden detail indicates an underdrain. The plan view does not show the underdrain or it's invert into the outlet control structure. The detail also indicates 2-3" of planting/filter soil mix. Although a likely typo, this should be revised to 2-3' to be consistent with design standards.
19. The outlet control structures for Ponds 2P and 3P in the HydroCAD analysis indicate a 48"x48" horizontal grate. This grate is not shown/dimensioned on the details. Additionally, the grate outlet is modelled incorrectly in the HydroCAD analysis. The model assumes a 48"x48" orifice, when the open area of a 48" grate is likely substantially less than that of a 48" square orifice.
20. The outlet for Pond 1P also indicates a 48"x48" grate outlet. The structure shown on the plans is not consistent with that shown for the outlets at Ponds 2P & 3P. It appears that this may be the Stormceptor treatment unit, but the detail shows a 24" frame and cover. A 48"x48" grate may not be compatible with this product. Please clarify where the Stormceptor is to be located on the site plans and revise per comment. Additionally, the grate outlet is modelled incorrectly in the HydroCAD analysis. The model assumes a 48"x48" orifice, when the open area of a 48" grate is likely substantially less than that of a 48" square orifice.
21. The Multi-Stage Outlet Structure detail on Sheet D-10 appears to show the outlet grate at an angle. The detail should be revised to show a flat outlet grate. Additionally, the drain-down valve should be set slightly below the grate so the grate can be opened without issue for maintenance needs.
22. The outlets for Ponds 4P & 5P indicate a 12" grate outlet, however this grate is not included in the details. Additionally, the grate outlet is modelled incorrectly in the HydroCAD analysis. The model assumes a 12" orifice, when the open area of a 12" grate is likely substantially less than that of a 12" orifice.
23. It is unclear what the pre-treatment mechanism is for the water quality swale. The stormwater report notes pea gravel diaphragms and/or a gravel verge. The plan view does not show either of these.
24. Per Vol.2 Ch.2 of the Mass. Stormwater Handbook, dry swales are to dewater in 72 hours or less, a calculation was not provided showing this to be the case. However, the Dry Swale detail on sheet D-1 indicates an underdrain, but its location and inverts are not shown on the plan. Additionally, seasonal high groundwater is not to be within 2-4 feet of the swale bottom for dry swales. Given the shallow groundwater at the site, and if an underdrain is not proposed, a wet swale seems to be a more adequate BMP for this location.
25. There are no inverts/pipe data shown on the plans for the athletic field underdrains.
26. The athletic fields are graded as such where runoff will sheet flow to the field edges and adjacent area drains. It appears that if this is the case, then runoff will largely bypass the closed drainage system by running off between these drains.
27. Outlets from the parking island, rain garden, and wetland basin 1 all discharge via pipe and/or spillway to the farm ditch along the southern property line. Additionally, runoff from swale S-1 and the catch basins north of the site driveway discharge directly to the farm ditch/abutters property. This farm ditch should be modelled in the stormwater analysis to determine if it has the capacity to handle flows from proposed conditions without flooding onto the abutting property.
28. The spillway for the eastern portion of Pond 3P should be relocated to the western side of this basin to reduce proximity of the discharge to the abutting property.
29. Per the Deerfield Stormwater Regulations, flow velocities are to be analyzed for the proposed development stormwater system. Please provide an analysis of flow velocities for pipe outlets including those discharging to the constructed farm ditch.
30. Outlet protection should be shown in the plan view at all pipe discharge points to mitigate erosion effects.
31. Inlets A, K, & Q have pipe covers ranging from approx. 0.53' to 0.65'. Additionally, inlet BB has a top of pipe higher than that of the inlet's grate. Given that mowing equipment is likely to be driven over these drain lines, it is recommended that pipe covers be increased at these inlets.
32. Please provide more information on the underground detention system beneath the basketball court as shown in Detail 2 on Sheet D-10, including the pipe size, type of piping and inverts.

33. Please provide more information for the french drain design, including, inverts, elevations, installation design.
34. Please provide additional grading and/or spot grades within the drainage swale along the Michael D. & Gail M. Dupuis property line, specifically in the northern portion of the swale and along the property line. Confirm the swale grading and design will prevent a discharge onto the Dupuis Property.

**Additional Comments:**

35. Wood recommends that the use of fertilizer on the proposed playing fields be limited to the minimum amount and frequency necessary to maintain healthy turfgrass and should be applied according to manufacturer's recommendations (these typically state applications should be made only when rain is not forecast for at least 48 hours). Wood also believes that responsible fertilizer use is not expected to harm the constructed wetlands; this should be considered part of their intended use. The constructed wetlands will have the beneficial function of removing excess nutrients and potential contaminants from playing field stormwater flows prior to their reaching the natural or replication wetlands and exiting the site.
36. Wood strongly recommends monitoring of invasive species during and immediately following construction to identify and eliminate occurrences of invasive plant species, at the very least the most noxious species. Efforts made early in the life of this project will be a big investment compared to efforts to remove the invasives later after they have become well-established and threaten to overtake the rain gardens or the field perimeters, which will be expensive and probably futile. Wood believes the worst offenders in this part of the state are likely to be Japanese knotweed, oriental bittersweet, and garlic mustard, however, monitoring for any plants on the state's list is recommended.

Wood would like to note that excluded from this peer review is the Notice of Intent (NOI), dated February 8, 2022, and the Traffic Impact and Access Study, dated December 13, 2021. The Landscaping Plan was reviewed in regard to stormwater and Site Plan Review Bylaw requirements only. Wood did not review the Landscaping Plan from an ecology standpoint, and will not be providing comments on the species, spacing, quantity, etc.

Wood remains available for continued evaluation of this project, and to discuss issues raised in this letter with the Town or their engineer. If there are any questions, or concerns, please do not hesitate to contact Andrew Vardakis at [Andrew.vardakis@woodplc.com](mailto:Andrew.vardakis@woodplc.com) or (978) 392-5341.

Sincerely,

**Wood Massachusetts, Inc.**



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Andrew Vardakis, P.E.  
Associate Engineer



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