



Oak Consulting Group

October 5, 2022

Project 16012

Ms. Elizabeth Hughes, Town Planner
Town of Concord
1414 Keyes Road
Concord, MA 01742

Re: CPW – Engineering Division Review
Concord Academy – Centennial Arts Center
Concord, Massachusetts

Dear Ms. Hughes:

We are in receipt of a memorandum dated 9/26/2022 from Justin Richardson, P.E., Assistant Town Engineer. The memo indicates most of the previous Engineering comments and requests for additional information have been addressed, however there were still a few items that needed additional information. We have made revisions to the plans and stormwater calculations in response to these comments. Please find the enclosed:

- Site Plans, Revised 10/4/22; and
- Stormwater Report, Revised 10/4/22.

Below are the comments received requiring response with the applicants response in **bold**.

Engineering Division Comments (09/26/2022):

6. Please explain why in HydroCAD the Lag/CN method was used in calculating the Tc instead of the more typical TR-55 method? Additionally, on the Pre and Post Development Subcatchment Plan please label the “longest flow path” lines so that it is clear what was used in the calculations. (8/31/22)

Applicant response 9/15/22: We typically use the Lag method as a simpler estimate of the Tc and this method is allowed in the MADEP Stormwater Handbook. However, the stormwater calculations were revised using the TR-55 method and the longest flow paths have been labeled on the Subcatchment plans.

CPW 9/26/22: *In the Pre-development and the Post-development conditions it is rare to have a sheet flow length of more than 50-feet this occurs multiple times in the pre and post drainage plans. Please either provide an explanation as to why the sheet flow lengths are so long or revise the calculations to have sheet flow lengths closer to 50-foot max. Also, the Tc for Subcatchment A1 would become channelized at approximately elevation 117 in the grassed swale.*

Applicant response 10/5/22: The TR-55 User Guide, published January 2009 by the NRCS limits sheet flow in Time of Concentration (Tc) calculations to 100 feet. We have revised the Tc calculations to reduce the sheet flow lengths to generally 50’ or less with the exception of a couple of location where a little bit longer sheet flow length (but less than 100 feet) is

warranted. We have also revised the Tc calculation for A1 to use a channel flow where it enters the existing swale at the end of the flow path.

11. Why is no sediment Forebay provided for Basin B? Stormwater runoff from the driveway of #228 Main Street flows into the basin.

Applicant response 9/15/22: Because of the sheet flow into the basin, a forebay is not practical for this basin. Alternatively, in combination with sediment removal from the moderately sloped lawn and landscape area upgradient of the basin, a pea stone diaphragm has been added to the top of the basin slope to help filter stormwater entering the basin.

CPW 9/26/22: Comment has been addressed, but recommend increasing the width of the diaphragm to 2 feet.

Applicant response 10/5/22: We have increased the width of the stone diaphragm as recommended.

15. Flood Plain fill areas should also include at least portions of the emergency access road. CPW Engineering requires AutoCAD design plans that include the existing and proposed surfaces to confirm the flood plain alteration. Please provide AutoCAD .dwg files for review.

Applicant response 9/15/22: Sheet C-009 has been revised to include the additional fill and compensatory storage area. The AutoCAD file will be forwarded directly to Engineering.

CPW 9/26/22: The Town's Zoning Bylaw under Section 7.2 Flood Plain Conservancy District requires the following: "Plans showing compensatory storage at a 1.5:1 ratio for floodplain displaced by the proposed project, prepared by a registered professional engineer, detailed in tabular format, in 1-foot incremental elevations of fill and storage volumes in cubic feet, with cut and fill areas shown on a plan. The 1.5:1 Compensatory storage ratio does not need to be obtained at each 1-foot increment and may be obtained as a total over the floodplain area, but a minimum of 1:1 ratio shall be maintained at all 1-foot increments;" Calculations were provided but they are not in volumetric units, and there is no documentation of the 1.5:1 ratio where provided. In using the CAD file provided Engineering obtaining a ratio of approximately 1.3:1. Please provide revised calculations as requested per the Bylaw.

Applicant response 10/5/22: We have revised some of the grading in the CAC parking lot to lessen the amount of fill and increase the compensatory storage to meet the 1.5:1 ratio required by the bylaw. Calculations are shown on Sheet C-009 and the CAD file has been provided to Engineering.

Engineering Division Comments (9/26/2022)

1. The discharge location for "Filter Strip A8" flows over the "Constructed Grass Paved Fire Lane" that is also a walkway/driveway. This could cause an issue during high storm events or icing conditions. Recommend either elevating the roadway and piping the discharge under the fire lane or obtaining Concord Fire Department approval of the condition. (9/26/2022)

Applicant response 10/5/22: The Sheet C-003 has been revised to add 3-8" pipes to outlet the area bounded by the fire lane and the Academy Village parking. These culverts have

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been modeled in HydroCAD to ensure the area will not over top for the 100-year storm.

2. Provide a detail of the DMH P2 showing the weir construction. (9/26/2022)

Applicant response 10/5/22: A detail for DMH P2 has been added to Sheet C-008.

3. Please identify material stock pile areas on the Site Preparation Plan. Also, add a note to avoid heavy equipment in the infiltration areas. (9/26/2022)

Applicant response 10/5/22: We have added a note to Sheet C-003 indicating the infiltration areas shall not be used for stockpiling and heavy equipment should avoid these areas. Additionally, we have discussed the location of stockpiles and laydown areas with the Natural Resources Director. We have indicated that the project will be complex and multi-phased and it is likely that most areas within the disturbed limit of work will be used for temporary stockpiles and/or material storage laydown areas. A contractor has not been selected yet to provide logistic plans. We have proposed a condition to limit the areas used for stockpiling and will provide a construction staging plan and schedule to the town prior to the pre-construction site visit.

4. The 118 Contour around the Water Quality Swale is incorrect. It crosses the Fire Lane at the "118.0 (ex)", but also continues on and closes on its self in the swale. Please revised the grading of the swale.

Applicant response 10/5/22: The contour have been corrected on Sheet C-003.

5. On the "FLOODPLAIN IMPACT AND MITIGATION PLAN" the Legend in the "Floodplain Fill Areas" has two green hatches. It is presumed that the 120.0-120.3 has is supposed to be magenta and not green, but please revise the plan for the final plan set.

Applicant response 10/5/22: The legend has been corrected on Sheet C-009.

We look forward to discussing the project further with the Planning Board. Please feel free to contact me at if you have any questions or require additional information.

Sincerely,

OAK CONSULTING GROUP, LLC



Sean P. Malone, P.E.
Vice President

SPM:
Enclosures

Cc: Delia Kaye, Natural Resources Director
Justin Richardson, P.E., Assistant Town Engineer