CONCORD PUBLIC WORKS
ENGINEERING DIVISION

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DATE: 09/26/2022

MEMORANDUM

TO: Elizabeth Hughes, Town Planner
TO: Delia Kaye, Natural Resources Director
COPY: Alan Cathcart, Director of Public Works
VIA: Steve Dookran, P.E., Town Engineer
FROM: Justin Richardson, P.E., Assistant Town Engineer
SUBJECT: Concord Academy: ZBA Special Permit, Site Plan Approval Application, and Notice of Intent

Concord Public Works (CPW) Engineering Division has reviewed the Notice of Intent and the ZBA Special Permit and Site Plan Approval Application, Plans, Calculations and Reports for Concord Academy West Campus, which were prepared by the Applicant, Don Kingman, and the design team, dated July 28, 2022, July 15, 2022, July 2022, and July 13, 2022, and provided comments dated August 31, 2022, seen below in bold and dated. The Applicant provided revised supplemental plans, reports, and calculations with a response letter to Engineering's comments, which were dated September 15, 2022 and September 16, 2022, respectively and seen below in italics and dated. The Engineering Division offers the following in bold and dated:

Engineering Division Comments (8/31/2022)

1. **Please provide a Stormwater Pollution Prevention Plan (SWPPP) and make the appropriate filings with National Pollutant Discharge Elimination System (NPDES) for the site alterations that are to be performed. (8/31/2022)**
   - *Applicant response 9/15/22: The applicant recognizes that the project will disturb more than one acre of land and will require coverage under the NPDES Construction General Permit (CGP). As part of this permit a site specific SWPPP is required.*
     The project is a large-scale project and will require coordination of logistics with the Owner,project design team and contractor. At this time has been no contractor chosen for the project. Prior to the start of construction, a SWPPP will be prepared, in coordination with the project team, and the appropriate NOI for coverage under the CGP will be filed. The applicant will provide a copy of this filing and the SWPPP to the Town. (9/16/2022)
     - **Comment has been addressed and should be a condition of approval. (9/26/2022)**

2. **The Traffic Study is required to determine if additional traffic will be generated by the development, and it should include tip generation for each driveway, peak hour volumes, estimated traffic for special events, frequency of events, and does the housing being moved affect the traffic volume for different driveways. Line of sight determinations for all driveways being utilized or improved should also be determined. (8/31/2022)**
   - *Applicant response 9/15/22: The applicant is in the process of retaining a traffic engineer and the requested report will be submitted as soon as its complete. (9/16/2022)*
     - **CPW Engineering will review the report when it becomes available (9/26/2022)**

3. **A Right of Way (ROW) and/or Driveway permit is required for the work being performed on Main Street and work inside the right of way shall comply with CONCORD PUBLIC WORKS DESIGN & CONSTRUCTION STANDARDS & DETAILS. This includes ADA compliant ramps at all driveway entrances. (8/31/2022)**
   - *Applicant response 9/15/22: The applicant will obtain a ROW and/or Driveway permit from CPW prior to starting work. All will comply with Concord Public Works Design & Construction Standards and Details. (9/16/2022)*
     - **Comment has been addressed and should be a condition of approval. (9/26/2022)**

4. **The accessible space at the southeasterly edge of the parking lot do not appear to be graded at 2% or less. (8/31/2022)**
   - *Applicant response 9/15/22: Additional grading detail as well as a note has been added to sheet C-003 indicating a maximum grade for the accessible spaces. (9/16/2022)*
     - **Comment has been addressed. (9/26/2022)**

5. **Please explain why in HydroCAD the Dynamic Storage-Indication method was used instead of the more typical Storage-Indication method? (8/31/2022)**
   - *Applicant response 9/15/22: We typically use this method to account for tailwater conditions within a system that can affect the flow through a system. The following is a description from HydroCAD about this method. "A dynamic routing method also calculates the nodes in flow order, but evaluates every node at each time step. This allows each node to respond to other conditions, such as varying tailwater or pump switching. For these situations, HydroCAD provides the Dynamic Storage-Indication method. DSI uses the same calculations as the Storage-Indication method, but permits automatic tailwater capabilities by updating the routing curves at each time step."*
     However, as required in the Town's drainage standards, the calculations have been revised using the Storage-Indication method. (9/16/2022)
     - **With the majority of the ponds having free discharge to reaches, and not many ponds in series except for drain manholes modeled as ponds the SI method is adequate for this project. Comment has been addressed. (9/26/2022)**

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. (8/31/2022)**
   - *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. (9/16/2022)*
     - **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. (9/26/2022)**

7. **The Plastic Grid Reinforced Lawn, Permeable Concrete Unit Pavers, and Stabilized Stone Dust Paving while still pervious should be called out separately in the Subcatchments with the appropriate curve number that is based on the compacted base. (8/31/2022)**
   - *Applicant response 9/15/22: The stormwater calculations have been revised with the areas of reinforced lawn, permeable pavers and stone dust areas have been separated out and classified as "gravel. (9/16/2022)*
     - **Comment has been addressed. (9/26/2022)**

8. **Inspection reports from the LTOMP are to be submitted to the CPW Engineering Division annually. (8/31/2022)**
   - *Applicant response 9/15/22: Comment noted. The applicant will submit all required reports and inspections. (9/16/2022)*
     - **Comment has been addressed and should be a condition of approval. (9/26/2022)**

9. **The Water Quality Swale (that is essentially a Basin), basins and Sediment Forebay need to be detailed. These area shall comply with CPW Design and Construction Standards, Sections 2 "Drainage Standards". Currently, the basin does not have an emergency overflow and the appropriate amount of freeboard. In the 100 year storm event the basins overtop according to the calculations. Please revise the drainage calculations to incorporate the changes necessary to comply with CPW Design and Construction Standards. (8/31/2022)**
   - *Applicant response 9/15/22: Water quality swale A has been revised to eliminate the outlet structure in favor of a longer conveyance with stone check dams to retain flow for treatment. Swale B has been revised to provide 1' of freeboard and a second area drain outlet structure has been added to serve as an emergency overflow.*
     A detail for the sediment forebay outlet has been added to the Sheet C-008 and Sheet C-011 has been added to the plan set with details and sections for the swales. (9/16/2022)
     - **Comment has been addressed. (9/26/2022)**

10. **Water Quality Volume calculations should be provided. (8/31/2022)**
    - *Applicant response 9/15/22: Water quality volume calculations have been included in Appendix D of the revised stormwater report. (9/16/2022)*
      - **Comment has been addressed. (9/26/2022)**

11. **Why is no sediment Forebay provided for Basin B? Stormwater runoff from the driveway of #228 Main Street flows into the basin. (8/31/2022)**
    - *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. (9/16/2022)*
      - **Comment has been addressed, but recommend increasing the width of the diaphragm to 2 feet. (9/26/2022)**

12. **A groundwater mounding analysis is required for all stormwater infiltration areas with less than 4-feet separation from estimated seasonal high ground water. (8/31/2022)**
    - *Applicant response 9/15/22: The mounding calculations using the Hantoush Method for the proposed infiltration basins (Subsurface Infiltration Basins 1 and 2) can be found in Appendix D*

in the revised Stormwater Report. These calculations show that the groundwater mound below the infiltration basins will not reach a breakout level. (9/16/2022)

- **Comment has been addressed. (9/26/2022)**

13. **The Subsurface Infiltration System is required to have an overflow per the CPW Design and Construction Standards, Sections 2 "Drainage Standards". (8/31/2022)**
    - *Applicant response 9/15/22: The Infiltration System 1 has been revised to include a grated opening on the inspection port in the northwest corner of the system where the grade is lowest. This will serve as an overflow for the system as well have aid in system venting. The downspout boot detail has been revised to specify an overflow that will spill to the ground is the system backs up. (9/16/2022)*
        - **Comment has been addressed. (9/26/2022)**

14. **The Stormwater Report should provide rational method calculations in accordance with Concord Public Works Design & Construction Standards & Details, Section 2 - Drainage Standards requires "rational method for a 100 year frequency storm event". Please provide these calculations, and also ensure that the grate capacities for catch basins are not exceeded. (8/31/2022)**
    - *Applicant response 9/15/22: The required grate capacity and stormwater conveyance calculations using the rational method are included in Appendix C of the revised stormwater report. (9/16/2022)*
        - **Comment has been addressed. (9/26/2022)**

15. **Flood Pain 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. (8/31/2022)**
    - *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. (9/16/2022)*
        - **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. (9/26/2022)**

16. **The Engineering Divisions reserves the right to comment on future submittals related to any new or previously submitted information provided to the Town for review. (8/31/2022)**
    - *Applicant response 9/15/22: Comment Noted. (9/16/2022)*
        - **Comment remains pertinent. (9/26/2022)**

Engineering Division Comments (9/26/2022)

17. **The discharge location for "Filter Strip A8" flows over the "Constructed Grass Paved Fire Lane" that is also a walkway/driveway. This could cause and 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)**

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

19. **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)**

20. **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.**

21. **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.**