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September 24, 2025

Neil Angus, FAICP CEP, LFA, LEED AP
Director/Land Use Administrator
Devens Enterprise Commission
33 Andrews Parkway
Devens, MA 01434

RE: Nitsch Project #9419
Multifamily Development
25 Adams Circle
Stormwater Review
Devens, MA

Dear Neil Angus:

Nitsch Engineering (Nitsch) received and reviewed the following updated documents:

- Stormwater Report, prepared by CEC, updated September 2025; and
- Site Plans, prepared by CEC, dated July 31, 2025.

Nitsch is providing comments with respect to Stormwater Management in this letter. For clarify, we have provided Nitsch's initial comments from August 21, 2025, in normal font; the responses from Civil & Environmental Consultants, Inc. (CEC) on September 16, 2025, in **bold** font; and Nitsch's updated responses in blue font.

DEC STORMWATER DESIGN STANDARDS

Stormwater Management:

1. **974 CMR 4.08(1)(b)** requires promoting decentralized stormwater management systems modeled after natural hydrologic features and infiltration practices that facilitate local groundwater recharge (Low Impact Development [LID] techniques). The Applicant is providing treatment with a linear bioswale and 6,000± square feet of porous asphalt. While we feel that the Applicant has met this requirement to a practicable level, Nitsch defers to Devens Enterprise Commission (DEC) on the acceptable level of compliance.

   CEC Response (09/16/2025): Comment acknowledged.

   Nitsch Response (09/24/2025): Nitsch feels that the Applicant has met this requirement to a practicable level.

2. **974 CMR 4.08(1)(c)** requires promoting water conservation and efficiency through stormwater capture, treatment, and reuse. The Applicant should review applicability of this requirement to building water demand such irrigation or toilet flushing.

   CEC Response (09/16/2025): Irrigation is not proposed as part of this project. The Applicant plans to utilize low-flow appurtenances.

   Nitsch Response (09/24/2025): Noted; comment closed.

3. **974 CMR 4.08(2)(d.ii)** requires that irrigation water be derived from detained treated stormwater (stormwater harvesting) or roof drainage to the maximum extent feasible. On-site cisterns may be installed to store water for irrigation. The Project does not appear to include irrigation; the Applicant should confirm for clarity.

   CEC Response (09/16/2025): Irrigation is not proposed as part of the project.

Nitsch Response (09/24/2025): Noted; comment closed.

4. **974 CMR 4.08(3)(c)** requires in addition to compliance with the Stormwater Management Standards (SMS), the post-development peak rate of stormwater discharge off-site shall not be greater than the pre-development peak rate of stormwater discharge for the 2, 10, 25, 50, and 100-year storm events from any point of discharge on the site. In accordance with Section 2.d.iii. above, pre-development peak rate calculations shall reflect the "green field" site condition, regardless of any existing development or impervious coverage on the site at the time of application. The Applicant should include the 50-year storm in the HydroCAD analysis and the Stormwater Report.

   CEC Response (09/16/2025): Pre-development peak rates calculations in accordance with Section 2.d.iii are included in the Stormwater Report. No impervious coverage is included in the existing condition area take-offs. Refer to the provided Stormwater Report, Appendix C, for the Existing Condition HydroCAD report.

   Both the existing and proposed HydroCAD reports include results for the 50-year storm. The results are also summarized in the Stormwater Report Table 3.3.

   Post-development peak rates do not exceed pre-development rates in the assessed storms.

   Nitsch Response (09/24/2025): The Applicant has revised the Stormwater Report and HydroCAD analysis to include the 50-year storm; comment closed.

5. **974 CMR 4.08(3)(f)** requires banks of wet ponds, swales not within maintained landscaped areas (such as lawns or parking lots), and other channels shall be vegetated with native woody plant material within 10 feet of the high water elevation and with herbaceous plant material at the edge of the pond at the high water elevation. While we believe the Applicant has met this requirement, they should provide confirmation that all vegetation within the bioswale meets this requirement.

   CEC Response (09/16/2025): The design of the proposed bioswale includes native vegetation. See Sheets 700-702 for additional detail.

   Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

6. **974 CMR 4.08(3)(g)** requires shelves below the design water level (as described in the Stormwater Plan) shall be vegetated with hydrophytic native plant species at a density needed to establish full coverage by the next growing season. Plant plugs or pre-vegetated coir-mesh blankets or carpets are recommended materials. The Applicant should review and address this requirement.

   CEC Response (09/16/2025): Native plugs are proposed within the bioswale below the design water level in compliance with 974 CMR4.08(3)(g). See Sheets C700-702 for additional detail.

   Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

7. **974 CMR 4.08(3)(i)** requires that stormwater management systems be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction area on the site. While we believe that the Applicant has met this requirement through retention of 1.0-inch over the site's total impervious

area, the Applicant states that the project is achieving 80% TSS removal in the Stormwater Report. The Applicant should review and address this requirement.

CEC Response (09/16/2025): Stormwater Report narrative has been revised to state 90% TSS removal provided by proposed site improvements.

Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

8. **974 CMR 4.08(3)(i.i)** requires average annual pollutant removal requirements in §4.08(3)(h) are achieved through one of the following methods:
   - Installing best management practices (BMPs) that meet the pollutant removal percentages developed consistent with the Environmental Protection Agency (EPA) Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or state-approved design guidance or performance standards (e.g. the Handbook) may be used to calculate BMP Performance;
   - Retaining the volume of runoff equivalent to, or greater than, 1.0 inch multiplied by the total post-construction impervious surface on the development site;
   - Meeting a combination of retention and treatment that achieves the above standards; or
   - Utilizing offsite mitigation in accordance with §4.08(3)(b) that meets the above standards within the same United States Geological Survey (USGS) Hydrologic Unit Code 12 (HUC12) as the development site.

   While we believe that this requirement has been met, the Applicant should provide documentation that the retention volume is provided for the total post-construction impervious area, including roof areas.

   CEC Response (09/16/2025): Documentation supporting that the bioswale and porous pavement provide the required pollutant removal levels has been included in Appendix C of the Stormwater Report. The 1-inch water quality volume, inclusive of all impervious area onsite including roof area, is provided by the proposed bioswale and proposed porous pavement, and has been retained onsite. See calculations provided in Appendix C for provided water quality volume.

   Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

9. **974 CMR 4.08(3)(j)** requires that, to support compliance with the Municipal Separate Storm Sewer System (MS4) Permit, all BMPs must be optimized for the removal of phosphorus. The justification and design of such BMPs must also include a methodology for assessing BMP performance. Pollutant removal shall be consistent with EPA Region 1's evaluation tool. Documentation on phosphorus removal should be provided.

   CEC Response (09/16/2025): The proposed bioswale and porous pavement are both BMPs recognized by USA EPA Region 1 to provide both Total Phosphorus (TP) and Total Suspended Solids (TSS) removal.

   In a report published by TetraTech prepared for US EPA Region 1, titled "Stormwater Best Management Practices (BMP) Performance Analysis" last revised March 2010, documentation was published for both bioretention practices and porous pavement. The BMP Performance Curve for Bioretention identifies that 60%removal (or more) of Total Phosphorous and more than 90% TSS removal was generated when providing at least 12 inches of Filter Course. Per

the Porous Pavement detail included on Sheet C800 of the project Site Plans, 12 inches of Filter Course is identified.

The BMP Performance Curve published for Bioretention identifies that for 1-inch of runoff treatment, more than 70% Total Phosphorus treatment is provided and over 100% TSS treatment is provided. Refer to Appendix C for the BMP performance curves published for the proposed BMPs.

Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

10. **974 CMR 4.08(4)(a)** requires that the design of stormwater and infiltration basins and associated structures shall minimize basin size to 5,000 square feet per basin or less (by using smaller catchment areas and/or alternative stormwater management design methods) and minimize disturbance to natural or re-established vegetated areas to the maximum extent feasible. If a basin exceeds 5,000 square feet, the Applicant shall demonstrate to the satisfaction of the DEC why a smaller size is not feasible. The Applicant should review and address this requirement.

CEC Response (09/16/2025): The proposed bioswale has a footprint of approximately ±9,500 SF and cannot feasibly be reduced as its proposed location is already in a subdivided portion of the original drainage catchment (the existing site only has one design point and one drainage catchment whereas the proposed drainage areas were divided into three catchments), so further subdividing catchments would not be practical.

Additionally, providing outlets for multiple basins would be infeasible due to the limited topographic relief within the parcel area as the parcel area is quite flat. The bioswale is proposed within existing grassed area, minimizing disturbance to natural areas and improving an existing re-established vegetated area.

Furthermore, the geometry of the bioswale spanning the rear of the parcels allows the bioswale to act as an impediment to stormwater sheet flowing from the existing hillside mitigating flooding of the proposed homes and providing pre-treatment in the bioswale.

Nitsch Response (09/24/2025): The Applicant could consider reducing the footprint of the bioswale by providing two separate, hydraulically linked bioswales, however, the bio-swale serves a linear/barrier function different from a traditional detention pond and therefore still meets the intent of the decentralized stormwater management requirement in 4.08(4)(a).

11. **974 CMR 4.08(4)(d)** requires that the design of stormwater and infiltration basins and associated structures have an emergency outlet to accommodate storm flows in excess of the 100-year storm event. A minimum 1-foot freeboard distance shall be established between the 100-year flood elevation and the top of embankment. The Applicant should review and address this requirement.

CEC Response (09/16/2025): One foot of freeboard is provided in the 100-year storm event. The top elevation of the Bioswale is 252.00 and the 100-year peak elevation within the bioswale is 251.00 providing one foot of freeboard. Refer to the Proposed Condition HydroCAD report in Appendix C of the Stormwater Report for the peak elevation within the bioswale.

Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

12. **974 CMR 4.08(4)(f)** The Applicant shall locate the floor of all basins/infiltration structure/swales a minimum of four feet above the high groundwater elevation. High groundwater testing shall be conducted before the basin design at the proposed location of each basin in compliance with Title V (310 CMR Section 15.103), as most recently amended or reliable data pursuant thereto shall be provided. The borings provided in the geotechnical report indicate that the soil on the site consists of relatively deep glacial outwash, an infiltrative soil type, with consistent groundwater levels that are sufficiently low. However, borings were not conducted at the proposed bioswale floor location. The Applicant should provide high groundwater testing at the proposed location of the bioswale.

    CEC Response (09/16/2025): While borings conducted onsite did not indicate high groundwater, we will verify required separation to groundwater through testing within the proposed bioswale footprint prior to applying for building permit.

    Stormwater test pits are in the process of being scheduled to verify the required offset to groundwater from proposed stormwater features.

    Nitsch Response (09/24/2025): Test pits should be required as a condition of any approval, prior to issuance of a building permit.

13. **974 CMR 4.08(4)(g)** The Applicant shall conduct a falling head soil permeability test in retention/infiltration basins before the basin design in all basins and infiltration structures. Soil with a percolation rate of two (2) minutes per inch or faster can be used to confirm the first Natural Resources Conservation Service (NRCS) Hydrologic Soil Group A with a Texture Class of Sand and an infiltration rate of 8.27 Inches per hour from the Rawls, et.al. table in the SMS. To use infiltration rates faster than 8.27 inches per hour, use 50% of the infiltration rate obtained from the falling head soil permeability test. See Comment 12; the Applicant should review and address this requirement.

    CEC Response (09/16/2025): The modeled infiltration rate will be updated upon results of infiltration testing to verify intended functionality prior to applying for building permit.

    Infiltration testing within the footprint of the proposed bioswale to verify the design infiltration rate is in the process of being scheduled. Per the provided HydroCAD report, an infiltration rate of 2.41 inches per hour was assumed based on the results of the borings performed onsite.

    Nitsch Response (09/24/2025): Falling head soil permeability tests should be required as a condition of any approval, prior to issuance of a building permit.

14. **974 CMR 4.08(4)(i)** Include fencing and/or screening of stormwater detention/retention basins if the DEC determines that safety or appearance require such measures. While we believe that the proposed bioswale does not require fencing and/or screening for safety or appearance measures, we defer to DEC on the acceptable level of compliance.

    CEC Response (09/16/2025): The proposed bioswale is two (2) feet in effective depth, less than the Massachusetts Stormwater Handbook requirement for fencing.

    Nitsch Response (09/24/2025): Nitsch does not take exception to this approach, and DEC Staff are in agreement. Comment closed.

15. **974 CMR 4.08(5)(b)** mandates that **porous asphalt** may be used where the underlying soils have a permeability of at least 0.3 inches per hour but shall not be used on high-traffic/high speed areas or on stormwater "hotspots" with high pollutant loads. Permeable paving shall meet the SMS specifications (or alternatives approved by the DEC), in addition to the following:
    1. Lined on the sides with a non-woven geotextile fabric to prevent influx of fines (no liner on bottom).
    2. A gravel trench surrounding the edge of the pavement connecting to the stone reservoir below the surface of the pavement may be required as a backup in the event of surface clogs.
    3. Installed by a qualified contractor with experience in permeable paving installation.
    4. Specification layer depths required by the SMS may be increased based on volume storage requirements.

    The Applicant should confirm that porous asphalt systems have been designed with a geotextile fabric liner on the sides of the system and provide clarification on the porous asphalt detail.

    CEC Response (09/16/2025): Detail for pervious pavement provided on Sheet C800 has been updated to include a note requiring non-woven geotextile fabric lining the sides of the proposed pervious pavement areas.

    Nitsch Response (09/24/2025): The Applicant has updated the porous pavement detail provided on Sheet C800; comment closed.

16. **974 CMR 4.08(6)(b)** requires Closed Drainage Systems (CDS) and swales shall be designed to accommodate the 25-year storm event based on the Rational Method without surcharging. The CDS shall be designed in accordance with the SMS. Intensity/duration/frequency curves for the Worcester area, as presented in Technical Paper 40 of the National Weather Service and the *Massachusetts Hydrology Handbook for Conservation Commissioners*, March 2002, as amended, shall be used in the drainage design calculations. The minimum time of concentration shall be five minutes. The Applicant should identify the pipe sizes and slopes of the roof drains on Sheet C301 and provide confirmation that this requirement is met.

    CEC Response (09/16/2025): Closed drainage pipe systems previously proposed have been eliminated.

    Nitsch Response (09/24/2025): Due to the removal of the closed drainage pipe system, this comment is void; comment closed.

17. **974 CMR 4.08(6)(f)** requires flow capacities shall be calculated, using 2 feet per second (fps) minimum velocity and 10 fps maximum velocity under a 2-to-25-year design storm event. The designer shall account for partial pipe flow capacities, if applicable to the design. The Applicant should review and address this requirement.

    CEC Response (09/16/2025): Closed drainage pipe systems previously proposed have been eliminated.

    Nitsch Response (09/24/2025): Due to the removal of the closed drainage pipe system, this comment is void; comment closed.

18. **974 CMR 4.08(1)(e)** requires the Applicants shall submit annual stormwater monitoring and maintenance reports to the DEC addressing inspection and maintenance of the BMPs. The reports shall include:
    1. Descriptions of the condition of the BMPs;
    2. Descriptions of maintenance performed; and
    3. Receipts for maintenance performed.

    For ease of reporting, the DEC and MassDevelopment have created standard annual reporting templates for use by all Applicants. Failure to submit the required annual report is a violation of the Unified Permit. The Applicant should include a statement confirming compliance with this requirement in the Operations and Maintenance Plan.

    CEC Response (09/16/2025): The recordkeeping section of the project Operations and Maintenance Plan has been revised to include the requirement to submit the stated annual reporting in the required format.

    Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

STORMWATER DESIGN AND CALCULATIONS

19. The peak runoff rates in Table 3.3 of the Stormwater Report are shown as 0.60, 2.23, and 5.29 cubic feet per second (cfs) for the 10-, 25-, and 100-year storms, respectively. However, the HydroCAD model indicates that the outflows at DP-1 are 0.61, 2.42, and 5.88 cfs, respectively. The Applicant should address these discrepancies.

    CEC Response (09/16/2025): The design storm rainfall events have been revised to be consistent between the provided HydroCAD reports and Stormwater Report narrative. The design storm precipitation frequency estimates have been sourced from NOAA and are included in Appendix C.

    Nitsch Response (09/24/2025): The Applicant has addressed this discrepancy; comment closed.

20. The general approach of collecting the roof runoff and directing it to the swale is an acceptable standard approach. However, to reduce concentrated flows at discharge points along the swale, the Applicant could consider discharging the roof runoff to a splash block, allowing runoff to flow overland to the swale.

    CEC Response (09/16/2025): Closed drainage pipe systems previously proposed have been eliminated in favor of discharging roof runoff to a splash block and allowing runoff to flow overland.

    Nitsch Response (09/24/2025): Due to the removal of the closed drainage pipe system, this comment is void; comment closed.

21. The Applicant should confirm constructability of the roof drain system and provide the pipe size and slope of the roof drains on sheet C301.

    CEC Response (09/16/2025): Closed drainage pipe systems previously proposed have been eliminated.

Nitsch Response (09/24/2025): Due to the removal of the closed drainage pipe system, this comment is void; comment closed.

22. The Applicant should provide additional information on the intent of the grading within the landscaped islands adjacent to the porous asphalt driveways to confirm constructability.

CEC Response (09/16/2025): The proposed contours within identified landscape islands have been revised to add clarity.

Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

23. As currently designed, the overflow spillway is extremely flat and appears to be difficult to construct. Based on the configuration of the proposed overflow spillway, the Applicant should confirm that this will sufficiently provide backup of the system in case of failure.

CEC Response (09/16/2025): The primary outlet of the proposed bioswale is a weir provided at elevation 150.68, with an emergency spillway at elevation 152.00 in the event of a failure. The grading on the outlet side of the spillway provides a proposed slope of 1.2% away from the bioswale, generating positive drainage away from the bioswale.

Nitsch Response (09/24/2025): Given the relatively limited topographic relief and flat conditions at the site, Nitsch agrees with this approach. Comment closed.

24. Per Massachusetts Department of Environmental Protection (MassDEP) guidance, porous pavement systems should be designed with gentle slopes of 5.00% or less. Due to the proposed 5.50-6.25% pitch on the driveways, the Applicant should confirm that there is no concern that water will extrude bottom of the system due to slope.

CEC Response (09/16/2025): Proposed grading within the driveways has been revised to keep slopes less than 5%. The current slopes within the proposed driveway areas now range from 1.0-4.6%.

Nitsch Response (09/24/2025): The Applicant has addressed this comment; comment closed.

CONFORMANCE WITH THE MASSDEP STORMWATER STANDARDS

In accordance with **974 CMR 4.08(2)(a),** Nitsch reviewed the stormwater design and calculations for general conformance with the MassDEP Stormwater Standards. Based on this review, Nitsch offers the following comments:

25. **Standard 4** requires that stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

    a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
    b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
    c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

    The site has highly infiltrative soils, using a rate of 2.41 inches per hour, thus requiring 44% TSS removal during pretreatment prior to infiltration. Nitsch believes that the roof runoff is relatively clean

per the Stormwater Report, therefore the bioswale does not need to provide pretreatment. However, as currently designed, pretreatment is not provided for the porous asphalt driveways, which will manage runoff from vehicles. The Applicant should review and address this requirement.

CEC Response (09/16/2025): Porous pavement is a recognized BMP by the US EPA Region 1. Provided in Appendix C of the project Stormwater Report is the BMP Performance Curve for Porous Pavement identifying 90% TSS treatment with 12-inches of Filter Course. As porous pavement is designed to infiltrate stormwater that comes into contact with it, no additional pre-treatment can reasonably be provided beyond the 90% TSS treatment provided.

Nitsch Response (09/24/2025): Given the constraints at the site, Nitsch does not take exception to this approach. Comment closed.

If the Commission has any questions, please call.

Very truly yours,

Nitsch Engineering, Inc.

Kathryn Piasecki, EIT, AICP
Planner

Approved by:

Sandra Brock, PE, LEED AP BD+C
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KEP/SAB/pfv

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