Staff Report

Devens Enterprise Commission

Date: March 4, 2026

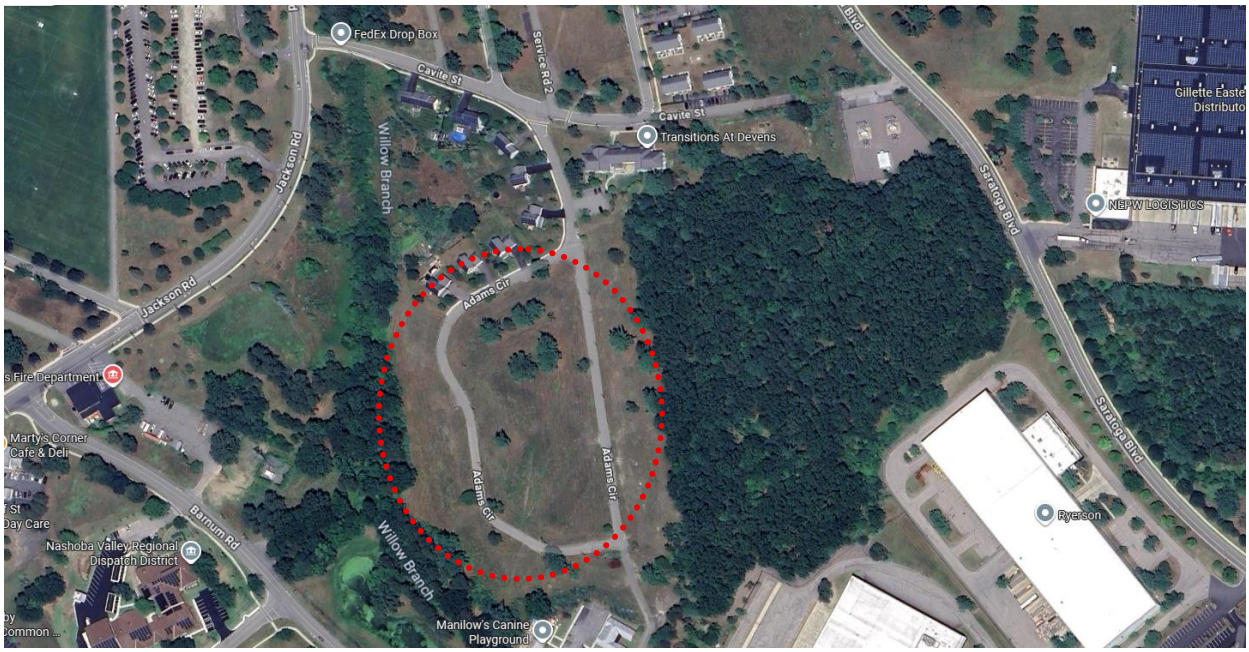
To: **Devens Enterprise Commission**

From: Neil Angus, Director

RE: **Adams Circle Reconstruction and Infrastructure Upgrades**

Owner: MassDevelopment
Applicant: MassDevelopment/Devens Engineering/VHB, Inc.
Location: 100 Adams Circle, Devens, MA (Road & Parcels A – 26-10-100, B – 26-10-109 and C 26-10-110)
Zoning: Residential II, Aquifer Water Resources Protection Overlay District.

1. **Proposed Project:** Devens Engineering is seeking a Wetland Request for Determination of Applicability in order to reconstruct a stormwater management system around Adams Circle (existing residential street) that will involve work within 100 feet of Willow Brook. The work also includes infrastructure improvements adjacent to the existing road such as pervious parking bays, pervious sidewalks, grass buffer strips, street trees, and lighting.



This area is a former military housing neighborhood that contained townhomes and parking. The site was previously contaminated by past army activities and has been cleaned up to unrestricted (residential) standards. The majority of proposed improvements are located outside of wetland resource area buffer zones for Willow Brook, however the Project does propose to construct a new stormwater detention basin within a portion of the 100-foot Buffer Zone. The previous eight (8) lots on Adams Circle

Wetland Resource Areas:
While the only portion of the project that is within 100 feet of wetlands is the construction of the new infiltration basin, runoff from all the proposed improvements drains to this area and therefore has the potential to impact the quality of stormwater that reaches this wetland resource area. Therefore, staff and the DEC's peer review engineering consultants have reviewed the entire project for compliance with 974 CMR 4.06 and 4.08 (Wetland protection and Stormwater Management).

Drainage Design:
The drainage design includes a decentralized system to meet the DEC's Low-Impact Development requirements. There are currently 37 existing catch basins around Adams Circle that will be removed and replaced with 15 new deep sump, hooded catch basins, an infiltration swale, rain garden, and stormwater wetland. The recently approved Reframe 12-lot subdivision will be handling all of their drainage on-site through an infiltration swale and porous pavement driveways. The proposed street redevelopment includes two 10-foot travel lanes (22 feet width total), along with porous pavement sidewalks to help reduce the amount of impervious area. Instead of one large detention basin, the new drainage design includes a rain garden at the corner of Adams and Adams, and an infiltration swale and constructed stormwater wetland that will provide improved stormwater treatment as well as decentralized infiltration, promoting more groundwater recharge and reducing the potential impacts from more frequent and intense storms.

The originally designed constructed stormwater wetland had a fairly deep depth to intercept groundwater and provide additional stormwater filtration through the aquatic plants and soils. The DEC's peer review engineers recommended replacing the sediment forebay with a new water quality unit for pre-treatment which would allow the Applicant to raise the elevation of the system 1-2 feet and reduce the amount of standing water and ultimately convert it into more of a vegetated basin, reducing safety risks. With the relatively sandy soils, the area is well drained. Proper soil mix and proper plant selection will further reduce the potential for any standing water. Plant establishment and invasive species control will be critical items to ensure proper functioning of this system. Similar to the reconstruction of the Willow Brook corridor, a three-year invasive species monitoring and management plan should be in place to ensure proper establishment of vegetation in this constructed stormwater wetland system.

The DEC's peer review engineers had a few additional review comments that should be addressed in the final plans prior to construction (see attached). Staff has added a condition to require these changes. All the proposed improvements will bring this stormwater management system into compliance with the EPA's National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit for Devens, addressing both total suspended solids, as well as phosphorus removal.

Street Standards:
While this is an existing street, the proposed improvements offer opportunity to bring it up to standard with a number of the DEC Street Standards in 974 CMR 2.07:

a) Street trees should be included a minimum of every 50 feet where feasible. These are required for all public streets and help absorb more runoff, extend the life of the pavement (shading), and improve public safety by proving a buffer between vehicles and pedestrians, while also acting as a traffic calming mechanism – slowing down drivers by creating a sense of enclosure vs. a wide open, unobstructed street. This is particularly important given the layout of Adams Circle with fairly long straightaways.
b) The Applicant is proposing bituminous asphalt curbing. 974 CMR 2.07 requires the use of concrete curbing in residential areas. The existing roadway has sloped granite curbing. This material is much more durable and should be reused where feasible in appropriate sections of the roadway. It is understood that future development around Adams Circle is uncertain so if this curbing is temporary, the Applicant should indicate so. Curbing can also be eliminated where it is not necessary.
c) Street Lighting should be provided and complaint with 974 CMR 3.04 (recessed bulbs, down-lit and a color temperature of no greater than 3000K). 2700K would blend better with the existing historic district lighting nearby.
d) Street name signage and stop sign should be placed at the corner of Adams and Adams. A stop bar should also be painted at this intersection (northwest corner), as well as a crosswalk connecting the existing and proposed sidewalks.

Public Safety:
New waterlines will be installed around Adams Circle that will connect to new fire hydrants for emergency services for bot the recently approved Reframe subdivision and any other future development. Due to the relatively steep slopes and potential for standing water, the Applicant has included fencing around the constructed stormwater wetland. With the close proximity to existing residents, dust control and general good housekeeping will be important for this project to reduce the potential for nuisance conditions. Stop signs,

crosswalk and pavement markings have also been included to help ensure safe vehicle and pedestrian movements

2. **Application and Process:** MassDevelopment/Devens Engineering submitted a Level I Permit application package, including the application, Request for Determination of Applicability, project Description and Plans on February 25, 2026. The DEC Director and Peer Review Engineers have reviewed the submittal rendered a preliminary negative determination. In accordance with 974 CMR 4.06(6)(c), any determination by the Director is valid only upon ratification by the DEC at a public meeting. As required under the Wetland Protection Act, the DEC published a legal notice in the Nashoba Valley Voice on February 26, 2026 to alert the public of this application and preliminary determination.

3. **Recommended Action:** Staff have reviewed the proposed project and associated activities with the Applicant and Peer Review Engineers, and made a preliminary decision to issue a negative wetland determination of applicability, subject to a number of conditions that will ensure there are no direct or indirect impacts to wetlands or public safety:

   (1) Prior to commencement of construction, a preconstruction meeting shall be held with MassDevelopment, the selected contractor(s) and DEC staff. The Applicant shall also provide public notice and emergency contact info. to all residents on Adams and Cavite Streets (including Transitions).

   (2) Limits of clearing and erosion controls shall be marked in the field and inspected by DEC Staff. The Applicant shall make every effort to preserve all trees 12" cal or greater.

   (3) Fencing around the constructed stormwater wetland shall be a minimum of 4 feet in height and black vinyl chain link, with adequate access gate for maintenance. Such fencing shall be maintained by MassDevelopment/Devens DPW at all times.

   (4) The Applicant shall prepare and implement a three-year invasive species monitoring and management plan for the constructed stormwater wetland system. Annual reports shall be provided to the DEC.

   (5) The Applicant shall address all outstanding peer review comments in the February 19, 2026 peer review letter from Nitsch Engineering and submit updated plans, HydroCAD report, and supporting information.

   (6) MassDevelopment has agreed in writing to maintain Adams Circle as a public way and these stormwater management system improvements shall be maintained by MassDevelopment/Devens Public Works and will treat all runoff from Adams Circle prior to discharging to Willow Brook in compliance with NPDES MS4 permit for Devens.

   (7) To ensure compliance with the DEC Street Standards, Stormwater Management, and Public Safety, the Applicant shall undertake the following measures:

      (a) Street trees Street trees shall be included a minimum of every 50 feet along both sides of the road where feasible.

      (b) Street lighting no greater than 3000K (2700K ideal).

      (c) Street name signage and stop sign shall be placed at the corner of Adams and Adams. A stop bar shall also be painted at this intersection (northwest corner), along with a crosswalk to connect existing and proposed sidewalks. Pedestrian crossing signage shall also be included.

      (d) Sloped granite curbing shall be reused where feasible in appropriate sections of the roadway. Curbing may be eliminated where it is not necessary and bituminous curbing may be used for any temporary curbing needs.

   If the Commission is in agreement, a motion should be made as follows:

   "In accordance with 974 CMR 4.06(6)(c), the Commission hereby ratifies the Director's decision to issue a Negative Determination of Applicability for the above-referenced project subject to the six (6) conditions listed in the 3/4/26 staff Report."

Attachments:

- Street Improvement Plans
- Nitsch Peer Review Comments

CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 7

NAD 83

N

PARCEL A
155,856± S.F
3.578± AC.

ADAMS CIRCLE

ADAMS CIRCLE ℄

EXISTING 25' UTILITY EASEMENT

PROP MILL & OVERLAY

REM EXIST PAVEMENT
PROP LOAM & SEED

PROP EDGE OF PAVEMENT (TYP)

PROP RAIN GARDEN 2
SEE SHEET 39 FOR DETAILS

PROP TREE PROTECTION

PROP FULL DEPTH
PAVEMENT RECLAMATION

PROP FULL DEPTH
PAVEMENT WIDENING

EXISTING TOWN LAYOUT

PROP LOAM FOR
ROADSIDES & SEED
(TYP)

PROP LIGHT
POLE (TYP)

PROP HMA BERM
TYPE A-MODIFIED

PROP EDGE OF PAVEMENT
(TYP)

APPROXIMATE LIMIT OF
GRADING (TYP)

REM EXIST PAVEMENT
PROP LOAM FOR
ROADSIDES & SEED

END
PROP
BERM

PROP
R1-1

REM SGC

PT +70.43

31+54.83

PROP HMA BERM
TYPE A-MODIFIED

PROJECT END
STA 31+35.73
N3022943.2584
E627862.7015

LIMIT OF MILL & OVERLAY

MEET EXIST
WALK

PROP FULL DEPTH
PAVEMENT RECLAMATION

PROP CEM CONC PCR (TYP)

PROP 5'x5' CEM CONC WALK
PANEL BOTH SIDES

MEET EXIST
WALK

PROJECT BEGIN
STA 11+93.75
N3023018.1311
E627867.0577

8' CW

R&R

10+00

PROP GRASS BUFFER
WIDTH VARIES 5'-8.5'

PROP HMA DRIVEWAY

PROP HMA DRIVEWAY

PROP LOAM FOR
LAWNS AND SEED

PROP 2' GRANITE
CURB CORNER (TYP)

EXISTING TOWN
LAYOUT

PROP HMA DRIVEWAY

PROP LOAM FOR
ROADSIDES & SEED

PROP 5' PERVIOUS
CEM CONC SIDEWALK (TYP)

APPROXIMATE LIMIT OF GRADING (TYP)

BEGIN HMA BERM
PROP GRASS BUFFER
WIDTH VARIES 5'-8.5'

R&R GRAN
EDGING

PROP CEM CONC
PCR (TYP)

EXISTING UTILTY
EASEMENT

26-10-103
NOW OR FORMERLY
MESFIN B. DEMISSIE
ILINA T. HAILEMARIAM
97 ADAMS CIRCLE
WCRD BOOK 49073
PAGE 349
(LOT 3)
PLAN BK 888
PLAN 59 OF 2011

26-10-104
NOW OR FORMERLY
SURYA &
POORNAMACHARY SENTHIL
14 ADAMS CIRCLE
WCRD BOOK 49920
PAGE 333
(LOT 4)
PLAN BK 888
PLAN 59 OF 2011

26-10-105
NOW OR FORMERLY
HAIBO & JIE LUO MAO
8 ADAMS CIRCLE
WCRD BOOK 50682
PAGE 257
(LOT 5)
PLAN BK 888
PLAN 59 OF 2011

26-10-106
NOW OR FORMERLY
DANIEL MCGAHN
2 ADAMS CIRCLE
WCRD BOOK 49668
PAGE 377
(LOT 6)
PLAN BK 888
PLAN 59 OF 2011

26-99-1601
NOW OR FORMERLY
MDFA
18 CAVITE STREET
MSRD BOOK 26137 PAGE 3
PLAN 411 OF 1996
WCRD BOOK 17907 PAGE 1
PLAN BK 703
PLAN 112 OF 1996
PLAN BK 872
PLAN 102 OF 2009
(LOT BV-1)

CAVITE STREET

LOT 11
15,380± S.F
0.353± AC.

LOT 10
15,380± S.F
0.353± AC.

LOT 9
15,380± S.F
0.353± AC.

SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	COLOR			UNIT AREA (S.F.)
	WIDTH	HEIGHT		BACK-GROUND	LEGEND	BORDER	
R1-1	30"	30"	STOP	RED	WHITE	WHITE	6.25

NOTES:
1. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED, AND MASSDOT SIGN BOOK FOR TEXT DIMENSIONS

0 20 50 100
SCALE: 1" = 20'

FOR PROFILES:
SEE SHEETS 11 TO 12

15812.15_HD(GEN).DWG Plotted on 12-Feb-2026 2:51 PM

CONTINUED ON SHEET NO. 8

NAD 83

N

DEVENS
ADAMS CIRCLE
CONSTRUCTION PLANS
SHEET 7 OF 39

PARCEL A
155,856± S.F
3.578± AC.

APPROXIMATE LIMIT OF GRADING (TYP)

EXISTING TOWN LAYOUT

PT +77.05

PROP FULL DEPTH PAVEMENT RECLAMATION

ADAMS CIRCLE

PC +97.77

PROP LOAM FOR ROADSIDES AND SEED

PROP HMA BERM TYPE A-MODIFIED

REM EXIST HMA PAVEMENT
PROP LOAM FOR ROADSIDES & SEED

PROP HMA BERM TYPE A-MODIFIED

ADAMS CIRCLE BL CONST ℄ STA 19+76.78 =
BARNUM RD CONNECTION BL CONST ℄ STA 100+00.00

PROP TREE PROTECTION

REM 24" TREE

PROP PCR (TYP)

END PROP 5' WALK

PT +08.24

REM TREE

PI +76.78

100+00

PROP EDGE OF PAVEMENT (TYP)

APPROXIMATE LIMIT OF GRADING (TYP)

PROP LOAM FOR ROADSIDES & SEED (TYP)

PROP HMA BERM TYPE A-MODIFIED

ADAMS CIRCLE ℄

PROP HMA BERM TYPE A-MODIFIED

PROP 5' PERVIOUS CEM CONC SIDEWALK (TYP)

PROP LOAM FOR ROADSIDES & SEED

PROP TREE PROTECTION

PROP FULL DEPTH PAVEMENT RECLAMATION

PROP FULL DEPTH PAVEMENT WIDENING

ADAMS CIRCLE

EXISTING TOWN LAYOUT

RET

PROP GRASS BUFFER WIDTH VARIES 5'-8.5'

PROP 2' GRANITE CURB CORNER (TYP)

PC +95.89

PROP 6' GRAVEL PATH

PROP TREE PROTECTION

PI +18.85

APPROXIMATE LIMIT OF GRADING (TYP)

PROP HMA DRIVEWAY

PROP HMA DRIVEWAY

PROP LIGHT POLE (TYP)

PROP HMA DRIVEWAY

PROP HMA DRIVEWAY

PROP HMA DRIVEWAY

PROP LOAM FOR LAWNS AND SEED

TP #1

LOT 14
15,388± S.F
0.353± AC.

LOT 13
15,380± S.F
0.353± AC.

LOT 12
15,380± S.F
0.353± AC.

LOT 11
15,380± S.F
0.353± AC.

LOT 10
15,380± S.F
0.353± AC.

FOR PROFILES:
SEE SHEETS 11 TO 12

0 20 50 100
SCALE: 1" = 20'

CONTINUED ON SHEET NO. 10

CONTINUED ON SHEET NO. 6

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DEVENS
ADAMS CIRCLE
CONSTRUCTION PLANS
SHEET 8 OF 39

15812.15_HD(GEN).DWG Plotted on 12-Feb-2026 2:52 PM

NAD 83

MHW–135
MHW–136
MHW–137
MHW–138
MHW–139
MHW–140
MHW–141
MHW–142
MHW–143
MHW–144

INVERT
INV 36"RCP
ELEV. 242.20'

PARCEL B
188,011± S.F
4.316± AC.

WOODED
GRASS
48"OAK

LIMIT OF 100' BUFFER

ADAMS CIRCLE

PROP LOAM FOR ROADSIDES & SEED (TYP)
PROP EDGE OF PAVEMENT (TYP)
PROP HMA BERM TYPE A-MODIFIED
PROP FULL DEPTH PAVEMENT RECLAMATION
PROP FULL DEPTH PAVEMENT WIDENING
REM EXIST HMA PAVEMENT PROP LOAM FOR ROADSIDES & SEED
APPROXIMATE LIMIT OF GRADING (TYP)

EXISTING TOWN LAYOUT
REM BC
PT +59.39
24
ADAMS CIRCLE 8
25
REM SGC
REM BC
26
PT +89.35
PC +60.66
PC +47.11
PC +75.18
23
REM EXIST PVMNT PROP LOAM FOR ROADSIDE & SEED
PROP HMA BERM TYPE A-MODIFIED
PROP LOAM FOR ROADSIDES & SEED (TYP)
PROP EDGE OF PAVEMENT (TYP)
REM EXIST PVMNT PROP LOAM FOR ROADSIDE & SEED
APPROXIMATE LIMIT OF GRADING (TYP)
PROP RAIN GARDEN SEE SHEET 39 FOR DETAILS
BREAK HMA BERM FOR STORMWATER ACCESS
APPROXIMATE LIMIT OF GRADING (TYP)
PT +77.05
22
EXISTING TOWN LAYOUT
APPROXIMATE LIMIT OF GRADING (TYP)
PROP EDGE OF PAVEMENT (TYP)
PC +97.77
21
PROP FULL DEPTH PAVEMENT WIDENING
PROP FULL DEPTH PAVEMENT RECLAMATION
PROP EDGE OF PAVEMENT (TYP)

CABLE LINE (R)

PARCEL A
155,856± S.F
3.578± AC.

0 20 50 100
SCALE: 1" = 20'

FOR PROFILES:
SEE SHEETS 11 TO 12

CONTINUED ON SHEET NO. 9

CONTINUED ON SHEET NO. 7

DEVENS
ADAMS CIRCLE
CONSTRUCTION PLANS
SHEET 9 OF 39

15812.15_HD(GEN).DWG Plotted on 12-Feb-2026 2:53 PM

MHW–126 MHW–125 MHW–124 MHW–123 MHW–122 MHW–121 MHW–120 MHW–119 MHW–118 MHW–117 MHW–116 MHW–115 MHW–114 MHW–113 MHW1–112 MHW1–111 MHW1–110 MHW1–109 MHW1–108 MHW1–107 MHW1–106 MHW1–105 MHW1–104 MHW1–103 MHW1–102 MHW1–101 MHW1–100

WILLOW BRANCH

INVERT
INV. 18IN"RCP
ELEV: 242.17'

NAD 83

N

WOODED

PROP EROSION CONTROL (TYP)

TP#5 TP#3 TP#4 TP#2

PROP CONSTRUCTED STORMWATER WETLAND SEE SHEET 38 FOR DETAILS

PROP 6' BLACK VINYL CHAIN LINK FENCE (TYP)

APPROXIMATE LIMIT OF GRADING (TYP)

WETLAND MAINTENANCE ACCESS GATE

LIMIT OF 100' BUFFER

GRASS

REM EXIST FENCE & LANDSCAPING AREA

END HMA BERM; MATCH EXIST SGC

ADAMS CIRCLE

REM EXIST HMA PAVEMENT PROP LOAM FOR ROADSIDES & SEED

PROP EDGE OF PAVEMENT (TYP)

PROP FULL DEPTH PAVEMENT RECLAMATION

PROP FULL DEPTH PAVEMENT WIDENING

EXISTING TOWN LAYOUT

PC +60.66

PC +47.11

PT +89.35

ADAMS CIRCLE ℄

PROP FULL DEPTH PAVEMENT WIDENING

PROP FULL DEPTH PAVEMENT RECLAMATION

BREAK HMA BERM FOR STORMWATER ACCESS

PROP STABILIZED TURF MAT

LIMIT OF FULL DEPTH RECLAMATION STA 28+08

PROP MILL & OVERLAY

PROP LOAM FOR ROADSIDES & SEED (TYP)

APPROXIMATE LIMIT OF GRADING (TYP)

PROP EDGE OF PAVEMENT (TYP)

PROP RAIN GARDEN 1 SEE SHEET 39 FOR DETAILS

PROP HMA BERM TYPE A-MODIFIED

PROP STABILIZED TURF MAT

PROP TREE PROTECTION RET TREE

PT +70.83

26–10–101
NOW OR FORMERLY
DAVID M. AND KEIKO DION
89 ADAMS CIRCLE
WCRD BOOK 50503
PAGE 156
(LOT 1)
PLAN BK 888
PLAN 59 OF 2011

26–10–102
NOW OR FORMERLY
FRANK TETSUNG LIN CHI HSU YU
93 ADAMS CIRCLE
WCRD BOOK 48058
PAGE 308
(LOT 2)
PLAN BK 888
PLAN 59 OF 2011

26–10–103
NOW OR FORMERLY
MESFIN B. DEMISSIE HILINA T. HAILEMARIAM
97 ADAMS CIRCLE
WCRD BOOK 49073
PAGE 349
(LOT 3)
PLAN BK 888
PLAN 59 OF 2011

26–10–10
NOW OR FORM
SURYA &
POORNAMACHARY
14 ADAMS CIR
WCRD BOOK 4
PAGE 333
(LOT 4)
PLAN BK 88
PLAN 59 OF

PARCEL A
155,856± S.F
3.578± AC.

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE:
SEE SHEET 12

CONTINUED ON SHEET NO. 8

CONTINUED ON SHEET NO. 6

Nitsch Engineering

2 Center Plaza, Suite 430
Boston, MA 02108-1928
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F: 617-338-6472
www.nitscheng.com

February 19, 2026

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

RE: Nitsch Project #9419
Adams Circle
Roadway Reconstruction & Utility Improvements
Stormwater Review
Devens, MA

Dear Neil Angus:

Nitsch Engineering (Nitsch) received and reviewed the Site Plans entitled “Adams Circle Roadway Reconstruction & Utility Improvements” (the Plans), dated February 2026, prepared by Vanasse Hangen Brustlin, Inc. (VHB). In addition, Nitsch has received and reviewed the following documents:

1. Stormwater Report, prepared by VHB, dated February 2026.

Nitsch is providing comments with respect to Stormwater Management in this letter.

PROJECT UNDERSTANDING

The Project Site consists of the existing Adams Circle loop and the adjacent interior parcel, totaling approximately 6.66 acres within the Residential II Zoning District. The existing loop road contains some utility infrastructure, and the interior parcel is a grass pasture with some trees and generally flat topography. Existing stormwater runoff from the Site drains to Willow Branch, a perennial stream located west of the Site that ultimately drains to the Nashua River. MassDevelopment (the Applicant) is proposing a full depth reclamation of Adams Circle with 11-foot width travel lanes, as well as utility replacements, porous pavement sidewalks, a constructed stormwater wetland, and a rain garden. The proposed Project is being designed to support both existing and future residential growth in the area. This Review of the proposed stormwater system is exclusive to the Adams Circle right-of-way and did not consider any future development at the Site.

Based on Nitsch’s review of the submitted documents and the above-referenced regulations, we offer the following comments for consideration:

DEC STORMWATER DESIGN STANDARDS

1. **974 CMR 3.04(4)(a)(3)** decrees that Low Impact Development (LID) Stormwater Management design shall be incorporated into the site plan to allow for the full utilization of the property while maintaining the pre-development characteristics of the site as though it were a "green field" (volume, frequency, peak runoff rate) to the maximum extent feasible. Maximizing the use of pervious areas minimizes stormwater runoff from a site, improves stormwater quality, and increases groundwater recharge. Maintenance of these on-site stormwater management systems must be incorporated into facility operations and is the responsibility of the landowner.

   While Nitsch agrees with the approach to construct the driveway apron immediately adjacent to the roadway with standard hot mix asphalt (HMA), the Applicant should provide additional justification for interrupting the porous pavement sidewalk with HMA driveways, as both the sidewalks (proposed under this Project) and the proposed duplex driveways (proposed under a separate Project) will utilize porous pavement. The Applicant could consider constructing the proposed driveway entrance along the sidewalk extents with porous pavement to further decentralize infiltration on site and maintain consistency of pavement materials.

2. **974 CMR 3.04(4)(c)** requires that the applicant shall include a Stormwater Operations and Maintenance Plan in accordance with 974 CMR 4.08(7) as may be applicable. The Site Plan shall specify the construction and post development Maintenance Schedule in detail on the Utility Plan. This will ensure that all parties understand and are aware that a Stormwater Operations and Maintenance Plan exists. The Applicant should review and address this standard by providing a note on Sheet 2.

3. **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.

   Nitsch notes that there is a minor increase in rate and volume (0.05 cubic feet per second [cfs] and 0.103 acre feet [af], respectively) for the 2-year storm when comparing the proposed condition to the existing condition. However, based on Nitsch's review of the HydroCAD model, this increase is negligible and is within the tolerance of the model.

4. **974 CMR 4.08(3)(i)** requires stormwater management systems shall 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.

   Nitsch offers the following comments related to pollutant removal:

   a. The impervious catchment areas for the porous pavement systems listed in the pollutant removal calculations included in Appendix C do not match the subcatchment areas from the Stormwater Report.
   b. The BMP storage design volume for the porous pavement systems in the pollutant removal calculations should be revised to reflect the available storage with 40% voids.
   c. It appears that the runoff depth is based on the depth of filter course within the porous pavement section (see excerpt from MS4 Draft General Permit Appendix F Attachment 3 below). The Applicant should review pollutant removal calculations and address these discrepancies to confirm compliance with this standard.

MA Draft MS4 General Permit Page F3-63

Table 3- 24 Porous Pavement SCM Performance Table

Porous Pavement SCM Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction				
SCM Capacity: Depth of Filter Course Area (inches)	12.0	18.0	24.0	32.0
Cumulative Phosphorus Load Reduction	62%	70%	75%	78%
Cumulative Nitrogen Load Reduction	76%	77%	77%	79%

5. **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 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; or
   - Retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface on the development site, or
   - 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 USGS HUC12 as the development site.

   In line with Massachusetts Department of Environmental Protection (MassDEP) guidance, retainage volume should be calculated as the volume below the lowest outlet within a system. While we believe this standard is being met, the Applicant should revise the Water Quality Volume Calculations provided in Appendix D of the Stormwater Report to indicate the storage volume below the lowest outlet or provide storage tables from the HydroCAD model.

6. **974 CMR 4.08(4)(a)** 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 is a constructed stormwater wetland, it may exceed 5,000 square feet upon approval by the Devens Enterprise Commission (DEC). Constructed stormwater wetlands shall be designed in compliance with the SMS.

   Nitsch notes that the proposed Constructed Wetland is approximately 10,271 square feet (sf). Per the HydroCAD model, the Constructed Wetland provides approximately 3 feet of freeboard in the 100-year storm event. Given the high infiltrative capacity of soils on site and the depth of proposed freeboard, the Applicant should provide additional information to justify the size of the system.

7. **974 CMR 4.08(4)(g)** The design of stormwater and infiltration basins and associated structures 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 2 minutes per inch or faster can be used to confirm the first 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. The Plans and Report do not indicate that permeability testing was performed. The test pits indicate loamy sand with gravel/cobbles, and the HydroCad model indicates an infiltration rate of 5.67 inches per hour was used. The MassDEP Stormwater Handbook classifies loamy sand with a Rawls Rate of 2.41 inches per hour. The Applicant should provide additional information to justify the use of this infiltration rate.

   Additionally, it appears permeability tests were not conducted within the proposed rain garden locations.

8. **974 CMR 4.08(5)(b)** mandates porous pavement 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:
   - Lined on the sides with a non-woven geotextile fabric to prevent influx of fines (no liner on bottom).
   - 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.
   - Installed by a qualified contractor with experience in permeable paving installation.
   - Specification layer depths required by the SMS may be increased based on volume storage requirements.

   The detail on Sheet 31 specifies 3 inches of filter course, whereas the SMS requires 12 inches. The Applicant should review and address this standard.

9. **974 CMR 4.08(6)(c)** requires all drainage structures shall be constructed of pre-cast concrete. While the Catch Basin Detail and Outlet Control Structure appear to be pre-cast, the Applicant should add notes to the applicable details to ensure this requirement is met.

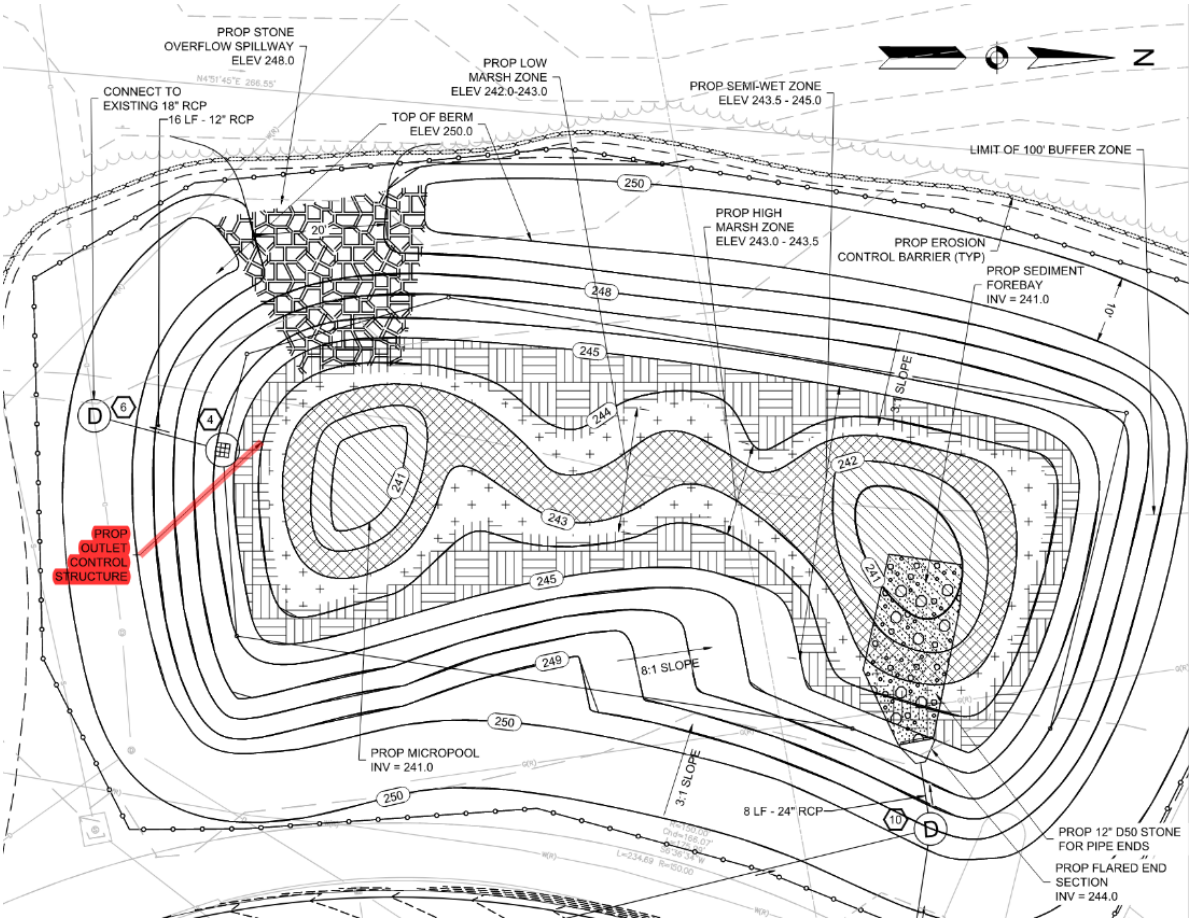
10. **974 CMR 4.08(6)(e)** requires details for all drainage structures shall be provided. It appears details for a Flared End Section and a Clean Out Structure are not provided. Additionally, the Applicant should review the requirement upon any updates to the Drainage Plan.

STORMWATER DESIGN AND CALCULATIONS

11. The Applicant has indicated that the "inner" porous sidewalk will be installed as part of future residential development. Nitsch recommends that approval is conditioned to include a minimum of 8,398 square feet of porous pavement, per the storage included in the Stormwater Report.

12. Nitsch offers the following comments on the HydroCAD modeling of the Constructed Stormwater Wetland:
    a. The Plans indicate that the rim elevation of CB-4 is 244.87 feet, whereas the HydroCAD model indicates that the rim elevation is 246.55 feet. The Applicant should review and address this inconsistency.
    b. The Plans indicate a 12-inch outlet pipe is exiting CB-4, whereas the HydroCAD model indicates an 8-inch outlet pipe. The Applicant should review and address this inconsistency.
    c. Additionally, Based on Nitsch's review, Weir B in the Outlet Control Structure Detail corresponds to Device #5 in the HydroCAD model of the Constructed Wetland. The Outlet Control Structure Detail on Sheet 39 indicates an additional outlet exiting the structure at Orifice A. However, no elevation is provided within the HydroCAD model. The Applicant should clarify the purpose of Orifice A on the detail and why it is not included in the HydroCAD model.

13. The Proposed Outlet Control Structure is incorrectly labeled on the Plan View provided with the Constructed Stormwater Wetland Detail on Sheet 39 (see excerpt from Plan below). The Applicant should address this discrepancy.



14. The Underdrain Detail on Sheet 39 indicates 30± inches of washed stone surrounding the pipe, which is inconsistent with the Constructed Wetland Detail. The Applicant should confirm that the Underdrain Detail is representative of the underdrain within the berm of the Constructed Wetland. Nitsch recommends the Applicant update the Constructed Wetland Detail to provide more information on how the underdrain will function.

15. In Table 2 of the Stormwater Report (Page 7 of Report), neither the Pervious Area nor the Total Area sums to 6.66 acres. The Applicant should revise and address for clarity.

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:

16. **Standard 3** requires that loss of annual recharge to groundwater be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, LID techniques, stormwater BMPs, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

    While we believe this Standard has been met, the summary of recharge calculations provided on Page 12 of the Stormwater Report does not account for void space within the porous pavement sections. The Applicant should review and revise these calculations.

17. **Standard 4** requires 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:

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

    While we believe this Standard is being met, the Applicant should revise pollutant removal calculations to confirm compliance. See Comments 4 and 5 for specific comments on calculations.

18. **Standard 10** requires that all illicit discharges to the stormwater management system are prohibited. Comment closed upon receipt of signed Illicit Discharge Statement to DEC.

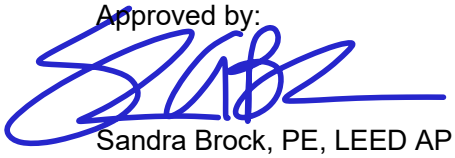
If the Commission has any questions, please call.

Very truly yours,

Nitsch Engineering, Inc.

CP
Planner

Approved by:



Sandra Brock, PE, LEED AP BC+C
Vice President

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