OWNER AUTHORIZATION FOR ENTITY

I, Thomas J. Aspell, (print name), as the duly authorized

City Manager (member, manager, etc.) of the City of Concord, NH (name of entity)

by my signature below, hereby authorize Concord Coach Lines, Inc (name of applicant) to

Submit Zoning Board of Adjustment/Planning Board/Planning Division applications and applicable materials for presentation to Concord Planning Division/Concord Zoning Board of Adjustment/Concord Planning Board for the proposed development at:

Map 6414Z, Lot 92, Unaddressed Storrs Street lot
(address of site)

(Signature)

11/13/2025
(Date)

GALLAGHER CALLAHAN & GARTRELL

ARI B. POLLACK
214 N. Main Street
Concord, NH 03301

Direct Dial: (603) 545-3630
Fax: (603) 228-8396
pollack@gcglaw.com

December 2, 2025

Via Submission Through Permit Portal

Timothy J. Thompson, AICP
Acting City Planner
City of Concord
41 Green Street
Concord, NH 03301

Re: Application No. PL-SPR-2025-0053; Major Site Plan and CUP;
Storrs Street, Concord, NH

Dear Tim:

In connection with the above-referenced and pending Application for Major Site Plan and Conditional Use Permit filed on behalf of Concord Coach Lines, Inc. ("Applicant"), please accept this request for waivers of Site Plan Regulation (SPR) Sections 6.03(2)(c) and 11.05. The waiver is procedural in nature and falls under the general jurisdiction of the Planning Board to excuse its two-step deliberative process for good cause shown and because "the spirit and intent [of the] regulations may be served to a greater extent by an alternative proposal". See SPR Section 36.08.

In this case, good cause exists for waiving the so-called "two-step process" because there are exigent circumstances surrounding the efficiency of the planning review. Hearing the application on the same evening as the determination of completeness may serve to expedite the granting of a conditional approval. Thereafter, working expeditiously to address conditions may result in an expedited solution to parking congestion surrounding the bus and transportation terminal. Simply put, the faster the application is processed, the quicker the parking improvements can be constructed and put into service.

Specifically, the Applicant requests waivers from SPR Sections 6.03(2)(c) and 11.05 such that both a determination of completeness and the commencement of a public hearing may occur at the Board's regular meeting scheduled for December 17, 2025. Relative to SPR Section 36.08(1) through (5), the Applicant states the following:

(1) The granting of the waiver will not be detrimental to the public safety, health or welfare or injurious to other property because the effect of granting the waiver will not excuse elements of Staff or Planning Board review, but rather may result in a shortened timeline to the commencement of construction.

(2) The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not applicable generally to other property because the Applicant is proposing temporary surface parking improvements upon land of the City through a leasehold interest. No permanent structures are proposed as a result of this application. The project is intended to be a short-term fix for the considerable parking congestion now occurring at and around the terminal and during peak travel periods.

(3) Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved, a particular and unnecessary hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out because the Applicant proposes temporary parking improvements for a site adjacent to an existing parking area.

(4) Specific circumstances relative to the site plan or conditions of the land where a site plan is proposed indicate that the waiver will properly carry out, or not be contrary to, spirit and intent of these regulations because the planning regulations are intended to offer a means of straightforward and comprehensive consideration, which can be accommodated in a single meeting and following a public hearing. One purpose behind the site regulations, for example, is "[t]o establish procedures for the review of site plans in order to further the establishment of a harmonious and compatible land use pattern." See SPR Section 3.10.

(5) The waivers will not in any manner vary the provisions of the Zoning Ordinance, Master Plan Reports, or Official Map because the process and procedure for site plan review arises out of the City of Concord's Site Plan Regulations, which are waivable by the Planning Board per SPR Section 36.08.

Thank you for your consideration.

Very truly yours,

Ari B. Pollack, Esq.

Cc: Ben Blunt, Concord Coach Lines, Inc.
Tom D'Aguiar, VHB

PLANNING BOARD CITY OF CONCORD, NH
MAJOR SITE PLAN CHECKLIST

This checklist is intended to assist applicants and design professionals in the preparation of major site plan applications for consideration by the City of Concord Planning Board. The checklist is also intended as an aid to City staff in its review of a subdivision application. Any question about the applicability of any of the items in the checklist to a particular subdivision application should be discussed with a member of the Planning staff at 603-225-8515, before an application is submitted.

The first section lists the plans and documents needed for an application to be complete. The second section lists elements of each of the plans and documents required for an application to be complete. The third section is designed to provide guidance on the items to be completed after conditional Planning Board approval is obtained from the Planning Board.

Summary

Name of Development: Concord Coach Temporary Parking Expansion

Owner's Name(s): City of Concord

Street Address: Storrs Street, Concord, NH 03301 Nearest Street(s): Storrs St, Loudon Rd, Higgins Pl

Map\Block\Lot(s): 6414/Z/92 Map\Block\Lot(s): _____ Map\Block\Lot(s): _____

Zoning District(s): OCP Overlay District(s): N/A

Municipal Water Supply Available: Yes N/A No____ Municipal Sanitary Sewer Available: Yes N/A No_____

Lot Frontage: Storrs St - 367', Higgins Pl - 84', Loudon Rd - 131' Lot Frontage Required: 150'

Lot Size 4.04 Acres Minimum Lot Size Required: N/A

Building Setbacks Required: Front 15' Back 15' Side 15' Shoreland N/A

Building Setbacks Proposed: Front N/A Back N/A Side N/A Shoreland N/A

Part 1: The following documents and plans are needed for an application to be determined complete by the Planning Board.

Documents

X An application either signed by all the current owner(s) of the property or signed by an individual authorized by the owner(s) to act as the agent. A letter must be submitted with the application authorizing the individual to act as agent on the owner(s) behalf when the agent signs the application.

X The appropriate application fees.

X List of the current abutters to the property including those property owners located across streets and streams from the property being subdivided. Please include the name, address, and profession of the professionals responsible for the preparation of the subdivision plans and supporting studies.

N/A If the project is to be phased, a description of project phasing and the proposed start and completion date for each phase.

X Two (2) copies of a Storm Water Management Plan as called for in Section 22.

N/A Two (2) copies of a Traffic Study as called for in Section 32.

N/A Special Investigative fee for review of a Traffic Study as set forth in Section 32.

N/A One (1) copy of any Impact Study which may be required by the Clerk of the Board.

N/A Special Investigative or Third Party Review fees as set forth in Section 32.

X Requests for any waivers from the Site Plan Regulations if any.

N/A A copy of any variances or special exceptions, which have been granted by the Zoning Board of Adjustment.

N/A Where Conditional Use Permits (CUP) are required in conjunction with a proposed subdivision, two (2) copies of complete CUP applications shall be provided for each CUP as set forth in Section 34.

Drawings

X Five (5) full sized hard copies of the site plans and one (1) digital copy sized at 11" x 17", including existing condition plan(s), demolition plan(s), site layout plan(s), grading, drainage and erosion control plan(s), utility plan(s), landscape plan(s), lighting plan(s), construction detail plan(s), and other improvement plans(s). Please note pursuant to Section 16, the plans may be consolidated onto one or more sheets, if the information can be clearly shown without obscuring information.

X Five (5) full sized hard copies of any off-site improvement plans and one (1) digital copy sized at 11" x 17".

N/A Two (2) hard copies of the architectural elevations and one (1) digital copy.

X Colored overview plan showing entire development with lot lines, buildings, parking lots, driveways, loading areas, solid waste facilities, green space and tree plantings, fences/walls/buffers, any outside sales and display areas, adjacent streets, along with other significant physical features shown on a single sheet suitable for display purposes.

X One (1) set of reductions (8½ x 11) of the site plan drawings except for construction detail plans, including architectural elevations.

X A New Hampshire Licensed Land Surveyor shall prepare, sign and seal the existing condition plan.

X A New Hampshire Licensed Professional Engineer shall prepare, sign and seal all plans where grading, drainage and utility information is proposed.

N/A Landscape plans shall be prepared by a New Hampshire Licensed Landscape Architect who shall sign and seal the landscape plan(s).

N/A Architectural elevations shall be signed or sealed by a New Hampshire Licensed Architect, or a New Hampshire Licensed Professional Engineer, as allowed by the State of New Hampshire professional licensing boards.

X Where wetland boundaries are required to be delineated, the delineation shall be performed by a New Hampshire Certified Wetland Scientist who shall sign and seal the plan upon which the wetland boundaries are mapped.

N/A Where soils are required to be identified, classified, and delineated, the identification, classification, and delineation shall be performed by a New Hampshire Certified Soil Scientist who shall sign and seal the plan upon which the soils are mapped.

Part 2: The following standards and items need to be shown on plans in order for a site plan application to be determined complete.

Drawing Standards

X All drawings shall be shown at 1"=10', 1"=20', 1"=30', 1"=40' or 1"=50' for all drawing sheets except for location plans, cover sheets, architectural elevations or engineering detail sheets. If alternative map scales may be warranted by the size and/or shape of the site, consult with the Planning Division staff prior to preparing the drawings.

N/A If multiple sheets are necessary to provide design detail at required scales, then a concept drawing sheet or cover sheet shall be included. The concept drawing sheet can be flexible in scale while showing general project information and a graphic conceptual layout. Each detail sheet must be indexed on the concept drawing sheet.

X North arrow.
X Bar scale.
X Drawing sheets not exceed 24" x 36" except for the colored overlay plan.

Title Block

X Title of development.
X Name and address of the owner and applicant.
X Date the plan was prepared and the date of subsequent revisions.
X Name, address, seal, and signature of the licensed professional who prepared the plan.
X Street Address(s).

Vicinity Plan

X The location of the development shall be shown.
X Streets, water bodies, city limits, parks, schools, and other significant physical and man made features shall be shown on the vicinity plan.
X Scale between 1"=1000' and 1"=2000'.

Location Plan

X Proposed property to be developed.
X Property lines.
X Abutters' property lines.
X Names and locations of nearby and adjacent City streets.
X Names and locations of adjacent water bodies and watercourses.
X Names and locations of nearby and adjacent parks, schools, churches, and other significant physical and man-made features.
X Nearest street intersections.
X The Tax Assessor's map-block-lot number, or map-lot number as applicable, for abutters and the properties to be developed.
X Zoning district designations and boundaries.
X Other special information which may be required by the Planning Board.
X Minimum scale 1" = 400'.

Standard Notes

X Purpose of the site plan.
X Ownership of parcel with deed references.
X Tax map-block-lot numbers, or map-lot number as applicable, of the existing parcels.
X Title reference for Book and Page number of the lot(s) being proposed for development and abutting properties from the Merrimack County Registry of Deeds. Title reference shall not be more than 5 days old at the time of filing.
X Plan references for prior recorded subdivisions or surveys on the properties proposed for development or abutting said properties proposed to be developed.
N/A Addresses for all proposed buildings or condominium units.
X Area of subject parcel(s).
X Zoning designation of subject parcel(s) including all overlay zones.
X Minimum lot area, frontage, and setback dimensions required for the zoning district(s) and for wetland buffers, bluff setbacks, the Shoreland Protection Overlay District buffers, and Aquifer Protection Areas.
N/A Required useable lot and buildable lot area and calculations.
X Tabulations of existing and proposed areas of wetlands, bluffs and ravines, steep slopes greater than 15% and greater than 25%. Existing and proposed impervious surface areas.

X Plan or deed references for recorded easements, whether public or private, on the properties proposed for development and existing easements on abutting properties, which are for the purposes of providing access, utilities, and drainage to the properties proposed to be subdivided.

X Deed reference and statement of any existing recorded covenants or restrictions relating to the use of the land proposed to be developed.

N/A Source of sanitary sewer and potable water supply.

N/A Zoning variances and/or special exceptions granted.

X Flood Insurance Rate Map sheets used to identify 100 year flood elevation and zone designation.

N/A If applicable, Flood Hazard Designation along Merrimack River (F1) or (F2) and minimum finished floor elevation.

X List of required local, state, and federal permits.

X List of any Planning Board waivers and Conditional Use Permits requested.

N/A Phasing description.

Existing Condition Plan

X Property lines for the parcel to be developed with bearings and dimensions.

X Full names and addresses of all abutters of the property.

X Addresses of the existing lots and/or uses located on the property.

X Title reference for Book and Page number of the lot from the Merrimack County Registry of Deeds. Title reference shall not be more than 5 days old at the time of filing.

X Zoning district designation and boundaries including Floodway and Floodplain Districts.

X Building setback lines and dimensions for all lots including wetland buffers, bluff setbacks, the Shoreland Protection Overlay District buffers, and Aquifer Protection areas.

X The location of existing features such as water courses and bodies, parks, open space, large trees, foliage lines, rock outcrops, railroads, buildings, and significant natural and man-made features. Other pertinent features such as, but not limited to, wetlands, cemeteries, and drainage ditches.

X The location of all existing buildings, structures, fences, stonewalls, driveways, parking, and any vehicular use areas.

X The location and dimensions of existing driveways, curb cuts, parking lots, loading areas, or any other vehicular use areas.

X The location of all existing access points (driveways) onto city streets.

X The location, travel way width, and rights-of-way of all existing adjacent city streets, as well as mapped future streets.

X The location, dimensions, and purpose of any easements or rights-of-way.

X Existing topographic conditions and all proposed changes in ground elevation at a contour interval of two (2) feet referred to sea level datum of the US Coast and Geodetic Survey.

X Where the land slopes less than two percent, spot elevations shall be shown at all breaks in grade, along all drainage channels or swales, and at selected points not more than 100 feet apart in all directions.

N/A Finished floor elevations and minimum finished floor elevations required within the Floodway or Floodplain Zoning District, if applicable.

X Wetland Delineation by NH Certified Wetland Scientist if the presence of wetlands is suspected.

X Steep slopes greater than 15% and greater than 25%.

X Buildable and Useable land area calculations as applicable.

X The location and size of existing ground signs.

X The type and location of existing outdoor lighting.

X The identification and classification of the extent and type of soils using the USDA Soil Conservation Services system, specifically identifying those soils recognized as wetlands and those important for agriculture.

N/A Soil test data as required by the NH Water Supply and Pollution Control Division, where municipal sewers are not present. A High Intensity Soil Survey may be required.

X The location, size, and invert elevations of existing sanitary and storm sewers including manholes, catch basins, and culverts.

X The location and size of all existing water mains including hydrants, gates, valves, and blowoffs.

N/A The location of wells and subsurface disposal systems if the property is not served by municipal water and sanitary sewers, including those on abutting property.

X The location of all existing non-municipal utilities including electric, telephone, gas, steam, and CATV systems, along with fire alarm cables, both on-site and within abutting rights-of-way.

N/A The type and location of existing solid waste disposal facilities.

Demolition Plan

N/A The demolition plan shall be based on the existing condition plan.

N/A The location and extent of removal of all buildings, structures, paving and landscaping shall be shown on the plan including the limits of any clearing, or site disturbance.

N/A Provisions for the removal or reuse or any construction or demolition debris from the site.

N/A The location and extent of any removal of utilities and drainage along with the provisions for the removal, and capping of underground public and private utilities.

N/A Plans and provisions for site restoration, erosion control and repaving of public or private streets disturbed.

Site Plan

X Property lines of the parcel to be developed including bearings and dimensions.

X Zoning district designation and boundaries including the Floodway and Floodplain Districts.

X Building setback lines, including dimensions including wetland buffers, bluff setbacks, the Shoreland Protection Overlay District buffers, and Aquifer Protection areas including labels.

X Full names and addresses of all abutters to the property.

X Title reference for Book and Page number of the lot from the Merrimack County Registry of Deeds. Title reference shall not be more than 5 days old at the time of filing.

X Locations of any wetlands, bluffs and ravines, and steep slopes greater than 15% and greater than 25%.

X Flood Hazard areas and boundaries.

X Finished floor elevations and minimum finished floor elevations required within the Floodway or Floodplain Zoning District, if applicable.

X Wetland Delineation by NH Certified Wetland Scientist if the presence of wetlands is suspected.

X The location, use and dimensions of all existing and proposed buildings and structures including fences, stonewalls, towers, mechanical equipment, etc. Separately identify proposed additions to buildings and structures.

X The location and dimensions of existing and proposed driveways, curb cuts, parking lots, loading areas, or any other vehicular use areas, including the number of parking and loading spaces per bay, and the designation of spaces for compact vehicles and the handicapped.

X The location and dimensions of existing and proposed pedestrian walkways, sidewalks and other paved surfaces, both on-site and within abutting rights-of-way.

X The location of existing features such as water courses and bodies, parks, open space, large trees, foliage lines, railroads, buildings, and significant natural and man-made features. Other pertinent features such as, but not limited to, wetlands, cemeteries, and drainage ditches.

X The location, travel way width, and right-of-way of all existing adjacent city streets, as well as mapped future streets.

X Existing public or private street names.

N/A Addresses for all existing and proposed buildings or condominium units.
N/A The location of any wells and the NHDES well radii.
N/A The location of septic tank drainfields and the required 4,000 square foot septic drain field area required by the NHDES.
N/A Fire lanes and fire access for fire apparatus.
N/A Phase boundaries and labels.
N/A The location, bearings, and dimensions and area of all property proposed to be set aside for park or playground use or other public or private reservation, with designation of the purpose thereof, and conditions, if any, of the dedication or reservation.
X The location, bearings, and dimensions of all existing and proposed easements.
X Notations of all covenants, easements, self-imposed restrictions, and any other restrictions or notations required by the Board.

Tabulations

X Gross acreage - Lot size in square feet is recommended for projects less than 1 acre.
X Square feet or acres devoted to the various uses.
N/A Ground coverage of buildings and structures in square feet and percent.
X Ground coverage for parking and loading areas including aisles and internal landscaping in square feet and percent.
X Internal parking lot landscaping in square feet and percent.
X Impervious surface coverage in square feet and percent.
X Useable land area calculations for residential development and net land area calculations for non-residential development.
N/A Total number of dwelling units, and total numbers of dwelling units by type and number of bedrooms.
N/A Square feet of floor area by type of use for all non-residential uses.
X Projected number of employees by shift if necessary for calculating required parking.
X Building occupancy or fixed seating if necessary for calculating required parking.
X Calculations of required parking and loading areas, including handicapped and compact spaces.
X Parking and loading areas provided including handicapped and compact spaces.

Note: Tabulations shall be completed for the entire project and for each development phase. When a site falls into more than one zoning district, separate tabulations will be required for each area covered by a different zoning district.

Please note the existing condition plan, demolition plan, grading and drainage plans, utilities plan, lighting, landscape and erosion control plans may be combined on the site plan or other drawing sheets if all the existing and proposed information is presented in a clear, understandable and legible manner.

Grading & Drainage Plans

X Existing topographic conditions and all proposed changes in ground elevation at a contour interval of two (2) feet referred to sea level datum of the North American Vertical Datum 1988 (NAVD88). Where the land slopes less than two percent (2%), spot elevations shall be shown at all breaks in grade, along all drainage channels or swales, and at selected points not more than one hundred (100) feet apart in all directions.

X Where the land slopes less than two percent, spot elevations shall be shown at all breaks in grade, along all drainage channels or swales, and at selected points not more than 100 feet apart in all directions.

X The identification and classification of the extent and type of soils using the USDA Soil Conservation Services system, specifically identifying those soils recognized as wetlands and those important for agriculture.

X The location of all significant natural features including, but not limited to, ledge outcroppings, streams and water bodies, wetlands, bluffs and ravines, and steep slopes in excess of 15% and 25%.

X Setbacks shall be shown and dimensioned including those required for yards, and the Shoreland Protection District, as well as bluff and wetland buffers and setbacks.

X The location and size of all swales, drainage ditches, culverts, drain pipes, inlet and outlet structures, catch basins and manholes, storm water treatment structures, easements, and detention and retention ponds, including invert elevations and cross-sections as may be necessary to determine the suitability and adequacy of the proposed system.

X 2-year, 10-year, 25-year and 100-year storm water runoff estimates, including all calculations.

X The location and size of proposed buildings, driveways (including proposed grades), and septic tank drain fields and receiving layers.

N/A Where municipal sewer service is not available, soil data and test results sufficient to submit an application for subdivision approval to the NHDES including a plan showing the location of test pits, the soil profiles, ground water elevation, and seasonal high water table elevation at each test pit. The required 4,000 square foot septic drain field area required by the NHDES shall be shown.

X The location, width, and purpose of existing and proposed easements for road rights-of-way, utilities, drainage, slope, open space or conservation easements, and any other easement as required. The easements to be shown include both public and private easements. The dimensions and bearings shall be shown for the boundaries of all easement areas except slope easements.

Utility Plans

X The location, size, and invert elevations of existing and proposed sanitary and storm sewers, including manholes, catch basins, culverts, and the location of any pump stations, lift stations, and other appurtenant facilities or structures.

X The location and size of all existing and proposed water mains, including hydrants, gates, valves, and blowoffs, and the location of any other appurtenant facilities.

X Profiles of all municipal utilities.

X Details for pump or lift stations, manholes, catch basins, fire hydrants, valves, etc. The use of details from the City of Concord Construction Standards is required when available, unless otherwise approved by the City Engineer.

X The location and size of all existing and proposed private underground and overhead utility improvements including, but not limited to, gas lines, electric transmission lines, telephone transmission lines, cable television, steam distribution mains, and fire and police alarm transmission lines. The location of all manholes, transformers, poles, and other appurtenant facilities or structures shall be shown.

N/A In the absence of municipal water supply, a plan indicating individual well locations shall be submitted including the NHDES required well radii.

N/A Where municipal sewer service is not available, soil data and test results sufficient to submit an application for subdivision approval to the NHDES including a plan showing the location of test pits, soil profiles, ground water elevation, and seasonal high water table elevation at each test pit. The 4,000 square foot septic drain field area required by the NHDES shall be shown.

N/A The location, width, and purpose of existing and proposed easements for road rights-of-way, utilities, drainage, slope, open space or conservation easements, and any other easement as required. The easements to be shown include both public and private easements. The dimensions and bearings shall be shown for the boundaries of all easement areas except slope easements.

Lighting Plan

X Lighting including building and pole and luminaire locations and details for poles and fixtures including colors, materials, dimensions and wattage.
X A lighting plan showing light levels in foot-candles shall be provided.
X Details of fixtures, poles, and mounting details.

Landscaping and Erosion Control Plans

N/A Plantings including location, caliper size, common and botanical names, and planting specifications and details. A landscape table is required.
N/A Plants to be preserved and methods to preserve trees during construction.
X Clearing limits.
N/A Calculations of trees required to be planted or preserved and the number and type provided and/or protected.
N/A Phased clearing plan with provisions for soil stabilization.
X Erosion Control and Sedimentation Plan.

Architectural Elevations

N/A Architectural elevations of all sides of all new buildings and of those sides or areas which are proposed to be altered showing the following types of information:
N/A Exterior materials and colors.
N/A Type and pitch of roofs.
N/A Size, spacing of windows, doors, and other openings.
N/A Size, location, colors, and copy of signs to be affixed to, or hanging from, the building.
N/A Size, height, colors, and copy of proposed ground signs.
N/A Size, type, and location of towers, chimneys, roof structures, flagpoles, antennas and similar structures.
N/A The relationship in bulk and height to other existing structures in the vicinity.
N/A Photographs of all existing facades and adjacent buildings and lots.

Off-site Improvement Plans

N/A Off-site improvement plans shall be prepared by a registered architect or engineer who shall sign the drawings and place his/her seal upon it.
N/A Any off-site improvement plans shall conform to the requirements as set forth in the City of Concord Subdivision Regulations and Construction Standards.

Part 3: The following documents and plans are required for a Certificate of Approval to successfully complete the site plan approval process prior to the issuance of any building permits.

Documents Needing Approval Prior To Issuance of a Certificate of Approval, where applicable.

N/A Easement deeds for street rights-of-way, utility, drainage, slope, conservation, or other public easements.
N/A Warranty deed or conservation easements for land set aside as open space.
N/A Agreements to convey easements for private access, utilities, drainage, or other common facilities to be recorded with a future property transfer.
N/A Construction cost estimate for all public and private common facilities.
N/A Financial guarantees for all public improvements.

N/A Where applicable, a Site Stabilization Guarantee.
N/A Agreements between the applicant and the City regarding public improvements.
N/A Certificate of City Council approval where required for utility extension.
N/A Copies of any approvals or permits required from State and Federal agencies.
N/A Electronic plan submission as set forth in Section 12.08 of the Subdivision Regulations.
N/A License from City Council, where applicable, for a use within the public right-of-way.

CONDITINAL USE PERMIT APPLICATION CHECKLIST

Project Name: Concord Coach Temporary Parking Expansion **Date:** November 18, 2025

SECTION 12 General Requirements for All drawings

12.02 All Applications:

⊗ (1) *Title Block*:
⊗ (a) Title of plan;
⊗ (b) Name and address of the owner and applicant;
⊗ (c) The date the plan was prepared and date of subsequent revisions; and
⊗ (d) Name, address and seal of the licensed professionals who prepared the plan.
⊗ (2) *Scale*.
⊗ (3) *North Arrow and Bar Scale* except for detail drawings.

12.03 Plan Certification:

⊗ (1) A New Hampshire Licensed Land Surveyor shall prepare, sign and seal the existing condition plan.
⊗ (2) A New Hampshire Licensed Professional Engineer shall prepare, sign and seal all plans where grading, drainage and utility information is proposed.
N/A○ (3) Landscape plans shall be prepared by a New Hampshire Licensed Landscape Architect who shall sign and seal the landscape plan(s).
N/A○ (4) Architectural elevations shall be signed or sealed by a New Hampshire Licensed Architect, or a New Hampshire Licensed Professional Engineer, as allowed by the State of New Hampshire professional licensing boards.
⊗ (5) Where wetland boundaries are required to be delineated, the delineation shall be performed by a New Hampshire Certified Wetland Scientist who shall sign and seal the plan upon which the wetland boundaries are mapped.
N/A○ (6) Where soils are required to be identified, classified, and delineated, the identification, classification, and delineation shall be performed by a New Hampshire Certified Soil Scientist who shall sign and seal the plan upon which the soils are mapped.

12.04 Location Plan: Each site plan application shall have on the site plan, or a cover sheet, a detailed location plan prepared at a minimum scale of 1"= 400' showing clearly the following information:

⊗ (1) Proposed property to be developed;
⊗ (2) Property lines;
⊗ (3) Abutter's property lines;
⊗ (4) Names and locations of nearby and adjacent City streets;
⊗ (5) Names and locations of adjacent water bodies and watercourses;
⊗ (6) Names and locations of nearby and adjacent parks, schools, churches, and other significant physical and man made features;
⊗ (7) Nearest street intersections;
⊗ (8) The tax assessor's map, block and lot number for abutters and the properties to be developed;
⊗ (9) Zoning district designations and boundaries; and
⊗ (10) Other special information which may be required by the Planning Board.

12.05 Vicinity Plan: Each site plan shall have on the site plan or the cover sheet a vicinity plan prepared at a scale between 1"=1000' and 1"=2000' clearly showing the following:

⊗ (1) The location of the property to be developed; and,
⊗ (2) Streets, water bodies, city limits, parks, schools, and other significant physical and man-made features.

12.06 Plan References: The following references shall be included on the site plan and existing condition plan:

⊗ (1) *Certificate of Ownership*: A certificate of ownership identifying each parcel, including which property is owned by each owner, and a deed citation for each deed from the Merrimack County Registry of Deeds;

⊗ (2) *Easements*: Plan or deed references for recorded easements, whether public or private, on the properties proposed for development; and existing easements on abutting properties, which are for the purposes of providing access, utilities or drainage to the properties proposed to be developed;

⊗ (3) *Existing Restrictions*: Deed reference and statement of any existing recorded covenants or restrictions relating to the use of the land proposed to be developed;

⊗ (4) *Prior Subdivisions or Surveys*: Plan references for prior recorded subdivisions or surveys on the properties proposed for development, or abutting said properties proposed to be development; and

⊗ (5) *Other Plans:* Plan references for applicable road, utility or site improvement plans, which are available in City records or are available to the surveyor or engineer preparing the plans.

⊗ *12.07 Wetland Delineations:* Wetland delineations are to be prepared by a New Hampshire Certified Wetland Scientist who shall sign and seal the existing condition plan and site plan. The date of the wetland delineation shall be noted on the plans.

⊗ *12.09 As-Built Drawings:* Prior to the issuance of a Certificate of Occupancy digital as-built drawings shall be provided conforming to the City Engineering Division's As-Built checklist.

SECTION 13 General Requirements for Documentation

13.01 All Applications: The following information is required for all site plan applications except for Preliminary Conceptual Consultation Phase:

⊗ (1) *Authorization of the Property Owner:* The applicant for site plan review must either own the fee simple interest in the property(s) that is the subject of the review or have written permission of the fee simple owner. All applications shall include written evidence that the fee simple owner of the property has authorized the application and does not object to the application being made. Evidence shall include either the owner's signature on the application or a letter signed by the owner authorizing the submittal of the application.

⊗ (2) *Application Form:* A completed application form endorsed by the owner, or submitted by his agent where written authorization has been provided by the owner. A copy of the owner's written authorization needs to be attached to those applications signed by the agent.

⊗ (3) *Application Fee*: An application fee as set forth in Appendix A, Fees, which are due and payable upon submission or prior to the recording of any documents or plans.

⊗ (4) *Abutters List*: An abutters list including a list of names and addresses of all abutters as indicated in the records of the City Tax Assessor not more than five (5) days before the filing of the application.

N/A ○ (5) *Zoning Board of Adjustment Actions:* A copy of any actions by the Zoning Board of Adjustment on requests for special exceptions or variances from the City of Concord Zoning Ordinance.

N/A ○ (6) *State and Federal Permits*: A copy of any application made to a State or Federal agency required for the approval of this site plan, including those required for the development of off-site improvements.

N/A ○ (7) *Phasing Plan*: A statement describing the proposed phasing of the site plan including the time frame, percentage of total residential and non-residential uses, and the improvements and facilities provided in each phase.

N/A ○ (9) *Special Investigative Studies or Third Party Reviews:* Special Investigative Studies pursuant to RSA 676:4 I(g), or Third Party Review pursuant to RSA 676:4-b for all or a portion of a site plan application, or impact study, shall be provided where required in accordance with Section 31, Special Investigative Studies – Third Party Review, of these regulations, or as may be specifically required by the Planning Board in order to satisfactorily complete its review of a proposed application.

SECTION 15 Application Requirements for Conditional Use Permit plans

34.01 General.

⊗ (1) A narrative addressing the criteria set forth in the Zoning Ordinance for the Conditional Use Permit(s) requested, and the general criteria for the issuance of Conditional Use Permits in Article 28-9-4(b);

⊗ (2) All items set forth in Section 14.02, Design Review Phase Requirements;

14.02 Design Review Phase Requirements.

(1) Site Analysis Plan shall show:

(a) Natural Features: The following information both on and adjacent to the site to be subdivided:

⊗ i. Identification of wetlands and wetland buffers;

⊗ ii. Vegetation survey showing fields, swamplands, wetlands, grasses, shrubs and trees (deciduous and evergreen);

⊗ iii. Rock outcrops, ledges, surface water, streams, seasonal or permanent water bodies or water courses including any known flood elevations, as well as identification of high water marks;

N/A ○ iv. Important views of and from the site;

N/A ○ v. Orientation to the sun and direction of prevailing winds;

⊗ vi. Contour lines at a minimum of two (2) foot intervals with ten (10) foot contour intervals highlighted;

⊗ vii. Slopes in excess of fifteen percent (15%) and in excess of twenty five percent (25%);

N/A ○ viii. Identification of bluffs and buffers to bluffs;

⊗ ix. Identification and classification of the extent and types of soils using the USDA Natural Resource Conservation Service System;

⊗ x. Wellhead protection areas;

⊗ xi. Wetland Delineation;

N/A ○ xii. Wetland buffers; and

(b) Man-made Features: The following items, both on and adjacent to the site to be developed, are required to be shown at a minimum, but are not exclusive:

⊗ i. Location of utilities including any specific rights-of-way; the size of sanitary sewers; water mains, storm sewers, including surface and subsurface drainage systems; and non-municipal utilities including overhead transmission lines;

⊗ ii. Identification of municipal special district boundaries;

⊗ iii. Location and purpose or use of building and structures;

⊗ iv. Location of walls, fences and wells;

⊗ v. Location of existing conservation and open space easements, and easements for utilities, storm drainage, slopes, vehicular and pedestrian access;

⊗ vi. Public streets and highways and mapped future streets as defined on the Official Map;

⊗ vii. Railroad tracks and rights-of-way, and airport approach zones;

⊗ viii. Driveways, curb cuts, and parking lots;

N/A ○ ix. Any historic structures or sites listed or eligible for the National or State Registers of Historic Places, and any historic markers;

N/A ○ x. Any cemeteries, stone walls or foundations, or known archeological sites; and

N/A ○ xi. Public and private recreation areas, parks and open space.

○ (c) Proposed highways or other major public improvements planned by public authorities for future construction on or in proximity to the site;

⊗ (d) Planned private improvements on or in proximity to the site, including any previously approved subdivision or adjacent site plan;

⊗ (e) Any other significant man-made or natural features which have relevance to the development of the site; and

○ (f) Photographs of the site showing existing features and conditions. Notes shall be made of camera locations, direction, view, and key numbers.

(2) Proposed Site Layout Plan: A proposed site layout plan shall show:

⊗ (a) The approximate location, number, and type of parking spaces, the location of loading areas, interior landscaping, access aisles and storage or display areas for motor vehicles;

⊗ (b) The approximate location of pedestrian and/or bicycle facilities including those along the frontage of the property;

⊗ (c) All driveway and access locations including approximate locations of interconnected parking lots, or other shared access;

⊗ (d) The approximate location and size of buildings and structures;

⊗ (e) The location of perimeter yards, buffer yards and fences, and other landscape or open space areas;
⊗ (f) Tabulations of the gross land area and buildable land area, approximate lot coverage of buildings and impervious surfaces, parking lot area including aisles and driveways, required open space, number of dwelling units, residential density, square footage of non-residential uses, and ; and
⊗ (g) Any proposed impacts to wetlands and bluffs, buffers to bluffs and wetlands, Shoreland Protection (SP) District buffers, and Aquifer Protection Areas.

(3) Site Utility and Drainage Layout Plan: A site utility and drainage layout plan shall show the following:
⊗ (a) The location of existing sanitary sewers and/or septic systems, water mains and/or potable wells, culverts, and existing utility poles;
⊗ (b) Existing utility rights-of-way;
⊗ (c) Existing drainage facilities and the approximate layout of all proposed storm drainage facilities, including detention and retention ponds and drainage swales;
N/A ○ (d) Preliminary proposals for connection with existing water supply and sanitary sewage systems or alternative means of providing water supply and sanitary waste treatment and disposal; and
⊗ (e) Existing non-municipal utilities on, or adjacent to the site, and the approximate layout of non-municipal utilities proposed.

⊗ **(4) Other Requirements**: The Board may require further detailing of information and additional meetings, before advising the applicant to proceed with a formal application for a major site plan.

November 19, 2025

Ref: 176455.000

City of Concord Planning Department
41 Green Street
3rd Floor
Concord, NH 03301

Re: Concord Coach Lines, Inc. Temporary Parking Expansion – Conditional Use Permit
Storrs Street – Map 6414/Z, Lot 92
Conditional Use Permit (CUP) Narrative

Dear Acting City Planner Thompson:,

In support of the conditional use permit application for the Concord Coach Lines, Inc. Temporary Parking Expansion project, VHB is providing this narrative to satisfy the CUP checklist item under Section 15(1). Please refer below.

Summary

The Applicant, Concord Coach Lines, Inc., is requesting a Conditional Use Permit in relation to Section 28-7-10(d), related to installation of parking area trees as part of the project. As allowed under Section 28-7-10(d), the Applicant is utilizing the provision to request a fee paid to the City of Concord Urban Tree Fund in lieu of planting trees which would be vulnerable to removal given the temporary nature of this parking lot upon leased City land. The project is non-residential, and the total number of trees that would be required otherwise is estimated to be 42 trees, per the calculation shown on sheet C2.01 of the site plan application.

The criteria for a CUP and the provisions in which this proposed use meets them are outlined below:

a. The use is specifically authorized in this ordinance as a conditional use;

The alternative for an in-lieu payment is authorized in Section 28-7-10(d).

b. If completed as proposed by the applicant, the development in its proposed location will comply with all requirements of this Article, and with the specific conditions or standards established in this ordinance for the particular use;

The proposed use and the project comply with the applicable ordinances and regulations.

c. The use will not materially endanger the public health or safety;

Paying an in-lieu fee to the Urban Tree Trust Fund does not endanger the public health or safety.

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d. The use will be compatible with the neighborhood and with adjoining or abutting uses in the area in which it is to be located;

Neither the existing parcel nor the surrounding parcels are heavily planted and, given the presence of the adjacent railroad and other industrial uses, contribution to the Urban Tree Trust Fund will not cause incompatibility.

e. The use will not have an adverse effect on highway or pedestrian safety;

Paying an in-lieu fee does not impact any highway function or pedestrian safety.

f. The use will not have an adverse effect on the natural, environmental, and historic resources of the City; and

The use does not have an adverse effect on the above-mentioned resources of the City. The stewards of the Urban Tree Trust Fund can decide how best to allocate City resources.

g. The use will be adequately serviced by necessary public utilities and by community facilities and services of a sufficient capacity to ensure the proper operation of the proposed use, and will not necessitate excessive public expenditures to provide facilities and services with sufficient additional capacity.

The above-mentioned section does not apply to the use requested. If anything, the request to contribute to the fund lessens obligations to maintain landscaping during and after the leasehold interest runs its course.

On behalf of the Applicant, we hope this information is satisfactory in describing the request for the Conditional Use Permit pursuant to Section 28-7-10(d) of the Zoning Ordinance. Please feel free to contact me with any questions you may have.

Thank you,

Dave Fenstermacher, PE

Managing Director

GALLAGHER CALLAHAN & GARTRELL

ARI B. POLLACK
214 N. Main Street
Concord, NH 03301

Direct Dial: (603) 545-3630
Fax: (603) 228-8396
pollack@gcglaw.com

November 19, 2025

Via Submission Through Permit Portal

Timothy J. Thompson, AICP
Acting City Planner
City of Concord
41 Green Street
Concord, NH 03301

Re: Map 6414/Z, Lot 92, Stickney Avenue, Concord, NH

Dear Tim:

In connection with an Application for Major Site Plan Review filed contemporaneously herewith and on behalf of Concord Coach Lines, Inc. ("Applicant"), please accept this request for waivers of Site Plan Regulations pursuant to SPR Section 36.08. In each case, the waiver falls under the general jurisdiction of the Planning Board to excuse requirements for good cause shown in relation to "specific circumstances relative to the site plan". In this case, good cause for waiving certain of the development regulations arises out of the short-term nature of the leasing arrangement with the landowner, the City of Concord. Simply put, the possibility of having to unwind and vacate the premises in a timeframe as short as 5- or 10-years, per the City's leasing terms, requires that the Applicant identify areas of the project that can be scaled-back for efficiency and reasonable return on investment.

Specifically, Applicant requests the following waivers.

1. Section 16.02(15) – Landscape Plans – generally omitted due to lack of proposed landscaping.

2. Section 18.17 – Tree Plantings – due to the temporary nature of the parking lot improvements, planted trees are likely to be moved in the future and just as they achieve maturity.

3. Section 18.19 – Curbing and Guardrails – due to the temporary nature of the parking lot improvements, curbing has been excluded from the proposed design. Curbing is not necessary on this site to control stormwater runoff given the relatively flat grades.

4. Section 18.20 – Construction Standards - due to the temporary nature of the parking lot improvements, a waiver is requested from the typical pavement section. Instead, pavement specifications would be in accord with Sheet C6.01 of the submitted plan set. The design life of this parking lot (+/- 10 years) is much shorter than what the City of Concord Construction Standards are aiming to accomplish, and therefore results in extra material that will likely need to be removed. To the extent the lease is renewed for additional years, Applicant remains responsible for repair and maintenance of the site per lease arrangements with the City.

5. Section 22.07(1) – Storm Events – due to the temporary nature of the parking lot improvements, having to comply with the 100-year storm event results in a large subsurface infiltration system. A design for the 25-year storm has been provided, and the 100-year storm has been checked for flooding impacts on the site. Under a 100-year storm event, minor ponding within the parking areas is possible, but does not leave the project site and does not impact abutters or the public on adjacent properties. Additionally, NHDES AOT does not require pre/post-development peak rate analysis for the 100-year storm.

6. Section 27.03 – Landscape Plans – generally omitted due to lack of proposed landscaping for this project. Basic landscaping is proposed, but those details do not rise to the level of design needing separate plans or stamps by a landscape architect.

   As to each of the above requests, the Applicant states the following:

   (1) The granting of the waiver will not be detrimental to the public safety, health or welfare or injurious to other property because the proposed parking lot continues to be designed for safe use and maintenance, while supplementing existing and adjacent parking that currently serves the State's transportation terminal.

   (2) The conditions upon which the request for a waiver is based are unique to the property for which the waiver is sought and are not applicable generally to other property because the Applicant's use of the parcel is limited by the term and conditions of lease offered by the landowner, the City of Concord. The

proposed improvements, therefore, are intended to be a temporary means of adding additional parking supply for periods of peak public parking demand.

(3) Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved, a particular and unnecessary hardship to the owner would result, as distinguished from a mere inconvenience, if the strict letter of these regulations are carried out because the temporary nature of the leasehold rights would put the project at a significant economic disadvantage and risk of cancellation if strict compliance was to be required.

(4) Specific circumstances relative to the site plan or conditions of the land where a site plan is proposed indicate that the waiver will properly carry out, or not be contrary to, spirit and intent of these regulations because the proposed design does not compromise safety elements of the program, but instead the waivers are aimed at modifying some of the attributes (i.e., landscaping) that are more closely associated with permanent (i.e., not leasehold) improvements.

(5) The waivers will not in any manner vary the provisions of the Zoning Ordinance, Master Plan Reports, or Official Map because all requested waivers arise out of the site plan regulations and are generally consistent with the regional transportation needs/goals of the community, as the same are discussed in the Master Plan.

Lastly, please note that an application for a conditional use permit (CUP) pursuant to Zoning Ordinance Section 28-7-10(d) has also been submitted herewith. This CUP enables the Planning Board to approve payment in lieu to the City of Concord Urban Tree Trust Fund such that Applicant may be excused from the installation and maintenance of plantings in a short-term non-residential development.

Thank you for your consideration.

Very truly yours,

Ari B. Pollack, Esq.

Cc: Benjamin Blunt, Concord Coach Lines, Inc.
Tom D'Aguiar, PE, Vanasse Hangen Brustlin, Inc.

Concord Coach – Temporary Parking Expansion

Storrs Street
Concord, NH 03301

PREPARED FOR

Concord Coach Lines
7 Langdon Avenue
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603.228.3521

PREPARED BY

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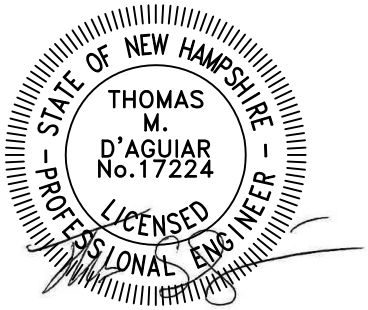

November 18, 2025

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1

Introduction

This report has been prepared by VHB to provide a brief description of existing and proposed drainage areas, design methodology, soil characteristics, and a summary of peak discharge rates for the project area. The proposed project will require review and approval by the City of Concord.

The Site is located off of Storrs Street in Concord, New Hampshire (see Figure 1: Site Location Map). The site is owned by the City of Concord and the 3.48-acre parcel is currently undeveloped, but has been previously disturbed by an incomplete project. The Project Site consists of approximately 2.22-acres that will be disturbed during the construction of the temporary parking facility. The Site is bounded by Higgins Place to the north, a NHDOT parking lot along Stickney Avenue to the east, Storrs Street and the existing railroad to the south, the existing railroad to the west. There are no Wetland Resources on the Project Site.

The Project Site is undeveloped and consists of poorly-grassed land cover. No trees are located on the development area, and remnants of the incomplete development can be found in the form of a partially constructed detention basin and stormwater manholes & catch basins. Under existing conditions, stormwater runoff primarily drains to the east via overland flow. From there, runoff appears to enter the NHDOT parking lot or the adjacent development at 11/13 Stickney Avenue. Though catch basins and the detention basin were installed as part of the former, incomplete development, the catch basins appear to be raised above existing grades and runoff is not directed into them. Due to that factor, the detention basin only receives flow that arrives via overland flow. The basin also has no apparent outlet. Therefore, the existing basin was not considered to be a pond for modeling purposes, and instead was treated as a depression within a subcatchment.

Under proposed conditions, stormwater runoff will be collected on site through a closed drainage system and discharged to two subsurface infiltration systems. A small amount of runoff at the eastern driveway entrance will flow to the NHDOT parcel to the existing closed drainage system within that parcel. The same closed drainage system will receive the overflow from the two proposed subsurface infiltration systems, when overflow occurs. The proposed infiltration systems will provide water quality treatment, groundwater recharge, and water quantity control to properly mitigate the increase in new impervious area created by the Project. Wherever possible, existing drainage and grading patterns were maintained in the proposed design. In addition to the infiltration systems, additional water quality and quantity control measures including deep sump catch basins and outlet control structures have been designed and incorporated to protect the surrounding natural resources from potential stormwater runoff impacts.

A hydrologic model was developed to evaluate the existing and proposed drainage conditions on the Site. The results of the analyses indicate that there is no increase in peak discharge rates between the pre- and post-development conditions for the 2, 10, 25, and 100-year storm events. The pre- and post-development peak discharge rates are presented in the Stormwater Management Impacts Section of this report.

2

Existing Conditions

2.1 Description of Contributing Areas

The study area for the development is primarily comprised of developed land within the Merrimack River watershed (see Figure 2, Existing Conditions: Drainage Area Plan). The existing drainage study area is 2.7-acres in size and is extremely flat with elevations ranging from 235' up to 238.' The area is not developed and is covered in non-turf forming grasses, with no trees or impervious surfaces.

The study area has been divided into five drainage areas that discharge into five discharge points. The discharge points are multiple abutters to the east, including the UHaul site, the NHDOT parking lot, and the development at 11/13 Stickney Avenue. Additionally, a small portion of the study area flows to the existing railroad tracks. The remainder of the area drains to the center of the site where the incomplete detention basin was partially installed with no outlets. Water is conveyed to this design points via overland flow.

Table 1 summarizes the study area and its characteristics.

Table 1: Drainage Area Characteristics Summary (Existing Conditions)

Discharge Point		Sub-Area(s)	Area (Acres)	Tc (Min.)	CN
DP-1	UHaul	EX-1	0.15	8.7	69
DP-2	East Parking	EX-2	1.03	6.9	69
DP-3	New Development	EX-3	1.02	11.7	69
DP-4	Existing Basin	EX-4	0.48	11.3	69
DP-5	Tracks	EX-5	0.02	6.0	69
Total			2.69	n/a	69*

* Weighted CN Value

2.2 Soil Conditions

The study area is comprised of several different soil types as defined by the Natural Resources Conservation Service (NRCS). As part of the required site investigations before development on the project site can occur, a Site Specific Soil Investigation was performed onsite, on June 11, 2025. The findings of that report are listed in Table 2, below, and is included in this Report's Appendices. Table 2, Soil Types, lists the designations, names, and groups of the soils located within the study area. The Appendices contains a copy of the soil mapping and soil types found within the study area.

Table 2: Soil Types

Soil Designation	Soil Name	Hydrologic Soil Group
498A	Urban land-Pootatuck complex, 0-8%	B*
699B	Urban land, 0-8%	B*

*HSG B was assumed as both complexes are not defined, but Pootatuck soils are HSG B independently. Other native soils nearby are HSG A, but HSG B was assumed in order to provide a conservative estimate.

2.3 Existing Hydrologic Flow Patterns

Stormwater runoff from the existing study area flows generally from north to south from the higher elevation terrain elevations towards the southern drainage system.

The following describes the existing stormwater flow patterns for each of the sub areas.

- Sub Area EX-1 is entirely grass and flows from the north towards UHaul (DP-1) via overland flow.
- Sub Area EX-2 is predominantly grass and flows from the north/central area of the site towards the NHDOT East Parking Lot (DP-2) via overland flow
- Sub Area EX-3 is entirely grass and flows from the central/south towards the New Development at 11/13 Stickney Avenue (DP-3) via overland flow.
- Sub Area EX-4 is entirely grass and flows from the central area towards the incomplete Existing Basin (DP-4) via overland flow.
- Sub Area EX-5 is entirely grass and flows from the southwestern area towards the adjacent railroad tracks (DP-5) via overland flow.

3

Proposed Conditions

3.1 Description of Contributing Areas

The proposed development for the study area includes the construction of a new temporary paved parking lot. The project will also include the construction of pedestrian amenities and walkways, landscaping, drainage, and utility improvements. Temporary and permanent erosion control measures will be incorporated into the site design. (See Figure 3, Proposed Conditions: Drainage Area Plan)

The proposed conditions sub-areas are comprised of the same 2.69 acre study area represented in the existing conditions drainage analysis. The study area has been divided into 6 subcatchments that discharge into four of the same design points as in the existing conditions analysis, but DP-4 was removed entirely as the existing basin will be filled in as part of the Project. The proposed development will add approximately 2 acres of impervious area to the site with the remaining areas of the development covered with landscaping, grass, and/or existing vegetation.

Table 3 summarizes the proposed sub areas and their characteristics.

Table 3: Drainage Area Characteristics Summary (Proposed Conditions)

Discharge Point		Sub-Area(s)		Area (Acres)	Tc (Min.)	CN
DP-1	UHaul	PR-1		0.11	6.0	69
DP-2	East Parking	PR-2	Remaining area east of site	0.13	6.0	78
		PR-4	Northern area of parking lot	1.04	6.0	94
		PR-6	Central and Southern area of parking lot	1.25	6.0	91
DP-3	New Development	PR-3		0.14	6.0	69
DP-5	Tracks	PR-5		0.02	6.0	69
Total				2.69	n/a	89*

* Weighted CN Value

3.2 Proposed Hydrologic Flow Patterns

The proposed development has been designed to direct the stormwater runoff from the site's impervious areas into two separate subsurface infiltration systems for water quality treatment

and peak rate control which will then discharge towards existing flow patterns. Runoff from the remaining areas within the study area will generally maintain their existing overland flow patterns.

The following describes the proposed stormwater flow patterns for each of the sub areas.

- Sub Area PR-1 consists of remaining area of EX-1 that will not be developed. The area is entirely grassed and runs to DP-1 via overland flow.
- Sub Area PR-2 consists of remaining area of EX-1 that will not be developed. The area is mostly grassed and runs to DP-2 via overland flow into the closed system on the NHDOT parcel.
- Sub Area PR-3 consists of remaining area of EX-3 that will not be developed. The area is entirely grassed and runs to DP-3 via overland flow.
- Sub Area PR-4 consists of the northern part of the proposed parking lot and is directed to the closed drainage system. The flow from PR-4 enters Pond #1, where overflows are directed to the closed drainage system at DP-2.
- Sub Area PR-5 consists of remaining area of EX-5 that will not be developed. The area is entirely grassed and runs to DP-5 via overland flow.
- Sub Area PR-6 consists of both the central and southern part of the proposed parking lot and is directed to the closed drainage system. The flow from PR-6 enters Pond #2, where overflows are directed to the closed drainage system at DP-2.

The proposed development will add approximately 2 acres of impervious area to the studied watershed. As a result, the peak stormwater runoff rates will increase from pre- to post-development conditions. However, to mitigate the increase in peak runoff rates, two subsurface infiltration systems have been incorporated into the design. The infiltration system will mitigate the increased runoff rates by restricting stormwater outflow from the basin through the use of an outlet control structure. The purpose and functions of the outlet control structures will be discussed in more detail later in this report.

4

Methodology & Design Criteria

VHB evaluated the hydrologic and hydraulic impacts for proposed development's stormwater runoff. VHB analyzed the proposed development's hydrologic impacts using the Soil Conservation Service (SCS) Technical Release 20 (TR-20) methodology. The following section summarizes the design parameters/constraints that were used during the drainage design for this development under the SCS and Rational Methodologies. Additionally, this section summarizes the methodology used for the development's proposed erosion control and stormwater treatment methods.

4.1 Hydrologic Model Description

VHB analyzed the proposed developments stormwater runoff impacts using the SCS TR-20 methodology. The hydrologic program HydroCAD, as developed by HydroCAD Software Solutions, LLC., was utilized to compute and develop the stormwater runoff model. HydroCAD's SCS TR-20 program is designed to model complex watersheds, such as the watershed analyzed in this report. The complexity of the watershed has been based on multiple land uses (surface conditions) with varying soil conditions and inter-connected sub-watersheds reflecting complex hydrologic flow patterns.

4.1.1 Design Storms

VHB analyzed the proposed stormwater impacts for the 2, 10, 25, and 100-year design storms per the City of Concord requirements.. These rainfall events are based on a 24-hour storm duration using a Type III distribution curve. The appendices contain copies of the rainfall data charts used in the calculations.

4.1.2 Curve Number

VHB developed weighted curve numbers for each sub-area based on the different ground covers and hydrologic soil group types found within each area. The curve numbers were based on the SCS TR-55 methodology and are included in hydrologic calculations.

4.1.3 Travel Times & Time of Concentration

VHB calculated the Travel Times (Tt) and the Time of Concentrations (Tc) for each of the individual sub-areas using the hydraulically most distant point within each area. A minimum time of 6 minutes was used in the calculations. The Tt's and Tc's were based on SCS TR-55 methodology and are included in hydrologic calculations.

4.2 Stormwater Detention

The proposed development increases the amount of impervious area from that of the existing conditions; as a result, the runoff curve numbers will increase for the proposed conditions. The higher curve numbers will increase the calculated stormwater runoff rate from that of the existing site, therefore, stormwater detention has been proposed for this project. This detention area, which consists of two infiltration systems, will mitigate the increased stormwater runoff rates by infiltration/detaining water and using outlet control structures to reduce the proposed stormwater discharge rates from the site.

VHB used the following design parameter and criteria to design the detention areas:

- Design Storms: 2, 10, 25, and 100-year
- Detention Time: Less than 72 Hours

Refer to the appendices for further information and design calculations.

Table 4: Susbsurface Infiltration System Characteristics Summary

Characteristic		Pond #1	Pond #2
Storage Volume (cf)		9,191	8,530
Max. Storage Height (ft)		236.35′	236.25′
Peak Water Elevation (ft)	2 Year	234.82′	234.05
	10 Year	235.75′	234.73′
	25 Year	235.85′	234.93′
	100 Year	236.27′	235.85′

4.2.1 Outlet Control Structure

The stormwater that discharges from the subsurface infiltration systems will be controlled through an outlet control structure. The outlet control structures have been designed to reduce the peak outflow rates from the basin for the design storm events.

4.3 Base Calculations (GRV and WQV)

Computations can be found in Appendix A.

5

Stormwater Management Impacts/Conclusion

5.1 Stormwater Quality Mitigation

Under the proposed conditions, the peak flow rates were calculated for the 2, 10, and 25-year storm events. As part of the site plan application, a waiver has been requested to remove the requirement to match or reduce peak runoff rates in the 100-year storm. Though the 100-year storm was not analyzed for pre/post-development peak runoff rates, the 100-year storm was analyzed for flooding impact and was found that the 100-year storm does not cause flooding out of the proposed infiltration basins.

Otherwise, the peak runoff rates for the proposed conditions, in the absence of mitigation, are anticipated to increase over the existing condition rates. These peak flow increases are to be reduced to below current peak runoff rates at each Discharge Point by routing the runoff through the proposed infiltration systems. The proposed development will incorporate a stormwater collection system that will capture runoff from impervious areas by means of catch basins and will then direct runoff to the proposed subsurface infiltration systems.

The subsurface infiltration systems are designed to attenuate site runoff by utilizing restrictive outlet control structure that will cause excess runoff to be temporarily detained within the system. The outlet structure will meter outflow rates from the detention area, such that the outflow will be approximately equal to or below the existing flow rates for the design storm events.

Table 5 provides a summary of the peak stormwater runoff rates from the proposed development. For the design storms (2-, 10- and 25-year) and at all discharge points, the peak stormwater runoff rate is being reduced or matched, thus having a positive impact not only on site but on all stormwater areas downstream of our site.

Table 6 provides a summary of the stormwater volumes from the proposed development. For the 2-year storm, the stormwater volume is being reduced.

Table 5: Peak Stormwater Runoff Rate Summary (cfs)

Discharge Point		Condition	2-yr	10-yr	25-yr
DP-1	UHaul	Existing	<0.1	0.2	0.32
		Proposed	<0.1	0.17	0.26
DP-2	East Parking	Existing	0.53	1.48	2.34
		Proposed	0.14	0.35	2.34
DP-3	New Development	Existing	0.45	1.25	2.00
		Proposed	<0.1	0.21	0.33
DP-4	Existing Basin	Existing	0.21	0.59	0.94
		Proposed*	-	-	-
DP-5	Tracks	Existing	<0.1	<0.1	<0.1
		Proposed	<0.1	<0.1	<0.1

*Existing basin drained internally with no visible outlet; therefore DP-4 has been removed in the proposed condition.

Table 6: Stormwater Volume Summary (acre-feet)

Discharge Point	Condition	2-yr
Overall Site	Existing	0.129
	Proposed	0.025

5.2 Stormwater Quality Mitigation – Best Management Practices (BMP's)

The proposed Stormwater Management System contains Best Management Practices (BMP's) that will provide treatment of site generated stormwater runoff. Infiltration systems have been used to achieve 90% removal of Total Suspended Solids (TSS), 60% total nitrogen (TN), and 65% total phosphorus (TP) per the New Hampshire Volume 2 – Post-Construction Best Management Practices Section and Design Manual.

The proposed BMPs are described below:

5.2.1 Catch Basins with Sumps

Stormwater from the paved surfaces on-site will be collected in catch basins with sumps (3' deep). Catch basin sumps are effective pollution control devices for removal of large particulate and adsorbed pollutants. Catch basins with sumps are designed to collect sediment particles that are the largest constituents of the pollutant load in urban runoff. Regular maintenance and cleaning of catch basins is required to ensure adequate performance of these structures.

5.2.2 Subsurface Infiltration Systems

The infiltration system has pretreated runoff enters the basin, first filtering through an isolator row. This isolator row acts as a sediment forebay for the basin. As the water filters into the system, water will infiltrate. This will provide the adequate ground water recharge volume (GRV) and water quality volume (WQV). Per the New Hampshire Stormwater BMP Manual, infiltrations basins treat 90% of TSS, 60% TN, and 65% TP. The proposed infiltration systems have been designed to contain the 100-year sptorm event without flooding.

5.3 Erosion Control Measures

5.3.1 Temporary Erosion Control

During construction of the proposed development, the contractor shall be responsible for installation and maintenance of temporary sedimentation and erosion control measures to prevent off-site tracking and waterborne loss of earth sediment and debris. The specific measures proposed as a part of the project plan are shown in the Site Plan Package on the Sedimentation and Erosion Control Plan and the Erosion Control Details.

Removal of temporary erosion control measures will be prohibited until paving has been installed and vegetation (grass) is well established.

5.3.2 Permanent Erosion Control

At the completion of construction, all soils will be permanently stabilized by one or more of the following measures:

- Parking/Access: Driveways, parking areas and access roads will be stabilized with bituminous concrete pavement.
- Landscaped Areas: All disturbed areas, not permanently stabilized by pavement or buildings, will be covered with bark mulch, stone, sod, or a minimum of six (6) inches of topsoil and seeded.

Additionally, all catch basins will be constructed with deep sumps to collect sediment from parking areas and access roads.

5.4 Conclusion

By implementing standard stormwater management techniques, the proposed development is designed to successfully mitigate its impact on peak stormwater runoff rates. Furthermore, stormwater quality issues can be addressed through the proposed implementation of standard practices (i.e. subsurface infiltration systems) that are accepted by the City of Concord.

6

Figures

- Figure 1: Site Location Map
- Figure 2: Existing Conditions Drainage Area Plan
- Figure 3: Proposed Conditions Drainage Area Plan

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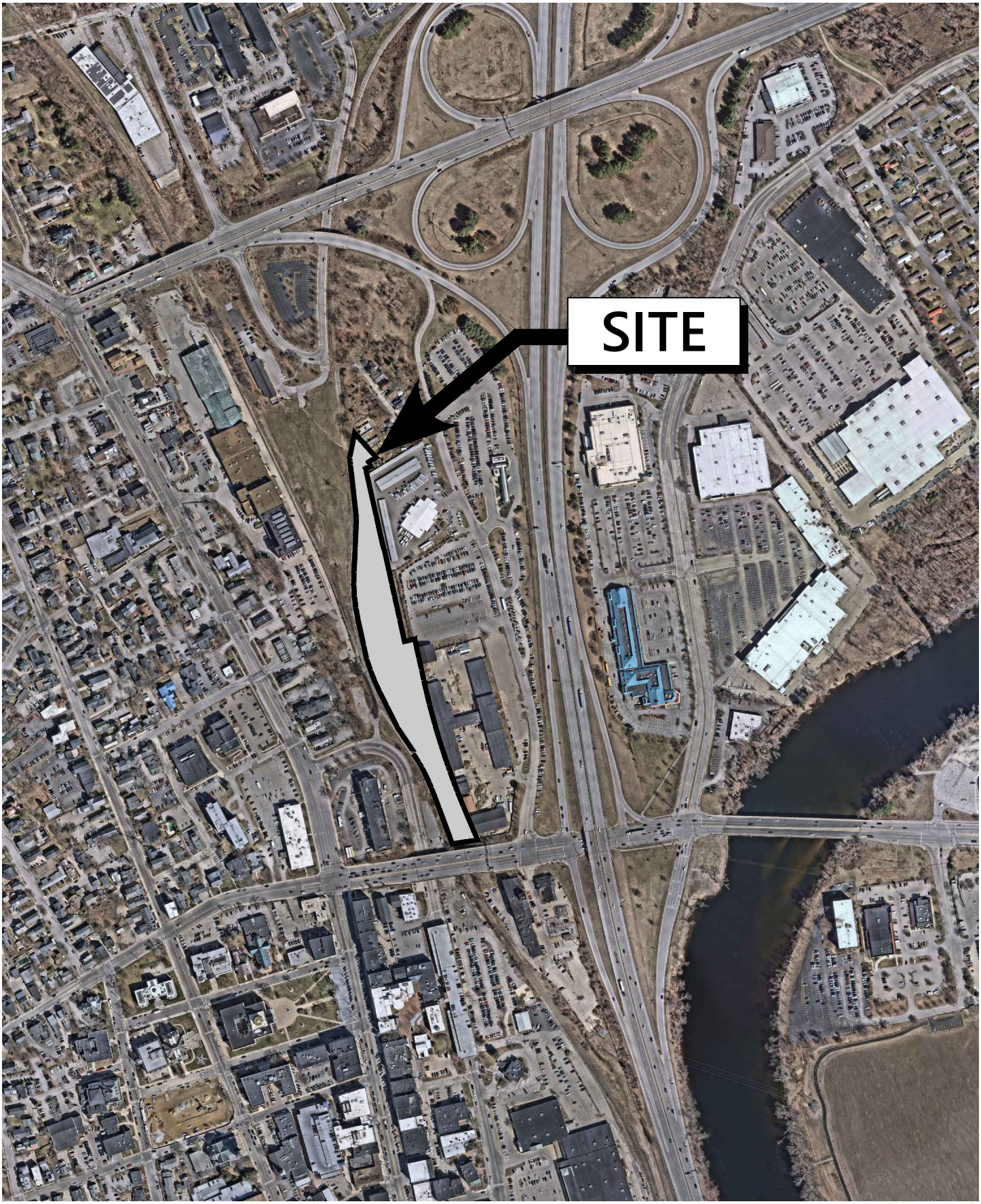

0 250 500 Feet

Site Location Map
Concord Coach
Concord, NH 03301

Figure 1

November 2025

Legend

SYMBOLS

- X — **DESIGN POINT**
- X — **DRAINAGE AREA DESIGNATION**
- X — **POND**

LINETYPES

- **DRAINAGE AREA BOUNDARY**
- **SOIL TYPE BOUNDARY**
- **TIME OF CONCENTRATION**

SCS SOIL CLASSIFICATIONS

498A	**Urban land-Pootatuck complex, 0 to 3 percent slopes, frequently flooded**
598B	**Windsor-Urban land complex, 0 to 8 percent slopes**
699B	**Urban land, 0 to 8 percent slopes**

0 40 80 Feet

vhb

Existing Drainage Conditions **Figure 2**

Concord Coach Temporary Expansion November 2025
Storrs Street, Concord, NH

C:\AMS\ACCDocs\VHB\176455.000-Concord Coach_Parking Lot Expansion\Project Files\05_Work\Cad\Id\Eng\Stormwater\176455.000-PR-Drainage Figure.dwg

Legend

SYMBOLS

- X — **DESIGN POINT**
- X — **DRAINAGE AREA DESIGNATION**
- X — **POND**

LINETYPES

- **DRAINAGE AREA BOUNDARY**
- **SOIL TYPE BOUNDARY**
- **TIME OF CONCENTRATION**

SCS SOIL CLASSIFICATIONS

498A	**Urban land-Pootatuck complex, 0 to 3 percent slopes, frequently flooded**
598B	**Windsor-Urban land complex, 0 to 8 percent slopes**
699B	**Urban land, 0 to 8 percent slopes**

0 40 80 Feet

Proposed Drainage Conditions **Figure 3**

Concord Coach Temporary Expansion November 2025
Storrs Street, Concord, NH

Appendix A: Support Data

- FEMA Map
- NRCS Web Soil Survey Map
- Groundwater Recharge Volume Calculations (GRV)
- BMP Worksheets

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FEMA Map

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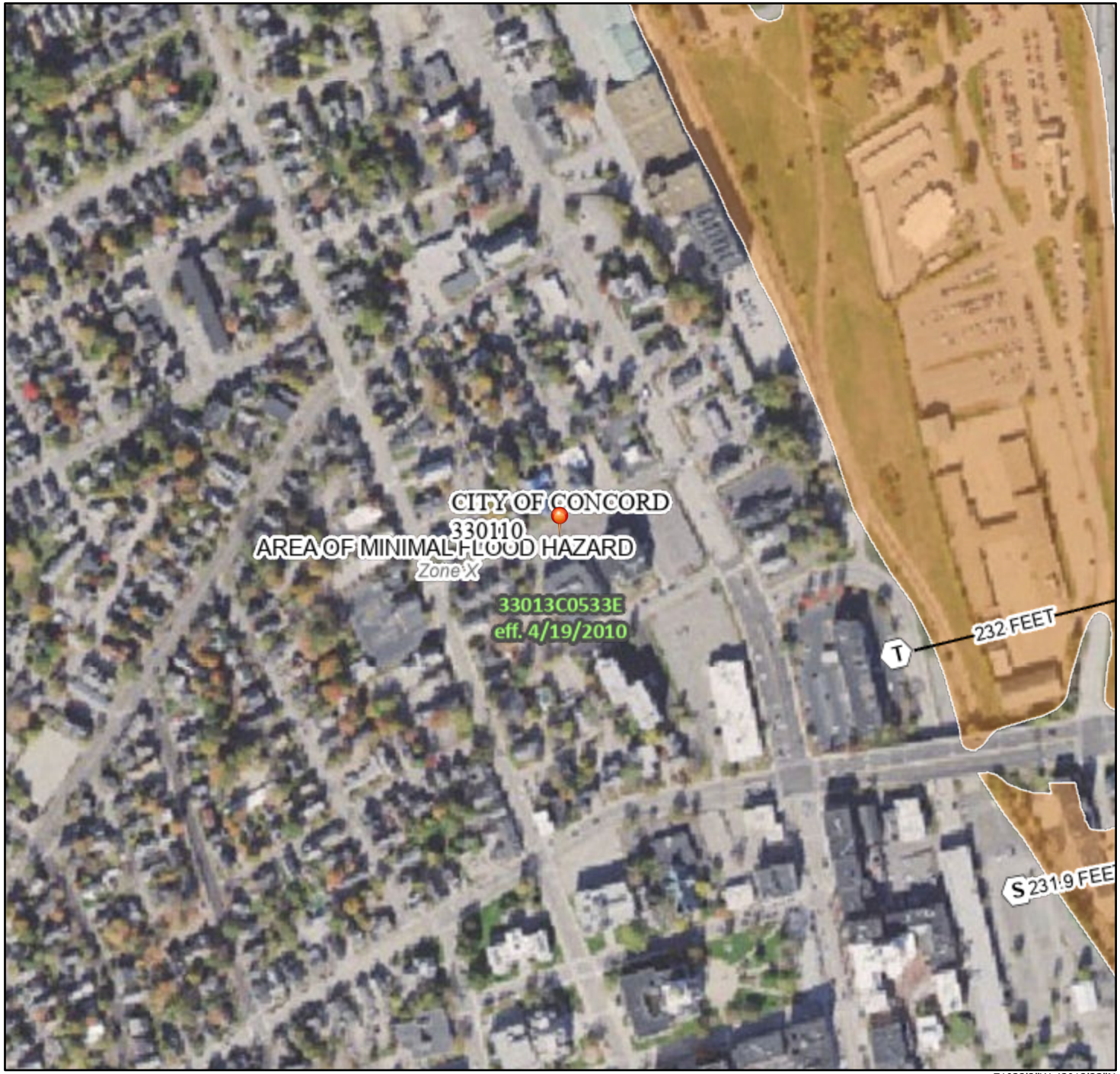
National Flood Hazard Layer FIRMette

FEMA

71°32'40"W 43°12'49"N



71°32'2"W 43°12'23"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/10/2025 at 2:57 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NRCS Web Soil Survey Map

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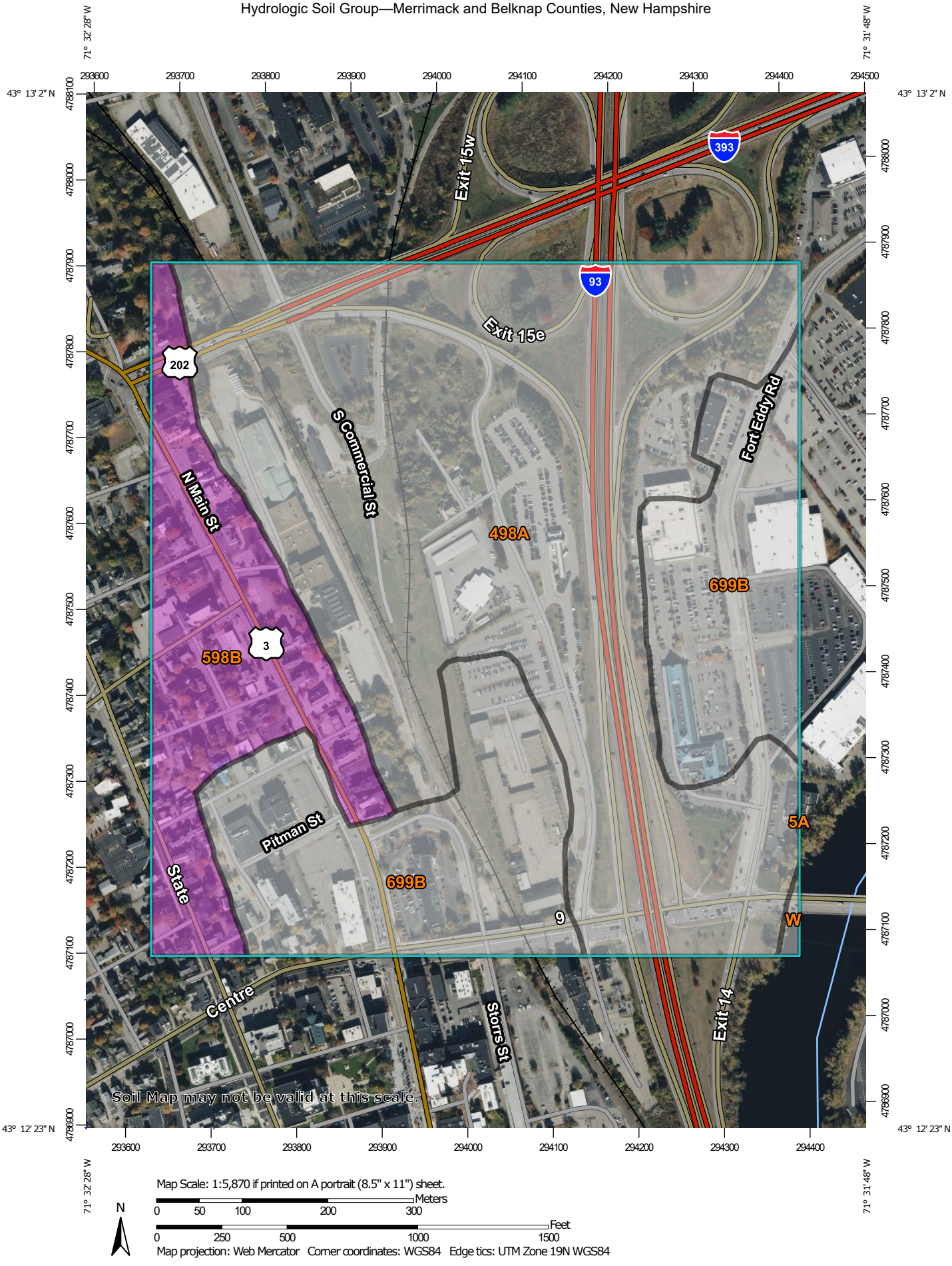
Hydrologic Soil Group—Merrimack and Belknap Counties, New Hampshire



Map Scale: 1:5,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
Survey Area Data: Version 31, Sep 10, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 6, 2022—Oct 22, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
5A	Rippowam very fine sandy loam, 0 to 3 percent slopes, frequently flooded	A/D	0.0	0.0%
498A	Urban land-Pootatuck complex, 0 to 3 percent slopes		86.0	56.6%
598B	Windsor-Urban land complex, 0 to 8 percent slopes	A	23.1	15.2%
699B	Urban land, 0 to 8 percent slopes		42.4	27.9%
W	Water		0.4	0.3%
Totals for Area of Interest			**151.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Groundwater Recharge Volume (GRV) Calculation

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GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
2.06	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = Weighted groundwater recharge depth	
0.5158	ac-in	GRV = AI * Rd	
1,872	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Ponds 1 and 2 provide recharge (total volume = 17,701 CF); exceeds GRV requirement.

BMP Worksheets

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INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Pond #1 (1P)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← **yes**
1.04	ac	A = Area draining to the practice	
0.89	ac	A_I = Impervious area draining to the practice	
0.86	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.85	ac-in	WQV= 1" x Rv x A	
3,103	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
776	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
2,293	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ **25%WQV**
9,171	cf	V = Volume[1] (attach a stage-storage table)	≥ **WQV**
5,067	sf	A_{SA} = Surface area of the bottom of the pond	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
24.5	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ **72-hrs**
233.10	feet	E_{BTM} = Elevation of the bottom of the basin	
229.04	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.06	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
#VALUE!	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
-	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ **24"**
-	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
Yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←**yes**
-		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← **yes**
-	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← **yes**
-	:1	If a basin is proposed, pond side slopes.	≥**3:1**
235.75	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
-	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
236.27	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← **yes**
NO		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Pond #2 (2P)**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← **yes**
1.25	ac	A = Area draining to the practice	
0.95	ac	A_I = Impervious area draining to the practice	
0.76	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.73	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.92	ac-in	WQV= 1" x Rv x A	
3,331	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
833	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
2,133	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ **25%WQV**
8,530	cf	V = Volume[1] (attach a stage-storage table)	≥ **WQV**
2,675	sf	A_{SA} = Surface area of the bottom of the pond	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
49.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ **72-hrs**
332.00	feet	E_{BTM} = Elevation of the bottom of the basin	
227.64	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
104.36	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
332.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
-	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ **24"**
-	ft	D_T = Depth of trench, if trench proposed	**4 - 10 ft**
Yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←**yes**
-		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← **yes**
-	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← **yes**
-	:1	If a basin is proposed, pond side slopes.	≥**3:1**
234.73	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
236.25	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← **yes**
-		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← **yes**

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Appendix B: Hydrologic Calculations

- Rainfall Data
- Existing Conditions
- Proposed Conditions

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Rainfall Data

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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.213 degrees North
Longitude	71.535 degrees West
Elevation	70 feet
Date/Time	Sun Nov 09 2025 07:58:15 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.39	0.49	0.64	0.80	1.01	**1yr**	0.69	0.98	1.17	1.47	1.86	2.36	2.56	**1yr**	2.09	2.47	2.89	3.59	4.12	**1yr**
2yr	0.31	0.48	0.60	0.79	1.00	1.25	**2yr**	0.86	1.15	1.45	1.81	2.26	2.81	3.14	**2yr**	2.49	3.02	3.50	4.18	4.78	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.58	**5yr**	1.08	1.45	1.83	2.28	2.83	3.50	3.98	**5yr**	3.10	3.83	4.43	5.20	5.90	**5yr**
10yr	0.42	0.66	0.84	1.14	1.48	1.89	**10yr**	1.28	1.71	2.19	2.73	3.37	4.13	4.77	**10yr**	3.66	4.59	5.29	6.13	6.91	**10yr**
25yr	0.50	0.79	1.01	1.39	1.85	2.38	**25yr**	1.60	2.15	2.76	3.44	4.24	5.16	6.05	**25yr**	4.57	5.82	6.69	7.62	8.53	**25yr**
50yr	0.56	0.90	1.16	1.62	2.20	2.85	**50yr**	1.89	2.56	3.32	4.13	5.05	6.10	7.25	**50yr**	5.40	6.97	7.99	8.99	10.01	**50yr**
100yr	0.65	1.05	1.35	1.91	2.61	3.39	**100yr**	2.25	3.04	3.96	4.92	5.99	7.22	8.69	**100yr**	6.39	8.36	9.56	10.62	11.74	**100yr**
200yr	0.74	1.21	1.57	2.24	3.09	4.04	**200yr**	2.67	3.62	4.72	5.86	7.13	8.55	10.43	**200yr**	7.57	10.03	11.43	12.54	13.78	**200yr**
500yr	0.89	1.47	1.91	2.77	3.88	5.11	**500yr**	3.35	4.55	5.97	7.40	8.97	10.71	13.27	**500yr**	9.47	12.76	14.50	15.63	17.05	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.39	0.53	0.65	0.88	**1yr**	0.56	0.87	1.04	1.37	1.59	1.99	2.42	**1yr**	1.76	2.32	2.64	3.27	3.84	**1yr**
2yr	0.30	0.47	0.57	0.78	0.96	1.14	**2yr**	0.83	1.12	1.30	1.72	2.19	2.74	3.05	**2yr**	2.43	2.93	3.41	4.07	4.66	**2yr**
5yr	0.34	0.53	0.66	0.90	1.15	1.37	**5yr**	0.99	1.34	1.53	1.99	2.56	3.28	3.70	**5yr**	2.91	3.56	4.12	4.87	5.54	**5yr**
10yr	0.38	0.58	0.72	1.01	1.31	1.54	**10yr**	1.13	1.51	1.74	2.24	2.86	3.77	4.29	**10yr**	3.34	4.12	4.75	5.56	6.33	**10yr**
25yr	0.44	0.67	0.83	1.18	1.55	1.80	**25yr**	1.34	1.76	2.05	2.59	3.33	4.51	5.20	**25yr**	3.99	5.00	5.71	6.64	7.53	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.02	**50yr**	1.53	1.98	2.33	2.91	3.74	5.18	6.02	**50yr**	4.58	5.79	6.55	7.59	8.62	**50yr**
100yr	0.54	0.82	1.02	1.48	2.03	2.28	**100yr**	1.75	2.23	2.64	3.26	4.20	5.95	6.98	**100yr**	5.26	6.71	7.54	8.69	9.85	**100yr**
200yr	0.60	0.90	1.14	1.65	2.30	2.55	**200yr**	1.99	2.49	2.99	3.66	4.73	6.84	8.07	**200yr**	6.05	7.76	8.65	9.97	11.25	**200yr**
500yr	0.69	1.03	1.33	1.93	2.74	2.96	**500yr**	2.37	2.89	3.55	4.28	5.53	8.22	9.81	**500yr**	7.28	9.43	10.32	11.96	13.46	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.54	0.73	0.90	1.08	**1yr**	0.78	1.06	1.19	1.59	1.98	2.51	2.74	**1yr**	2.22	2.64	3.14	3.82	4.34	**1yr**
2yr	0.33	0.50	0.62	0.84	1.03	1.24	**2yr**	0.89	1.21	1.39	1.83	2.33	2.90	3.24	**2yr**	2.56	3.12	3.63	4.31	4.93	**2yr**
5yr	0.41	0.63	0.78	1.07	1.36	1.58	**5yr**	1.17	1.55	1.79	2.29	2.92	3.72	4.28	**5yr**	3.30	4.12	4.74	5.52	6.26	**5yr**
10yr	0.49	0.75	0.93	1.30	1.68	1.93	**10yr**	1.45	1.88	2.18	2.73	3.48	4.52	5.29	**10yr**	4.00	5.09	5.86	6.67	7.55	**10yr**
25yr	0.62	0.95	1.18	1.69	2.22	2.51	**25yr**	1.91	2.46	2.81	3.44	4.38	5.83	7.01	**25yr**	5.16	6.74	7.71	8.57	9.63	**25yr**
50yr	0.74	1.13	1.41	2.03	2.73	3.08	**50yr**	2.36	3.01	3.40	4.11	5.21	7.07	8.67	**50yr**	6.26	8.33	9.51	10.37	11.59	**50yr**
100yr	0.90	1.37	1.71	2.47	3.39	3.77	**100yr**	2.92	3.69	4.13	4.90	6.20	8.59	10.74	**100yr**	7.61	10.33	11.75	12.54	13.95	**100yr**
200yr	1.09	1.63	2.07	3.00	4.18	4.63	**200yr**	3.61	4.52	5.01	5.85	7.39	10.43	13.30	**200yr**	9.23	12.79	14.54	15.17	16.79	**200yr**
500yr	1.40	2.09	2.68	3.90	5.55	6.08	**500yr**	4.79	5.95	6.48	7.40	9.35	13.50	17.66	**500yr**	11.95	16.98	19.28	19.54	21.44	**500yr**

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Existing Conditions

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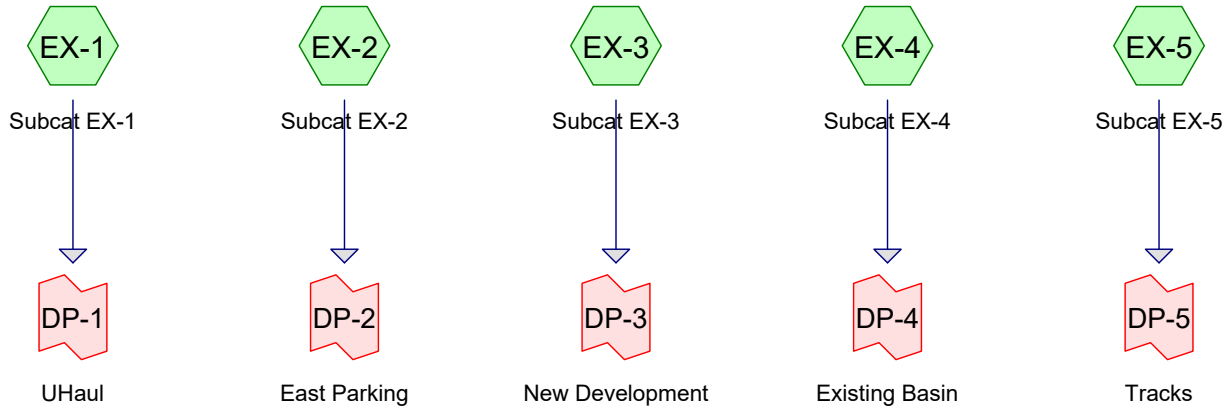


Subcat Reach Pond Link

Routing Diagram for 176455.000-EX
Prepared by VHB, Inc, Printed 11/17/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	Type III 24-hr		Default	24.00	1	2.81	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.13	2
3	25-YR	Type III 24-hr		Default	24.00	1	5.16	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.688	69	50-75% Grass cover, Fair, HSG B (EX-1, EX-2, EX-3, EX-4, EX-5)
0.006	98	Paved parking, HSG B (EX-2)
2.694	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.694	HSG B	EX-1, EX-2, EX-3, EX-4, EX-5
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.694		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.688	0.000	0.000	0.000	2.688	50-75% Grass cover, Fair	EX-1, EX-2, EX-3, EX-4, EX-5
0.000	0.006	0.000	0.000	0.000	0.006	Paved parking	EX-2
0.000	**2.694**	**0.000**	**0.000**	**0.000**	**2.694**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=40' Slope=0.0050 '/' Tc=8.7 min CN=69 Runoff=0.07 cfs 0.007 af

Subcatchment EX-2: Subcat EX-2 Runoff Area=1.026 ac 0.54% Impervious Runoff Depth=0.57"
Flow Length=120' Tc=6.9 min CN=69 Runoff=0.53 cfs 0.049 af

Subcatchment EX-3: Subcat EX-3 Runoff Area=1.021 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=230' Tc=11.7 min CN=69 Runoff=0.45 cfs 0.049 af

Subcatchment EX-4: Subcat EX-4 Runoff Area=0.476 ac 0.00% Impervious Runoff Depth=0.57"
Flow Length=75' Slope=0.0050 '/' Tc=11.3 min CN=69 Runoff=0.21 cfs 0.023 af

Subcatchment EX-5: Subcat EX-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.01 cfs 0.001 af

Link DP-1: UHaul Inflow=0.07 cfs 0.007 af
Primary=0.07 cfs 0.007 af

Link DP-2: East Parking Inflow=0.53 cfs 0.049 af
Primary=0.53 cfs 0.049 af

Link DP-3: New Development Inflow=0.45 cfs 0.049 af
Primary=0.45 cfs 0.049 af

Link DP-4: Existing Basin Inflow=0.21 cfs 0.023 af
Primary=0.21 cfs 0.023 af

Link DP-5: Tracks Inflow=0.01 cfs 0.001 af
Primary=0.01 cfs 0.001 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.128 af Average Runoff Depth = 0.57"
99.79% Pervious = 2.688 ac 0.21% Impervious = 0.006 ac

Summary for Subcatchment EX-1: Subcat EX-1

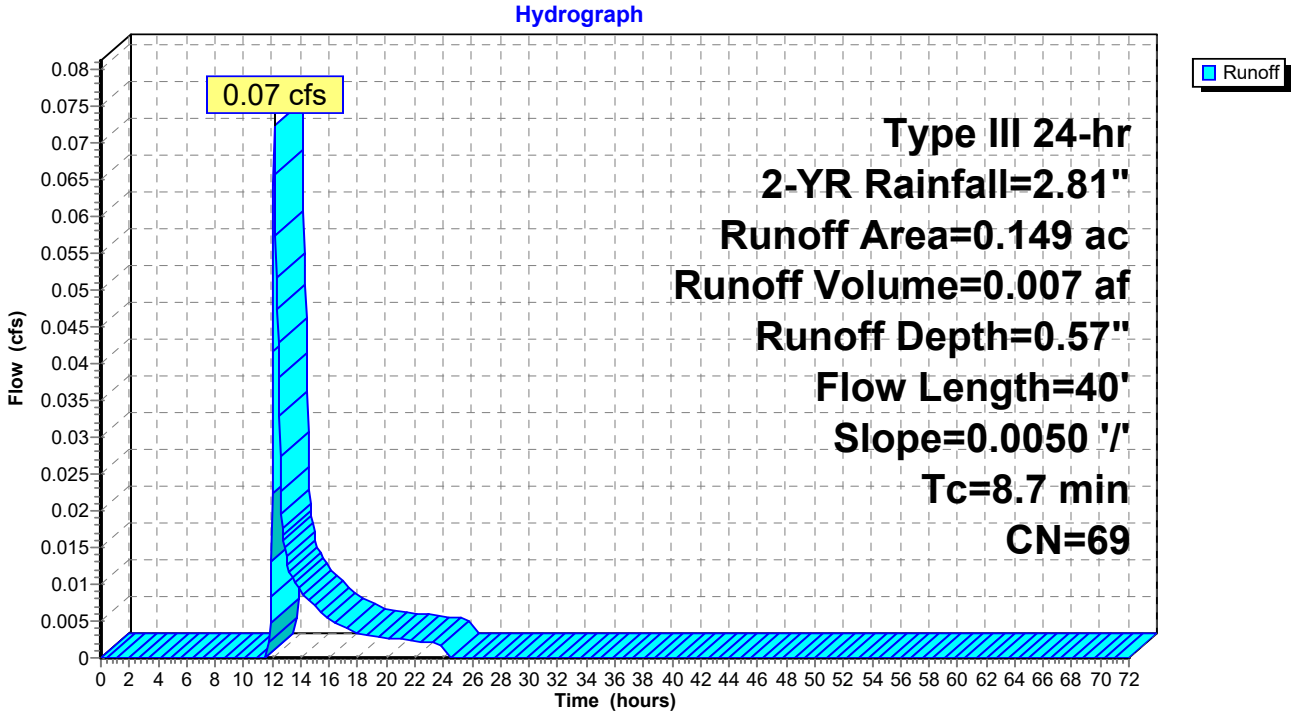
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.007 af, Depth= 0.57"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.149	69	50-75% Grass cover, Fair, HSG B
0.149		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"

Subcatchment EX-1: Subcat EX-1



Summary for Subcatchment EX-2: Subcat EX-2

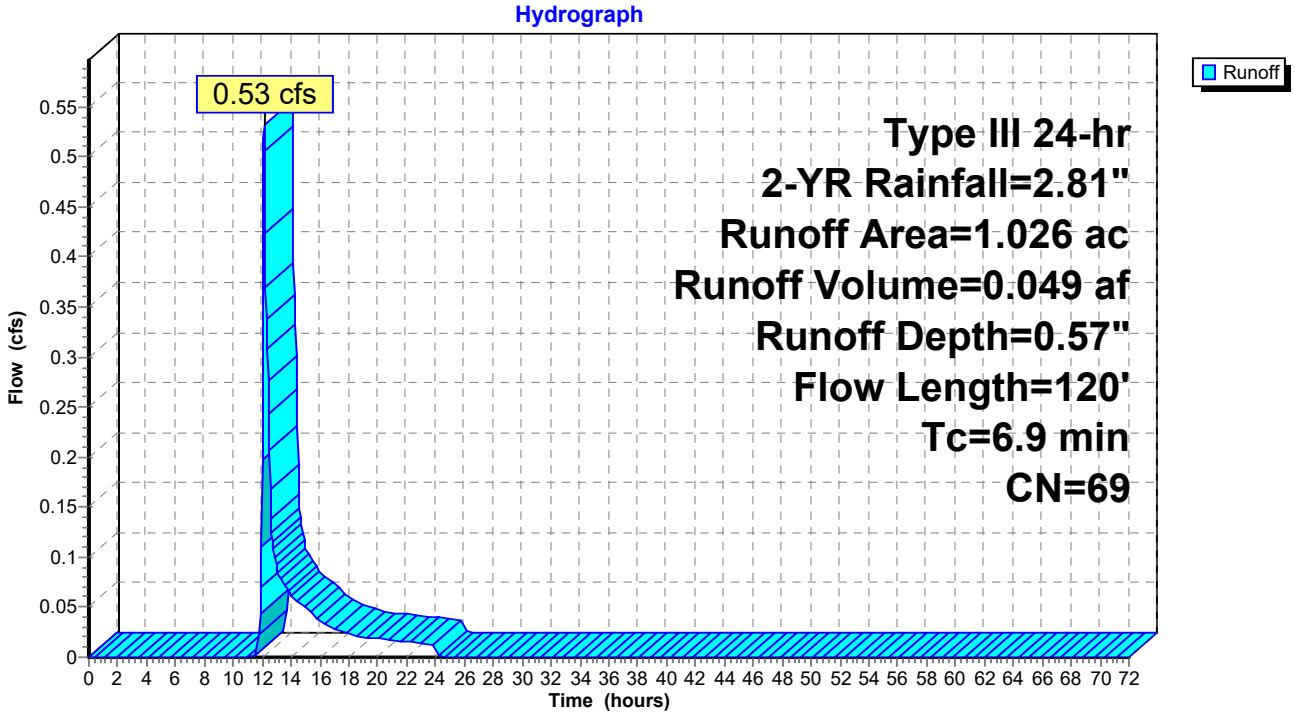
Runoff = 0.53 cfs @ 12.12 hrs, Volume= 0.049 af, Depth= 0.57"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
1.020	69	50-75% Grass cover, Fair, HSG B
0.006	98	Paved parking, HSG B
1.026	69	Weighted Average
1.020		99.46% Pervious Area
0.006		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0300	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
1.8	70	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.9	120	Total			

Subcatchment EX-2: Subcat EX-2



Summary for Subcatchment EX-3: Subcat EX-3

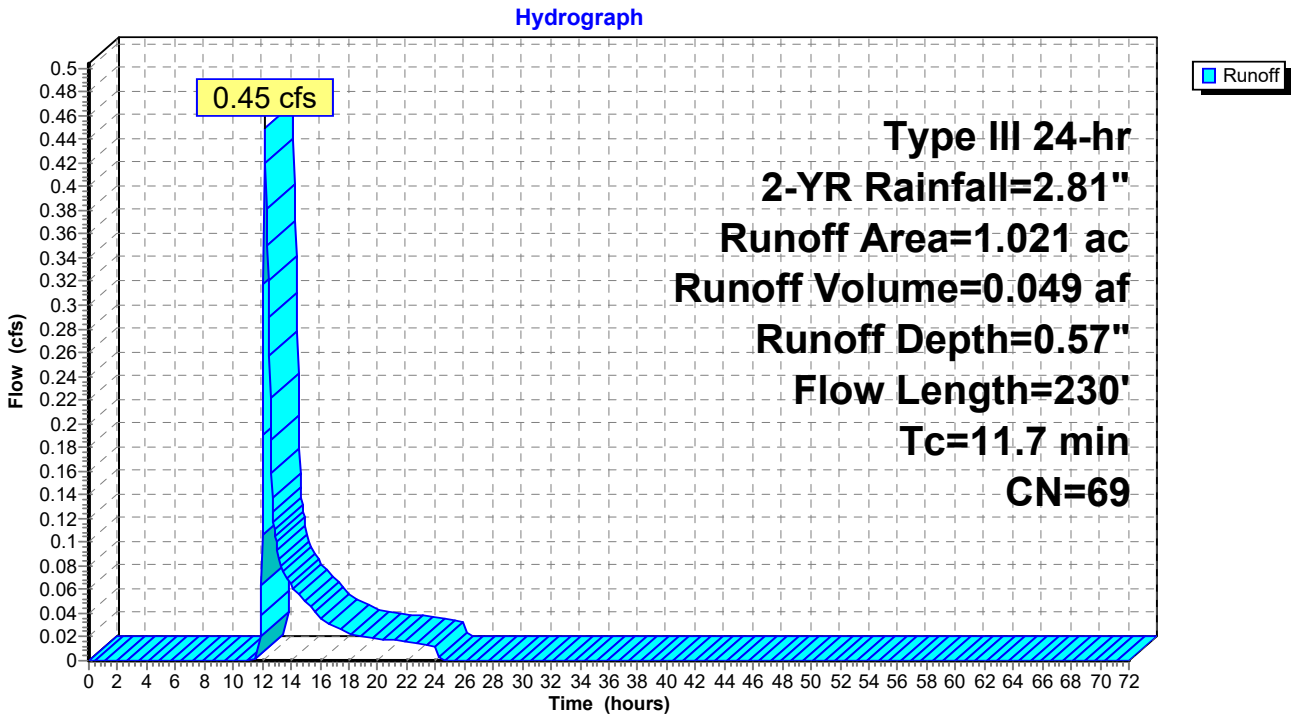
Runoff = 0.45 cfs @ 12.20 hrs, Volume= 0.049 af, Depth= 0.57"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
1.021	69	50-75% Grass cover, Fair, HSG B
1.021		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0090	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.4	180	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.7	230	Total			

Subcatchment EX-3: Subcat EX-3



Summary for Subcatchment EX-4: Subcat EX-4

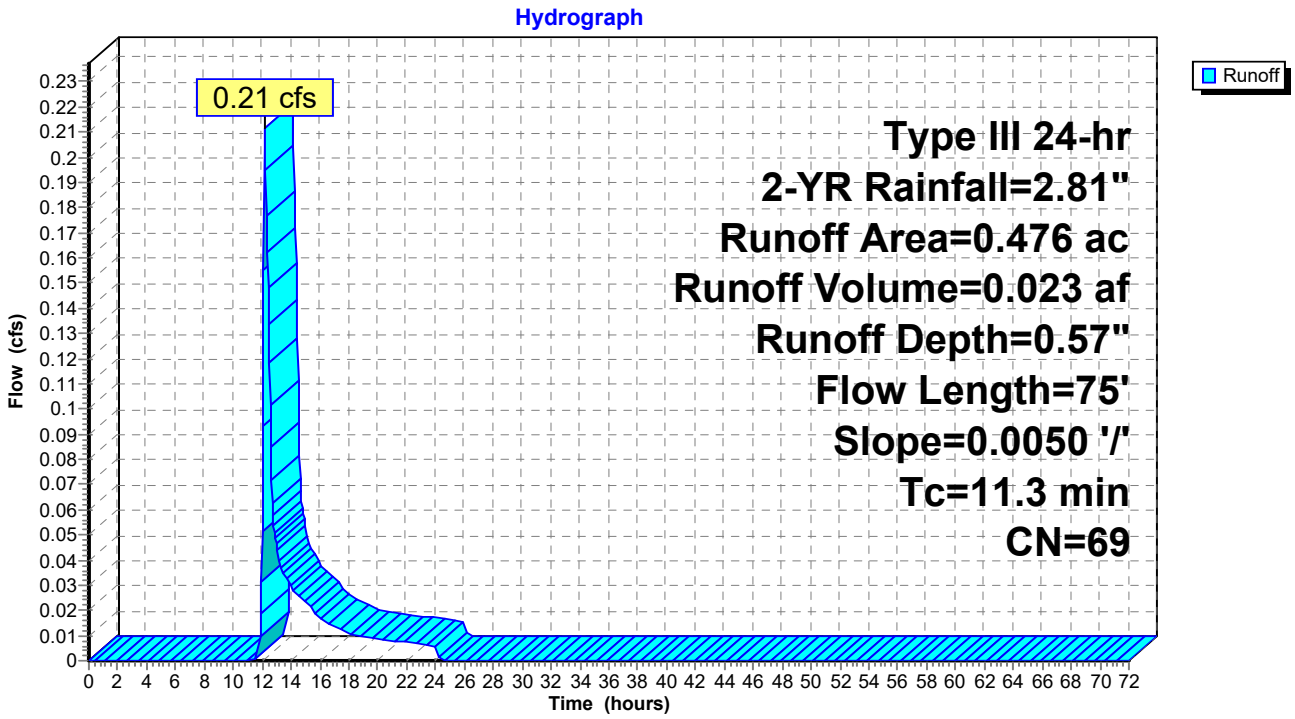
Runoff = 0.21 cfs @ 12.19 hrs, Volume= 0.023 af, Depth= 0.57"
Routed to Link DP-4 : Existing Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.476	69	50-75% Grass cover, Fair, HSG B
0.476		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
0.8	25	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.3	75	Total			

Subcatchment EX-4: Subcat EX-4



Summary for Subcatchment EX-5: Subcat EX-5

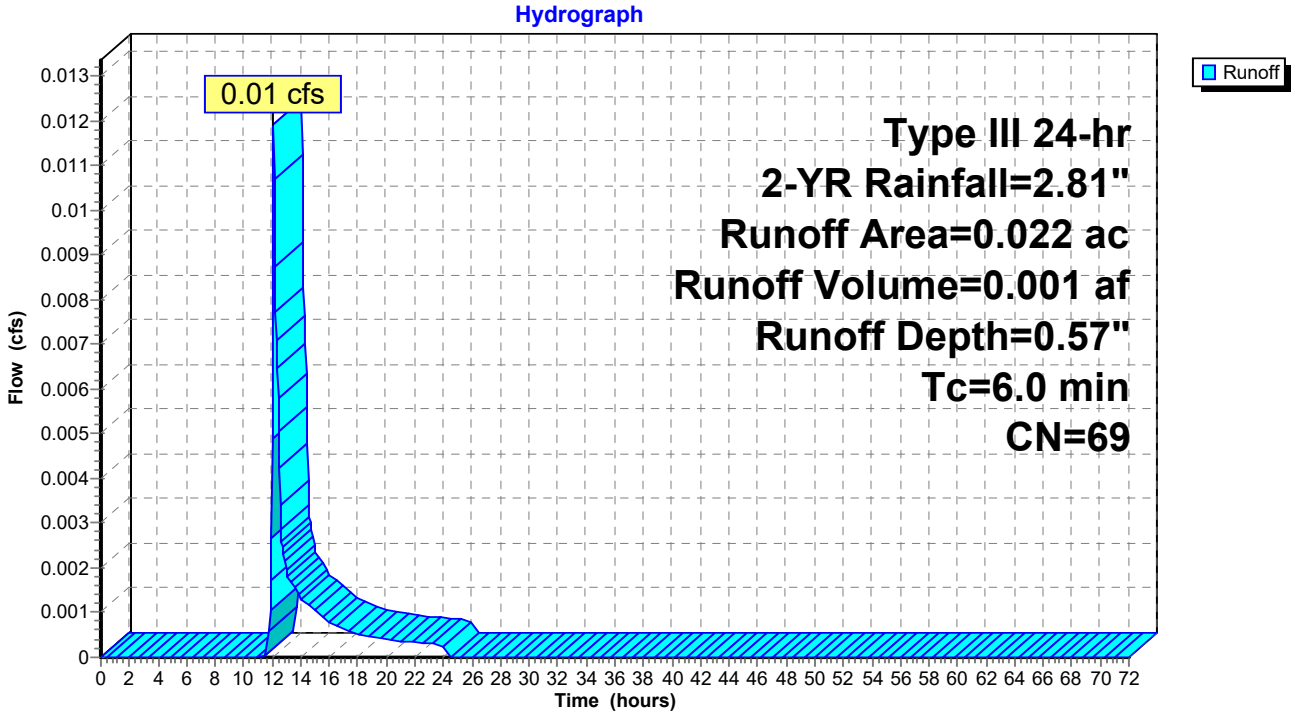
Runoff = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af, Depth= 0.57"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment EX-5: Subcat EX-5

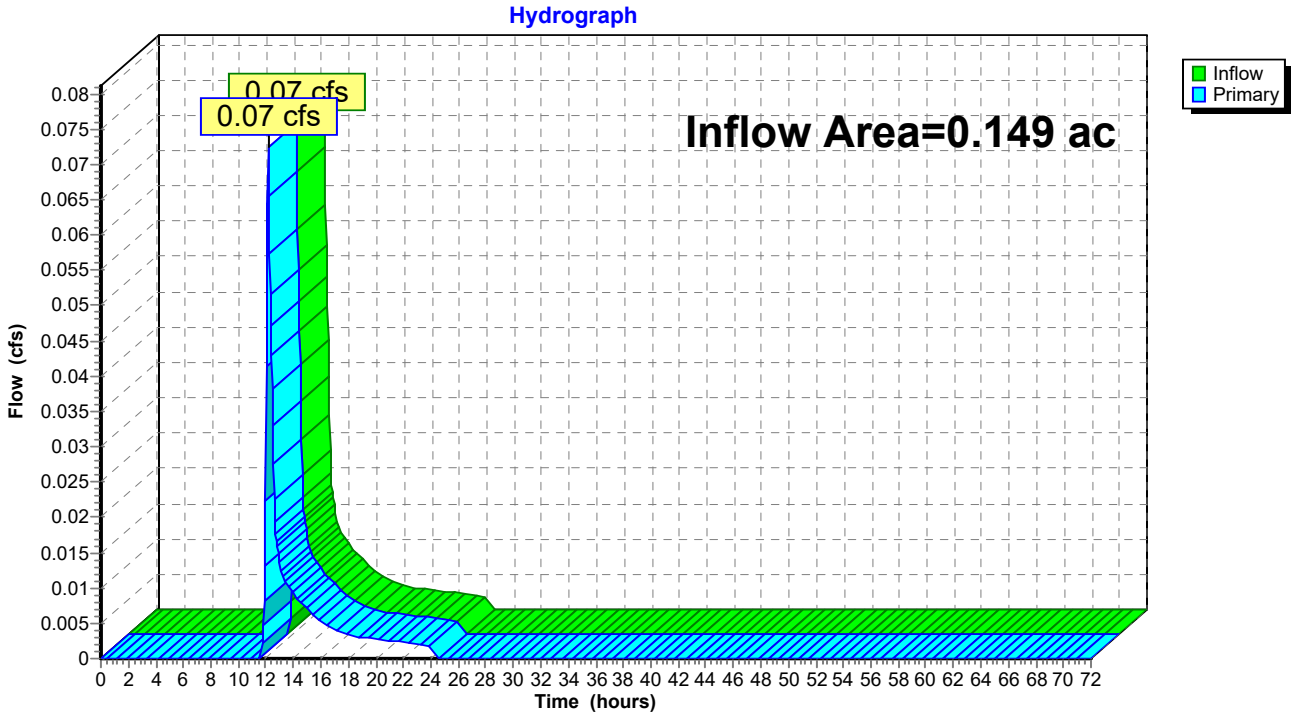


Summary for Link DP-1: UHaul

Inflow Area = 0.149 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.07 cfs @ 12.15 hrs, Volume= 0.007 af
Primary = 0.07 cfs @ 12.15 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

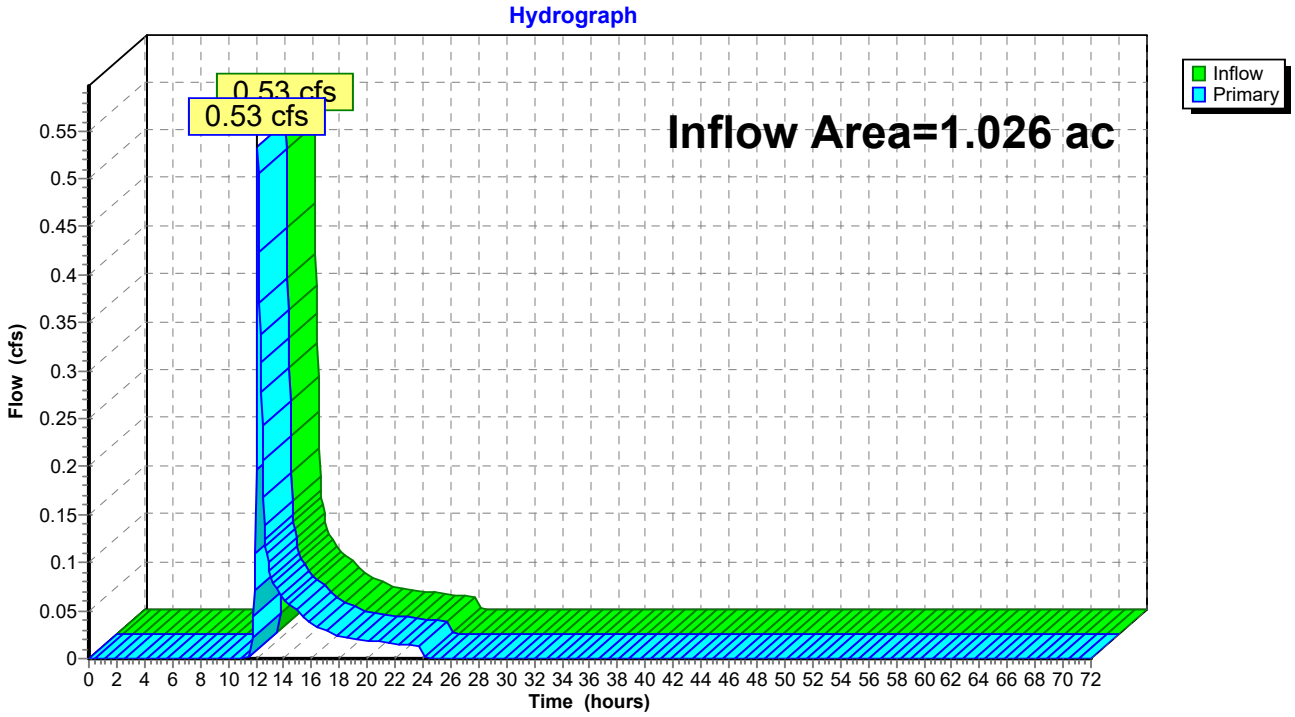


Summary for Link DP-2: East Parking

Inflow Area = 1.026 ac, 0.54% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.53 cfs @ 12.12 hrs, Volume= 0.049 af
Primary = 0.53 cfs @ 12.12 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

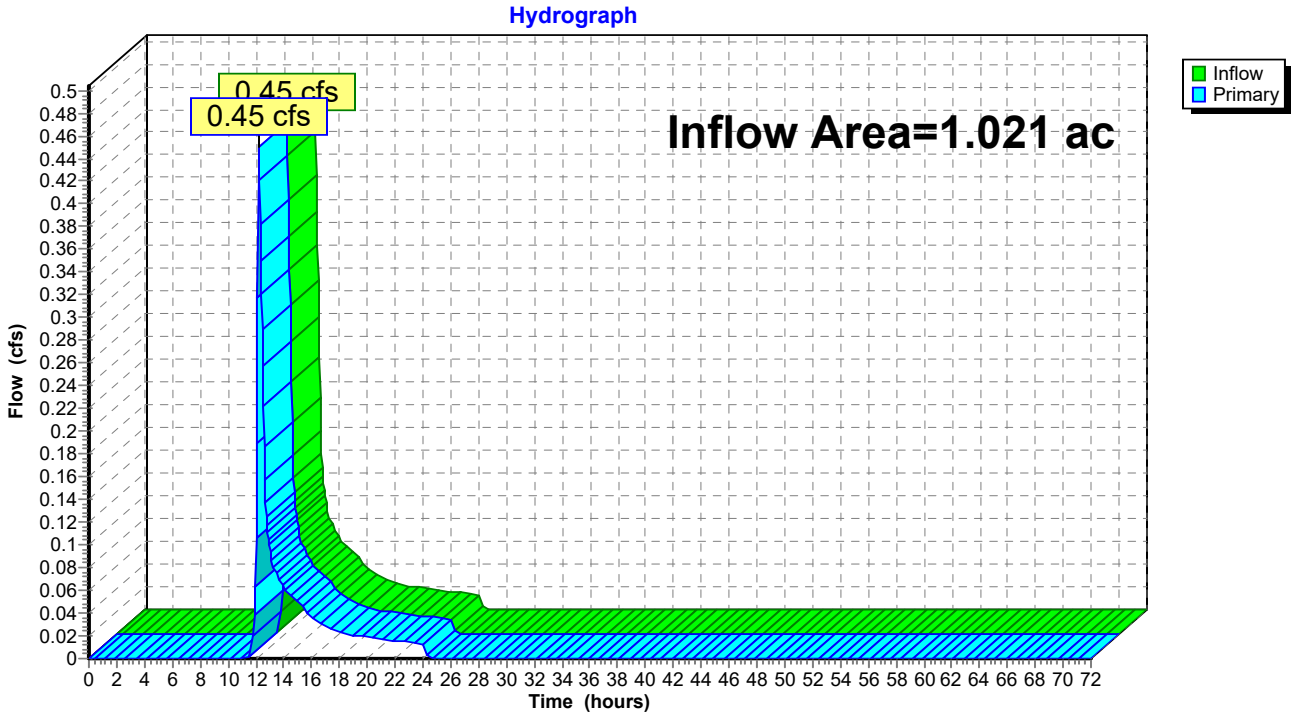


Summary for Link DP-3: New Development

Inflow Area = 1.021 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.45 cfs @ 12.20 hrs, Volume= 0.049 af
Primary = 0.45 cfs @ 12.20 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

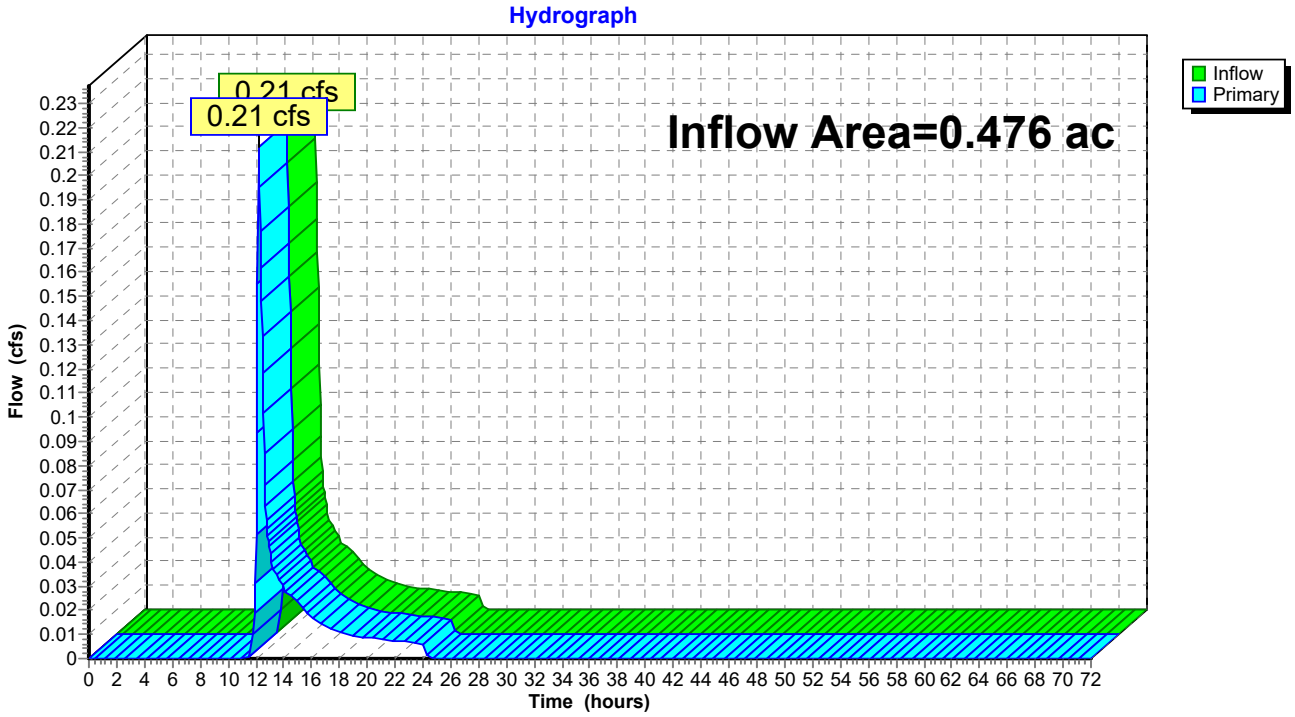


Summary for Link DP-4: Existing Basin

Inflow Area = 0.476 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.21 cfs @ 12.19 hrs, Volume= 0.023 af
Primary = 0.21 cfs @ 12.19 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Existing Basin

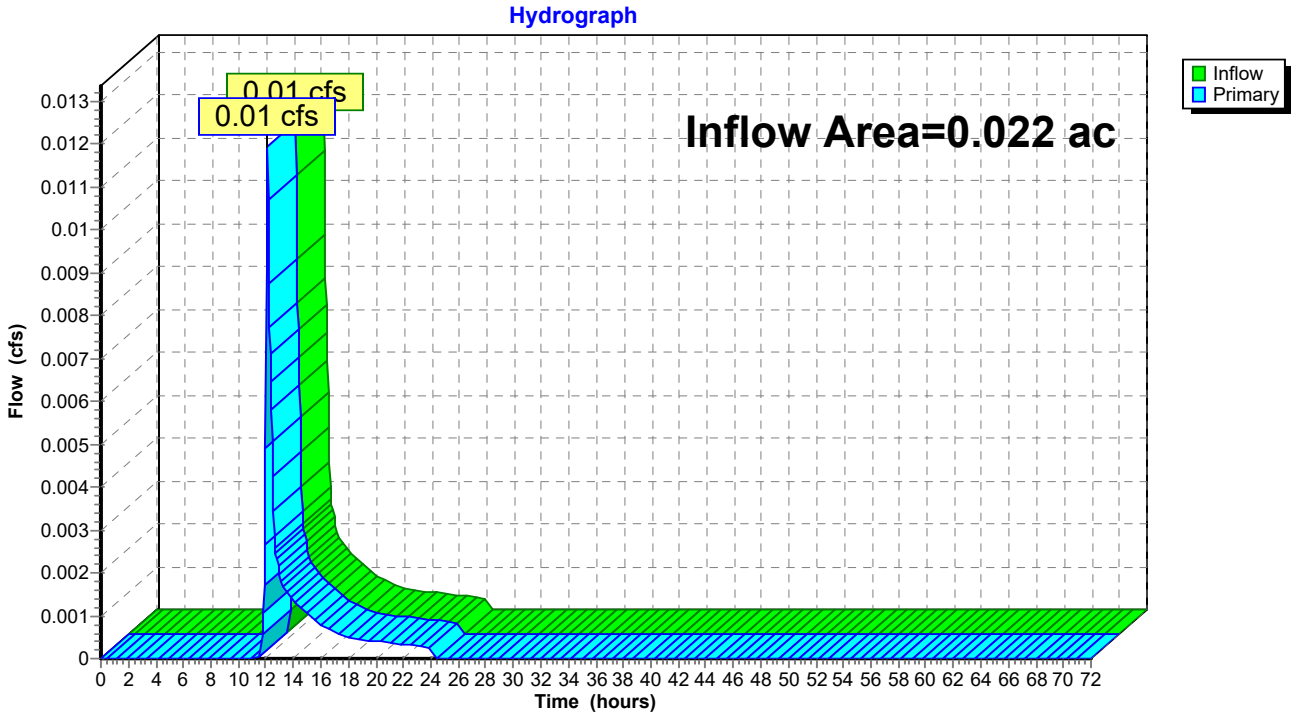


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af
Primary = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=40' Slope=0.0050 '/' Tc=8.7 min CN=69 Runoff=0.20 cfs 0.017 af

Subcatchment EX-2: Subcat EX-2 Runoff Area=1.026 ac 0.54% Impervious Runoff Depth=1.35"
Flow Length=120' Tc=6.9 min CN=69 Runoff=1.48 cfs 0.116 af

Subcatchment EX-3: Subcat EX-3 Runoff Area=1.021 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=230' Tc=11.7 min CN=69 Runoff=1.25 cfs 0.115 af

Subcatchment EX-4: Subcat EX-4 Runoff Area=0.476 ac 0.00% Impervious Runoff Depth=1.35"
Flow Length=75' Slope=0.0050 '/' Tc=11.3 min CN=69 Runoff=0.59 cfs 0.054 af

Subcatchment EX-5: Subcat EX-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=69 Runoff=0.03 cfs 0.002 af

Link DP-1: UHaul Inflow=0.20 cfs 0.017 af
Primary=0.20 cfs 0.017 af

Link DP-2: East Parking Inflow=1.48 cfs 0.116 af
Primary=1.48 cfs 0.116 af

Link DP-3: New Development Inflow=1.25 cfs 0.115 af
Primary=1.25 cfs 0.115 af

Link DP-4: Existing Basin Inflow=0.59 cfs 0.054 af
Primary=0.59 cfs 0.054 af

Link DP-5: Tracks Inflow=0.03 cfs 0.002 af
Primary=0.03 cfs 0.002 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.303 af Average Runoff Depth = 1.35"
99.79% Pervious = 2.688 ac 0.21% Impervious = 0.006 ac

Summary for Subcatchment EX-1: Subcat EX-1

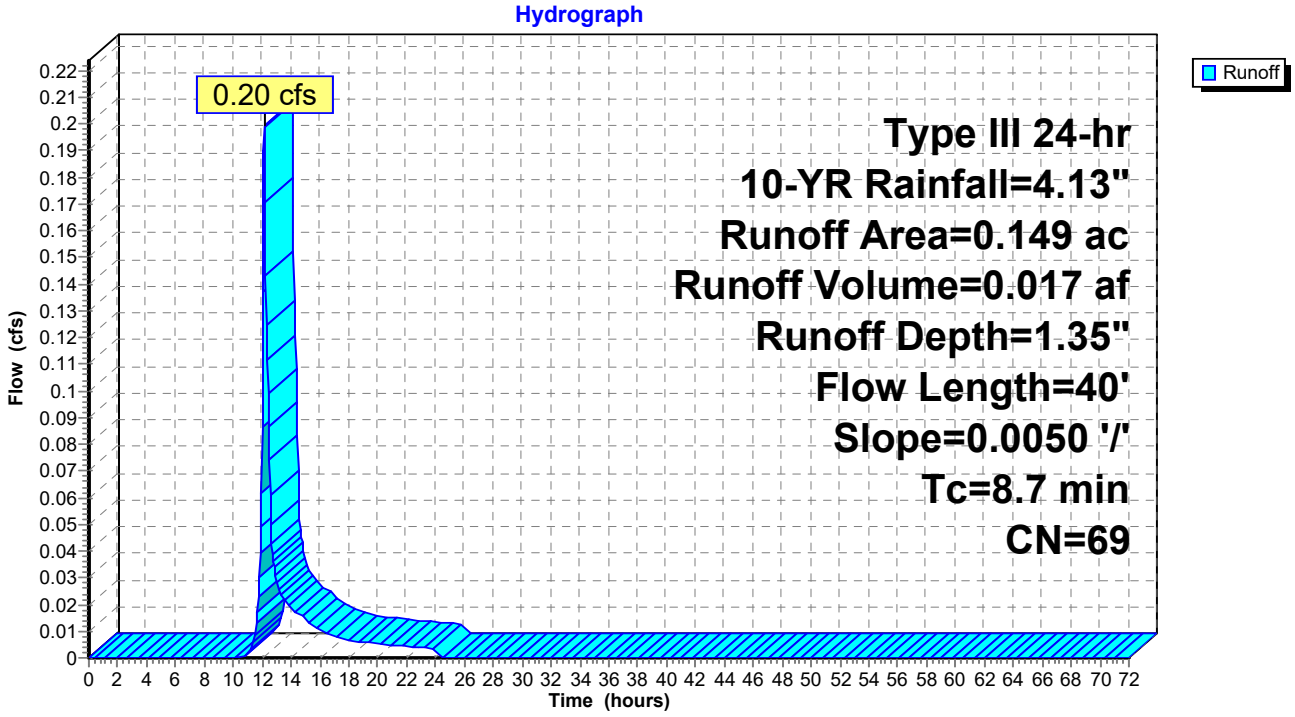
Runoff = 0.20 cfs @ 12.14 hrs, Volume= 0.017 af, Depth= 1.35"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.149	69	50-75% Grass cover, Fair, HSG B
0.149		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"

Subcatchment EX-1: Subcat EX-1



Summary for Subcatchment EX-2: Subcat EX-2

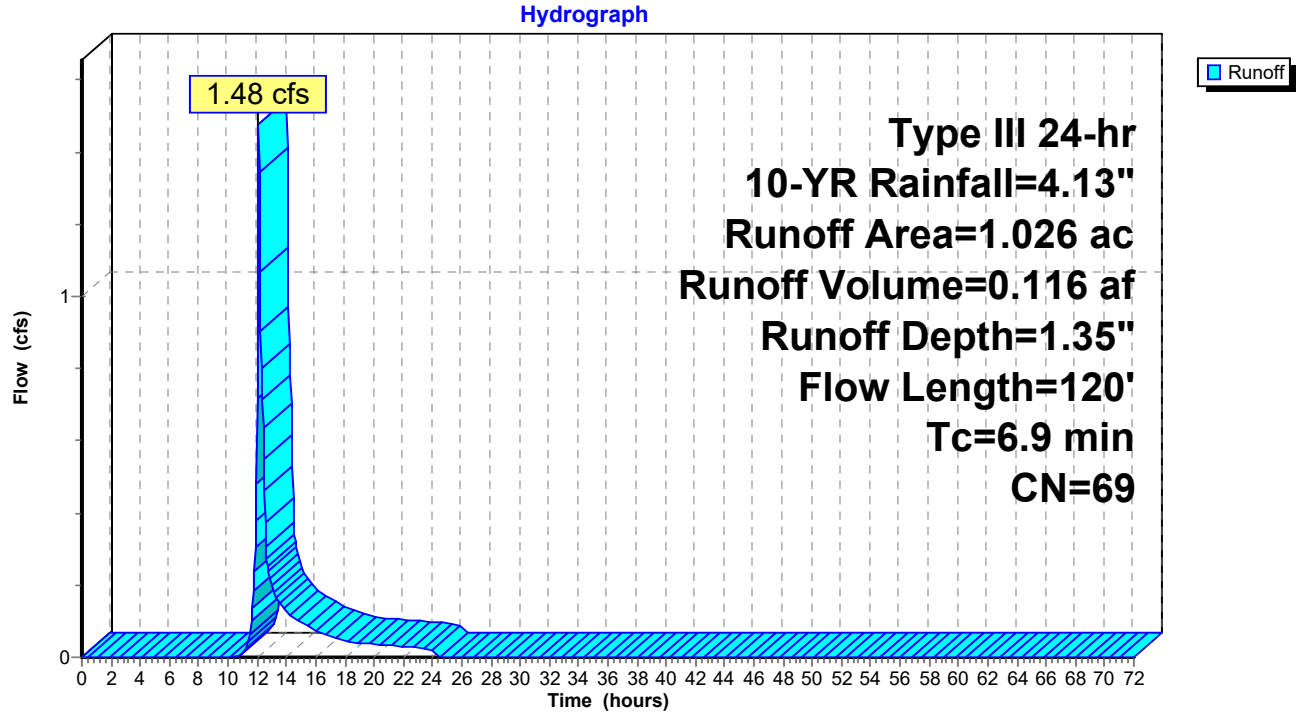
Runoff = 1.48 cfs @ 12.11 hrs, Volume= 0.116 af, Depth= 1.35"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
1.020	69	50-75% Grass cover, Fair, HSG B
0.006	98	Paved parking, HSG B
1.026	69	Weighted Average
1.020		99.46% Pervious Area
0.006		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0300	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
1.8	70	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.9	120	Total			

Subcatchment EX-2: Subcat EX-2



Summary for Subcatchment EX-3: Subcat EX-3

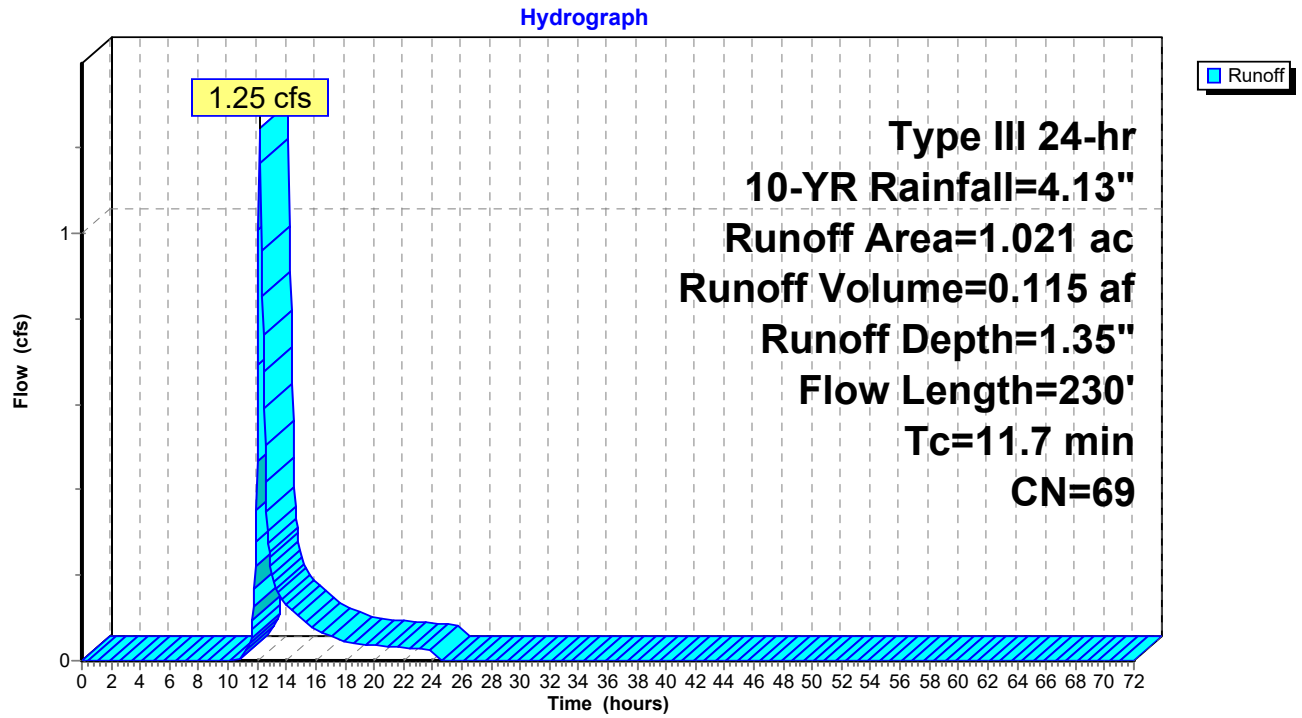
Runoff = 1.25 cfs @ 12.18 hrs, Volume= 0.115 af, Depth= 1.35"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
1.021	69	50-75% Grass cover, Fair, HSG B
1.021		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0090	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.4	180	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.7	230	Total			

Subcatchment EX-3: Subcat EX-3



Summary for Subcatchment EX-4: Subcat EX-4

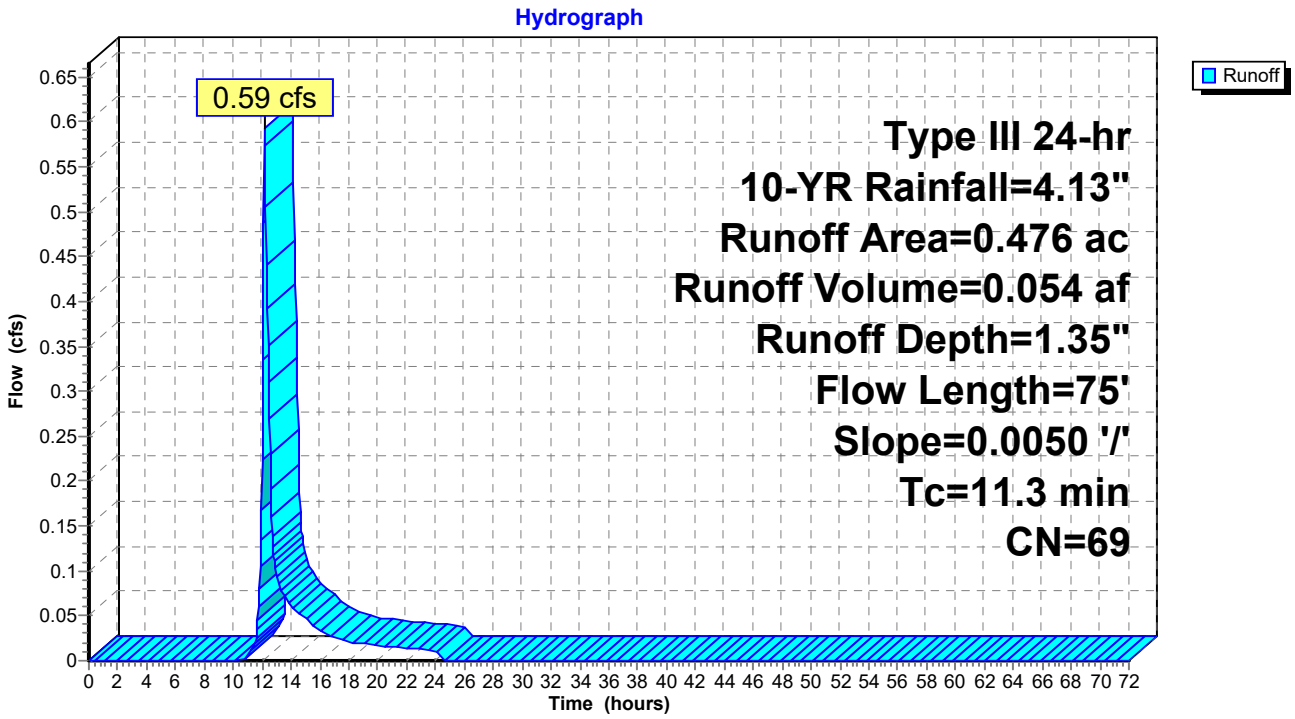
Runoff = 0.59 cfs @ 12.17 hrs, Volume= 0.054 af, Depth= 1.35"
Routed to Link DP-4 : Existing Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.476	69	50-75% Grass cover, Fair, HSG B
0.476		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
0.8	25	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.3	75	Total			

Subcatchment EX-4: Subcat EX-4



Summary for Subcatchment EX-5: Subcat EX-5

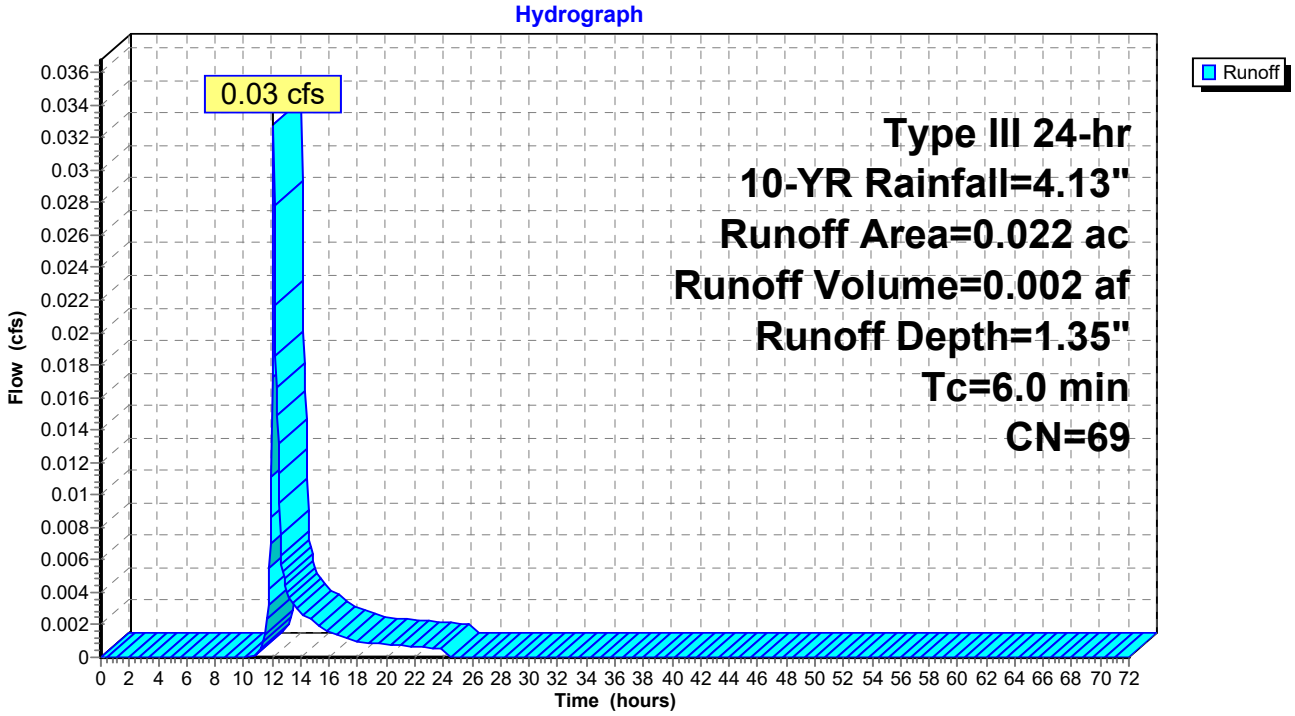
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Depth= 1.35"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment EX-5: Subcat EX-5

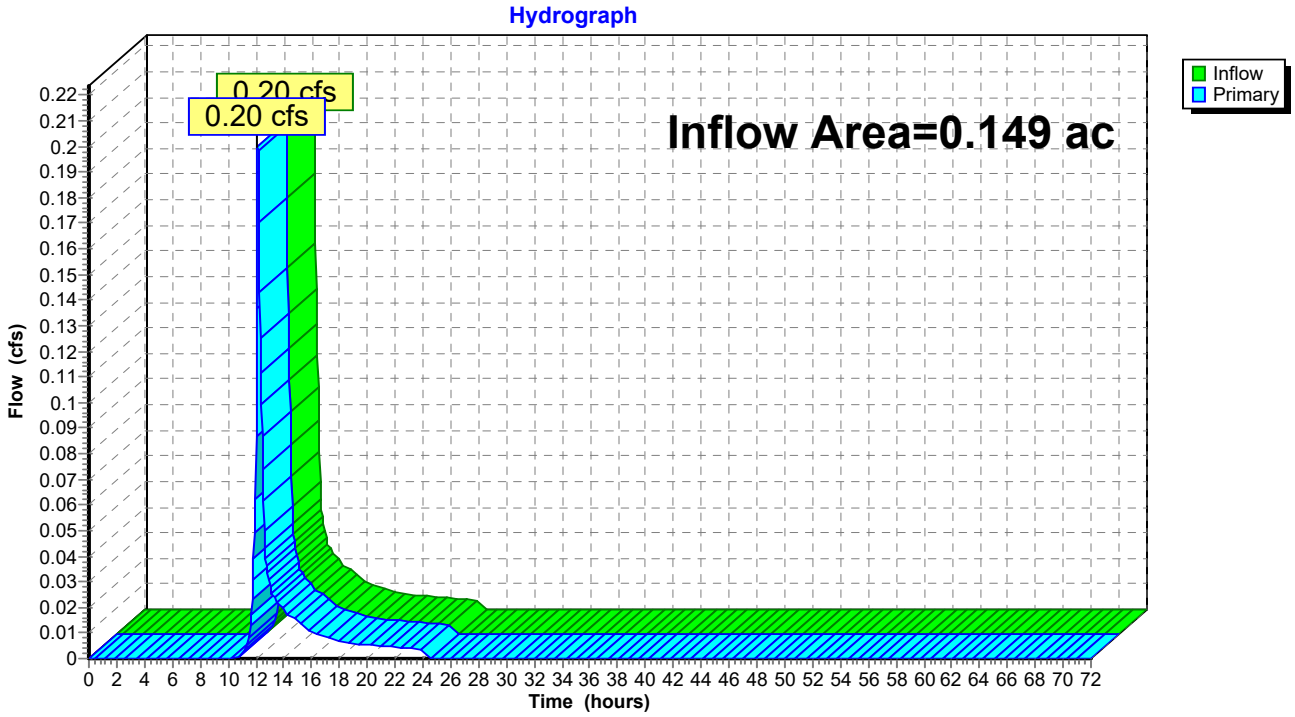


Summary for Link DP-1: UHaul

Inflow Area = 0.149 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.20 cfs @ 12.14 hrs, Volume= 0.017 af
Primary = 0.20 cfs @ 12.14 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

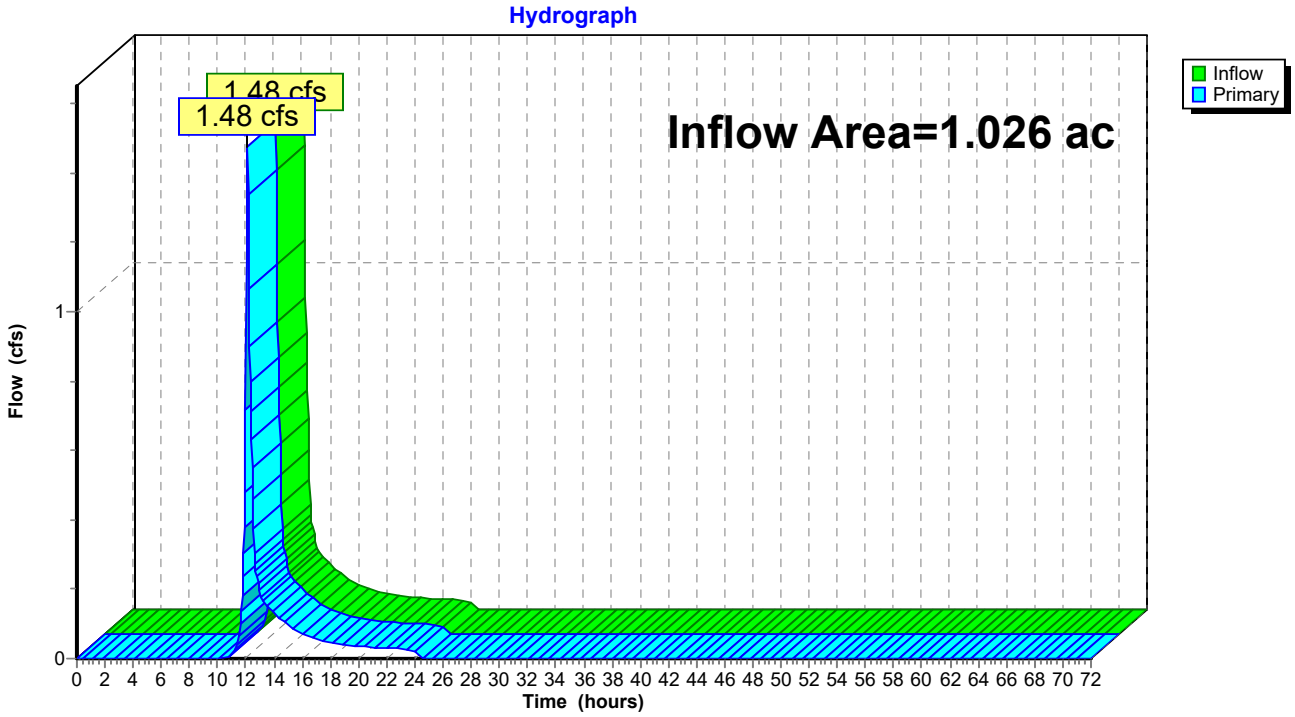


Summary for Link DP-2: East Parking

Inflow Area = 1.026 ac, 0.54% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 1.48 cfs @ 12.11 hrs, Volume= 0.116 af
Primary = 1.48 cfs @ 12.11 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

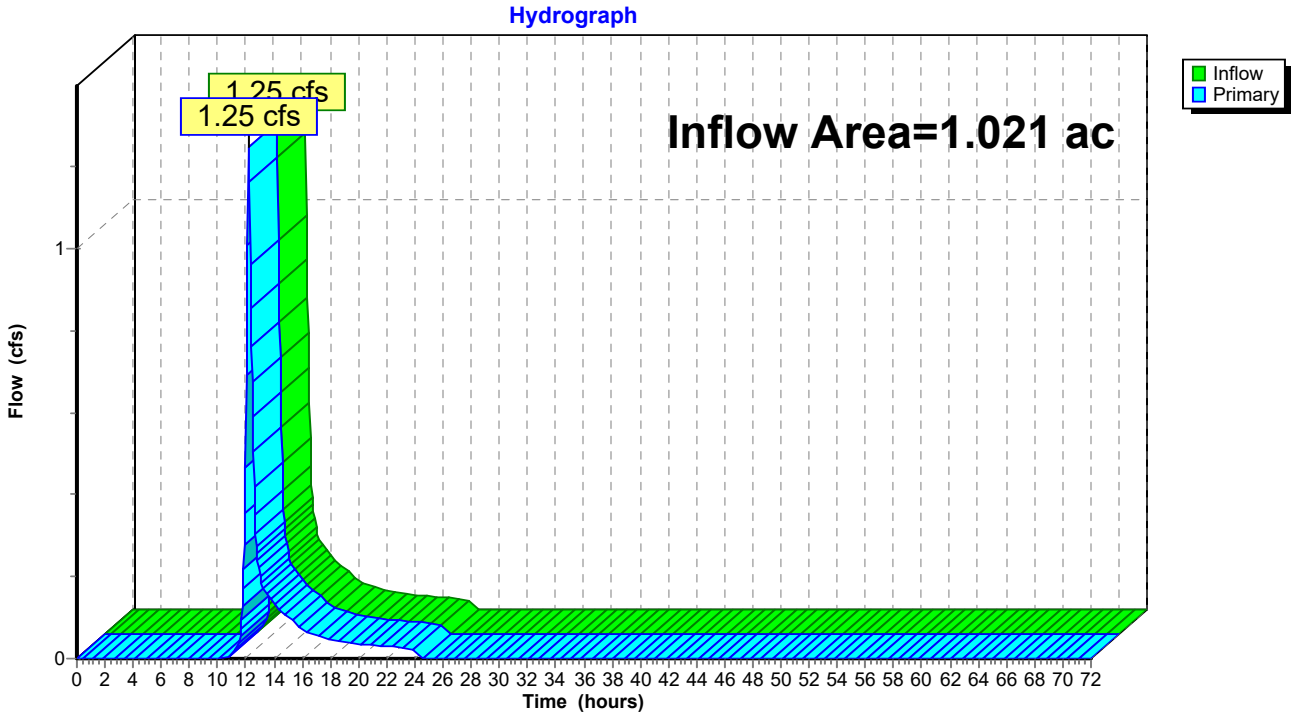


Summary for Link DP-3: New Development

Inflow Area = 1.021 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 1.25 cfs @ 12.18 hrs, Volume= 0.115 af
Primary = 1.25 cfs @ 12.18 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

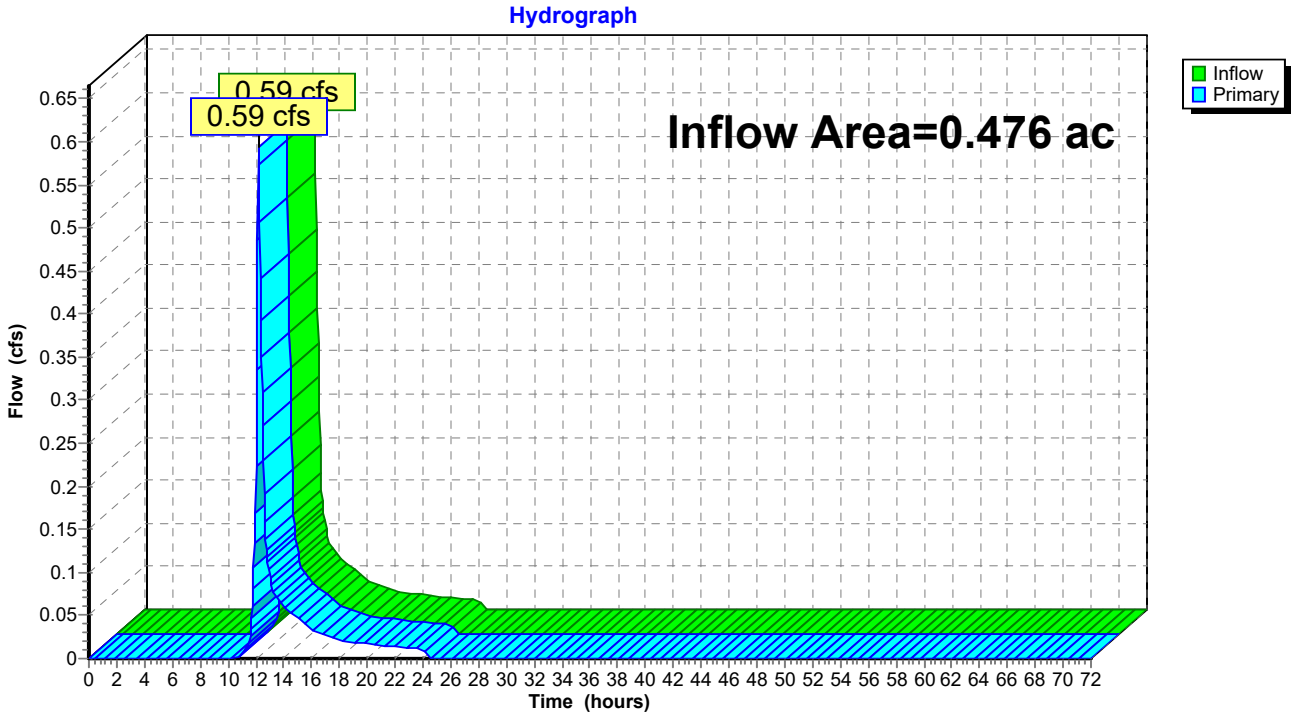


Summary for Link DP-4: Existing Basin

Inflow Area = 0.476 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.59 cfs @ 12.17 hrs, Volume= 0.054 af
Primary = 0.59 cfs @ 12.17 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Existing Basin

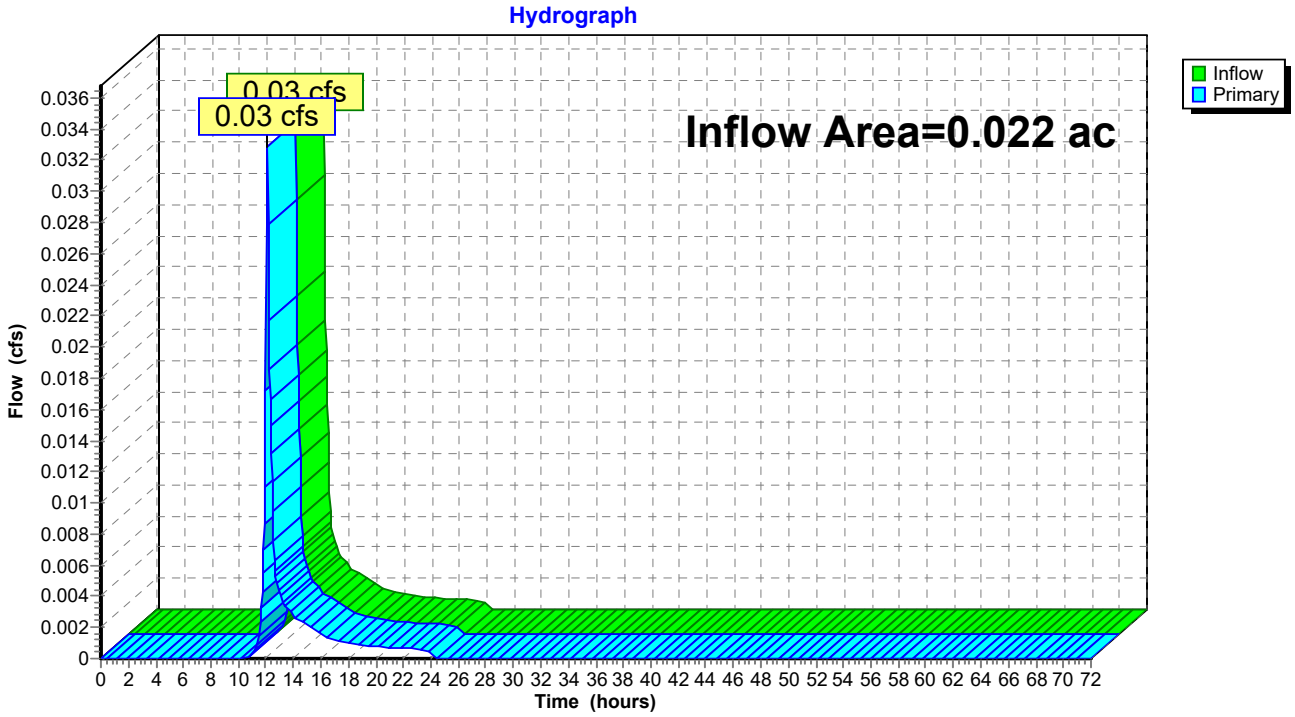


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af
Primary = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-1: Subcat EX-1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=2.07"
Flow Length=40' Slope=0.0050 '/' Tc=8.7 min CN=69 Runoff=0.32 cfs 0.026 af

Subcatchment EX-2: Subcat EX-2 Runoff Area=1.026 ac 0.54% Impervious Runoff Depth=2.07"
Flow Length=120' Tc=6.9 min CN=69 Runoff=2.34 cfs 0.177 af

Subcatchment EX-3: Subcat EX-3 Runoff Area=1.021 ac 0.00% Impervious Runoff Depth=2.07"
Flow Length=230' Tc=11.7 min CN=69 Runoff=2.00 cfs 0.176 af

Subcatchment EX-4: Subcat EX-4 Runoff Area=0.476 ac 0.00% Impervious Runoff Depth=2.07"
Flow Length=75' Slope=0.0050 '/' Tc=11.3 min CN=69 Runoff=0.94 cfs 0.082 af

Subcatchment EX-5: Subcat EX-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=69 Runoff=0.05 cfs 0.004 af

Link DP-1: UHaul Inflow=0.32 cfs 0.026 af
Primary=0.32 cfs 0.026 af

Link DP-2: East Parking Inflow=2.34 cfs 0.177 af
Primary=2.34 cfs 0.177 af

Link DP-3: New Development Inflow=2.00 cfs 0.176 af
Primary=2.00 cfs 0.176 af

Link DP-4: Existing Basin Inflow=0.94 cfs 0.082 af
Primary=0.94 cfs 0.082 af

Link DP-5: Tracks Inflow=0.05 cfs 0.004 af
Primary=0.05 cfs 0.004 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.466 af Average Runoff Depth = 2.07"
99.79% Pervious = 2.688 ac 0.21% Impervious = 0.006 ac

Summary for Subcatchment EX-1: Subcat EX-1

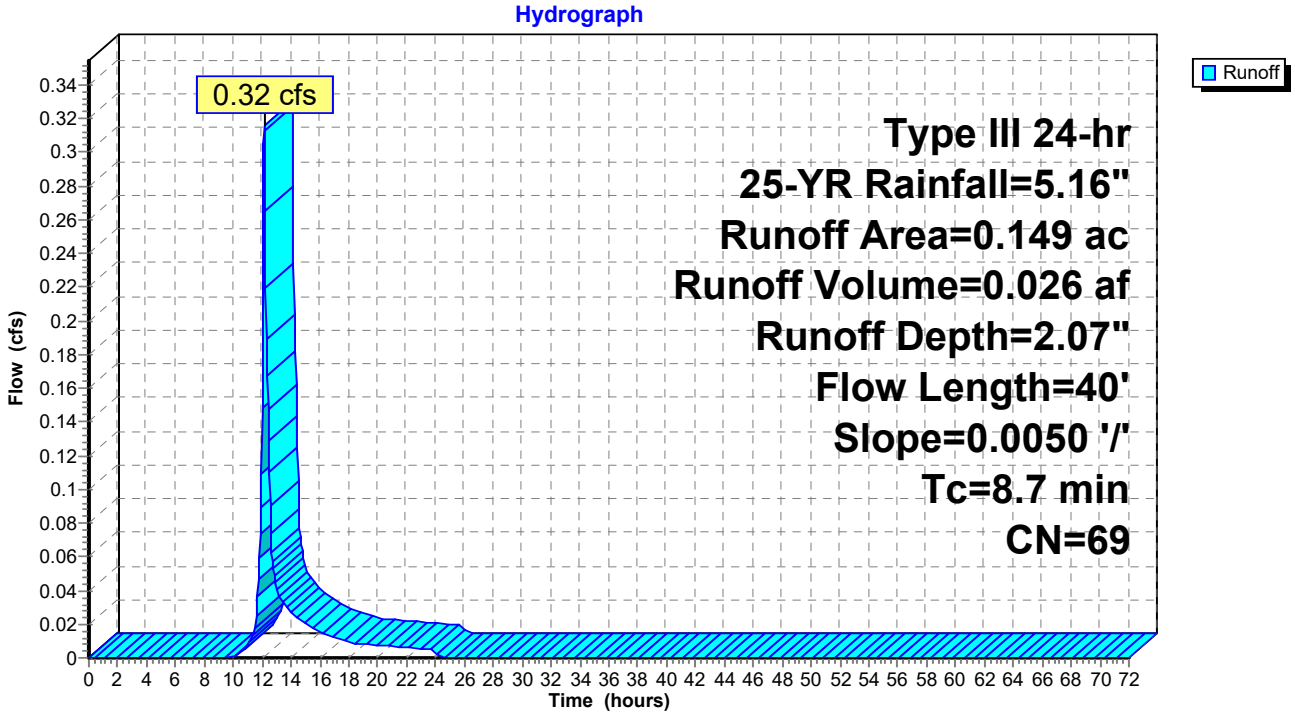
Runoff = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af, Depth= 2.07"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.149	69	50-75% Grass cover, Fair, HSG B
0.149		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"

Subcatchment EX-1: Subcat EX-1



Summary for Subcatchment EX-2: Subcat EX-2

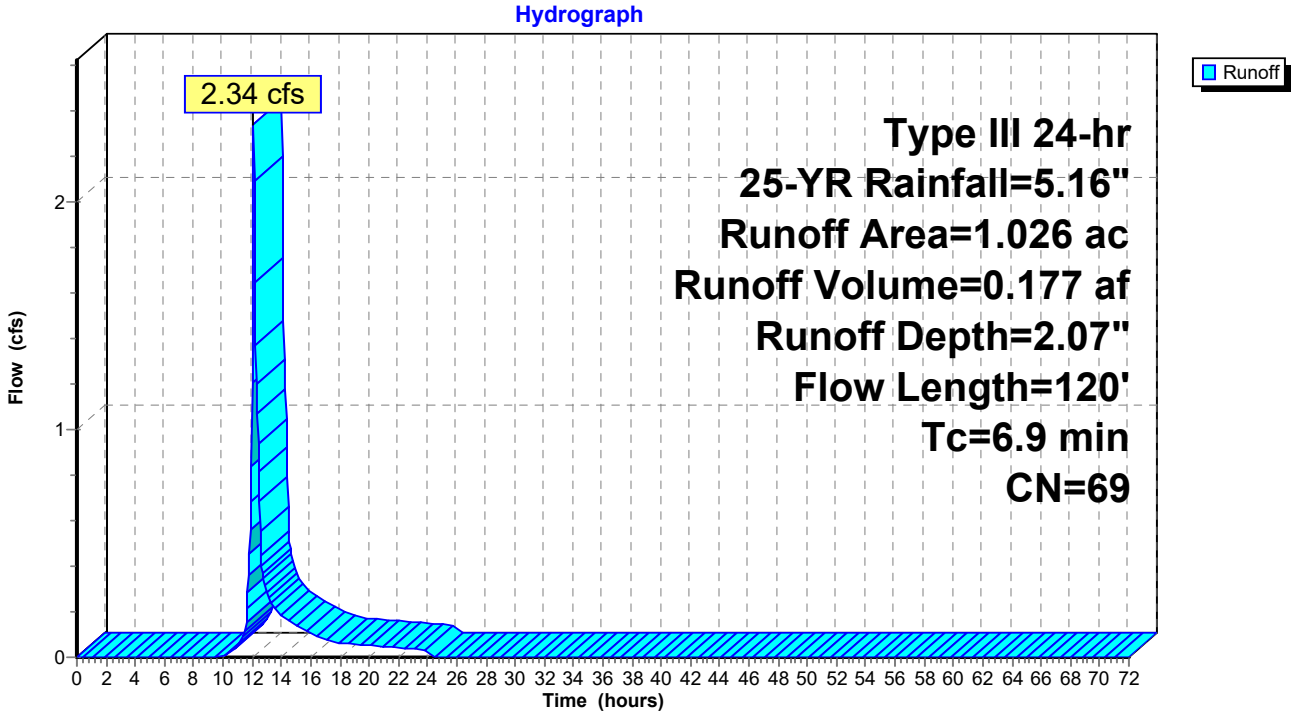
Runoff = 2.34 cfs @ 12.11 hrs, Volume= 0.177 af, Depth= 2.07"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
1.020	69	50-75% Grass cover, Fair, HSG B
0.006	98	Paved parking, HSG B
1.026	69	Weighted Average
1.020		99.46% Pervious Area
0.006		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0300	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
1.8	70	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.9	120	Total			

Subcatchment EX-2: Subcat EX-2



Summary for Subcatchment EX-3: Subcat EX-3

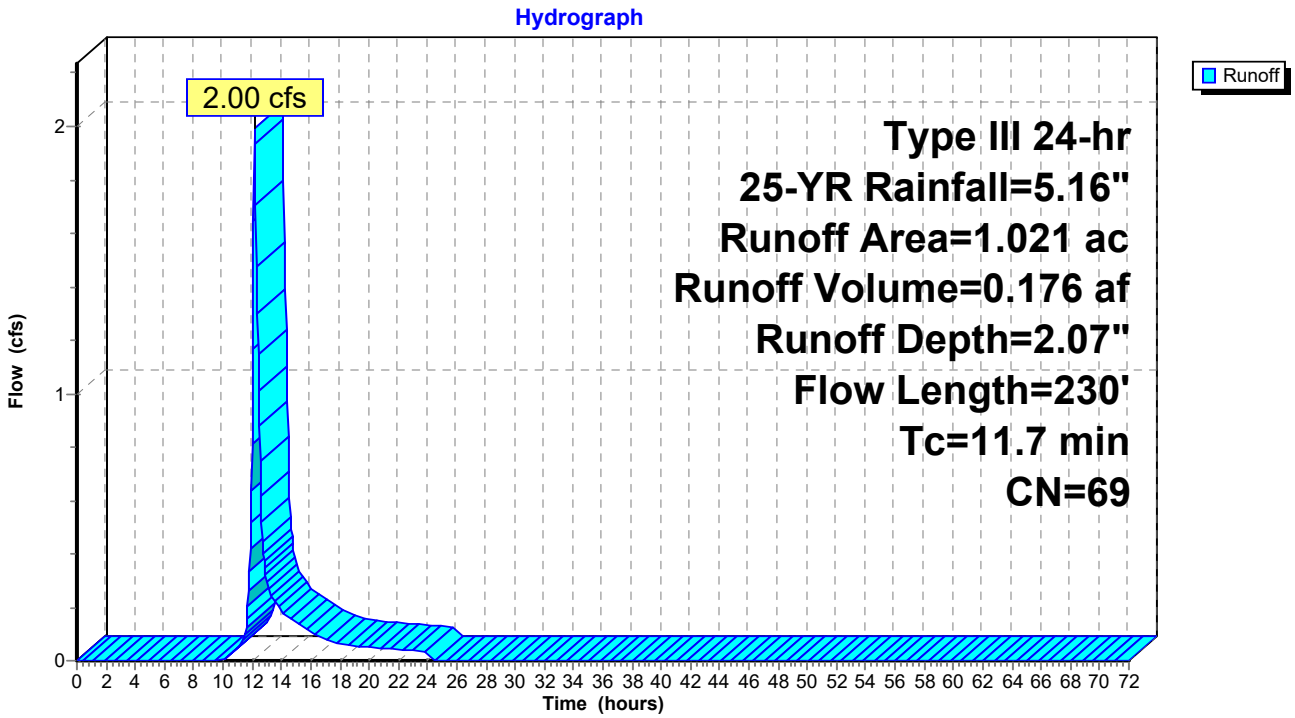
Runoff = 2.00 cfs @ 12.17 hrs, Volume= 0.176 af, Depth= 2.07"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
1.021	69	50-75% Grass cover, Fair, HSG B
1.021		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0090	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.4	180	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.7	230	Total			

Subcatchment EX-3: Subcat EX-3



Summary for Subcatchment EX-4: Subcat EX-4

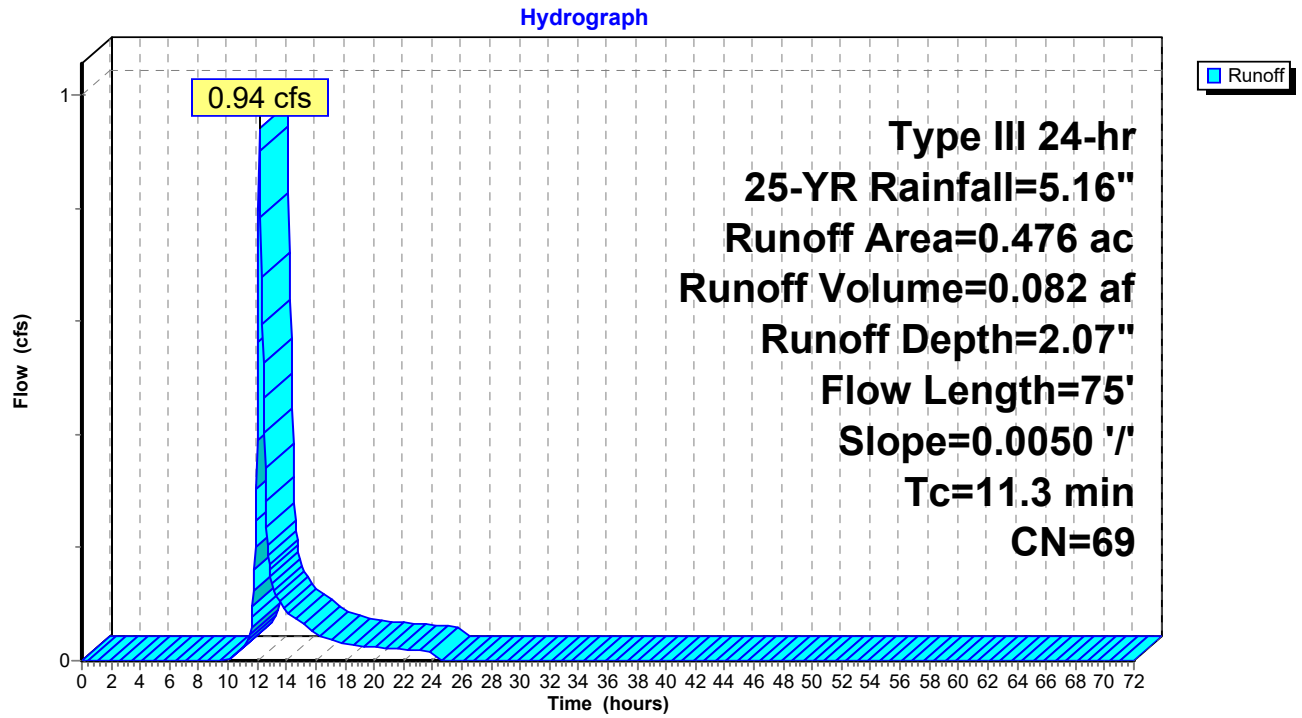
Runoff = 0.94 cfs @ 12.17 hrs, Volume= 0.082 af, Depth= 2.07"
Routed to Link DP-4 : Existing Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.476	69	50-75% Grass cover, Fair, HSG B
0.476		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
0.8	25	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.3	75	Total			

Subcatchment EX-4: Subcat EX-4



Summary for Subcatchment EX-5: Subcat EX-5

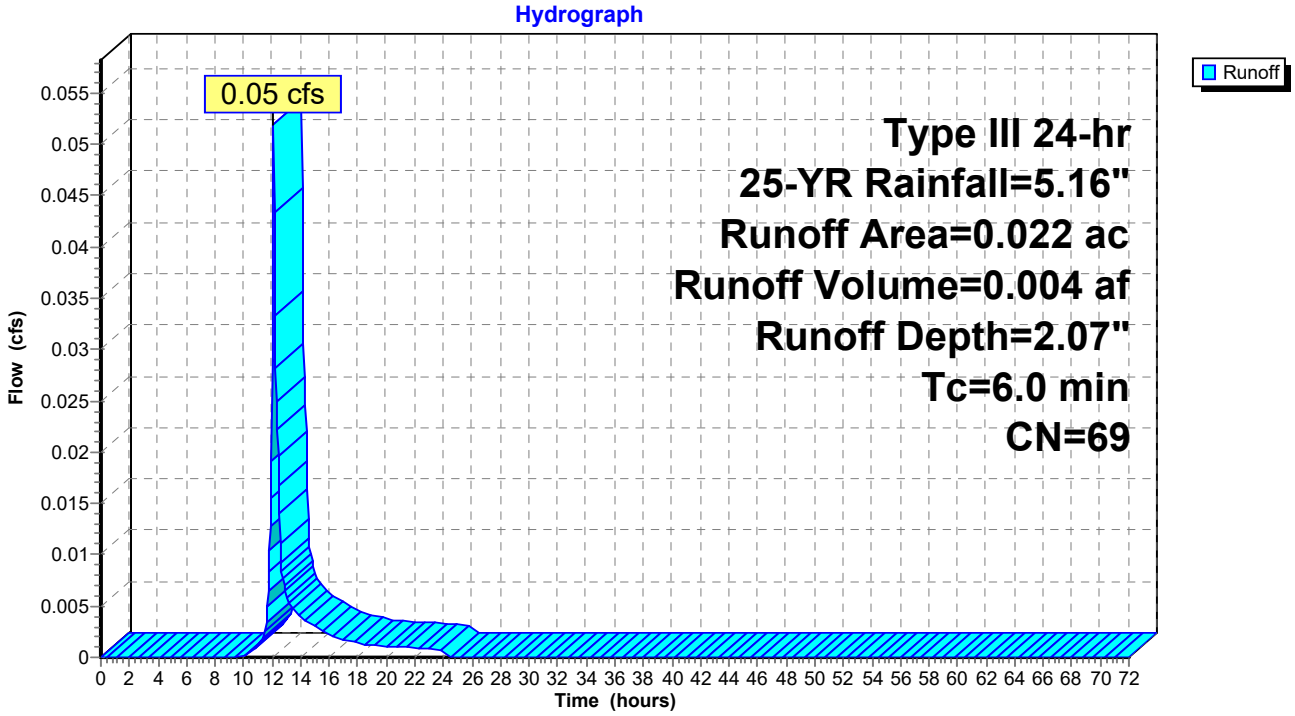
Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Depth= 2.07"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment EX-5: Subcat EX-5

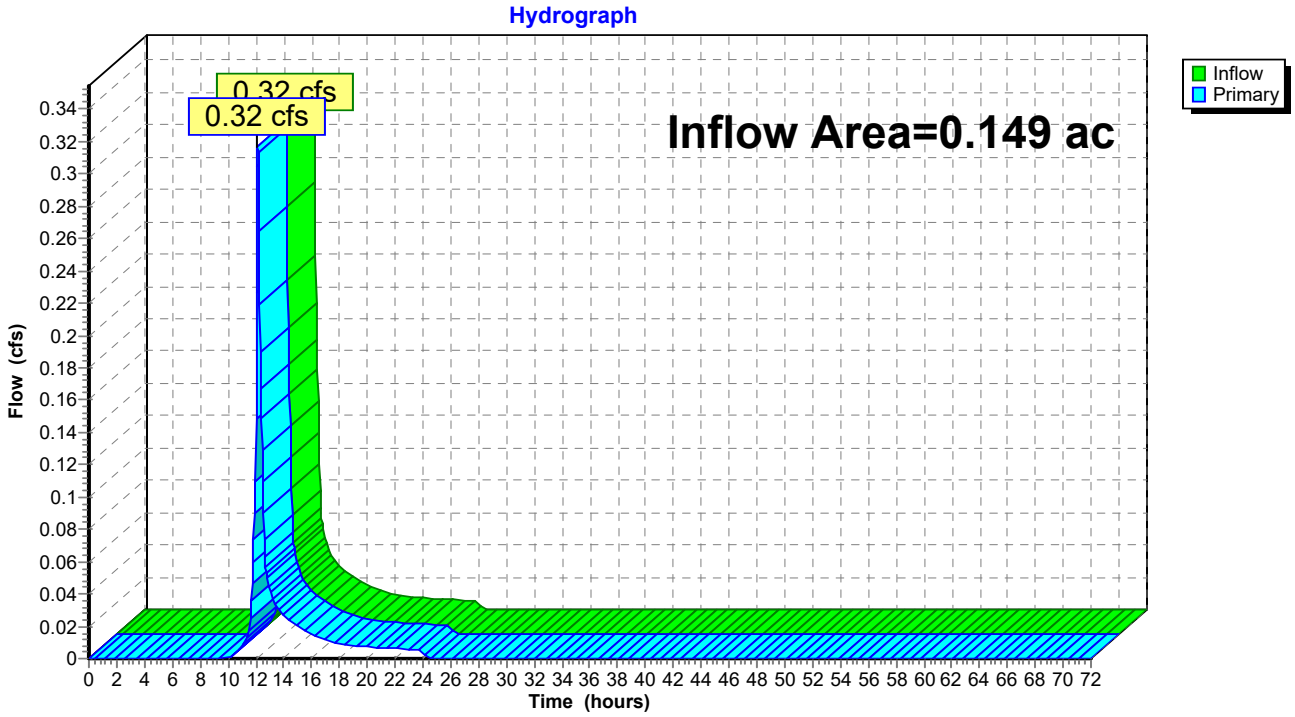


Summary for Link DP-1: UHaul

Inflow Area = 0.149 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af
Primary = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

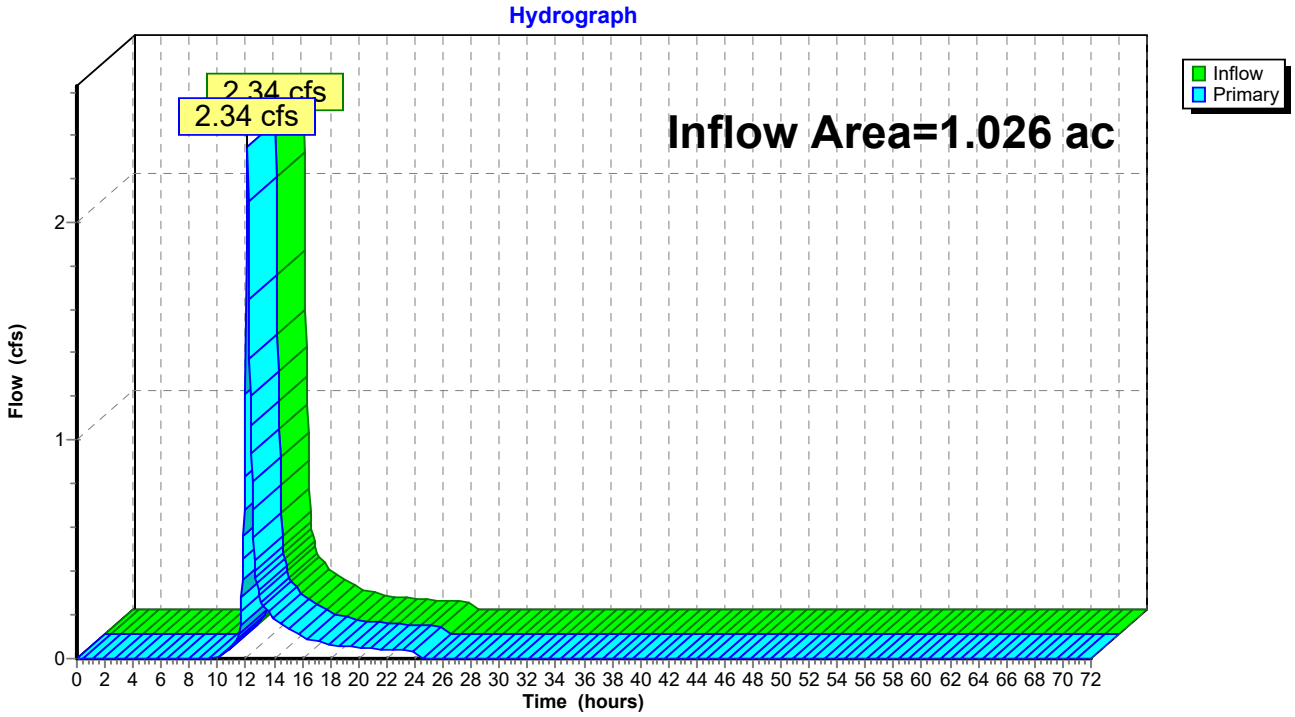


Summary for Link DP-2: East Parking

Inflow Area = 1.026 ac, 0.54% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 2.34 cfs @ 12.11 hrs, Volume= 0.177 af
Primary = 2.34 cfs @ 12.11 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

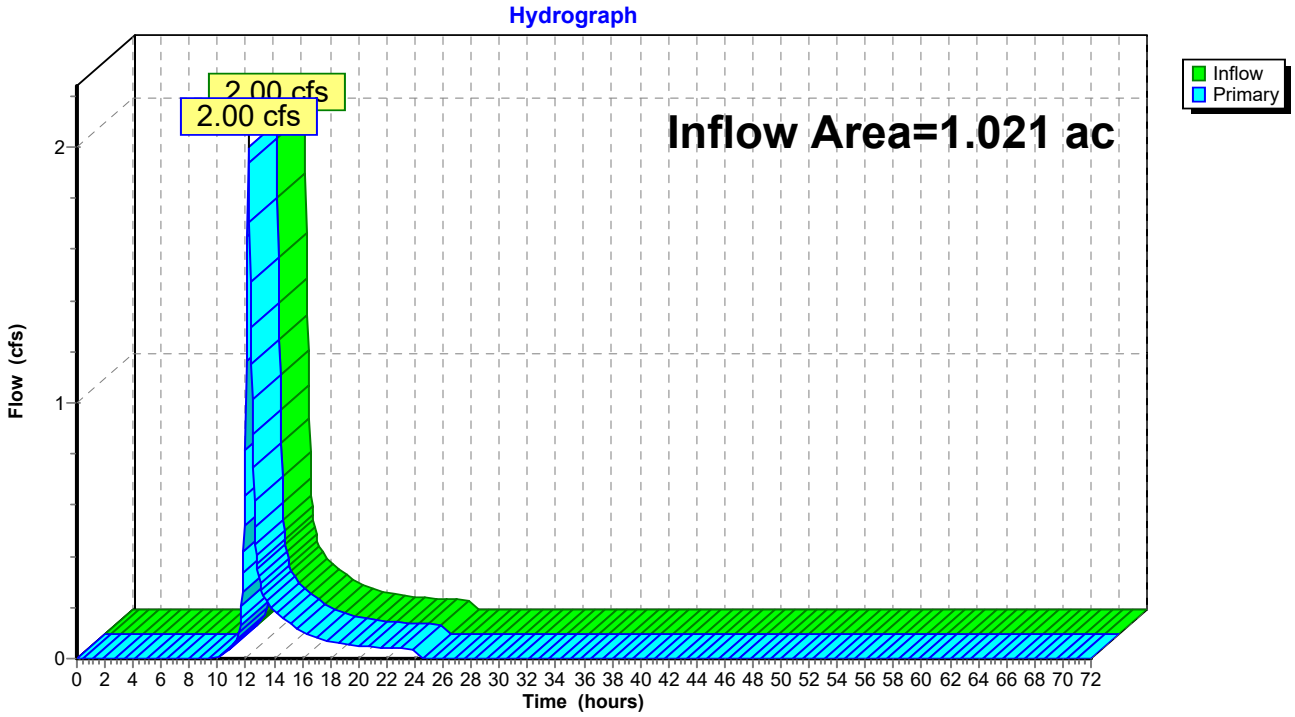


Summary for Link DP-3: New Development

Inflow Area = 1.021 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 2.00 cfs @ 12.17 hrs, Volume= 0.176 af
Primary = 2.00 cfs @ 12.17 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

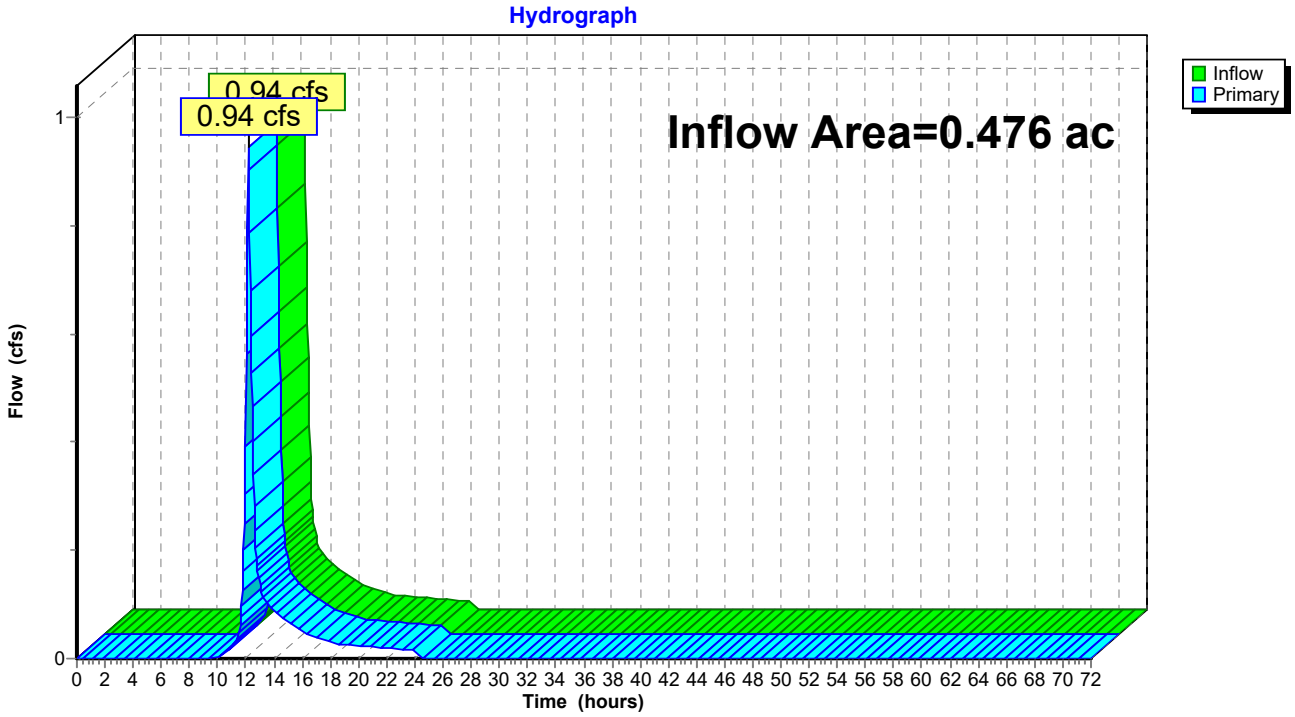


Summary for Link DP-4: Existing Basin

Inflow Area = 0.476 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.94 cfs @ 12.17 hrs, Volume= 0.082 af
Primary = 0.94 cfs @ 12.17 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-4: Existing Basin

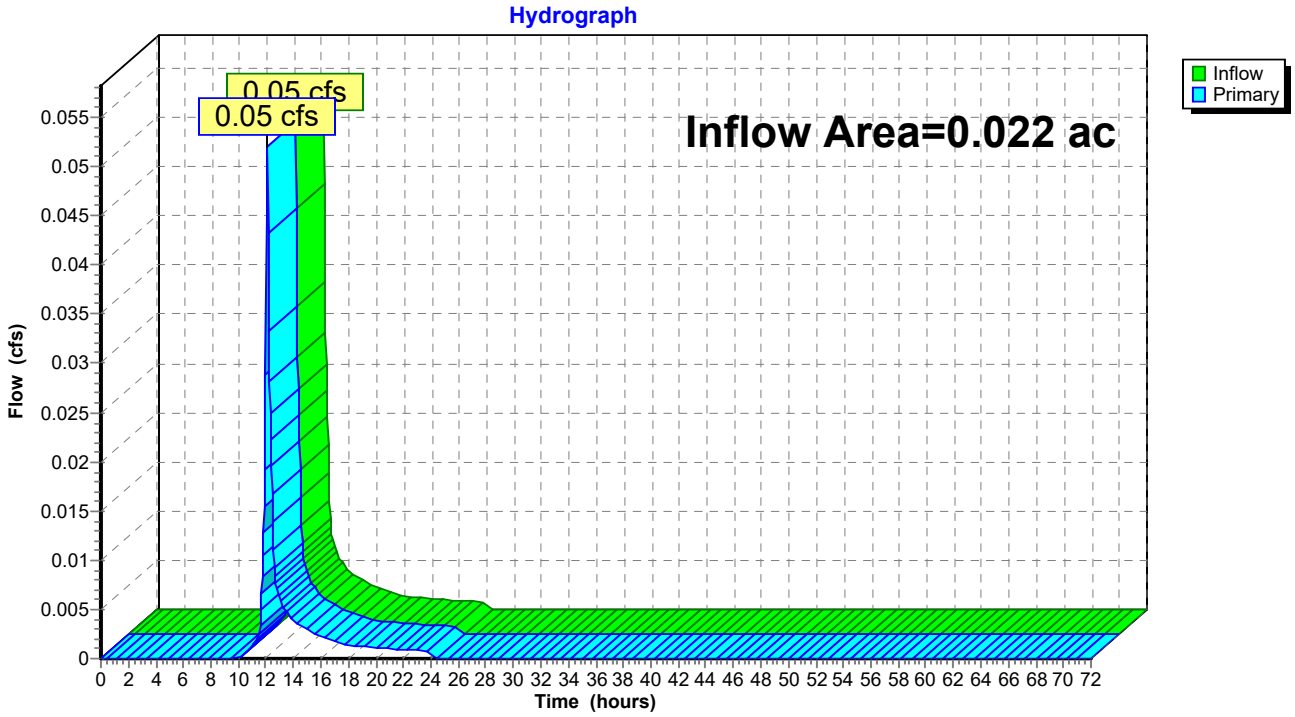


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Proposed Conditions

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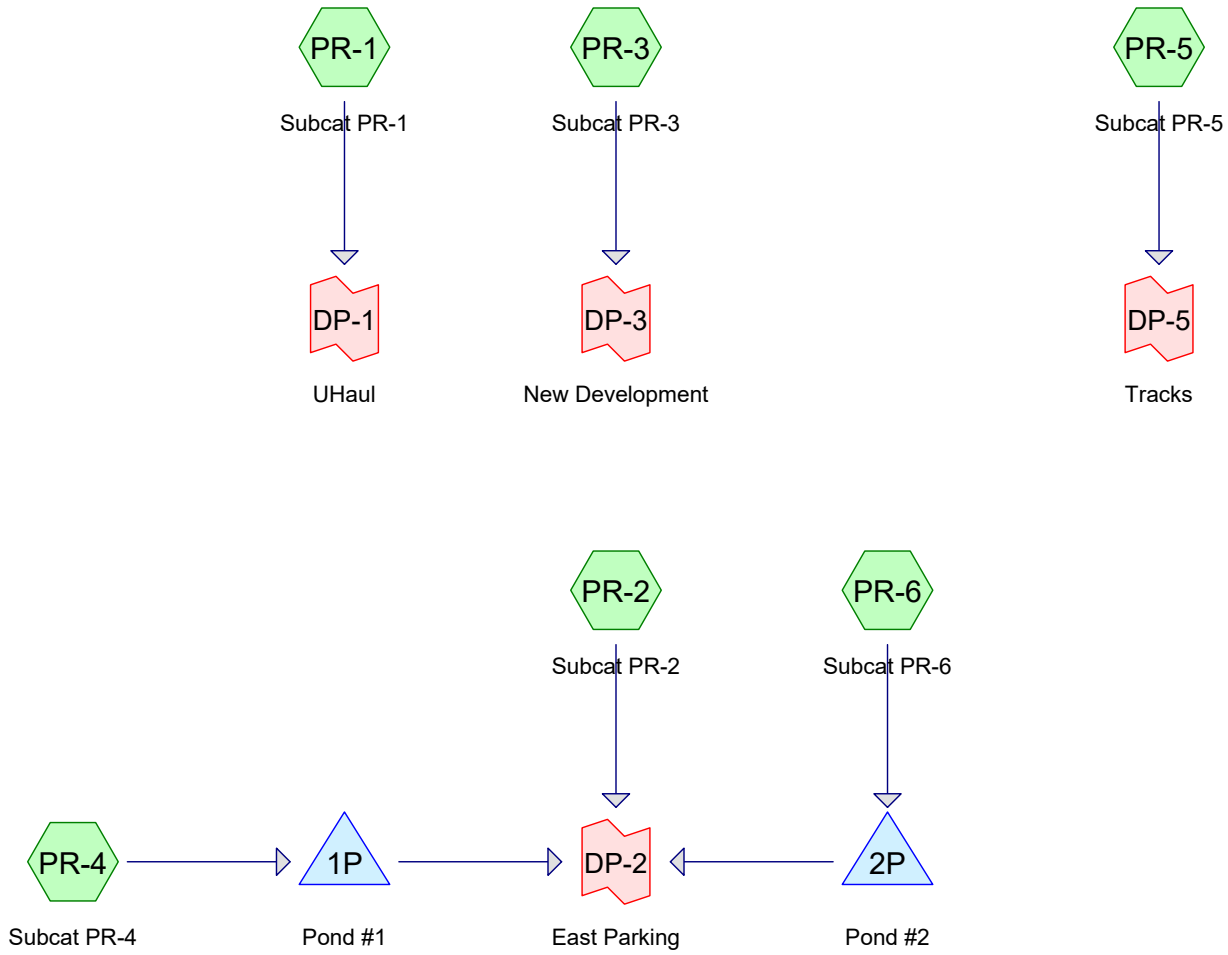


Subcat Reach Pond Link

Routing Diagram for 176455.000-PR
Prepared by VHB, Inc, Printed 11/18/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-YR	Type III 24-hr		Default	24.00	1	2.81	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.13	2
3	25-YR	Type III 24-hr		Default	24.00	1	5.16	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.810	69	50-75% Grass cover, Fair, HSG B (PR-1, PR-2, PR-3, PR-4, PR-5, PR-6)
1.883	98	Paved parking, HSG B (PR-2, PR-4, PR-6)
2.694	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.694	HSG B	PR-1, PR-2, PR-3, PR-4, PR-5, PR-6
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.694		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.810	0.000	0.000	0.000	0.810	50-75% Grass cover, Fair	PR-1, PR-2, PR-3, PR-4, PR-5, PR-6
0.000	1.883	0.000	0.000	0.000	1.883	Paved parking	PR-2, PR-4, PR-6
0.000	**2.694**	**0.000**	**0.000**	**0.000**	**2.694**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	1P	234.40	233.40	96.0	0.0104	0.013	0.0	12.0	0.0	
2	2P	233.50	232.60	130.3	0.0069	0.013	0.0	12.0	0.0	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=0.112 ac 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.06 cfs 0.005 af

Subcatchment PR-2: Subcat PR-2 Runoff Area=0.129 ac 32.21% Impervious Runoff Depth=1.00"
Tc=6.0 min CN=78 Runoff=0.14 cfs 0.011 af

Subcatchment PR-3: Subcat PR-3 Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.08 cfs 0.007 af

Subcatchment PR-4: Subcat PR-4 Runoff Area=1.038 ac 85.96% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=94 Runoff=2.49 cfs 0.187 af

Subcatchment PR-5: Subcat PR-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=0.57"
Tc=6.0 min CN=69 Runoff=0.01 cfs 0.001 af

Subcatchment PR-6: Subcat PR-6 Runoff Area=1.252 ac 75.88% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=91 Runoff=2.69 cfs 0.198 af

Pond 1P: Pond #1 Peak Elev=234.82' Storage=6,038 cf Inflow=2.49 cfs 0.187 af
Discarded=0.04 cfs 0.187 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.187 af

Pond 2P: Pond #2 Peak Elev=234.07' Storage=6,702 cf Inflow=2.69 cfs 0.198 af
Discarded=0.03 cfs 0.173 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.173 af

Link DP-1: UHaul Inflow=0.06 cfs 0.005 af
Primary=0.06 cfs 0.005 af

Link DP-2: East Parking Inflow=0.14 cfs 0.011 af
Primary=0.14 cfs 0.011 af

Link DP-3: New Development Inflow=0.08 cfs 0.007 af
Primary=0.08 cfs 0.007 af

Link DP-5: Tracks Inflow=0.01 cfs 0.001 af
Primary=0.01 cfs 0.001 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.409 af Average Runoff Depth = 1.82"
30.08% Pervious = 0.810 ac 69.92% Impervious = 1.883 ac

Summary for Subcatchment PR-1: Subcat PR-1

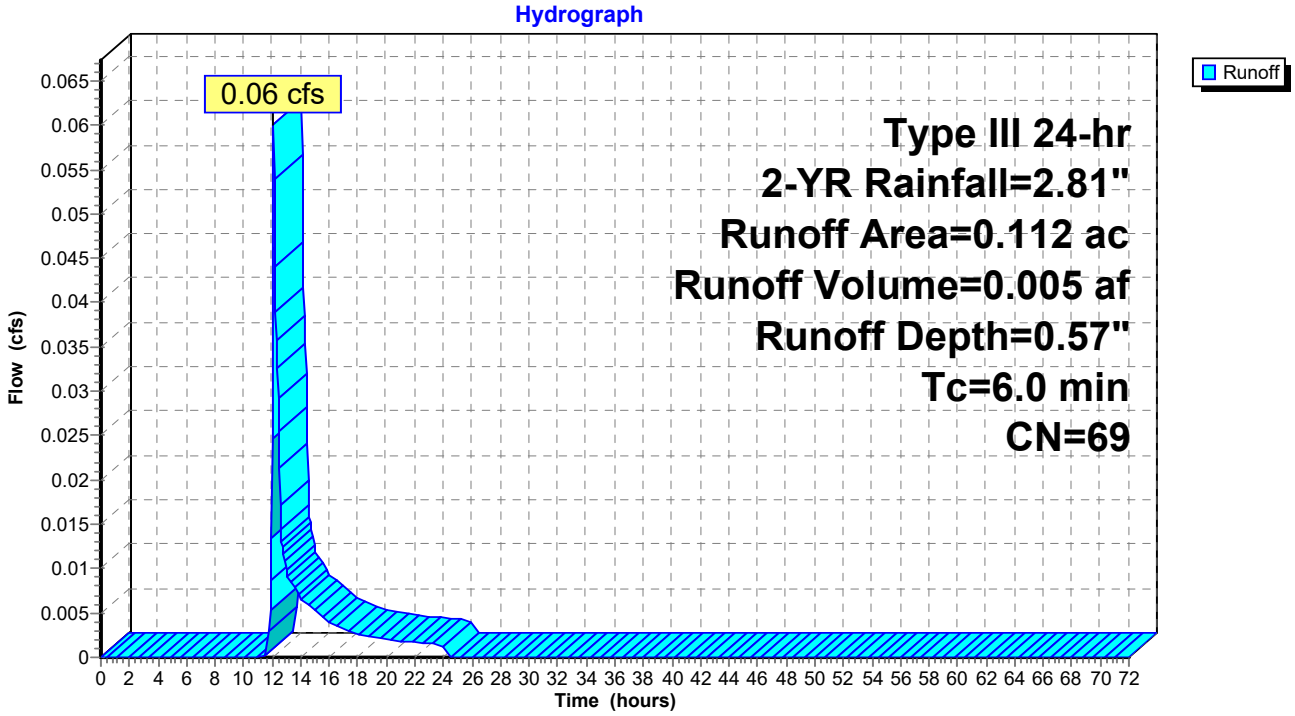
Runoff = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Depth= 0.57"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.112	69	50-75% Grass cover, Fair, HSG B
0.112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

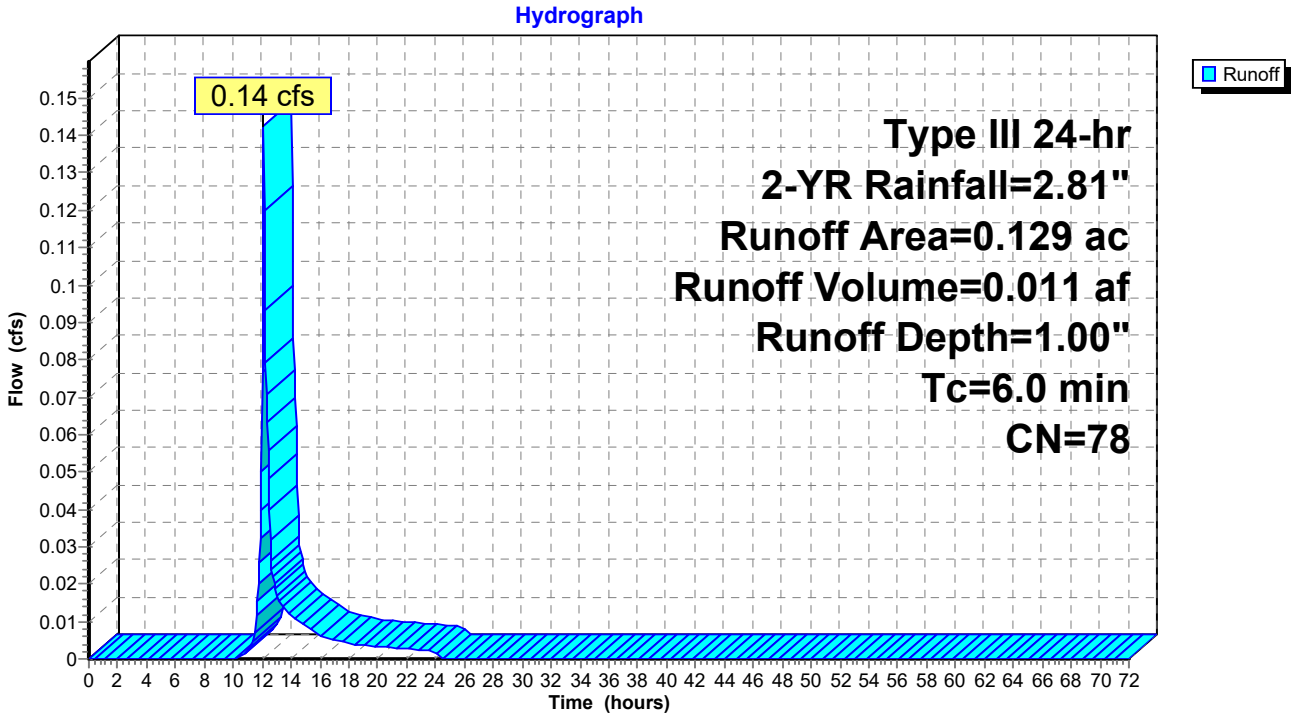
Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af, Depth= 1.00"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.087	69	50-75% Grass cover, Fair, HSG B
0.042	98	Paved parking, HSG B
0.129	78	Weighted Average
0.087		67.79% Pervious Area
0.042		32.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-2: Subcat PR-2



Summary for Subcatchment PR-3: Subcat PR-3

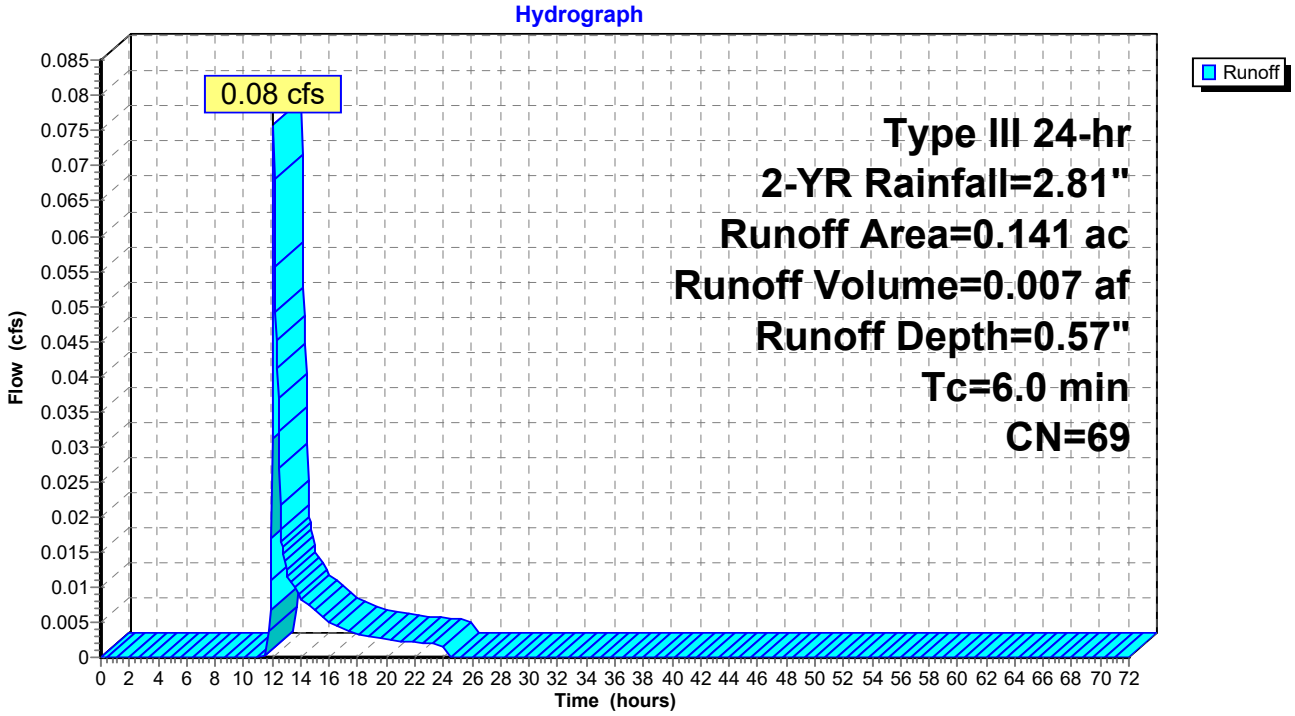
Runoff = 0.08 cfs @ 12.11 hrs, Volume= 0.007 af, Depth= 0.57"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.141	69	50-75% Grass cover, Fair, HSG B
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-3: Subcat PR-3



Summary for Subcatchment PR-4: Subcat PR-4

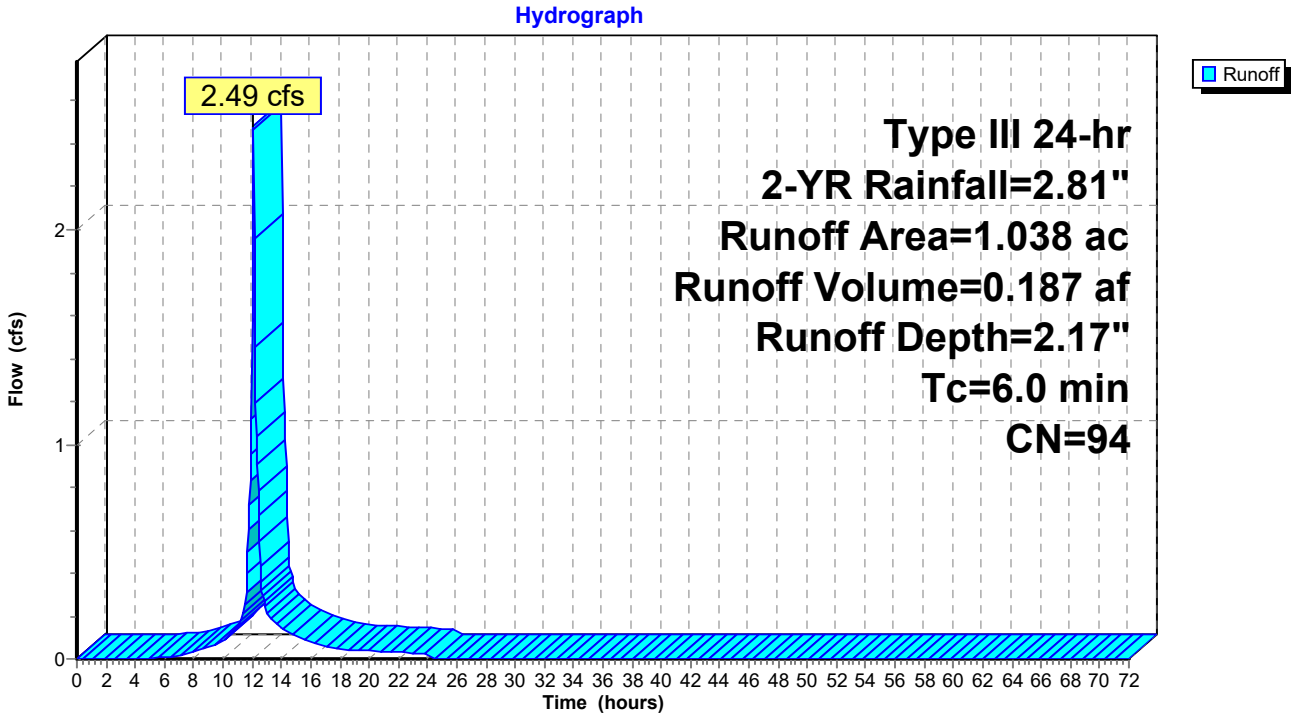
Runoff = 2.49 cfs @ 12.09 hrs, Volume= 0.187 af, Depth= 2.17"
Routed to Pond 1P : Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.146	69	50-75% Grass cover, Fair, HSG B
0.892	98	Paved parking, HSG B
1.038	94	Weighted Average
0.146		14.04% Pervious Area
0.892		85.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

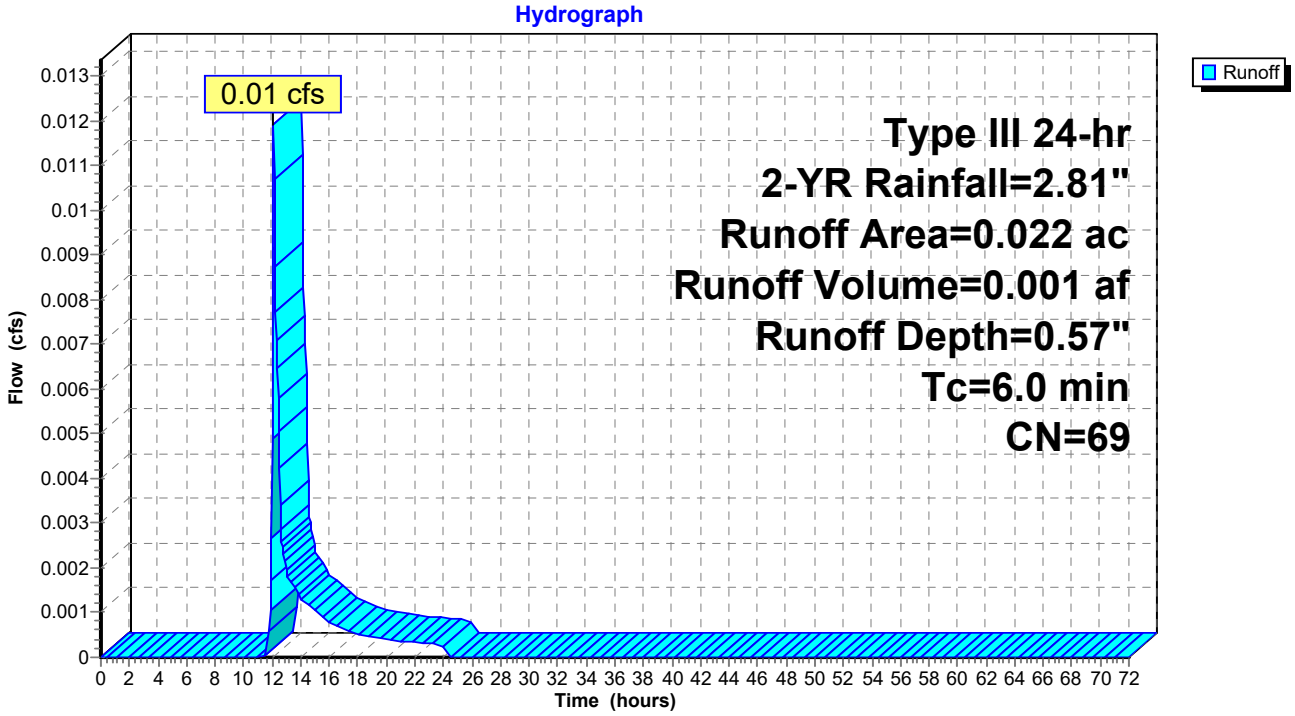
Runoff = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af, Depth= 0.57"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-5: Subcat PR-5



Summary for Subcatchment PR-6: Subcat PR-6

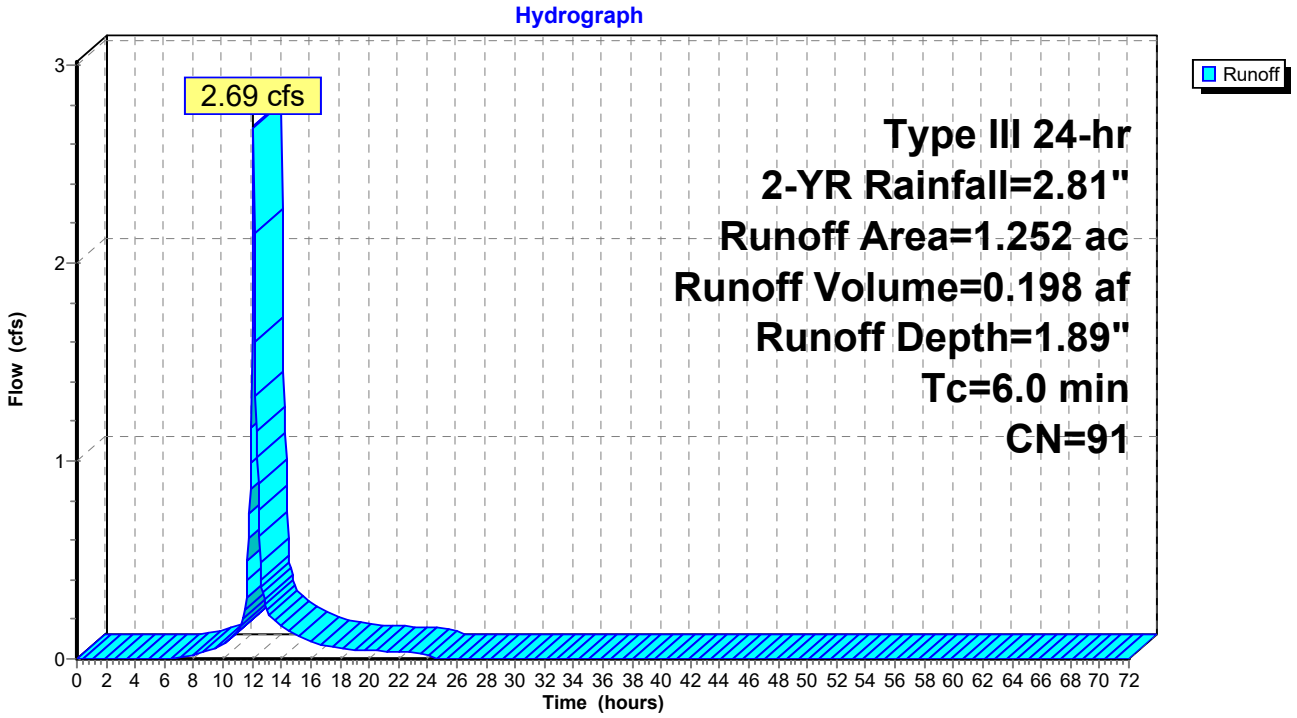
Runoff = 2.69 cfs @ 12.09 hrs, Volume= 0.198 af, Depth= 1.89"
Routed to Pond 2P : Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.81"

Area (ac)	CN	Description
0.302	69	50-75% Grass cover, Fair, HSG B
0.950	98	Paved parking, HSG B
1.252	91	Weighted Average
0.302		24.12% Pervious Area
0.950		75.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-6: Subcat PR-6



Summary for Pond 1P: Pond #1

Inflow Area = 1.038 ac, 85.96% Impervious, Inflow Depth = 2.17" for 2-YR event
Inflow = 2.49 cfs @ 12.09 hrs, Volume= 0.187 af
Outflow = 0.04 cfs @ 9.55 hrs, Volume= 0.187 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.04 cfs @ 9.55 hrs, Volume= 0.187 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 234.82' @ 20.57 hrs Surf.Area= 5,067 sf Storage= 6,038 cf
Flood Elev= 236.80' Surf.Area= 5,067 sf Storage= 11,789 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,547.9 min (2,339.4 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	233.10'	4,739 cf	**49.00'W x 103.40'L x 3.75'H Field A** 19,000 cf Overall - 7,151 cf Embedded = 11,848 cf x 40.0% Voids
#2A	233.60'	7,151 cf	**ADS_StormTech SC-800 +Cap** x 140 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 140 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		11,891 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	233.10'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	234.40'	**12.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.40' / 233.40' S= 0.0104 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	235.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 9.55 hrs HW=233.14' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=233.10' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)
↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Pond #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

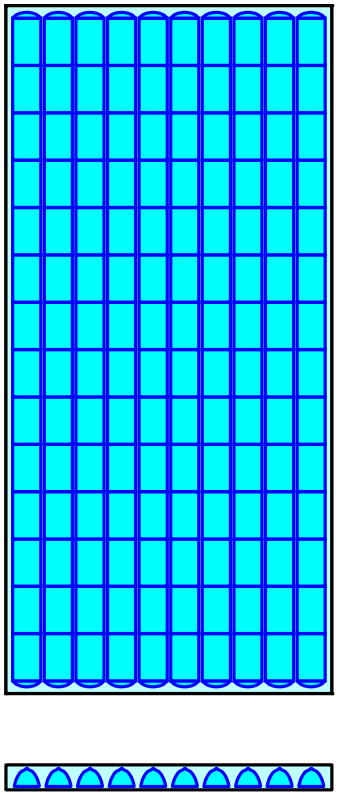
14 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 101.40' Row Length +12.0" End Stone x 2 = 103.40' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

140 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 7,151.3 cf Chamber Storage

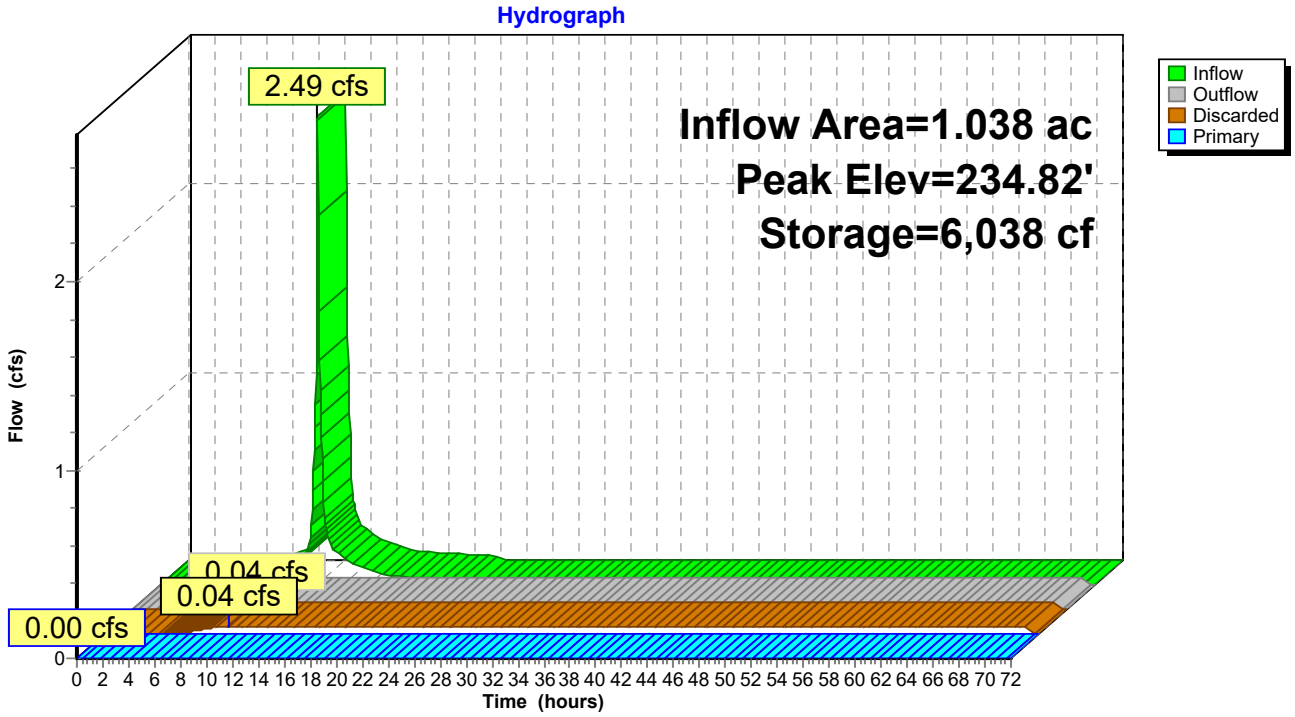
18,999.8 cf Field - 7,151.3 cf Chambers = 11,848.4 cf Stone x 40.0% Voids = 4,739.4 cf Stone Storage

Chamber Storage + Stone Storage = 11,890.7 cf = 0.273 af
Overall Storage Efficiency = 62.6%
Overall System Size = 103.40' x 49.00' x 3.75'

140 Chambers
703.7 cy Field
438.8 cy Stone



Pond 1P: Pond #1



Stage-Area-Storage for Pond 1P: Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
233.10	**5,067**	0
233.15	5,067	101
233.20	5,067	203
233.25	5,067	304
233.30	5,067	405
233.35	5,067	507
233.40	5,067	608
233.45	5,067	709
233.50	5,067	811
233.55	5,067	912
233.60	5,067	1,013
233.65	5,067	1,228
233.70	5,067	1,441
233.75	5,067	1,655
233.80	5,067	1,867
233.85	5,067	2,079
233.90	5,067	2,291
233.95	5,067	2,501
234.00	5,067	2,711
234.05	5,067	2,921
234.10	5,067	3,129
234.15	5,067	3,337
234.20	5,067	3,543
234.25	5,067	3,749
234.30	5,067	3,954
234.35	5,067	4,158
234.40	5,067	4,362
234.45	5,067	4,564
234.50	5,067	4,765
234.55	5,067	4,965
234.60	5,067	5,164
234.65	5,067	5,362
234.70	5,067	5,559
234.75	5,067	5,755
234.80	5,067	5,949
234.85	5,067	6,142
234.90	5,067	6,334
234.95	5,067	6,524
235.00	5,067	6,713
235.05	5,067	6,901
235.10	5,067	7,087
235.15	5,067	7,271
235.20	5,067	7,454
235.25	5,067	7,635
235.30	5,067	7,814
235.35	5,067	7,991
235.40	5,067	8,166
235.45	5,067	8,339
235.50	5,067	8,511
235.55	5,067	8,679
235.60	5,067	8,846
235.65	5,067	9,010
235.70	5,067	9,171
235.75	5,067	9,329
235.80	5,067	9,484
235.85	5,067	9,636
235.90	5,067	9,783
235.95	5,067	9,927
236.00	5,067	10,065
236.05	5,067	10,197
236.10	5,067	10,321
236.15	5,067	10,441
236.20	5,067	10,555
236.25	5,067	10,666
236.30	5,067	10,773
236.35	5,067	10,877
236.40	5,067	10,979
236.45	5,067	11,080
236.50	5,067	11,181
236.55	5,067	11,283
236.60	5,067	11,384
236.65	5,067	11,485
236.70	5,067	11,587
236.75	5,067	11,688
236.80	5,067	11,789
236.85	5,067	**11,891**

Summary for Pond 2P: Pond #2

Inflow Area = 1.252 ac, 75.88% Impervious, Inflow Depth = 1.89" for 2-YR event
Inflow = 2.69 cfs @ 12.09 hrs, Volume= 0.198 af
Outflow = 0.03 cfs @ 9.95 hrs, Volume= 0.173 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.03 cfs @ 9.95 hrs, Volume= 0.173 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 234.07' @ 22.82 hrs Surf.Area= 4,681 sf Storage= 6,702 cf
Flood Elev= 236.25' Surf.Area= 4,681 sf Storage= 11,826 cf

Plug-Flow detention time= 1,640.1 min calculated for 0.173 af (87% of inflow)
Center-of-Mass det. time= 1,584.1 min (2,391.6 - 807.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	232.00'	3,074 cf	**30.00'W x 89.17'L x 4.25'H Field A** 11,369 cf Overall - 3,684 cf Embedded = 7,685 cf x 40.0% Voids
#2A	232.50'	3,684 cf	**ADS_StormTech SC-800 +Cap** x 72 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 72 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		6,758 cf	x 1.75 = 11,826 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	232.00'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	233.50'	**12.0" Round Culvert** L= 130.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 233.50' / 232.60' S= 0.0069 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	234.65'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 9.95 hrs HW=232.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=232.00' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Controls 0.00 cfs)
↑**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Pond #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

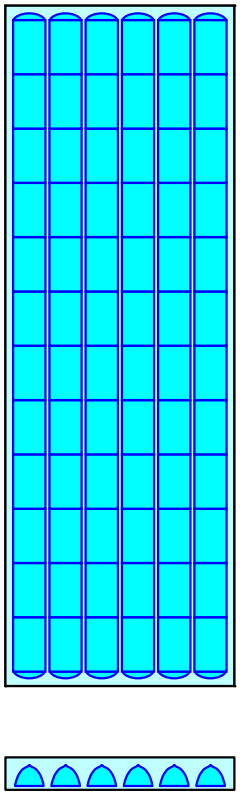
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.25' Field Height

72 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 3,683.7 cf Chamber Storage

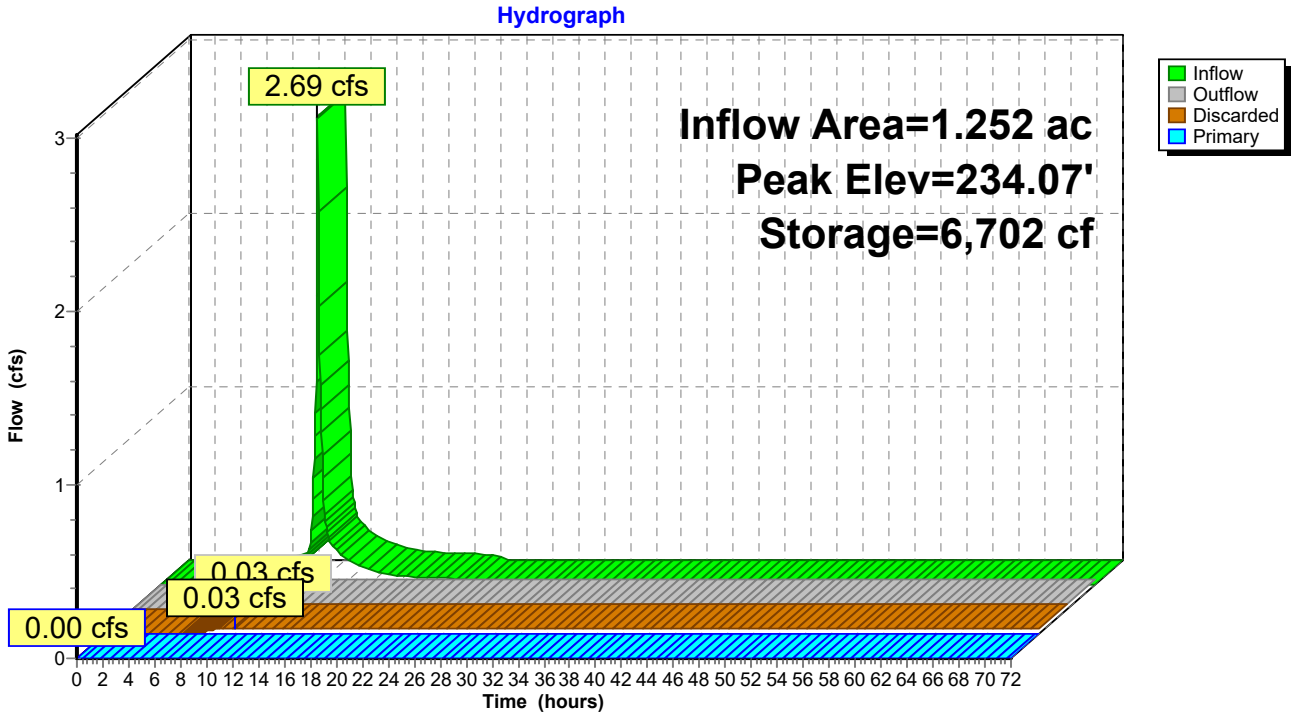
11,368.8 cf Field - 3,683.7 cf Chambers = 7,685.1 cf Stone x 40.0% Voids = 3,074.0 cf Stone Storage

Chamber Storage + Stone Storage = 6,757.7 cf = 0.155 af
Overall Storage Efficiency = 59.4%
Overall System Size = 89.17' x 30.00' x 4.25'

72 Chambers
421.1 cy Field
284.6 cy Stone



Pond 2P: Pond #2



Stage-Area-Storage for Pond 2P: Pond #2

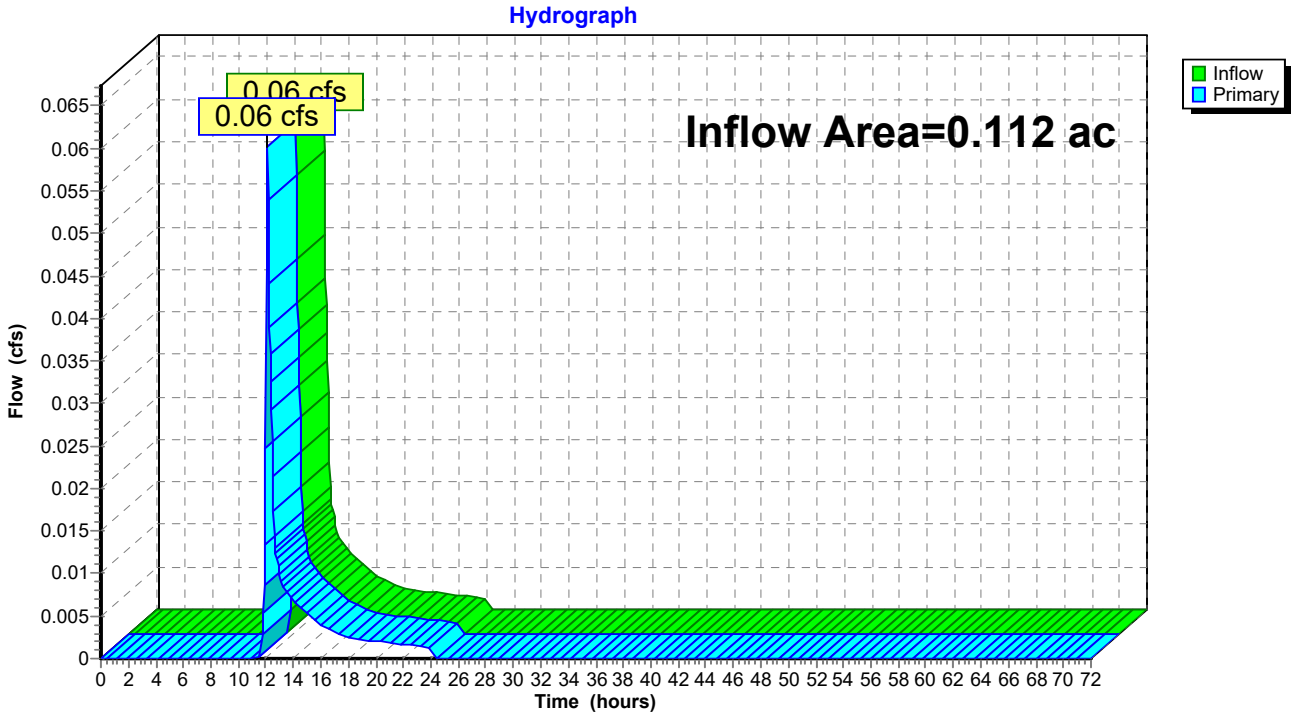
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.00	**4,681**	0
232.05	4,681	94
232.10	4,681	187
232.15	4,681	281
232.20	4,681	374
232.25	4,681	468
232.30	4,681	562
232.35	4,681	655
232.40	4,681	749
232.45	4,681	843
232.50	4,681	936
232.55	4,681	1,132
232.60	4,681	1,327
232.65	4,681	1,521
232.70	4,681	1,715
232.75	4,681	1,909
232.80	4,681	2,102
232.85	4,681	2,294
232.90	4,681	2,485
232.95	4,681	2,676
233.00	4,681	2,866
233.05	4,681	3,056
233.10	4,681	3,244
233.15	4,681	3,432
233.20	4,681	3,619
233.25	4,681	3,806
233.30	4,681	3,991
233.35	4,681	4,176
233.40	4,681	4,359
233.45	4,681	4,542
233.50	4,681	4,724
233.55	4,681	4,904
233.60	4,681	5,084
233.65	4,681	5,263
233.70	4,681	5,440
233.75	4,681	5,617
233.80	4,681	5,792
233.85	4,681	5,966
233.90	4,681	6,138
233.95	4,681	6,309
234.00	4,681	6,479
234.05	4,681	6,648
234.10	4,681	6,815
234.15	4,681	6,980
234.20	4,681	7,144
234.25	4,681	7,306
234.30	4,681	7,466
234.35	4,681	7,625
234.40	4,681	7,781
234.45	4,681	7,936
234.50	4,681	8,088
234.55	4,681	8,238
234.60	4,681	8,385
234.65	4,681	8,530
234.70	4,681	8,672
234.75	4,681	8,811
234.80	4,681	8,947
234.85	4,681	9,078
234.90	4,681	9,205
234.95	4,681	9,326
235.00	4,681	9,441
235.05	4,681	9,551
235.10	4,681	9,656
235.15	4,681	9,758
235.20	4,681	9,858
235.25	4,681	9,953
235.30	4,681	10,047
235.35	4,681	10,141
235.40	4,681	10,234
235.45	4,681	10,328
235.50	4,681	10,422
235.55	4,681	10,515
235.60	4,681	10,609
235.65	4,681	10,702
235.70	4,681	10,796
235.75	4,681	10,890
235.80	4,681	10,983
235.85	4,681	11,077
235.90	4,681	11,171
235.95	4,681	11,264
236.00	4,681	11,358
236.05	4,681	11,451
236.10	4,681	11,545
236.15	4,681	11,639
236.20	4,681	11,732
236.25	4,681	**11,826**

Summary for Link DP-1: UHaul

Inflow Area = 0.112 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

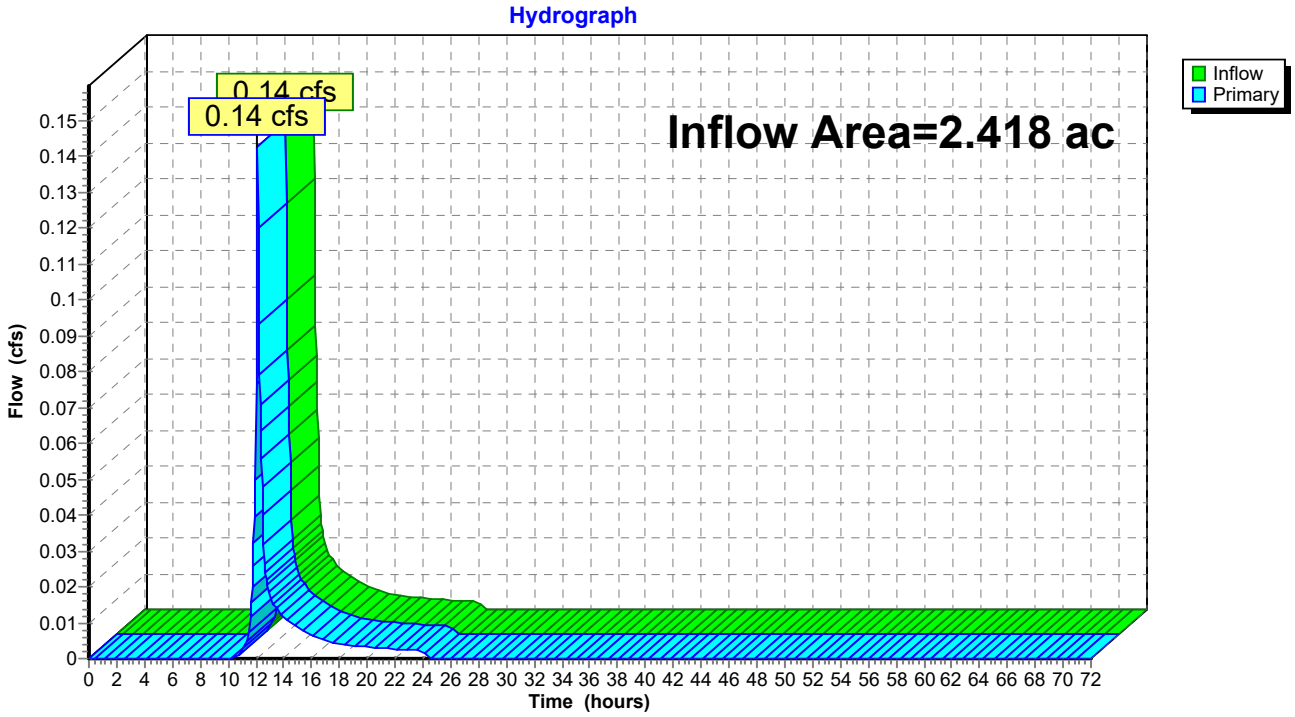


Summary for Link DP-2: East Parking

Inflow Area = 2.418 ac, 77.88% Impervious, Inflow Depth = 0.05" for 2-YR event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af
Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

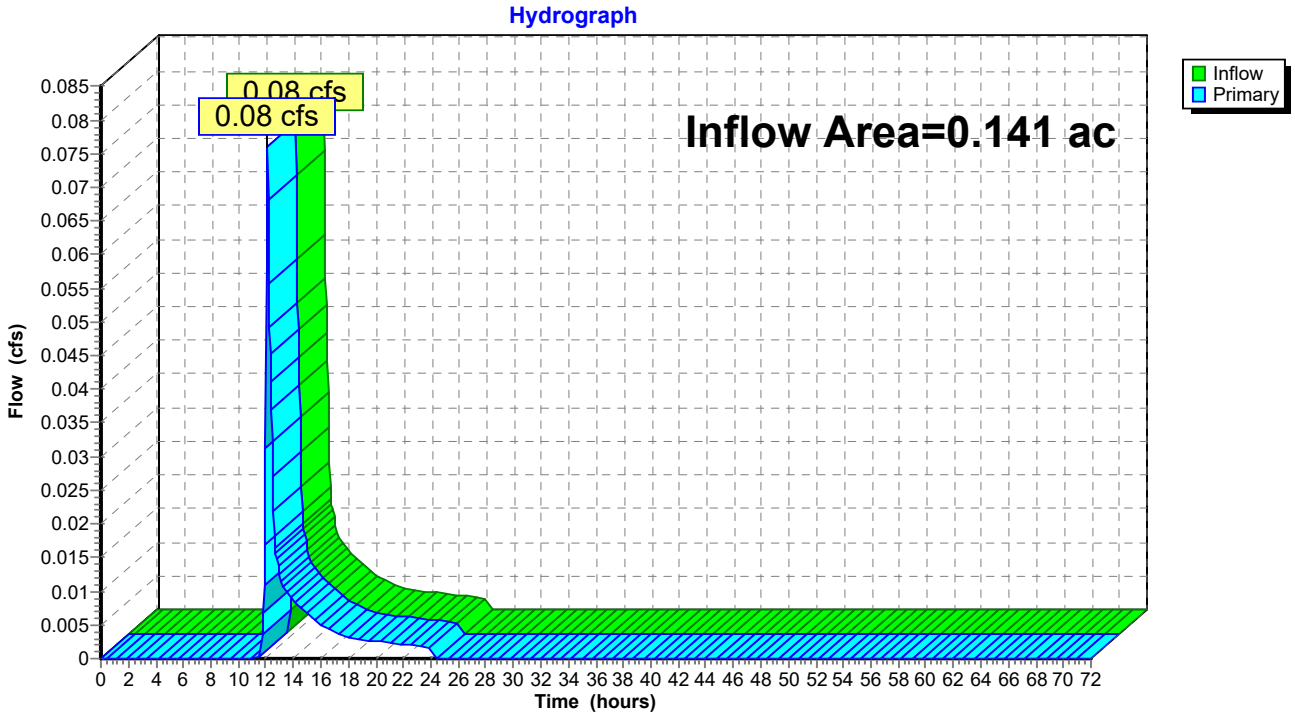


Summary for Link DP-3: New Development

Inflow Area = 0.141 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.08 cfs @ 12.11 hrs, Volume= 0.007 af
Primary = 0.08 cfs @ 12.11 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

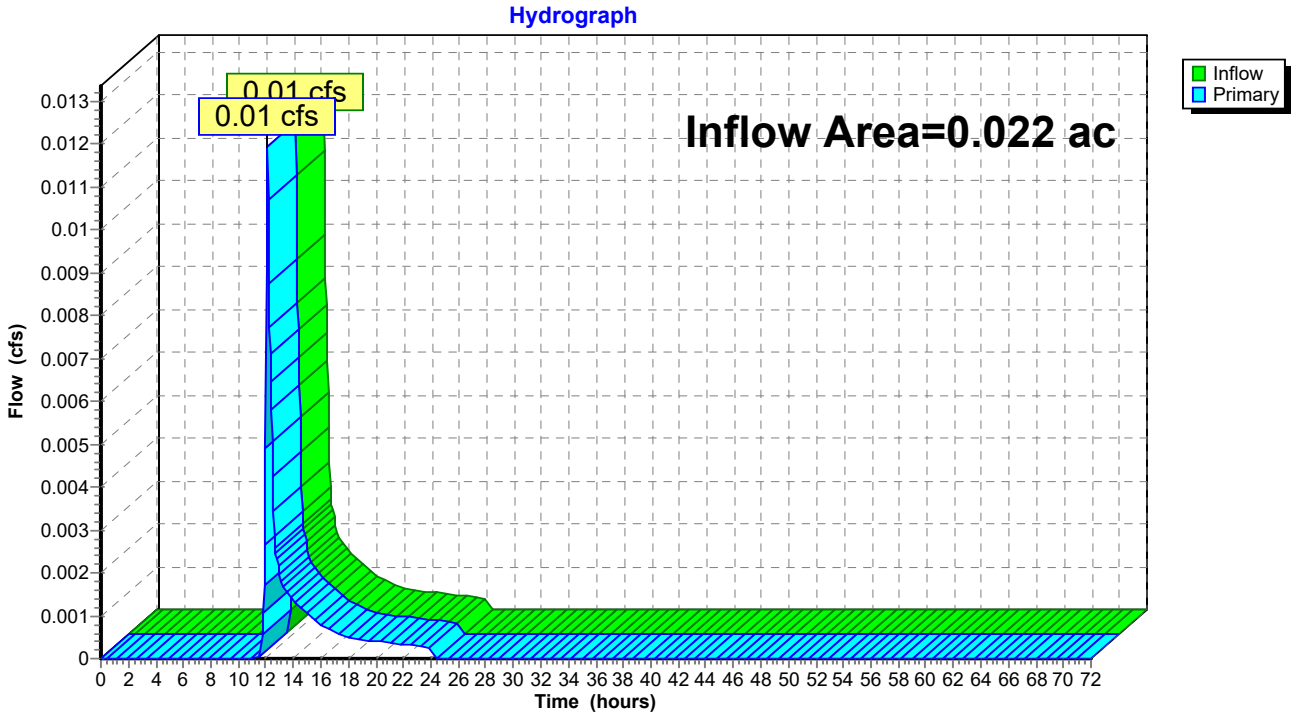


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 0.57" for 2-YR event
Inflow = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af
Primary = 0.01 cfs @ 12.11 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=0.112 ac 0.00% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=69 Runoff=0.17 cfs 0.013 af

Subcatchment PR-2: Subcat PR-2 Runoff Area=0.129 ac 32.21% Impervious Runoff Depth=1.99"
Tc=6.0 min CN=78 Runoff=0.29 cfs 0.021 af

Subcatchment PR-3: Subcat PR-3 Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=69 Runoff=0.21 cfs 0.016 af

Subcatchment PR-4: Subcat PR-4 Runoff Area=1.038 ac 85.96% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=94 Runoff=3.86 cfs 0.298 af

Subcatchment PR-5: Subcat PR-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=69 Runoff=0.03 cfs 0.002 af

Subcatchment PR-6: Subcat PR-6 Runoff Area=1.252 ac 75.88% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=91 Runoff=4.37 cfs 0.328 af

Pond 1P: Pond #1 Peak Elev=235.74' Storage=9,312 cf Inflow=3.86 cfs 0.298 af
Discarded=0.04 cfs 0.195 af Primary=0.12 cfs 0.032 af Outflow=0.16 cfs 0.227 af

Pond 2P: Pond #2 Peak Elev=234.73' Storage=8,768 cf Inflow=4.37 cfs 0.328 af
Discarded=0.03 cfs 0.177 af Primary=0.32 cfs 0.083 af Outflow=0.35 cfs 0.260 af

Link DP-1: UHaul Inflow=0.17 cfs 0.013 af
Primary=0.17 cfs 0.013 af

Link DP-2: East Parking Inflow=0.35 cfs 0.137 af
Primary=0.35 cfs 0.137 af

Link DP-3: New Development Inflow=0.21 cfs 0.016 af
Primary=0.21 cfs 0.016 af

Link DP-5: Tracks Inflow=0.03 cfs 0.002 af
Primary=0.03 cfs 0.002 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.679 af Average Runoff Depth = 3.02"
30.08% Pervious = 0.810 ac 69.92% Impervious = 1.883 ac

Summary for Subcatchment PR-1: Subcat PR-1

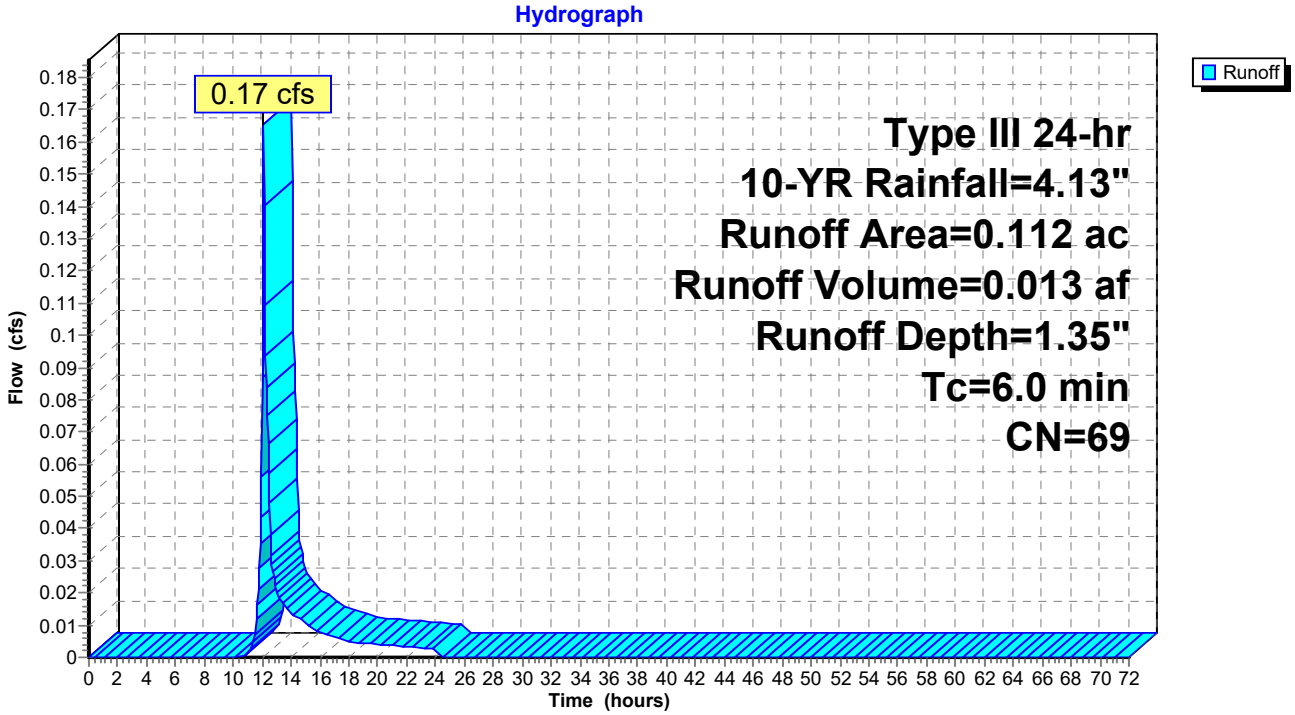
Runoff = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af, Depth= 1.35"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.112	69	50-75% Grass cover, Fair, HSG B
0.112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

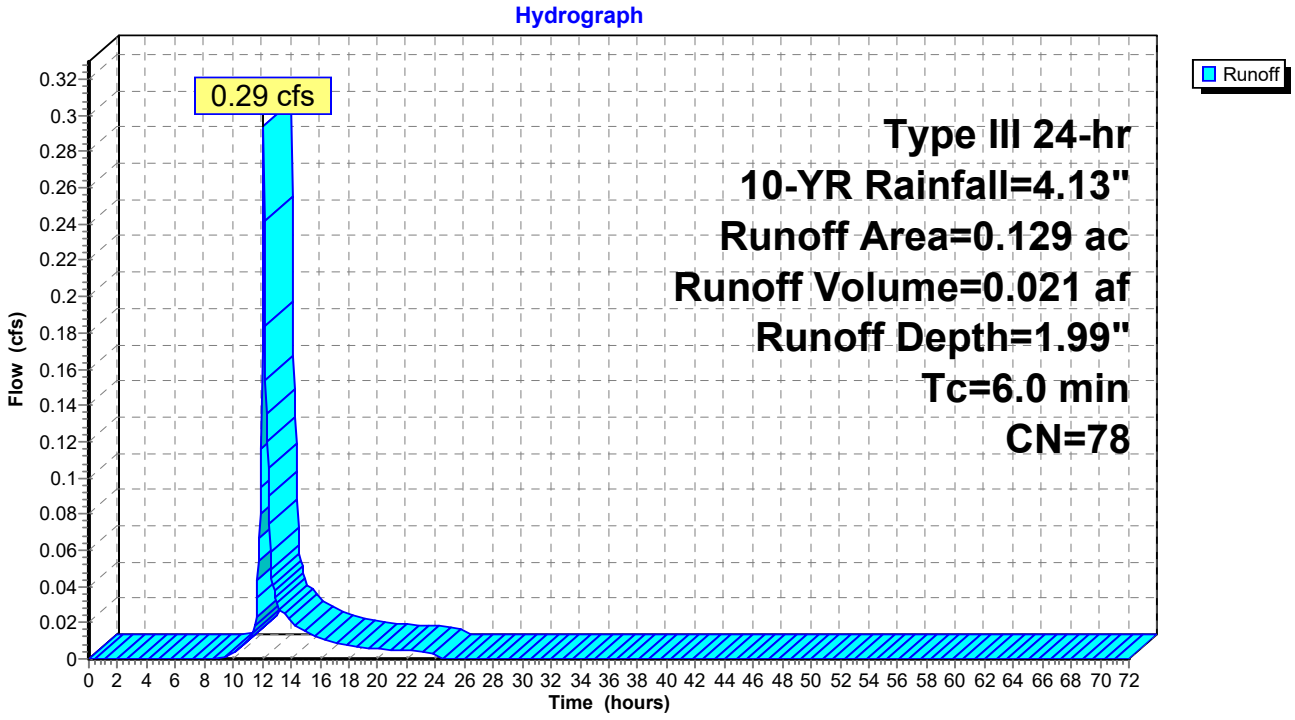
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.99"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.087	69	50-75% Grass cover, Fair, HSG B
0.042	98	Paved parking, HSG B
0.129	78	Weighted Average
0.087		67.79% Pervious Area
0.042		32.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-2: Subcat PR-2



Summary for Subcatchment PR-3: Subcat PR-3

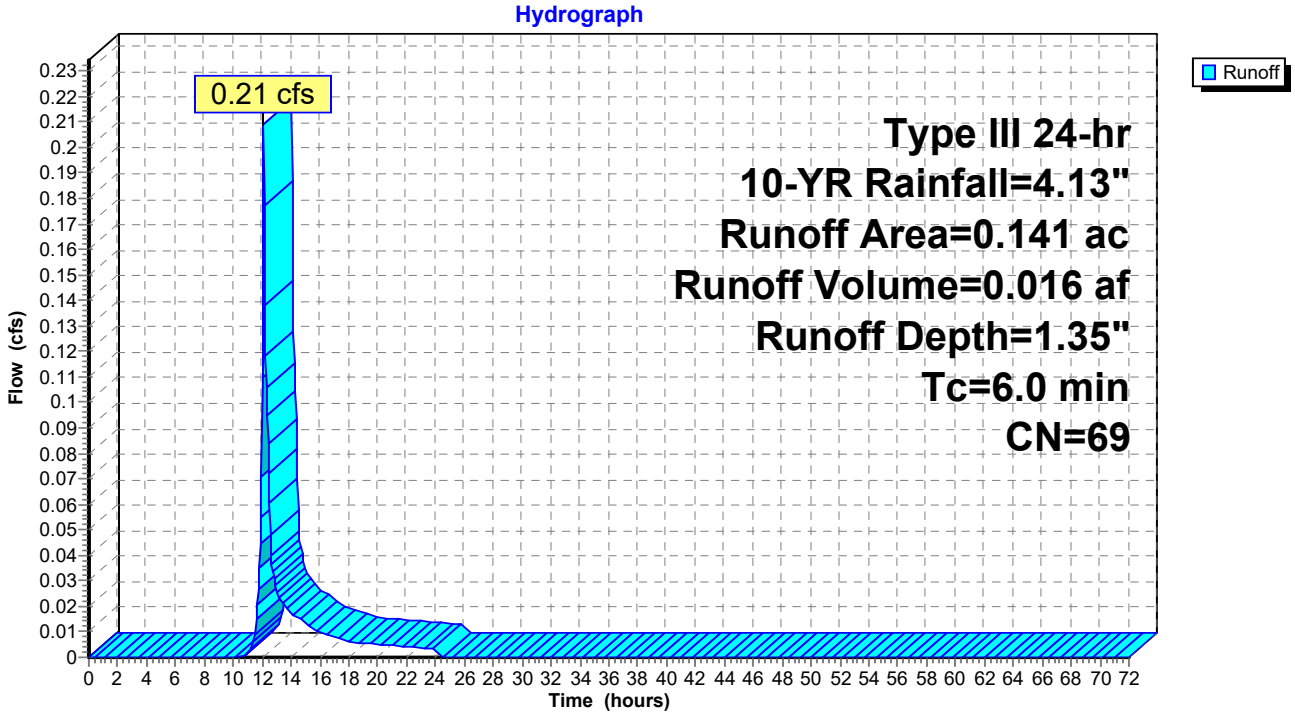
Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Depth= 1.35"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.141	69	50-75% Grass cover, Fair, HSG B
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-3: Subcat PR-3



Summary for Subcatchment PR-4: Subcat PR-4

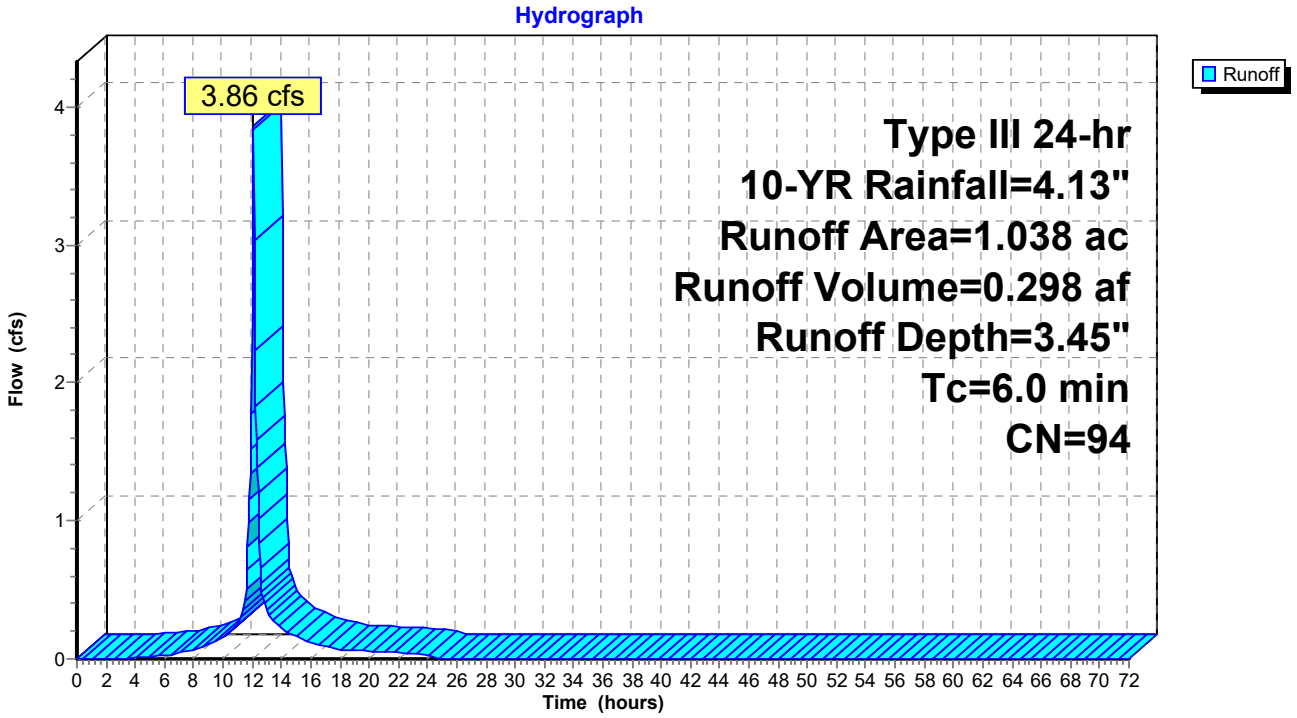
Runoff = 3.86 cfs @ 12.09 hrs, Volume= 0.298 af, Depth= 3.45"
Routed to Pond 1P : Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.146	69	50-75% Grass cover, Fair, HSG B
0.892	98	Paved parking, HSG B
1.038	94	Weighted Average
0.146		14.04% Pervious Area
0.892		85.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

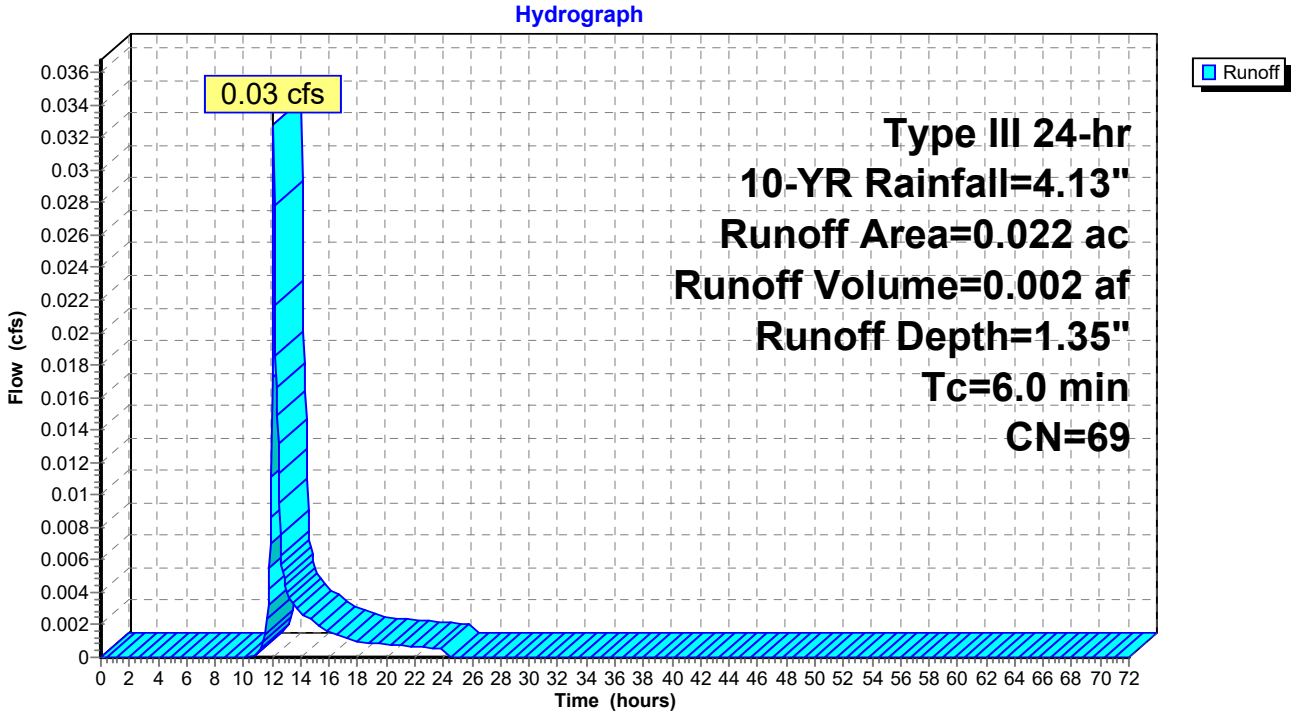
Runoff = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Depth= 1.35"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-5: Subcat PR-5



Summary for Subcatchment PR-6: Subcat PR-6

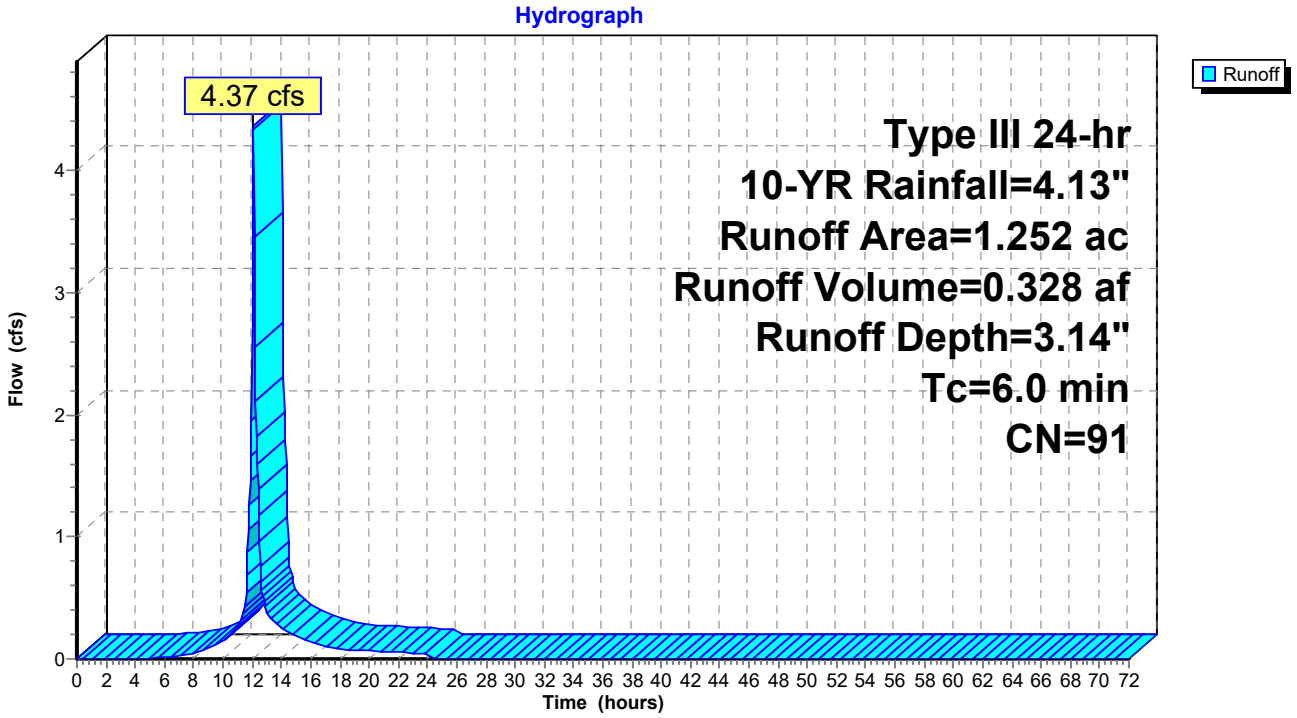
Runoff = 4.37 cfs @ 12.09 hrs, Volume= 0.328 af, Depth= 3.14"
Routed to Pond 2P : Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.13"

Area (ac)	CN	Description
0.302	69	50-75% Grass cover, Fair, HSG B
0.950	98	Paved parking, HSG B
1.252	91	Weighted Average
0.302		24.12% Pervious Area
0.950		75.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-6: Subcat PR-6



Summary for Pond 1P: Pond #1

Inflow Area = 1.038 ac, 85.96% Impervious, Inflow Depth = 3.45" for 10-YR event
Inflow = 3.86 cfs @ 12.09 hrs, Volume= 0.298 af
Outflow = 0.16 cfs @ 15.10 hrs, Volume= 0.227 af, Atten= 96%, Lag= 180.5 min
Discarded = 0.04 cfs @ 8.15 hrs, Volume= 0.195 af
Primary = 0.12 cfs @ 15.10 hrs, Volume= 0.032 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 235.74' @ 15.10 hrs Surf.Area= 5,067 sf Storage= 9,312 cf
Flood Elev= 236.80' Surf.Area= 5,067 sf Storage= 11,789 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,351.1 min (2,130.1 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	233.10'	4,739 cf	**49.00'W x 103.40'L x 3.75'H Field A** 19,000 cf Overall - 7,151 cf Embedded = 11,848 cf x 40.0% Voids
#2A	233.60'	7,151 cf	**ADS_StormTech SC-800 +Cap** x 140 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 140 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		11,891 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	233.10'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	234.40'	**12.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.40' / 233.40' S= 0.0104 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	235.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 8.15 hrs HW=233.14' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.12 cfs @ 15.10 hrs HW=235.74' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 0.12 cfs of 3.44 cfs potential flow)
↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.12 cfs @ 0.69 fps)

Pond 1P: Pond #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

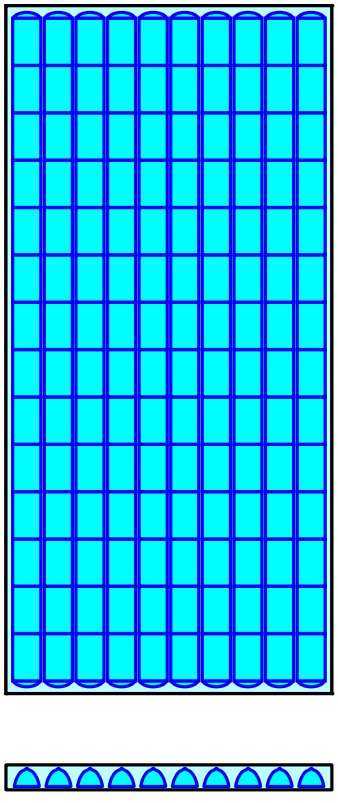
14 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 101.40' Row Length +12.0" End Stone x 2 = 103.40' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

140 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 7,151.3 cf Chamber Storage

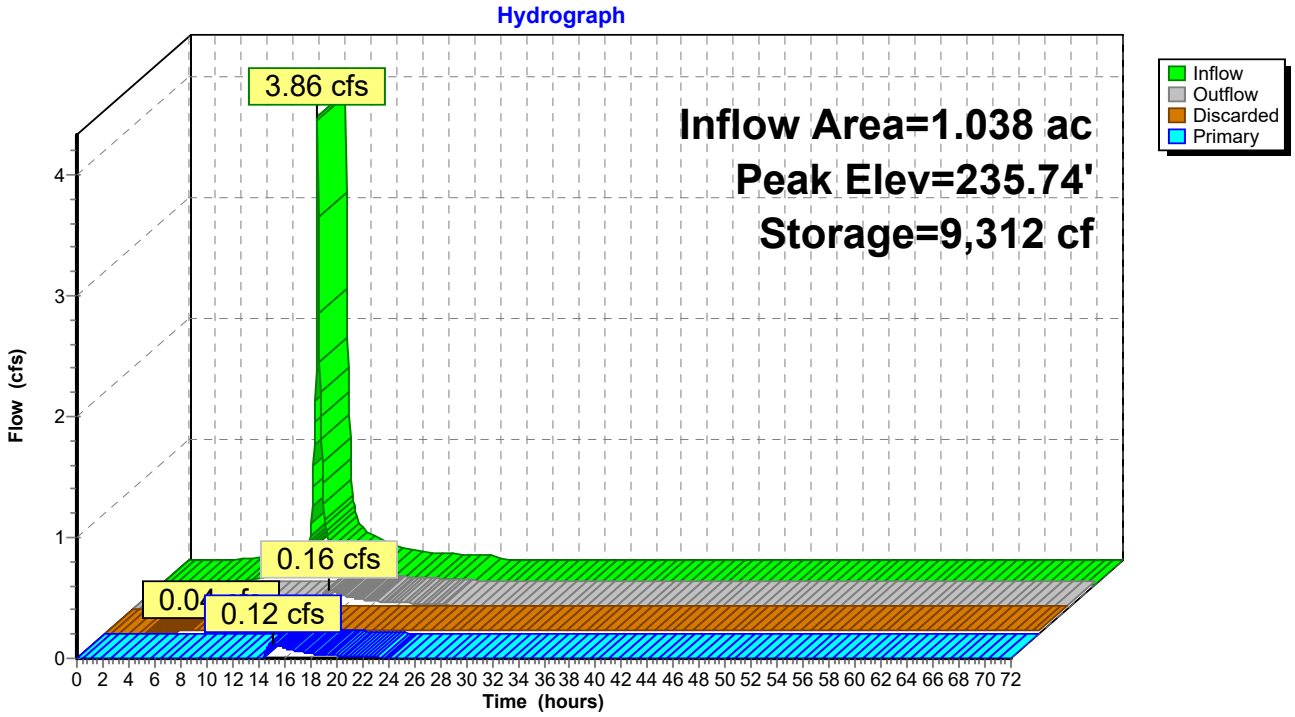
18,999.8 cf Field - 7,151.3 cf Chambers = 11,848.4 cf Stone x 40.0% Voids = 4,739.4 cf Stone Storage

Chamber Storage + Stone Storage = 11,890.7 cf = 0.273 af
Overall Storage Efficiency = 62.6%
Overall System Size = 103.40' x 49.00' x 3.75'

140 Chambers
703.7 cy Field
438.8 cy Stone



Pond 1P: Pond #1



Stage-Area-Storage for Pond 1P: Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
233.10	**5,067**	0
233.15	5,067	101
233.20	5,067	203
233.25	5,067	304
233.30	5,067	405
233.35	5,067	507
233.40	5,067	608
233.45	5,067	709
233.50	5,067	811
233.55	5,067	912
233.60	5,067	1,013
233.65	5,067	1,228
233.70	5,067	1,441
233.75	5,067	1,655
233.80	5,067	1,867
233.85	5,067	2,079
233.90	5,067	2,291
233.95	5,067	2,501
234.00	5,067	2,711
234.05	5,067	2,921
234.10	5,067	3,129
234.15	5,067	3,337
234.20	5,067	3,543
234.25	5,067	3,749
234.30	5,067	3,954
234.35	5,067	4,158
234.40	5,067	4,362
234.45	5,067	4,564
234.50	5,067	4,765
234.55	5,067	4,965
234.60	5,067	5,164
234.65	5,067	5,362
234.70	5,067	5,559
234.75	5,067	5,755
234.80	5,067	5,949
234.85	5,067	6,142
234.90	5,067	6,334
234.95	5,067	6,524
235.00	5,067	6,713
235.05	5,067	6,901
235.10	5,067	7,087
235.15	5,067	7,271
235.20	5,067	7,454
235.25	5,067	7,635
235.30	5,067	7,814
235.35	5,067	7,991
235.40	5,067	8,166
235.45	5,067	8,339
235.50	5,067	8,511
235.55	5,067	8,679
235.60	5,067	8,846
235.65	5,067	9,010
235.70	5,067	9,171
235.75	5,067	9,329
235.80	5,067	9,484
235.85	5,067	9,636
235.90	5,067	9,783
235.95	5,067	9,927
236.00	5,067	10,065
236.05	5,067	10,197
236.10	5,067	10,321
236.15	5,067	10,441
236.20	5,067	10,555
236.25	5,067	10,666
236.30	5,067	10,773
236.35	5,067	10,877
236.40	5,067	10,979
236.45	5,067	11,080
236.50	5,067	11,181
236.55	5,067	11,283
236.60	5,067	11,384
236.65	5,067	11,485
236.70	5,067	11,587
236.75	5,067	11,688
236.80	5,067	11,789
236.85	5,067	**11,891**

Summary for Pond 2P: Pond #2

Inflow Area = 1.252 ac, 75.88% Impervious, Inflow Depth = 3.14" for 10-YR event
Inflow = 4.37 cfs @ 12.09 hrs, Volume= 0.328 af
Outflow = 0.35 cfs @ 13.16 hrs, Volume= 0.260 af, Atten= 92%, Lag= 64.2 min
Discarded = 0.03 cfs @ 8.60 hrs, Volume= 0.177 af
Primary = 0.32 cfs @ 13.16 hrs, Volume= 0.083 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 234.73' @ 13.16 hrs Surf.Area= 4,681 sf Storage= 8,768 cf
Flood Elev= 236.25' Surf.Area= 4,681 sf Storage= 11,826 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,103.4 min (1,896.7 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	232.00'	3,074 cf	**30.00'W x 89.17'L x 4.25'H Field A** 11,369 cf Overall - 3,684 cf Embedded = 7,685 cf x 40.0% Voids
#2A	232.50'	3,684 cf	**ADS_StormTech SC-800 +Cap** x 72 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 72 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		6,758 cf	x 1.75 = 11,826 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	232.00'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	233.50'	**12.0" Round Culvert** L= 130.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 233.50' / 232.60' S= 0.0069 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	234.65'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 8.60 hrs HW=232.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.32 cfs @ 13.16 hrs HW=234.73' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 0.32 cfs of 3.05 cfs potential flow)
↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.32 cfs @ 0.95 fps)

Pond 2P: Pond #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

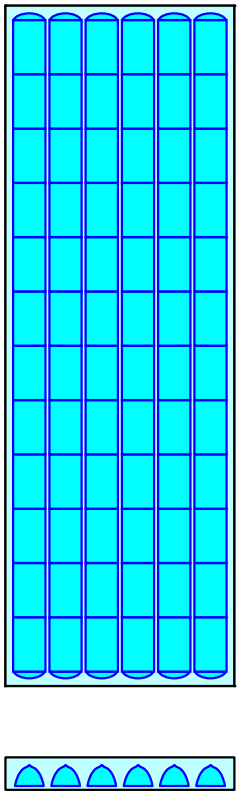
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.25' Field Height

72 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 3,683.7 cf Chamber Storage

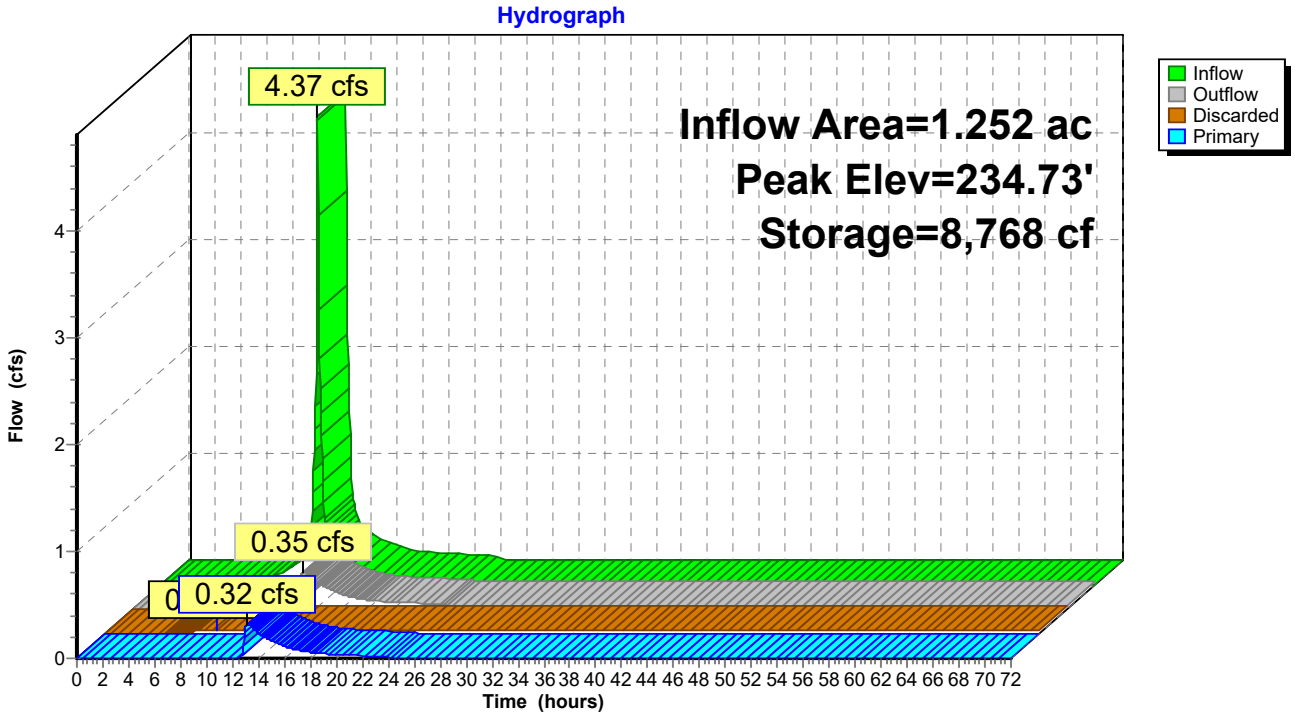
11,368.8 cf Field - 3,683.7 cf Chambers = 7,685.1 cf Stone x 40.0% Voids = 3,074.0 cf Stone Storage

Chamber Storage + Stone Storage = 6,757.7 cf = 0.155 af
Overall Storage Efficiency = 59.4%
Overall System Size = 89.17' x 30.00' x 4.25'

72 Chambers
421.1 cy Field
284.6 cy Stone



Pond 2P: Pond #2



Stage-Area-Storage for Pond 2P: Pond #2

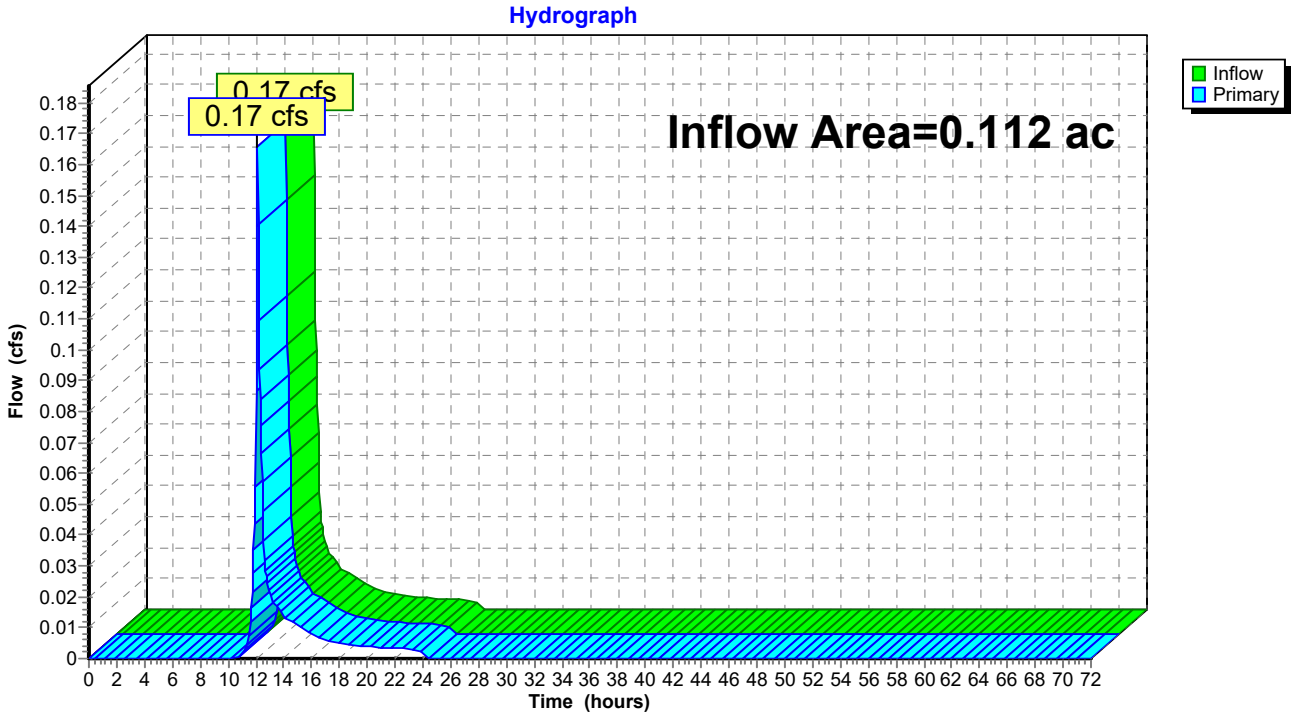
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.00	**4,681**	0
232.05	4,681	94
232.10	4,681	187
232.15	4,681	281
232.20	4,681	374
232.25	4,681	468
232.30	4,681	562
232.35	4,681	655
232.40	4,681	749
232.45	4,681	843
232.50	4,681	936
232.55	4,681	1,132
232.60	4,681	1,327
232.65	4,681	1,521
232.70	4,681	1,715
232.75	4,681	1,909
232.80	4,681	2,102
232.85	4,681	2,294
232.90	4,681	2,485
232.95	4,681	2,676
233.00	4,681	2,866
233.05	4,681	3,056
233.10	4,681	3,244
233.15	4,681	3,432
233.20	4,681	3,619
233.25	4,681	3,806
233.30	4,681	3,991
233.35	4,681	4,176
233.40	4,681	4,359
233.45	4,681	4,542
233.50	4,681	4,724
233.55	4,681	4,904
233.60	4,681	5,084
233.65	4,681	5,263
233.70	4,681	5,440
233.75	4,681	5,617
233.80	4,681	5,792
233.85	4,681	5,966
233.90	4,681	6,138
233.95	4,681	6,309
234.00	4,681	6,479
234.05	4,681	6,648
234.10	4,681	6,815
234.15	4,681	6,980
234.20	4,681	7,144
234.25	4,681	7,306
234.30	4,681	7,466
234.35	4,681	7,625
234.40	4,681	7,781
234.45	4,681	7,936
234.50	4,681	8,088
234.55	4,681	8,238
234.60	4,681	8,385
234.65	4,681	8,530
234.70	4,681	8,672
234.75	4,681	8,811
234.80	4,681	8,947
234.85	4,681	9,078
234.90	4,681	9,205
234.95	4,681	9,326
235.00	4,681	9,441
235.05	4,681	9,551
235.10	4,681	9,656
235.15	4,681	9,758
235.20	4,681	9,858
235.25	4,681	9,953
235.30	4,681	10,047
235.35	4,681	10,141
235.40	4,681	10,234
235.45	4,681	10,328
235.50	4,681	10,422
235.55	4,681	10,515
235.60	4,681	10,609
235.65	4,681	10,702
235.70	4,681	10,796
235.75	4,681	10,890
235.80	4,681	10,983
235.85	4,681	11,077
235.90	4,681	11,171
235.95	4,681	11,264
236.00	4,681	11,358
236.05	4,681	11,451
236.10	4,681	11,545
236.15	4,681	11,639
236.20	4,681	11,732
236.25	4,681	**11,826**

Summary for Link DP-1: UHaul

Inflow Area = 0.112 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af
Primary = 0.17 cfs @ 12.10 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

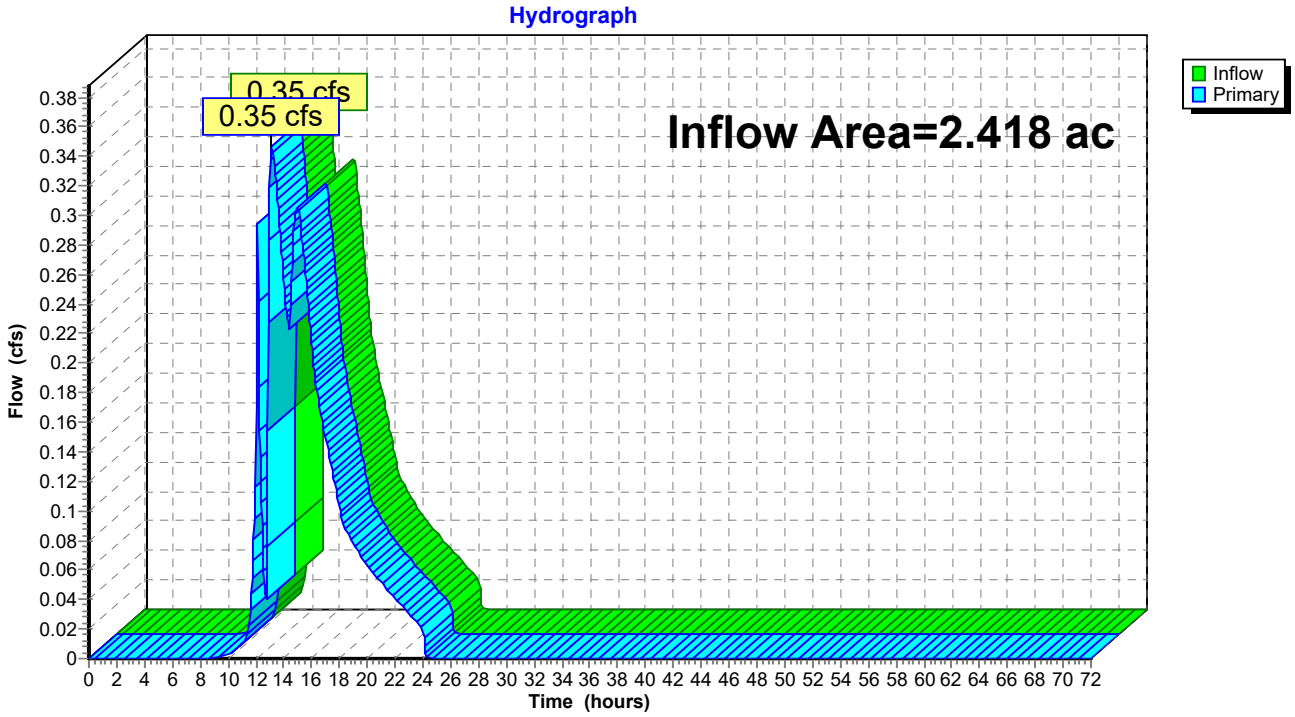


Summary for Link DP-2: East Parking

Inflow Area = 2.418 ac, 77.88% Impervious, Inflow Depth = 0.68" for 10-YR event
Inflow = 0.35 cfs @ 13.15 hrs, Volume= 0.137 af
Primary = 0.35 cfs @ 13.15 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

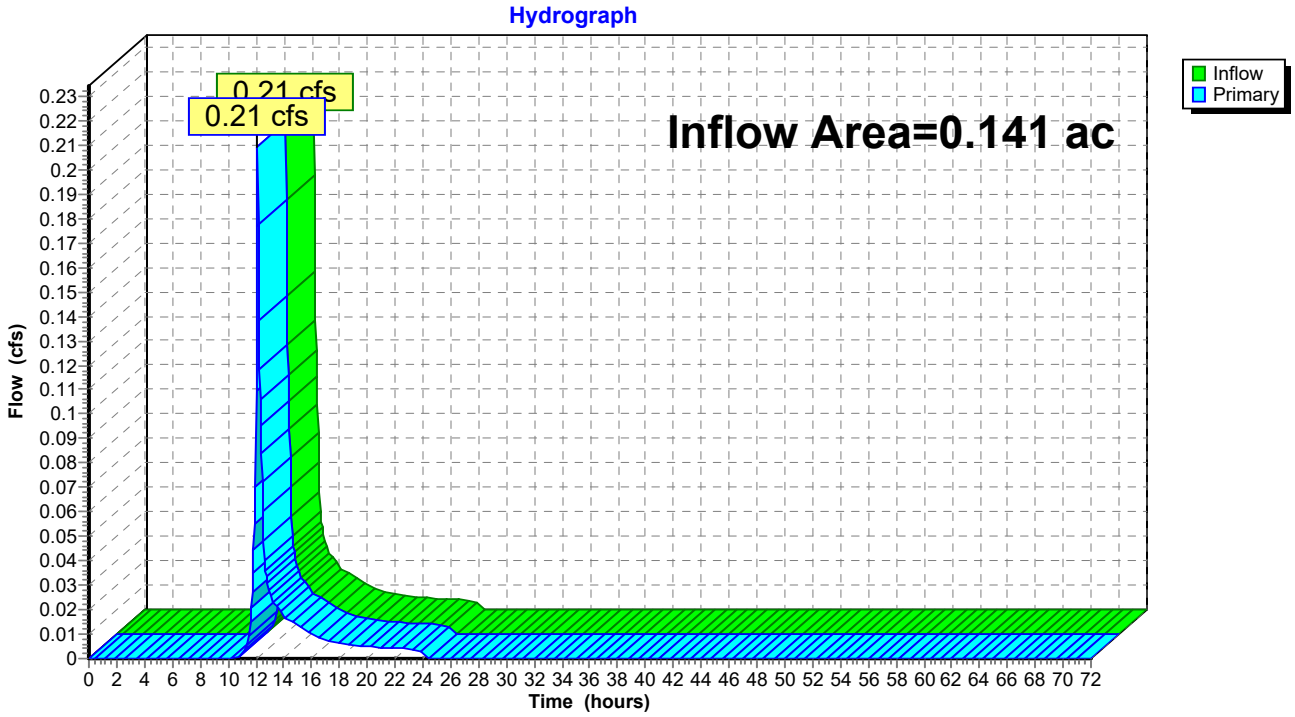


Summary for Link DP-3: New Development

Inflow Area = 0.141 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

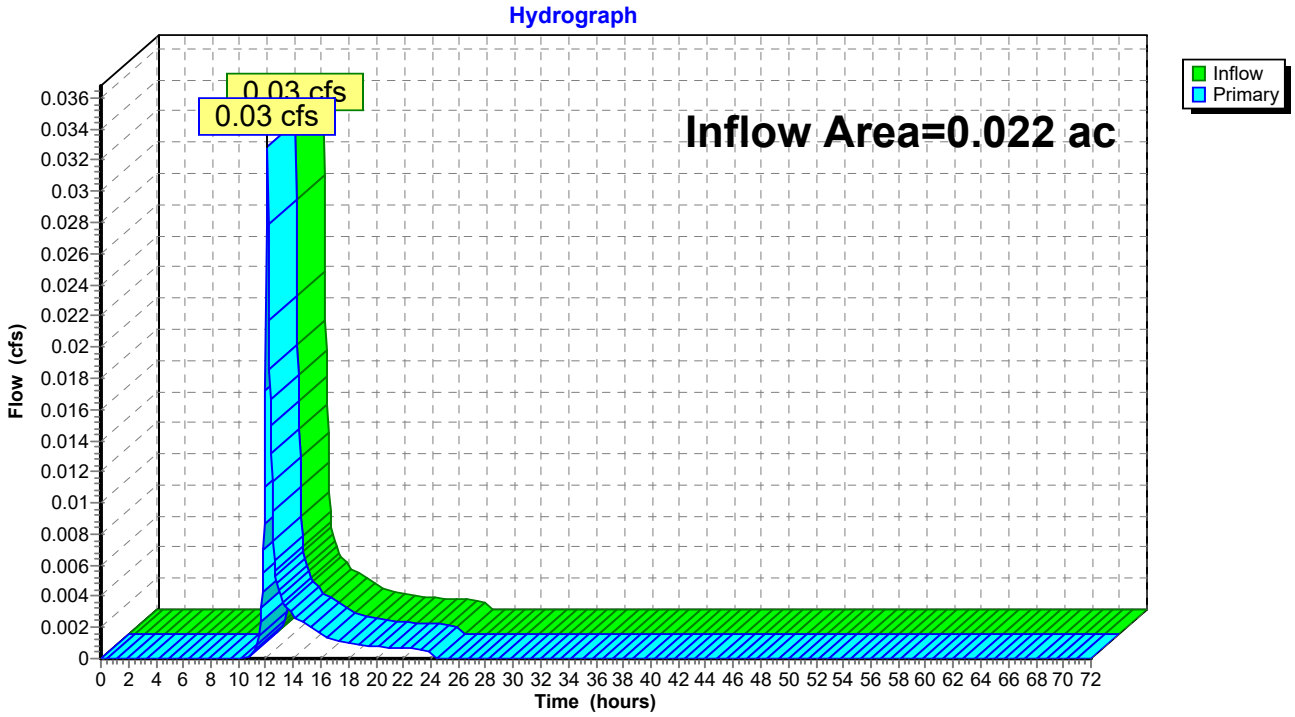


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 1.35" for 10-YR event
Inflow = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af
Primary = 0.03 cfs @ 12.10 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PR-1: Subcat PR-1 Runoff Area=0.112 ac 0.00% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=69 Runoff=0.26 cfs 0.019 af

Subcatchment PR-2: Subcat PR-2 Runoff Area=0.129 ac 32.21% Impervious Runoff Depth=2.85"
Tc=6.0 min CN=78 Runoff=0.42 cfs 0.031 af

Subcatchment PR-3: Subcat PR-3 Runoff Area=0.141 ac 0.00% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=69 Runoff=0.33 cfs 0.024 af

Subcatchment PR-4: Subcat PR-4 Runoff Area=1.038 ac 85.96% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=94 Runoff=4.92 cfs 0.386 af

Subcatchment PR-5: Subcat PR-5 Runoff Area=0.022 ac 0.00% Impervious Runoff Depth=2.07"
Tc=6.0 min CN=69 Runoff=0.05 cfs 0.004 af

Subcatchment PR-6: Subcat PR-6 Runoff Area=1.252 ac 75.88% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=91 Runoff=5.67 cfs 0.432 af

Pond 1P: Pond #1 Peak Elev=235.85' Storage=9,641 cf Inflow=4.92 cfs 0.386 af
Discarded=0.04 cfs 0.197 af Primary=0.77 cfs 0.117 af Outflow=0.80 cfs 0.314 af

Pond 2P: Pond #2 Peak Elev=234.94' Storage=9,297 cf Inflow=5.67 cfs 0.432 af
Discarded=0.03 cfs 0.180 af Primary=1.99 cfs 0.184 af Outflow=2.02 cfs 0.364 af

Link DP-1: UHaul Inflow=0.26 cfs 0.019 af
Primary=0.26 cfs 0.019 af

Link DP-2: East Parking Inflow=2.34 cfs 0.332 af
Primary=2.34 cfs 0.332 af

Link DP-3: New Development Inflow=0.33 cfs 0.024 af
Primary=0.33 cfs 0.024 af

Link DP-5: Tracks Inflow=0.05 cfs 0.004 af
Primary=0.05 cfs 0.004 af

Total Runoff Area = 2.694 ac Runoff Volume = 0.896 af Average Runoff Depth = 3.99"
30.08% Pervious = 0.810 ac 69.92% Impervious = 1.883 ac

Summary for Subcatchment PR-1: Subcat PR-1

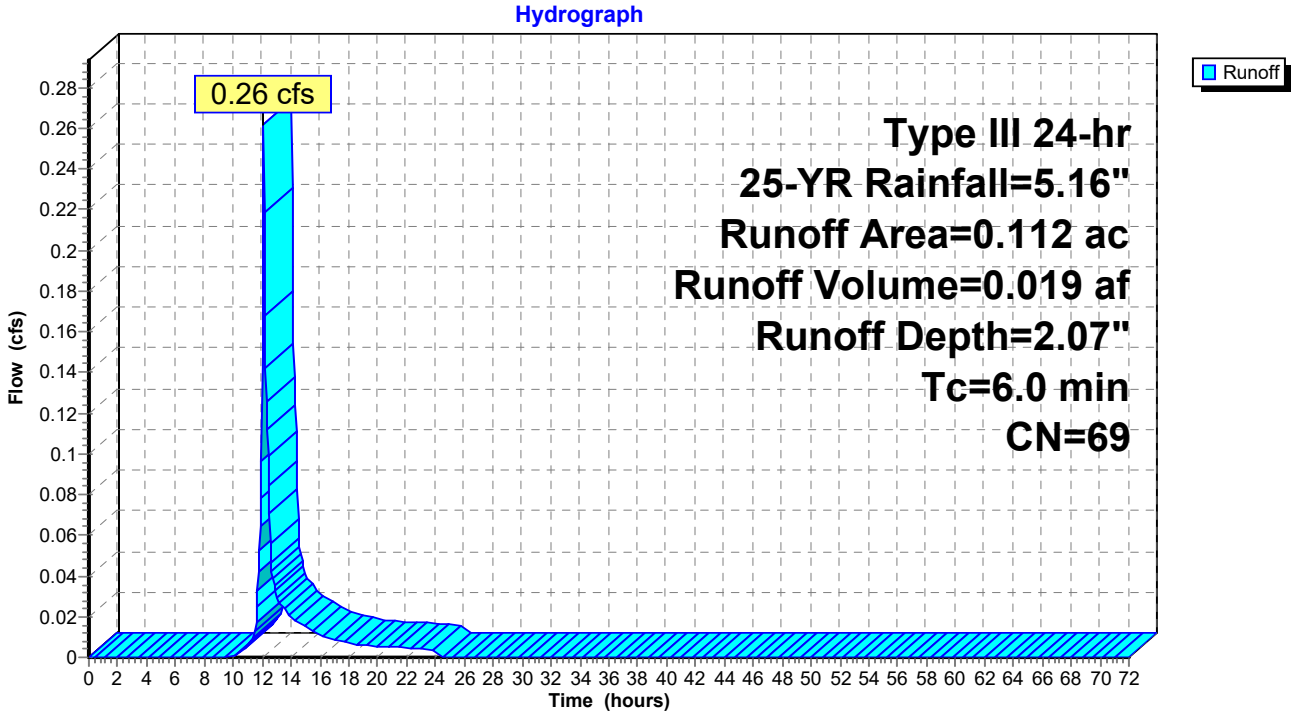
Runoff = 0.26 cfs @ 12.10 hrs, Volume= 0.019 af, Depth= 2.07"
Routed to Link DP-1 : UHaul

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.112	69	50-75% Grass cover, Fair, HSG B
0.112		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-1: Subcat PR-1



Summary for Subcatchment PR-2: Subcat PR-2

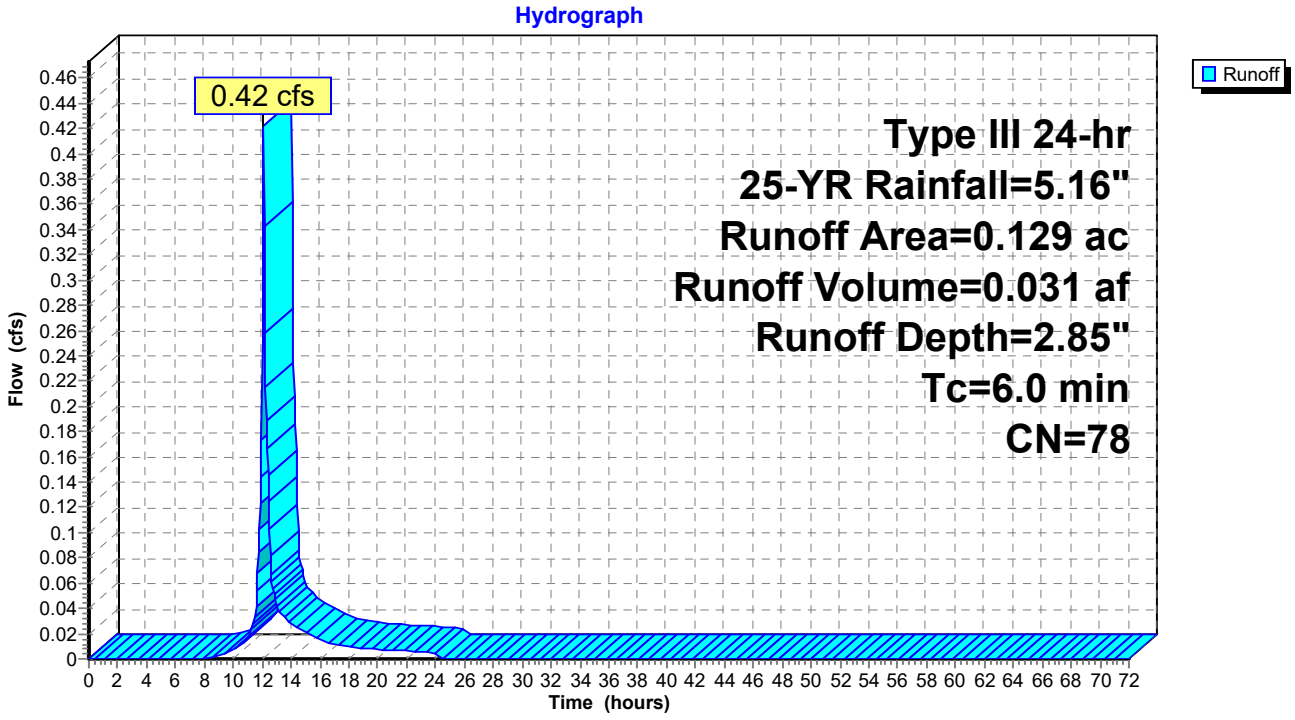
Runoff = 0.42 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 2.85"
Routed to Link DP-2 : East Parking

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.087	69	50-75% Grass cover, Fair, HSG B
0.042	98	Paved parking, HSG B
0.129	78	Weighted Average
0.087		67.79% Pervious Area
0.042		32.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-2: Subcat PR-2



Summary for Subcatchment PR-3: Subcat PR-3

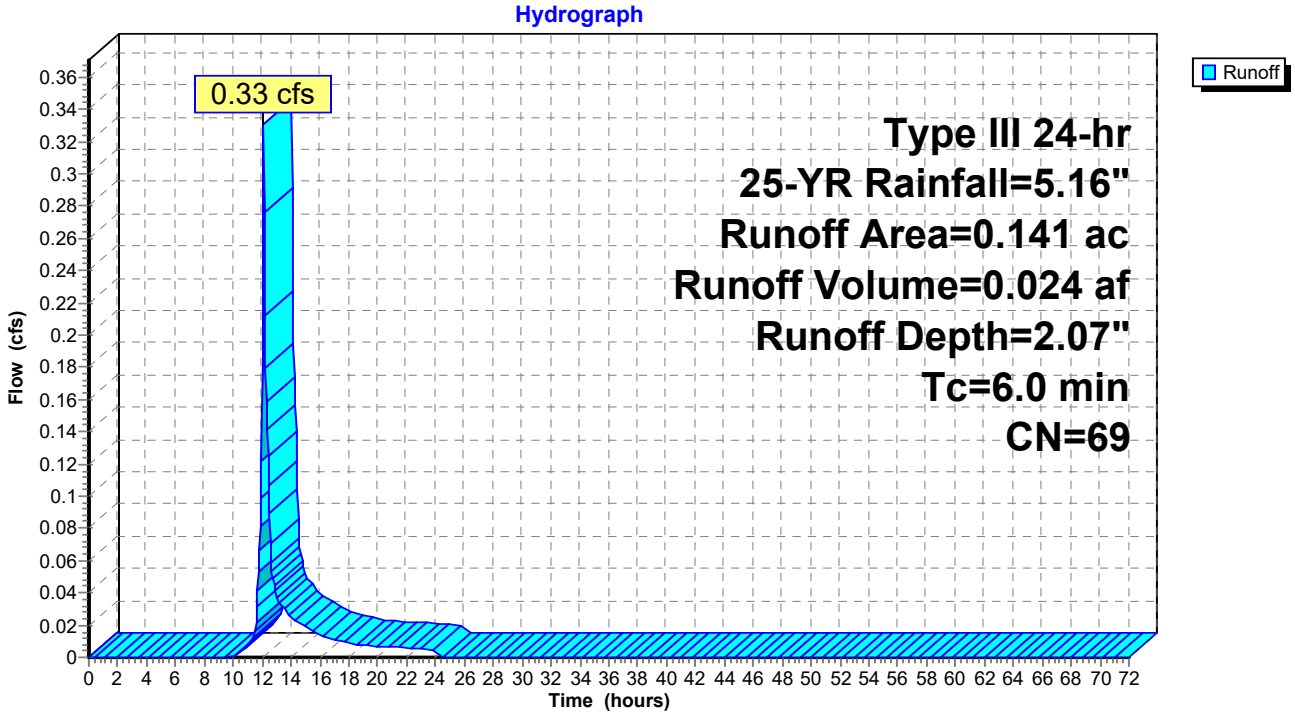
Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.024 af, Depth= 2.07"
Routed to Link DP-3 : New Development

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.141	69	50-75% Grass cover, Fair, HSG B
0.141		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-3: Subcat PR-3



Summary for Subcatchment PR-4: Subcat PR-4

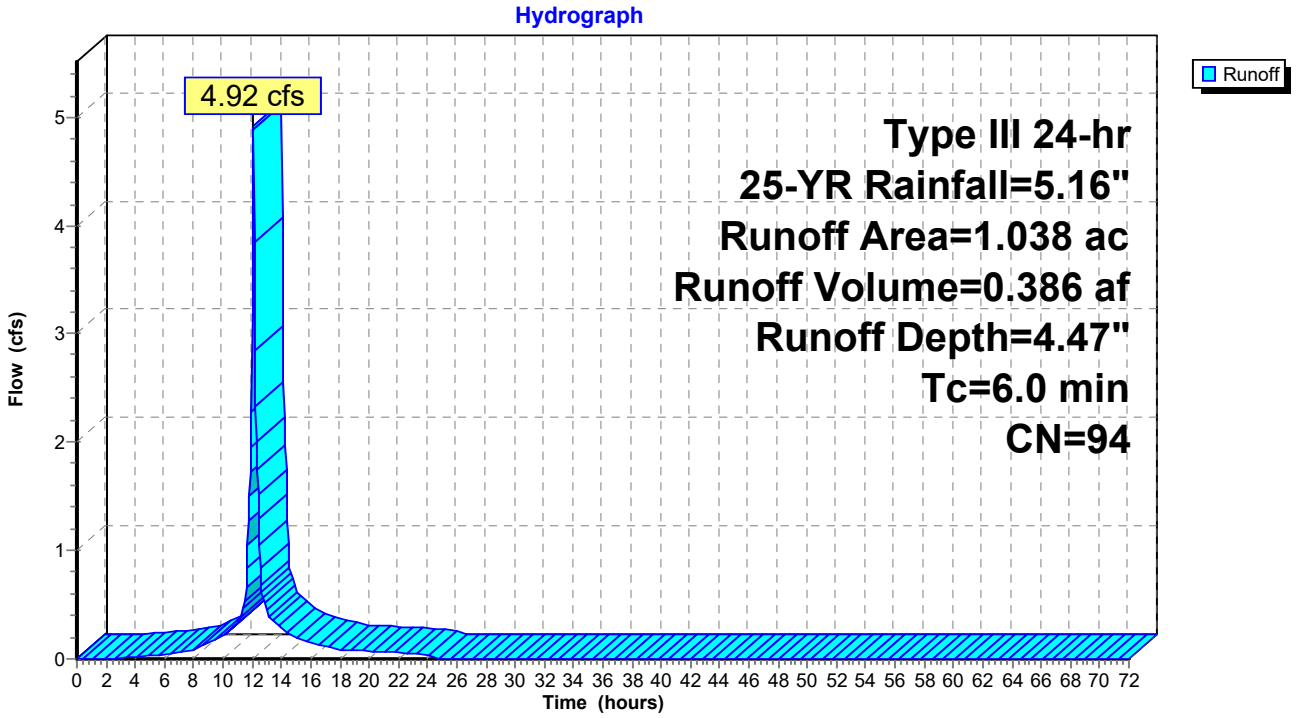
Runoff = 4.92 cfs @ 12.09 hrs, Volume= 0.386 af, Depth= 4.47"
Routed to Pond 1P : Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.146	69	50-75% Grass cover, Fair, HSG B
0.892	98	Paved parking, HSG B
1.038	94	Weighted Average
0.146		14.04% Pervious Area
0.892		85.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-4: Subcat PR-4



Summary for Subcatchment PR-5: Subcat PR-5

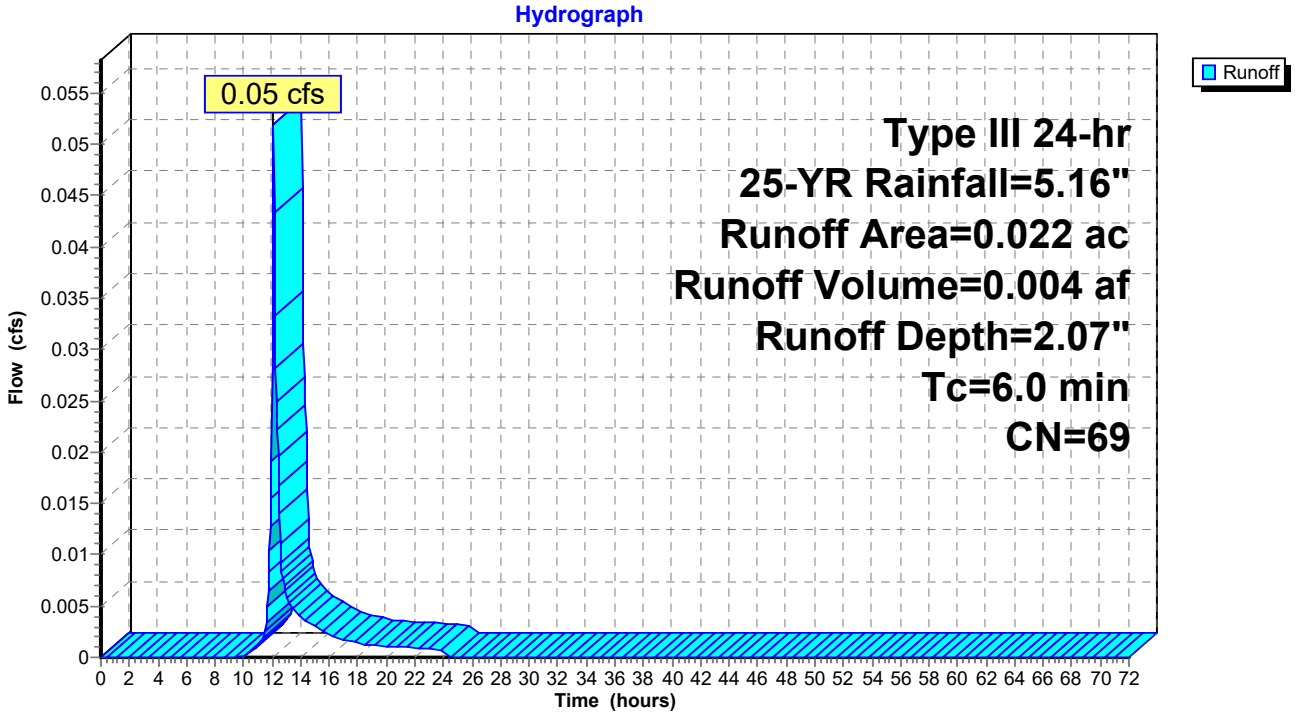
Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Depth= 2.07"
Routed to Link DP-5 : Tracks

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.022	69	50-75% Grass cover, Fair, HSG B
0.022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-5: Subcat PR-5



Summary for Subcatchment PR-6: Subcat PR-6

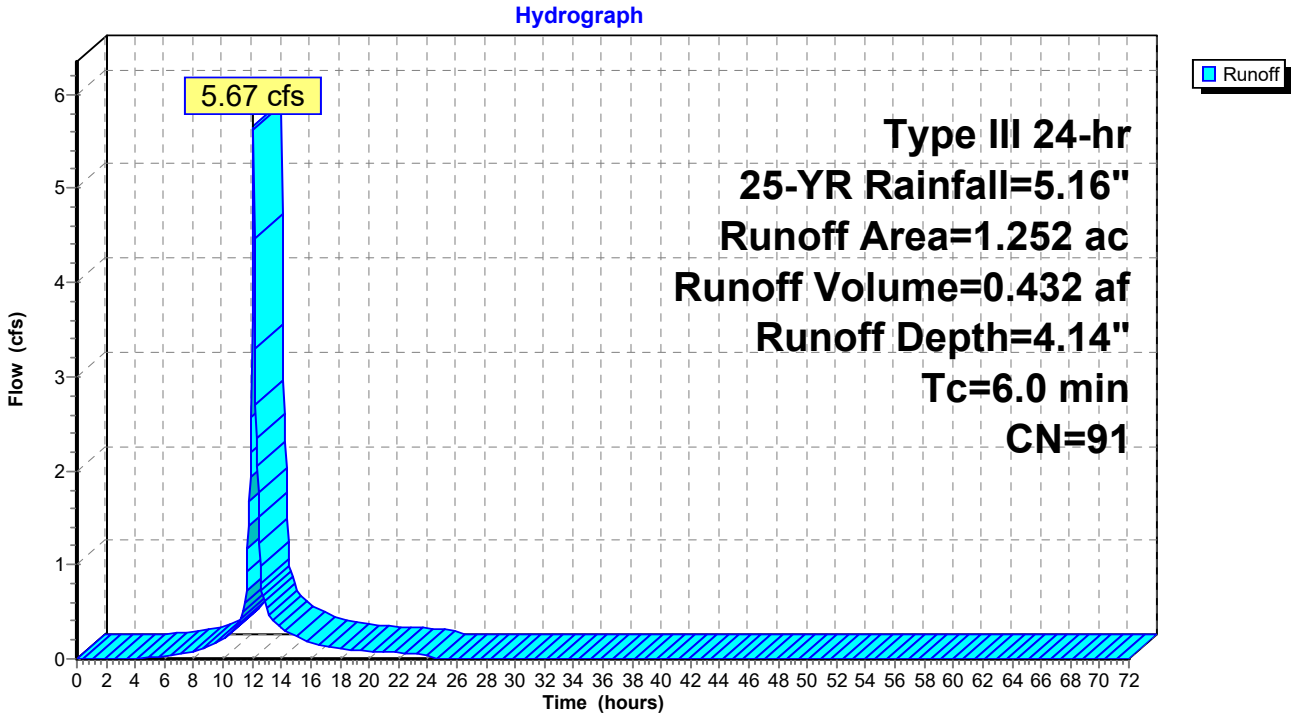
Runoff = 5.67 cfs @ 12.09 hrs, Volume= 0.432 af, Depth= 4.14"
Routed to Pond 2P : Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.16"

Area (ac)	CN	Description
0.302	69	50-75% Grass cover, Fair, HSG B
0.950	98	Paved parking, HSG B
1.252	91	Weighted Average
0.302		24.12% Pervious Area
0.950		75.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PR-6: Subcat PR-6



Summary for Pond 1P: Pond #1

Inflow Area = 1.038 ac, 85.96% Impervious, Inflow Depth = 4.47" for 25-YR event
Inflow = 4.92 cfs @ 12.09 hrs, Volume= 0.386 af
Outflow = 0.80 cfs @ 12.57 hrs, Volume= 0.314 af, Atten= 84%, Lag= 28.8 min
Discarded = 0.04 cfs @ 7.20 hrs, Volume= 0.197 af
Primary = 0.77 cfs @ 12.57 hrs, Volume= 0.117 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 235.85' @ 12.57 hrs Surf.Area= 5,067 sf Storage= 9,641 cf
Flood Elev= 236.80' Surf.Area= 5,067 sf Storage= 11,789 cf

Plug-Flow detention time= 1,069.3 min calculated for 0.314 af (81% of inflow)
Center-of-Mass det. time= 996.8 min (1,769.4 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	233.10'	4,739 cf	**49.00'W x 103.40'L x 3.75'H Field A** 19,000 cf Overall - 7,151 cf Embedded = 11,848 cf x 40.0% Voids
#2A	233.60'	7,151 cf	**ADS_StormTech SC-800 +Cap** x 140 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 140 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
		11,891 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	233.10'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	234.40'	**12.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 234.40' / 233.40' S= 0.0104 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	235.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 7.20 hrs HW=233.14' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.76 cfs @ 12.57 hrs HW=235.85' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 0.76 cfs of 3.57 cfs potential flow)
↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.76 cfs @ 1.27 fps)

Pond 1P: Pond #1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

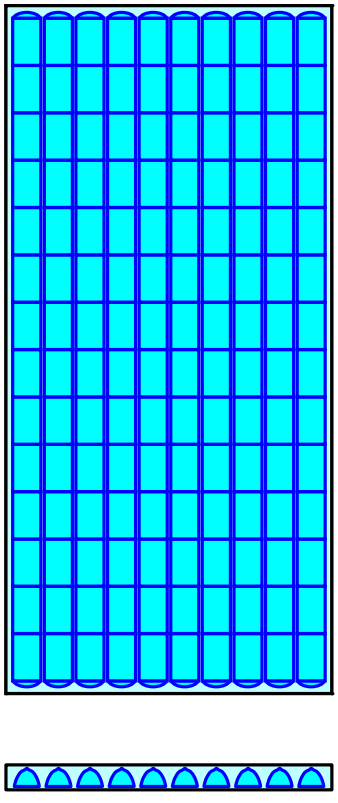
14 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 101.40' Row Length +12.0" End Stone x 2 = 103.40' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

140 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 7,151.3 cf Chamber Storage

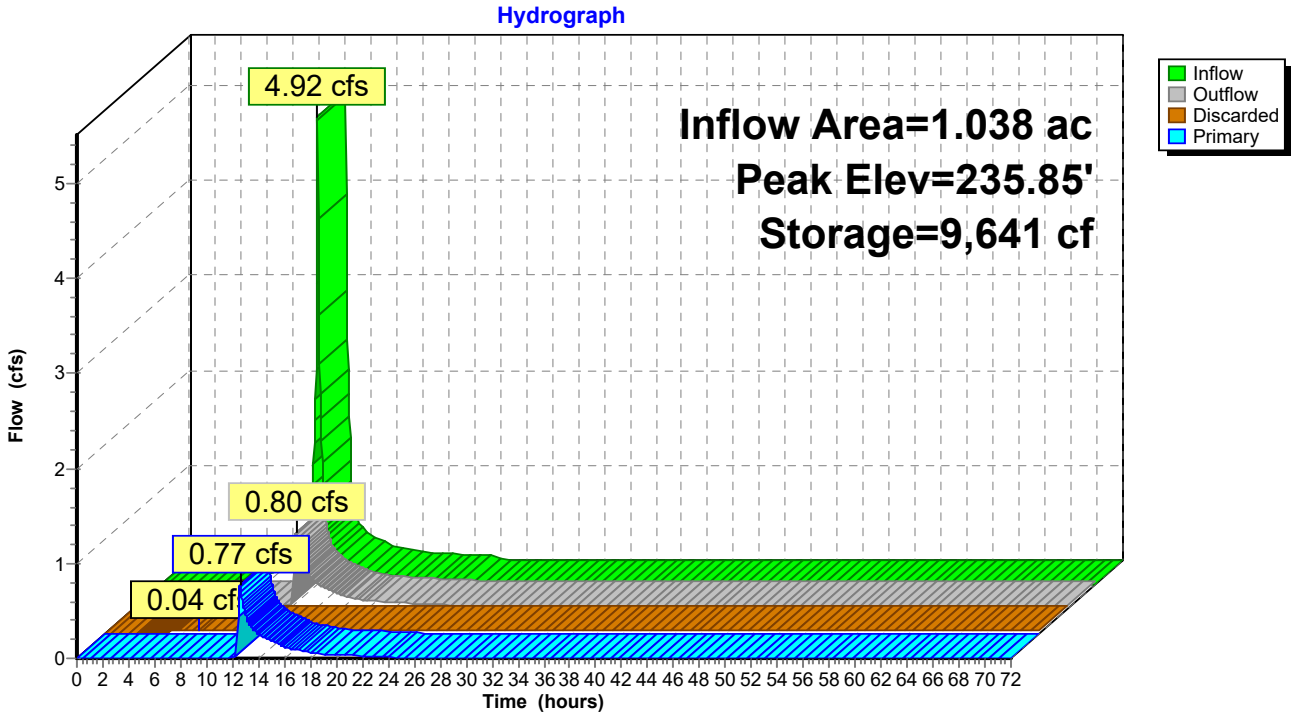
18,999.8 cf Field - 7,151.3 cf Chambers = 11,848.4 cf Stone x 40.0% Voids = 4,739.4 cf Stone Storage

Chamber Storage + Stone Storage = 11,890.7 cf = 0.273 af
Overall Storage Efficiency = 62.6%
Overall System Size = 103.40' x 49.00' x 3.75'

140 Chambers
703.7 cy Field
438.8 cy Stone



Pond 1P: Pond #1



Stage-Area-Storage for Pond 1P: Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
233.10	**5,067**	0
233.15	5,067	101
233.20	5,067	203
233.25	5,067	304
233.30	5,067	405
233.35	5,067	507
233.40	5,067	608
233.45	5,067	709
233.50	5,067	811
233.55	5,067	912
233.60	5,067	1,013
233.65	5,067	1,228
233.70	5,067	1,441
233.75	5,067	1,655
233.80	5,067	1,867
233.85	5,067	2,079
233.90	5,067	2,291
233.95	5,067	2,501
234.00	5,067	2,711
234.05	5,067	2,921
234.10	5,067	3,129
234.15	5,067	3,337
234.20	5,067	3,543
234.25	5,067	3,749
234.30	5,067	3,954
234.35	5,067	4,158
234.40	5,067	4,362
234.45	5,067	4,564
234.50	5,067	4,765
234.55	5,067	4,965
234.60	5,067	5,164
234.65	5,067	5,362
234.70	5,067	5,559
234.75	5,067	5,755
234.80	5,067	5,949
234.85	5,067	6,142
234.90	5,067	6,334
234.95	5,067	6,524
235.00	5,067	6,713
235.05	5,067	6,901
235.10	5,067	7,087
235.15	5,067	7,271
235.20	5,067	7,454
235.25	5,067	7,635
235.30	5,067	7,814
235.35	5,067	7,991
235.40	5,067	8,166
235.45	5,067	8,339
235.50	5,067	8,511
235.55	5,067	8,679
235.60	5,067	8,846
235.65	5,067	9,010
235.70	5,067	9,171
235.75	5,067	9,329
235.80	5,067	9,484
235.85	5,067	9,636
235.90	5,067	9,783
235.95	5,067	9,927
236.00	5,067	10,065
236.05	5,067	10,197
236.10	5,067	10,321
236.15	5,067	10,441
236.20	5,067	10,555
236.25	5,067	10,666
236.30	5,067	10,773
236.35	5,067	10,877
236.40	5,067	10,979
236.45	5,067	11,080
236.50	5,067	11,181
236.55	5,067	11,283
236.60	5,067	11,384
236.65	5,067	11,485
236.70	5,067	11,587
236.75	5,067	11,688
236.80	5,067	11,789
236.85	5,067	**11,891**

Summary for Pond 2P: Pond #2

Inflow Area = 1.252 ac, 75.88% Impervious, Inflow Depth = 4.14" for 25-YR event
Inflow = 5.67 cfs @ 12.09 hrs, Volume= 0.432 af
Outflow = 2.02 cfs @ 12.37 hrs, Volume= 0.364 af, Atten= 64%, Lag= 16.6 min
Discarded = 0.03 cfs @ 7.65 hrs, Volume= 0.180 af
Primary = 1.99 cfs @ 12.37 hrs, Volume= 0.184 af
Routed to Link DP-2 : East Parking

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 234.94' @ 12.37 hrs Surf.Area= 4,681 sf Storage= 9,297 cf
Flood Elev= 236.25' Surf.Area= 4,681 sf Storage= 11,826 cf

Plug-Flow detention time= 866.7 min calculated for 0.364 af (84% of inflow)
Center-of-Mass det. time= 801.1 min (1,586.9 - 785.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	232.00'	3,074 cf	**30.00'W x 89.17'L x 4.25'H Field A** 11,369 cf Overall - 3,684 cf Embedded = 7,685 cf x 40.0% Voids
#2A	232.50'	3,684 cf	**ADS_StormTech SC-800 +Cap** x 72 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 72 Chambers in 6 Rows Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf
		6,758 cf	x 1.75 = 11,826 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	232.00'	**0.300 in/hr Exfiltration over Surface area**
#2	Primary	233.50'	**12.0" Round Culvert** L= 130.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 233.50' / 232.60' S= 0.0069 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	234.65'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 7.65 hrs HW=232.04' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.96 cfs @ 12.37 hrs HW=234.93' TW=0.00' (Dynamic Tailwater)
↑**2=Culvert** (Passes 1.96 cfs of 3.08 cfs potential flow)
↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.96 cfs @ 1.75 fps)

Pond 2P: Pond #2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-800 +Cap (ADS StormTech® SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 6 rows = 41.0 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

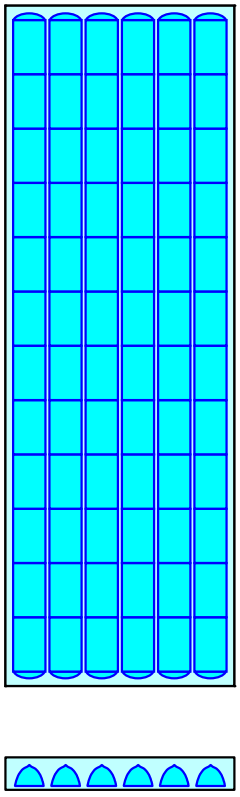
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
6 Rows x 51.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 12.0" Stone Cover = 4.25' Field Height

72 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 6 Rows = 3,683.7 cf Chamber Storage

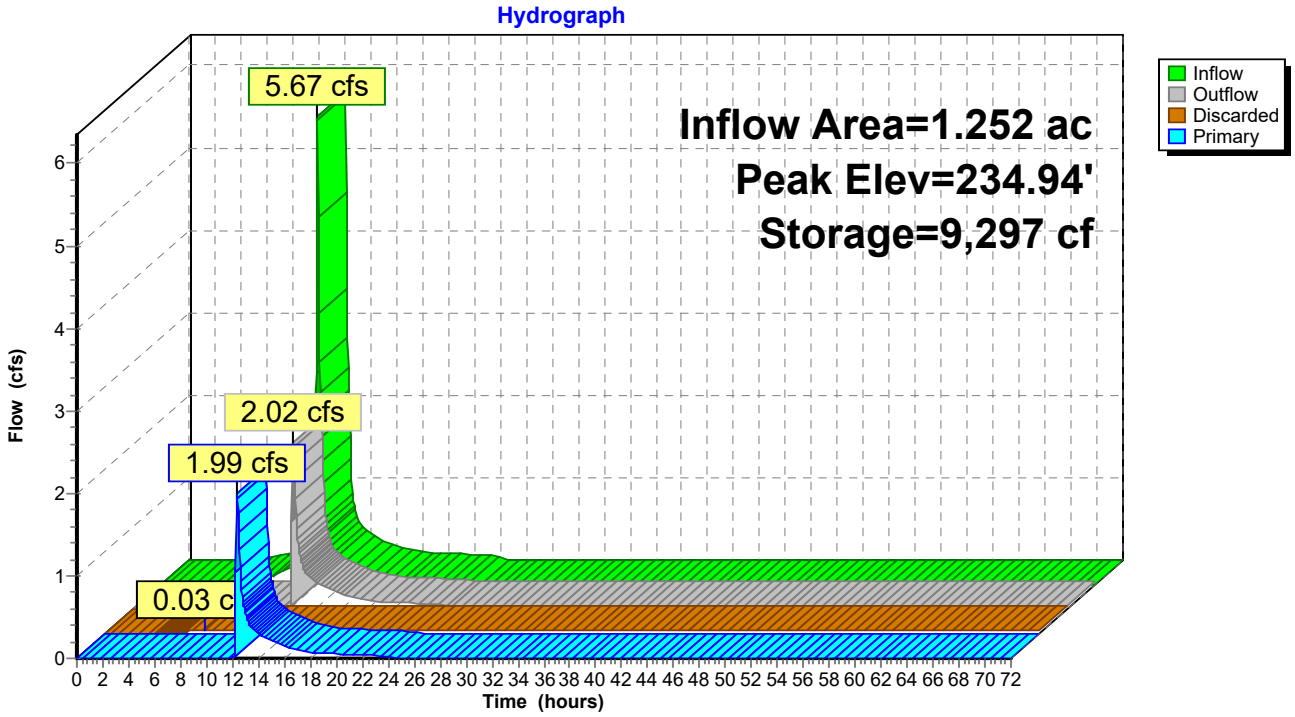
11,368.8 cf Field - 3,683.7 cf Chambers = 7,685.1 cf Stone x 40.0% Voids = 3,074.0 cf Stone Storage

Chamber Storage + Stone Storage = 6,757.7 cf = 0.155 af
Overall Storage Efficiency = 59.4%
Overall System Size = 89.17' x 30.00' x 4.25'

72 Chambers
421.1 cy Field
284.6 cy Stone



Pond 2P: Pond #2



Stage-Area-Storage for Pond 2P: Pond #2

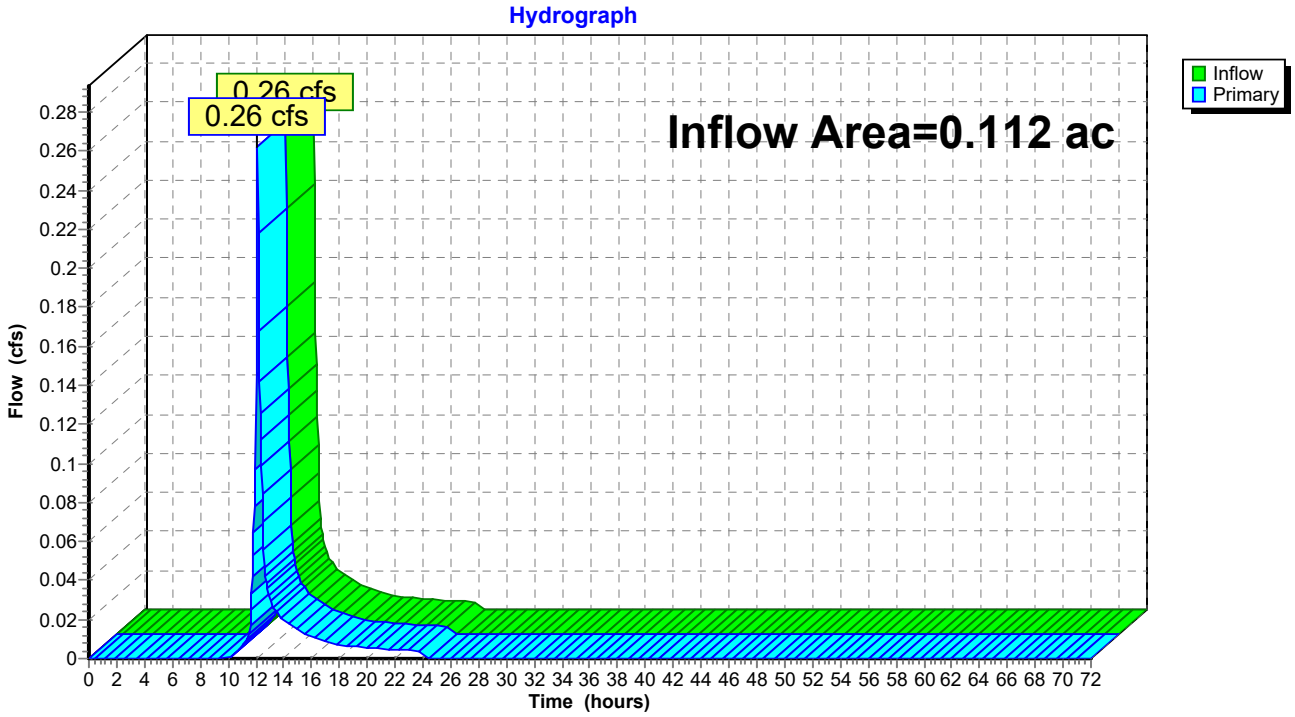
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
232.00	**4,681**	0
232.05	4,681	94
232.10	4,681	187
232.15	4,681	281
232.20	4,681	374
232.25	4,681	468
232.30	4,681	562
232.35	4,681	655
232.40	4,681	749
232.45	4,681	843
232.50	4,681	936
232.55	4,681	1,132
232.60	4,681	1,327
232.65	4,681	1,521
232.70	4,681	1,715
232.75	4,681	1,909
232.80	4,681	2,102
232.85	4,681	2,294
232.90	4,681	2,485
232.95	4,681	2,676
233.00	4,681	2,866
233.05	4,681	3,056
233.10	4,681	3,244
233.15	4,681	3,432
233.20	4,681	3,619
233.25	4,681	3,806
233.30	4,681	3,991
233.35	4,681	4,176
233.40	4,681	4,359
233.45	4,681	4,542
233.50	4,681	4,724
233.55	4,681	4,904
233.60	4,681	5,084
233.65	4,681	5,263
233.70	4,681	5,440
233.75	4,681	5,617
233.80	4,681	5,792
233.85	4,681	5,966
233.90	4,681	6,138
233.95	4,681	6,309
234.00	4,681	6,479
234.05	4,681	6,648
234.10	4,681	6,815
234.15	4,681	6,980
234.20	4,681	7,144
234.25	4,681	7,306
234.30	4,681	7,466
234.35	4,681	7,625
234.40	4,681	7,781
234.45	4,681	7,936
234.50	4,681	8,088
234.55	4,681	8,238
234.60	4,681	8,385
234.65	4,681	8,530
234.70	4,681	8,672
234.75	4,681	8,811
234.80	4,681	8,947
234.85	4,681	9,078
234.90	4,681	9,205
234.95	4,681	9,326
235.00	4,681	9,441
235.05	4,681	9,551
235.10	4,681	9,656
235.15	4,681	9,758
235.20	4,681	9,858
235.25	4,681	9,953
235.30	4,681	10,047
235.35	4,681	10,141
235.40	4,681	10,234
235.45	4,681	10,328
235.50	4,681	10,422
235.55	4,681	10,515
235.60	4,681	10,609
235.65	4,681	10,702
235.70	4,681	10,796
235.75	4,681	10,890
235.80	4,681	10,983
235.85	4,681	11,077
235.90	4,681	11,171
235.95	4,681	11,264
236.00	4,681	11,358
236.05	4,681	11,451
236.10	4,681	11,545
236.15	4,681	11,639
236.20	4,681	11,732
236.25	4,681	**11,826**

Summary for Link DP-1: UHaul

Inflow Area = 0.112 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.26 cfs @ 12.10 hrs, Volume= 0.019 af
Primary = 0.26 cfs @ 12.10 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-1: UHaul

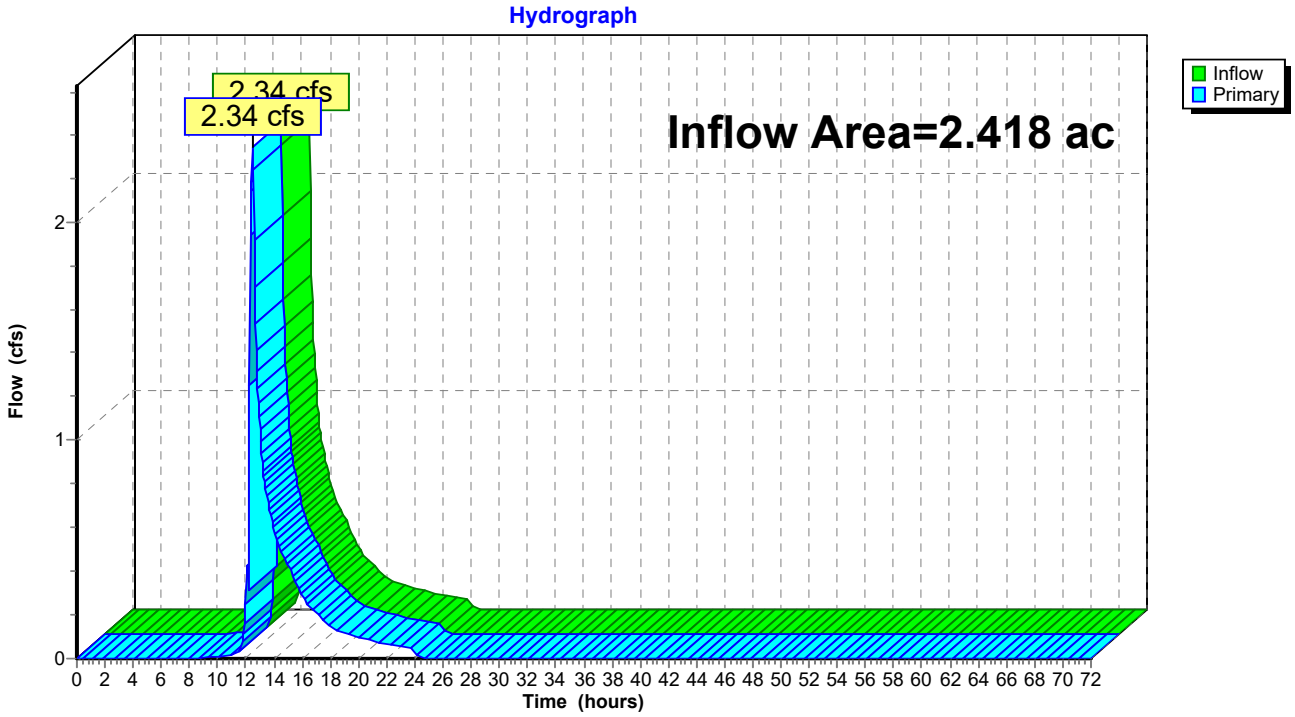


Summary for Link DP-2: East Parking

Inflow Area = 2.418 ac, 77.88% Impervious, Inflow Depth = 1.64" for 25-YR event
Inflow = 2.34 cfs @ 12.47 hrs, Volume= 0.332 af
Primary = 2.34 cfs @ 12.47 hrs, Volume= 0.332 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-2: East Parking

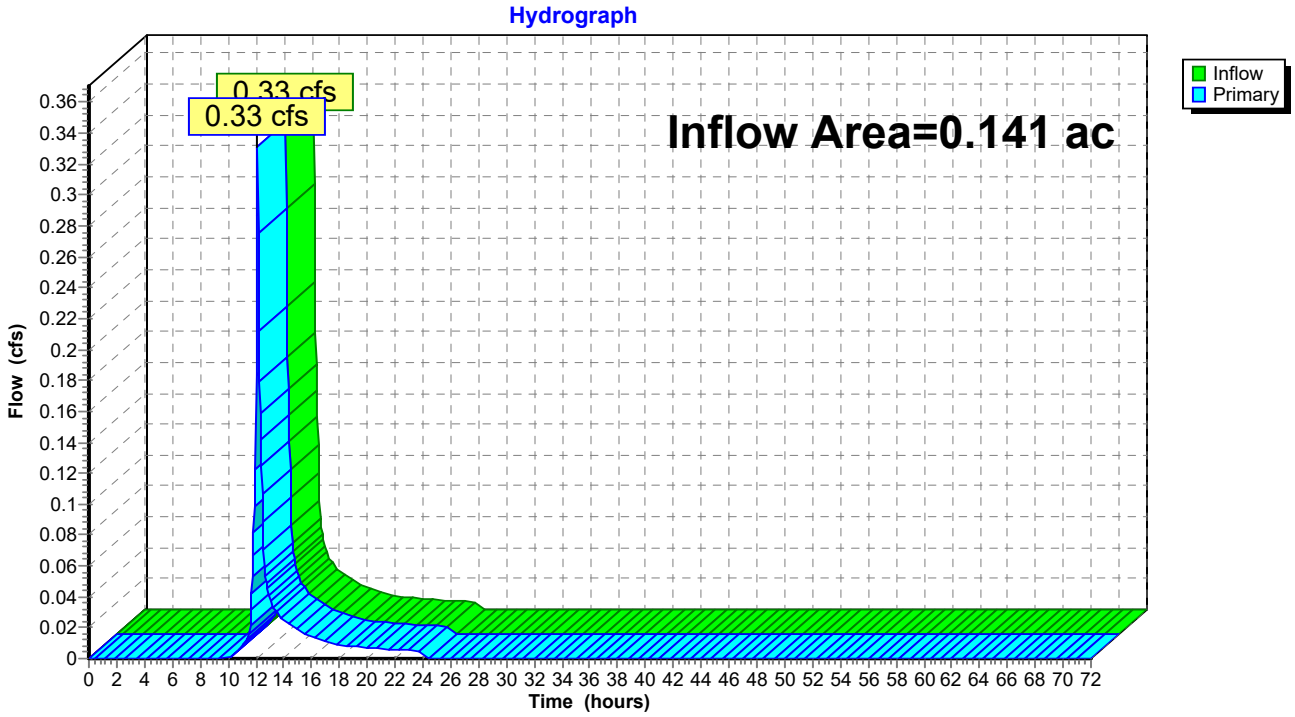


Summary for Link DP-3: New Development

Inflow Area = 0.141 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.024 af
Primary = 0.33 cfs @ 12.10 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-3: New Development

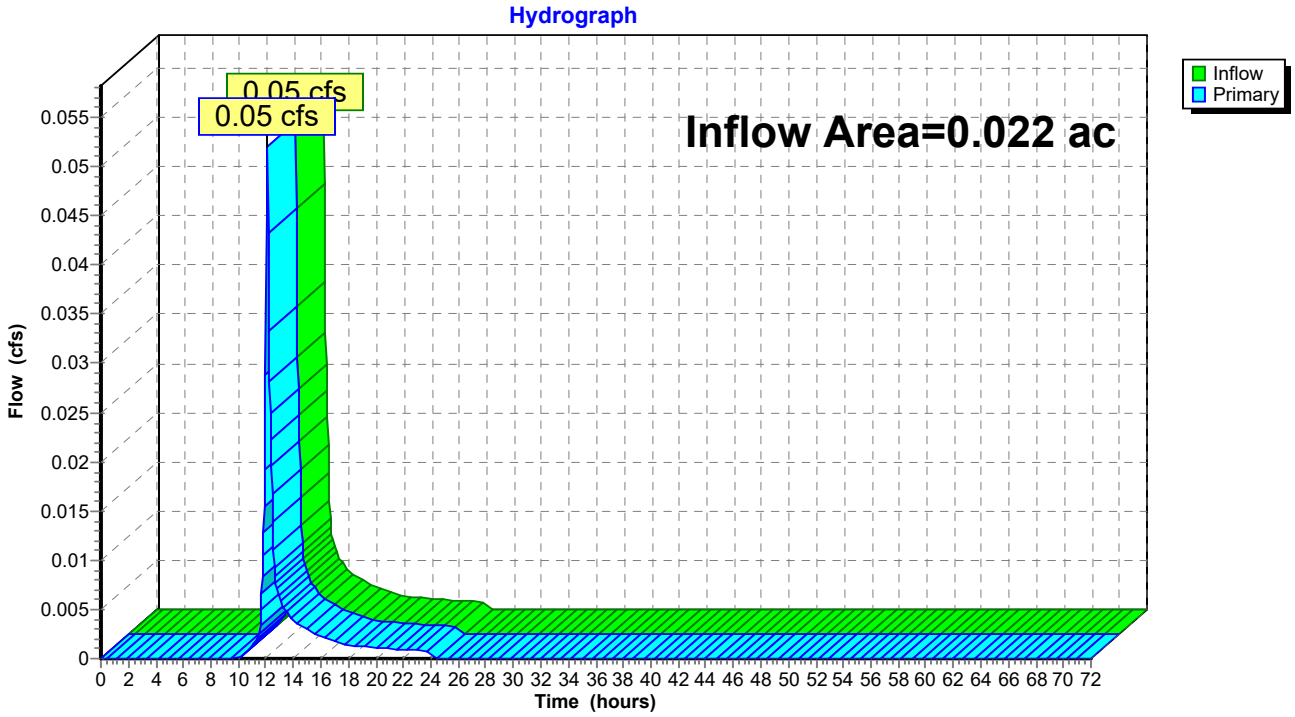


Summary for Link DP-5: Tracks

Inflow Area = 0.022 ac, 0.00% Impervious, Inflow Depth = 2.07" for 25-YR event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link DP-5: Tracks



Appendix C: Inspection and Maintenance Manual

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Concord Coach Temporary Parking Expansion

Concord, New Hampshire

PREPARED FOR

Concord Coach Lines
7 Langdon Avenue
Concord, NH 03301

PREPARED BY

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

November 18, 2025

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Introduction

VHB has prepared the following Stormwater Management System Inspection & Maintenance Manual for the Concord Coach Temporary Parking Expansion Project located in Concord, New Hampshire. The intent of this plan is to provide the applicant/owner with a list of procedures that document the inspection and maintenance requirements of the Stormwater Management System for this development.

The following inspection and maintenance program is necessary in order to keep the Stormwater Management System functioning properly. By following the enclosed procedures, the applicant will be able to maintain the functional design of the Stormwater Management System and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Responsible Party

The oversight of the inspection and maintenance program will be provided by:
Concord Coach Lines
7 Langdon Avenue
Concord, NH 03301

Stormwater Management System Components

The Stormwater Management System is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, its design includes the following elements:

Non-Structural BMP's

Non-structural best management practices (BMP's) are designed to minimize and/or remove contaminants before they enter the stormwater collection system. Several of these BMP's have been incorporated into the Stormwater Management System including reduced used of road deicing agents, and litter/trash removal. These types of BMP's are a highly effective initial treatment measure for reducing stormwater pollutant loading.

Structural BMP's

Structural BMP's have been incorporated into the overall stormwater management plan. Structural BMP's include deep sump catch basins.

Inspection & Maintenance Plan

By implementing the following procedures, the applicant will be able to maintain the functional design of the Stormwater Management System and maximize the system's ability to remove sediment and other contaminants from site generated stormwater runoff.

Source Control

- Routinely empty all outside waste receptacles provided for public use.
- Clearing litter from the parking area, islands and perimeter landscape areas.

Vegetated Areas Maintenance

Although not a specific component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- The grass vegetation should be cut to a height between three and four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of

vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

Deicing Agents

Deicing agents should be used in accordance with the following:

- Use sand as the primary agent for parking lot safety during ice and snow conditions.
- Use de-icing or anti-caking agents, added to enhance performance and application characteristics of sand mixtures, only as necessary and at minimum application rates.
- Maintain a Deicing Log to track the amount and type of deicing materials applied to the site.

Snow Management

Snow storage areas shall be maintained as follows:

- Snow storage areas will be managed to prevent blockage of storm drain catch basins. Snow combined with sand and debris may block a storm drainage system, diminishing the infiltration capacity of the system and causing localized flooding.
- Sand and debris deposited on vegetated or paved areas shall be cleared from the site and properly disposed of at the end of the snow season, no later than May 15.
- Snow shall not be dumped into any water body, pond, wetland resource area or stormwater detention basin.

Catch Basins

The proposed catch basins are constructed with sumps (minimum 3 feet) to trap debris, sediments, and floating contaminants. Disposal of all sediments must be in accordance with applicable local, state, and federal guidelines.

- Inspect catch basins at least two times per year and clean a minimum of once per year.
- Sediment greater than half the sump depth and/or floatable pollutants shall be pumped from the basin and disposed of at an approved offsite facility in accordance with all applicable regulations.

- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary.
- During colder periods, the catch basin grates must be kept free from snow and ice.
- During warmer periods, the catch basin grates must be kept free of leaves, litter, sand and debris.

Storm Drain Manholes

- Inspect at least once annually for clogging or sediment accumulation and clean as needed to ensure proper stormwater conveyance.

Subsurface Infiltration Basins

The subsurface infiltration/detention basins are used to detain and infiltrate roadway and rooftop runoff. There are two (2) subsurface infiltration basins at Concord Coach Temporary Parking Expansion. Each of these basins has a water quality pre-treatment device in the form of a subsurface sediment removal row to protect the infiltration bed from clogging. The sediment removal row is an integral part of the underground infiltration system and is comprised of a perforated pipe, wrapped in a filter fabric and surrounded with gravel. To maintain pre-treatment functionality, this sediment removal row requires regular inspection and cleaning.

Inspections and Cleaning

- The subsurface infiltration systems will be inspected at least once each year by removing the manhole/access port covers and determining the thickness of sediment that has accumulated in the sediment removal row.
- If sediment is more than six inches deep, it must be suspended via flushing with clean water and removed using a vactor truck.
- Manufacturer's specifications and instructions for cleaning the sediment removal row are provided as an attachment to this section.
- Emergency overflow pipes will be examined at least once each year and verified that no blockage has occurred.
- System will be observed after rainfalls to see if it is properly draining.

Invasive Plant Species Control

- Invasive plant species are alien or non-native plants which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control or food crops;

or arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some of these exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

- As part of the routine inspections of the drainage system and stormwater outfalls, the site should be checked for the presence of invasive plant species as defined by the New Hampshire Department of Agriculture, Markets & Food (a list is provide at the end of this manual).
- If invasive plant species are found to be present they should be controlled as described in the "Control of Invasive Plants" document prepared by the NH Department of Agriculture, Markets & Food. A copy is provided at the end of this manual.

Record Keeping

- Inspections of the stormwater management system shall be conducted in accordance with the Inspection & Maintenance Checklist provided in this Manual.
- An Inspection & Maintenance Log shall be completed for each inspection and maintenance activity.
- All record keeping required by the I&M manual shall be maintained by the Responsible Party.
- A deicing log shall be maintained that tracks the amount and type of deicing materials applied to the site.
- Any transfer of responsibility for the I&M activities or transfer of ownership shall be documented to the NHDES Water Division in writing.

Inspection & Maintenance Checklist/Log

The following pages contain an Inspection & Maintenance Checklist, a blank copy of the Stormwater Management System's Inspection & Maintenance Log, and a reduced

copy of the Grading and Utility Plans. These forms/plans are provided to assist the applicant with the inspection and maintenance of the Stormwater Management System.

Invasive Species Information

A copy of the New Hampshire Department of Agriculture, Markets & Food's document "Control of Invasive Plants" is provide at the end of this manual.

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Stormwater Management System

Inspection & Maintenance Checklist

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Source Control	Routinely	Inspect outdoor waste receptacles areas for spillage. Inspect and clear litter from parking area, islands and perimeter landscape areas.	Clean as required.
Deicing Agents	N/A	N/A	Use sand as primary agent for site roadway and parking safety during winter.

Inspection & Maintenance Checklist

Closed Drainage System			
Catch Basins	2 times per year	Check for sediment accumulation. Check for floatable contaminants.	≥ 2 ft. sediment depth. ≥ 3 in. floatable depth.
Storm Drain Manholes	1 time per 2 years	Check for sediment accumulation.	≥ 3 in. sediment depth.
Drainage Pipes	1 time per 2 years	Check for sediment accumulation/clogging.	≥ 2 in. sediment depth.
Subsurface Infiltration Basins	1 time per year	Check for sediment accumulation.	≥ 2 in. sediment depth.
Outlet Control Structure	2 times per year	Check for sediment accumulation/clogging	Clean/repair as needed.

Stormwater Management System

Inspection & Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed *(List Items/Comments)*	Date of Cleaning/Repair	Performed By

Stormwater Management System

Inspection & Maintenance Log

BMP/System Component	Date Inspected	Inspector	Cleaning/Repair Needed *(List Items/Comments)*	Date of Cleaning/Repair	Performed By

Notes:

Stormwater Management System

Deicing Log

Date	Type	Location/Amount	Name(s) of Maintenance Personnel

Control of Invasive Plants

New Hampshire Department of Agriculture, Markets & Food
Douglas Cygan
603-271-3488
doug.cygan@agr.nh.gov

This guide lists garden plants and weeds which are already causing significant changes to natural areas in the Mid-Atlantic. **Measures for controlling each species are indicated by number, e.g., (3), in the text with a full explanation at the end of this article.** Click on the word Control: to jump to that section. Then click your "back" button to return to the text. Following each section suggested alternative plants are given. These alternatives are native plants, well adapted and needing little care, attractive to birds and butterflies, and an important part of the food web for our indigenous species.

INVASIVE TREES

NORWAY MAPLE (*Acer platanoides*) has large leaves similar to sugar maple. To easily confirm that the plant is Norway maple, break off a leaf and if it's truly Norway maple it will exude milky white sap. Fall foliage is yellow. (Exception: cultivars such as 'Crimson King,' which have red leaves in spring or summer, may have red autumn leaves.) The leaves turn color late, usually in late October after native trees have dropped their foliage. This tree suppresses growth of grass, garden plants, and forest understory beneath it, at least as far as the drip-line. Its wind-borne seeds can germinate and grow in deep shade. The presence of young Norway maples in our woodlands is increasing.
Control: (1); (7), (8), (9), or (10); (11) in mid-October to early November, before the leaves turn color.

TREE OF HEAVEN (*Ailanthus altissima*), is incredibly tough and can grow in the poorest conditions. It produces huge quantities of wind-borne seeds, grows rapidly, and secretes a toxin that kills other plants. Its long compound leaves, with 11-25 lance-shaped leaflets, smell like peanut butter or burnt coffee when crushed. Once established, this tree cannot be removed by mechanical means alone.
Control: (1) - seedlings only. Herbicide - use Garlon 3a (9) with no more than a 1" gap between cuts, or (10); plus (11) on re-growth. Or paint bottom 12" of bark with Garlon 4 Ultra (in February or March to protect surrounding plants). USE MAXIMUM STRENGTH SPECIFIED ON LABEL for all herbicide applications on Ailanthus. Glyphosate is not effective against Ailanthus.

INVASIVE SHRUBS

AUTUMN OLIVE (*Eleagnus umbellata*): Formerly recommended for erosion control and wildlife value, these have proved highly invasive and diminish the overall quality of wildlife habitat.
Control: (1) - up to 4" diameter trunks; (7) or (10) or bury stump. Do not mow.
MULTIFLORA ROSE (*Rosa multiflora*), formerly recommended for erosion control, hedges, and wildlife habitat, becomes a huge shrub that chokes out all other vegetation and is too dense for many species of birds to nest in, though a few favor it. In shade, it grows up trees like a vine. It is covered with white flowers in June. (Our native roses have fewer flowers, mostly pink.) Distinguish multiflora by its size, and by the presence of very hard, curved thorns, and a fringed edge to the leaf stalk.
Control: (1) - pull seedlings, dig out larger plants at least 6" from the crown and 6" down; (4) on extensive infestations; (10) or (11). It may remain green in winter, so herbicide may *applied when other plants are dormant. For foliar application, mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants.*

BUSH HONEYSUCKLES (*Lonicera spp.*), including Belle, Amur, Morrow's, and Tatarian honeysuckle. (In our region, assume that any honeysuckle is exotic unless it is a scarlet-flowered vine). Bush honeysuckles create denser shade than native shrubs, reducing plant diversity and eliminating nest sites for many forest interior species.
Control: (2) on ornamentals; (1); on shady sites only, brush cut in early spring and again in early fall (3); (4) during the growing season; (7); or (10) late in the growing season.

BLUNT-LEAVED PRIVET (*Ligustrum* obtusifolium). *Control*: (1); (7) or (10); or trim off all flowers. Do not cut back or mow.

BURNING BUSH, WINGED EUONYMUS (*Euonymus alatus*), identified by wide, corky wings on the branches.
Control: (1); (7) or (10); or trim off all flowers.

JAPANESE BARBERRY (*Berberis thunbergii*), and all cultivars and varieties.
Control: (1); (7) or (10); or trim off all flowers.

INVASIVE WOODY VINES

All of these vines shade out the shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle. DO NOT PLANT NEXT TO OPEN SPACE.

JAPANESE HONEYSUCKLE (*Lonicera japonica*), including Hall's honeysuckle, has gold-and-white flowers with a heavenly scent and sweet nectar in June. This is probably the familiar honeysuckle of your childhood. It is a rampant grower that spirals around trees, often strangling them.
Control: (1); (3); (10); (11) in fall or early spring when native vegetation is dormant. Plan to re-treat repeatedly.

ORIENTAL BITTERSWEET (*Celastrus orbiculatus*) has almost completely displaced American bittersweet (*C. scandens*). The Asian plant has its flowers and bright orange seed capsules in clusters all along the stem, while the native species bears them only at the branch tips.
Control: (1); keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits; to eradicate use Garlon 3a (10).

JAPANESE KNOTWEED, MEXICAN BAMBOO (*Polygonum cuspidatum*) can grow in shade. The stems have knotty joints, reminiscent of bamboo. It grows 6-10' tall and has large pointed oval or triangular leaves.
Control: Cut at least 3 times each growing season and/or treat with Rodeo (10) or (11). In gardens, heavy mulch or dense shade may kill it.

INVASIVE HERBACEOUS PLANTS

GARLIC MUSTARD (*Alliaria petiolata*, *A. officinalis*), a white-flowered biennial with rough, scalloped leaves (kidney-, heart- or arrow-shaped), recognizable by the smell of garlic and taste of mustard when its leaves are crushed. (The odor fades by fall.)
Control: Pull before it flowers in spring (1), removing crown and roots. Tamp down soil afterwards. Once it has flowered, cut (2), being careful not to scatter seed, then bag and burn or send to the landfill. (11) may be appropriate in some settings.

JAPANESE STILT GRASS (*Microstegium vimineum*) can be identified by its lime-green color and a line of silvery hairs down the middle of the 2-3" long blade. It tolerates sun or dense shade and quickly invades areas left bare or disturbed by tilling or flooding. An annual grass, it builds up a large seed bank in the soil.
Control: Easily pulled in early to mid-summer (1) - be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to landfill. Mowing weekly or when it has just begun to flower may prevent it from setting seed (3). Use glyphosate (11) or herbicidal soap (less effective) on large infestations. Follow up with (5) in spring.

MILE-A-MINUTE VINE, DEVIL'S TAIL TEARTHUMB (*Polygonum perfoliatum*), a rapidly growing annual vine with triangular leaves, barbed stems, and turquoise berries in August which are spread by birds. It quickly covers and shades out herbaceous plants.
Control: same as for stilt grass.

SPOTTED KNAPWEED (*Centaurea maculosa*), a biennial with thistle-like flowers.
Control: Do NOT pull (1) unless the plant is young and the ground is very soft - the tap root will break off and produce several new plants. Wear sturdy gloves. (2); (6); (10) or (11).

CONTROL MEASURES

(1) PULL seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs.

(2) DEADHEAD to prevent spread of seeds of invasive plants. Cut off seeds or fruits before they ripen. Bag, and burn or send to a landfill.

(3) MOW or CUTTING at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year.

(4) CONTROLLED BURNING during the spring, repeated over several years, allows native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective.

(5) Use a CORN-BASED PRE-EMERGENCE HERBICIDE on annual weeds. This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.

(6) In lawns, SPOT TREAT with BROAD-LEAF WEEDKILLER. Good lawn-care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations.

(7) CUT DOWN the tree. Grind out the stump, or clip off re-growth.

(8) GIRDLE tree: cut through the bark and growing layer (cambium) all around the trunk, about 6" above the ground. Girdling is most effective in spring when the sap is rising, and from middle to late summer when the tree is sending down food to the roots. Clip off sucker sprouts.

(9)) FRILL: Using a machete, hatchet or similar device, hack scars (several holes in larger trees) downward into the cambium layer, and squirt in glyphosate (or triclopyr if recommended in text above). Follow label directions for Injection and Frill Applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.

(10) CUT STEM / CUT STUMP WITH GLYPHOSATE (or triclopyr if specified above). Follow label directions for Cut Stump Application. Clip off sucker sprouts or paint with glyphosate. See Note on Herbicides.

(11) OLIAR SPRAY WITH GLYPHOSATE herbicide (see Note on Herbicides). Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

NOTE ON HERBICIDES: It is highly recommended that small populations try to be controlled using non-chemical methods wherever feasible. However, for large infestations, and for a few plants specified above, herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some plants; for these, triclopyr (Garlon) may be indicated. When using herbicides, read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

Appendix D: Excerpts from Phase II ESA for Groundwater Depths

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PHASE II ENVIRONMENTAL SITE ASSESSMENT

TSUNIS PROPERTY
LOT 046-05-03
CONCORD, NEW HAMPSHIRE

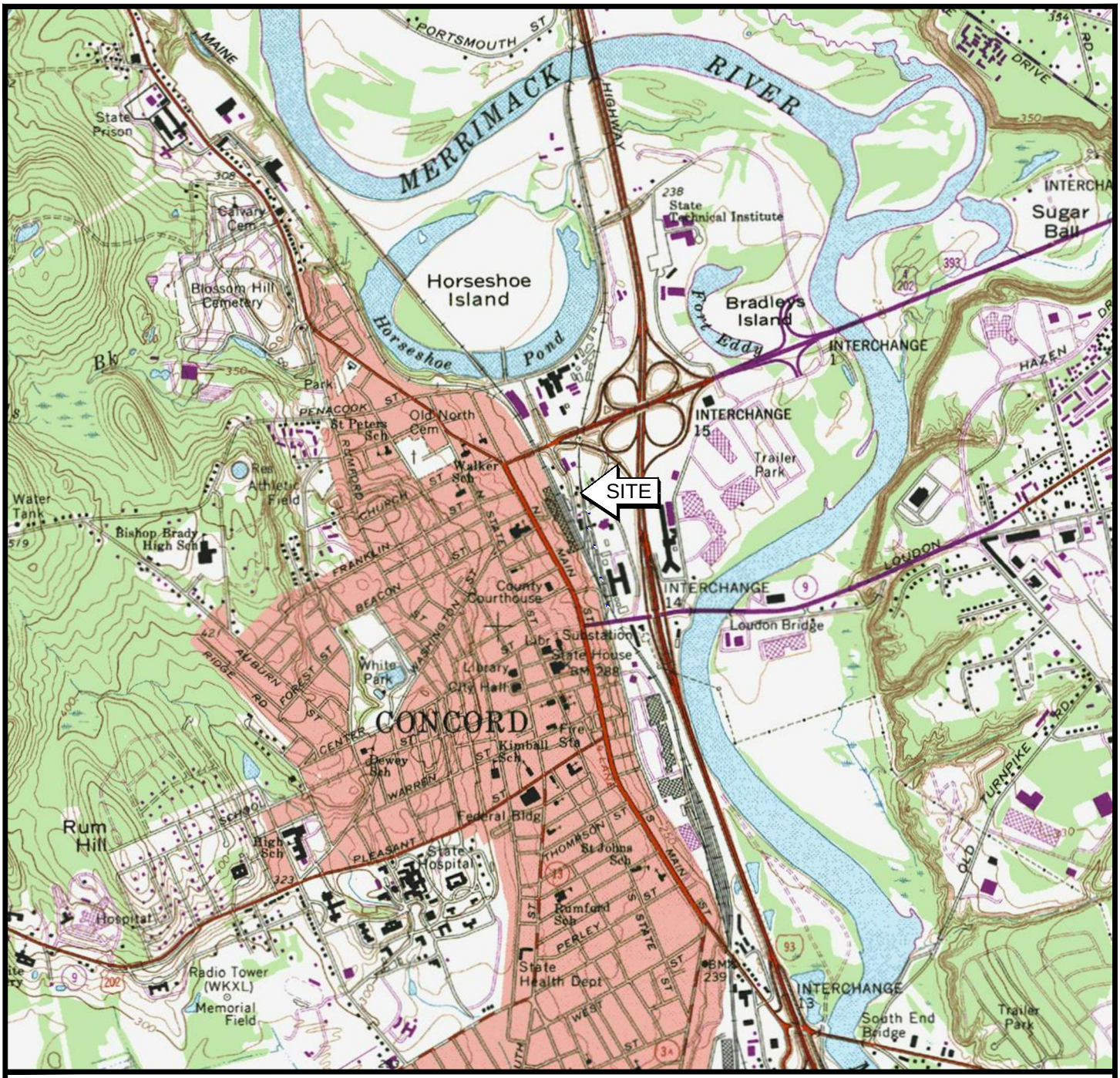
FOR

MATTHEW R. WALSH
DIRECTOR OF REDEVELOPMENT, DOWNTOWN SERVICES AND SPECIAL PROJECTS
CITY OF CONCORD
41 GREEN STREET
CONCORD, NH 03301

BY

NOBIS ENGINEERING, INC.
NH | MA | VT | NJ | MD
(800) 394-4182
www.nobiseng.com

Nobis Project No. 88310.00
August 29, 2014



NORTH

USGS TOPOGRAPHIC MAP

CONCORD, NEW HAMPSHIRE

APPROXIMATE SCALE
1 INCH = 2,000 FEET

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Engineering a Sustainable Future
Nobis Engineering, Inc.
18 Chenell Drive
Concord,NH 03301
T(603) 224-4182
www.nobiseng.com
Client-Focused, Employee-Owned

QUADRANGLE LOCATION

FIGURE 1

LOCUS PLAN
TSUNIS PROPERTY - LOT 046-05-03
STORRS STREET
CONCORD, NEW HAMPSHIRE

PROJECT NO. 88310.00

DATE: AUGUST 2014

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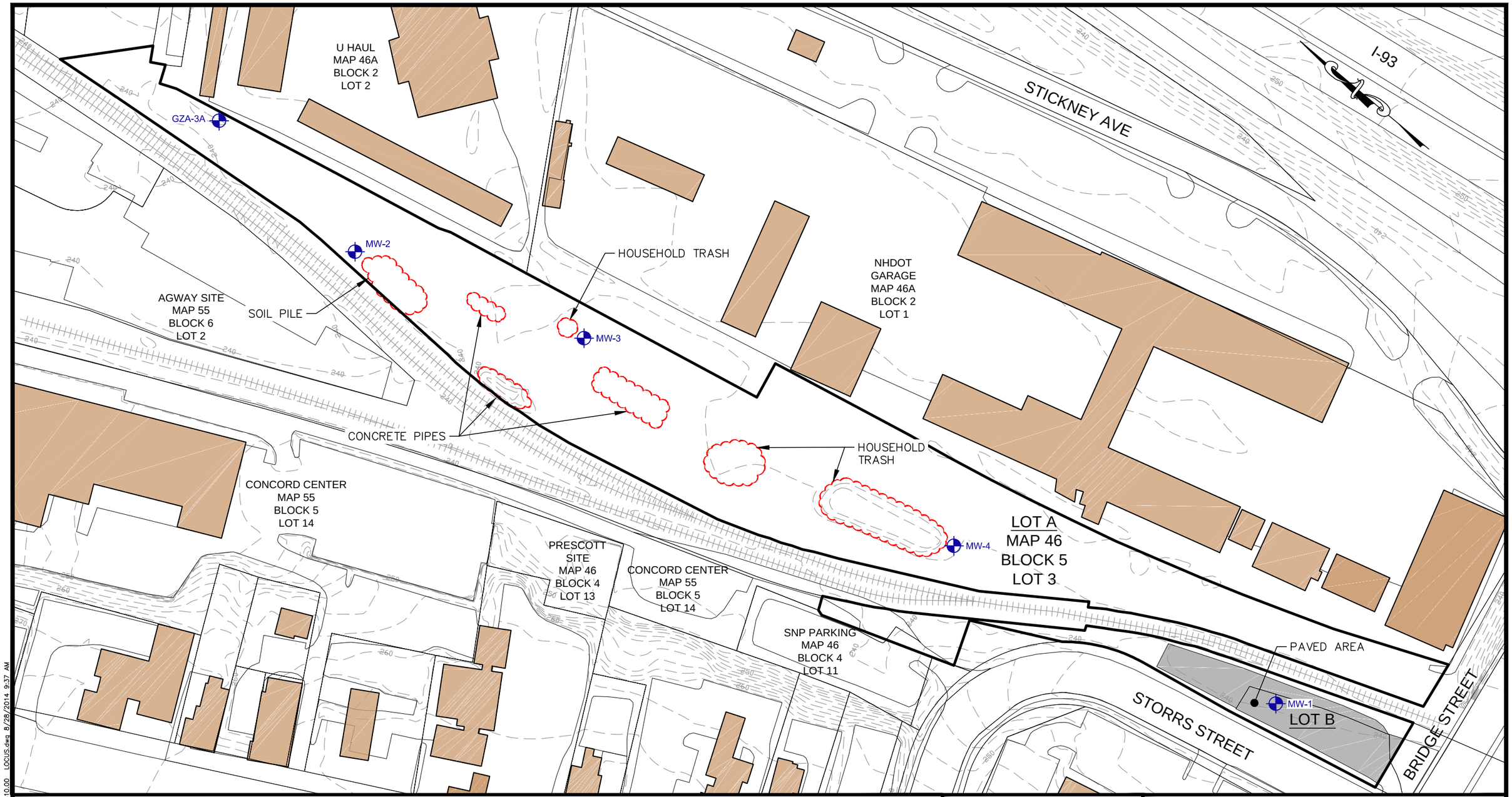

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LEGEND

- SITE BOUNDARY
- OTHER PROPERTY LINE
- MW-1 MONITORING WELL

0 100' 200'

GRAPHIC SCALE

NOTES:

1. THIS SITE SKETCH WAS DEVELOPED FROM A SITE PLAN BY CITY OF CONCORD GIS DATA AND SITE OBSERVATIONS BY NOBIS ENGINEERING, INC.
2. LOCATIONS OF ALL FEATURES ARE APPROXIMATE. PLAN IS FOR REFERENCE PURPOSES ONLY. NOBIS ENGINEERING, INC. MAKES NO CLAIMS, WARRANTIES, REPRESENTATIONS, EXPRESSED OR IMPLIED, RELATING TO THE COMPLETENESS, ACCURACY OR RELIABILITY OF THE DATA SHOWN.

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FIGURE 2

SITE SKETCH

TSUNIS PROPERTY - LOT 046-05-03
STORRS STREET
CONCORD, NEW HAMPSHIRE

DRAWN BY:	AKP	APPROVED BY:	TA
PROJECT NO.	88310.00	DATE:	AUGUST 2014

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Tsunis Property Phase I/II ESA

Location: Concord NH

Nobis Project No.: 88310.00

Boring No.: **MW-1**

Boring Location: Refer to Site Sketch

Checked by:

Date Start: July 2, 2014

Date Finish: July 2, 2014

Contractor: New England Boring, Inc.

Driller: W. Hoeckle

Nobis Rep.: K. Asmundsson

Rig Type / Model: ATV / Diedrich D-50

Hammer Type:

Hammer Hoist:

Ground Surface Elev.:

Datum:

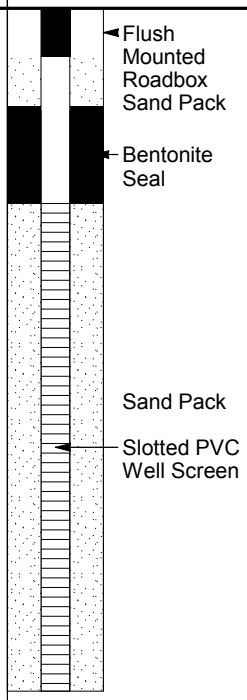
	Drilling Method	Sampler
Type	Hollow Stem Auger	Split-Spoon
Size ID (in.)	4 1/4"	
Advancement		140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
07/16/14	07:05	9.49			

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	PID (ppm)	Ground Water	Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified ASTM)
1	S-1	20	0-2	5 7 9 13	<1				S-1: Brown / black, dry, 10% Coarse Sand, 30% Medium Sand, 30% Fine Sand. 10% Gravel, 20 % Coal Ash. Bottom 8" Coal Ash.
3	S-2	16	2-4	4 8 14 14	<1				S-2: Grayish brown, moist, 40% Medium Sand, 30% Fine Sand. 10% Gravel, 20% Silt.
5	S-3	18	4-6	3 1 2 2	<1				S-3: Brown, moist, 20% Medium Sand, 40% Fine Sand. 40% Silt.
7	S-4	0	6-8	5 15 25 23					S-4: No Recovery.
9	S-5	20	8-10	7 10 12 15	<1				S-5: Brown with gray bands of silt, wet, 30% Medium Sand, 40% Fine Sand. 30% Silt.
14									Boring terminated at 14 feet.

WELL DETAIL



NOTES

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

Soil descriptions and gradation percentagesare based on visual classifications and should be considered approximate. Stratification lines are approximate boundaries between stratums; transitions may be gradual.

BOREHOLE LOG - NOBIS GINT DATA TEMPLATE OCT 7 2011.GDT - 8/29/14 09:54 - J:\88310.00 TSUNIS ASSESSMENT\BORING LOGS\BORING LOGS.GPJ

BORING LOG

Nobis — Engineering a Sustainable Future

Project: Tsunis Property Phase I/II ESA
Location: Concord NH
Nobis Project No.: 88310.00

Boring No.: **MW-2**
Boring Location: Refer to Site Sketch
Checked by:
Date Start: July 2, 2014
Date Finish: July 2, 2014

Contractor: New England Boring, Inc.
Driller: W. Hoeckle
Nobis Rep.: K. Asmundsson

Rig Type / Model: ATV / Diedrich D-50
Hammer Type:
Hammer Hoist:

Ground Surface Elev.:
Datum:

	Drilling Method	Sampler
Type	Hollow Stem Auger	Split-Spoon
Size ID (in.)	4 1/4"	
Advancement		140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
07/16/14	07:15	10.27			

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	PID (ppm)	Ground Water	Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified ASTM)
1	S-1	12	0-2	3 12	<1				S-1: Gray, dry, 100% Crushed Gravel.
2				7 44					
3	S-2	0	2-4	60 80					S-2: Spoon broke in borehole. No sample recovered.
4				50 25					
5	S-3	20	4-6	4 4	<1				S-3: Gray, wet, 20% Medium Sand, 40% Fine Sand. 40% Silt.
6				8 6					
7	S-4	21	6-8	4 3	<1				S-4: Gray, wet, 20% Medium Sand, 40% Fine Sand. 40% Silt.
8				6 9					
9	S-5	18	8-10	8 12	<1				S-5: Grayish brown, wet, 50% Fine Sand. 40% Silt, 10% Gravel.
10				15 18					
11									
12									Boring terminated at 12 feet.
13									
14									
15									
16									
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23									
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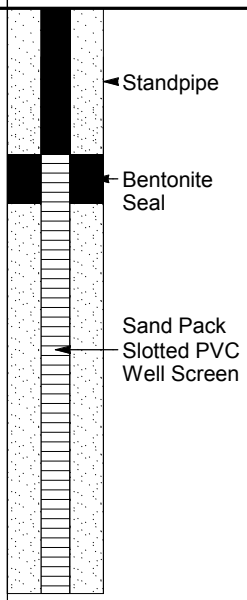
WELL DETAIL



NOTES

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

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BORING LOG

Nobis — Engineering a Sustainable Future

Project: Tsunis Property Phase I/II ESA

Location: Concord NH

Nobis Project No.: 88310.00

Boring No.: **MW-3**

Boring Location: Refer to Site Sketch

Checked by:

Date Start: July 2, 2014

Date Finish: July 2, 2014

Contractor: New England Boring, Inc.

Driller: W. Hoeckle

Nobis Rep.: K. Asmundsson

Rig Type / Model: ATV / Diedrich D-50

Hammer Type:

Hammer Hoist:

Ground Surface Elev.:

Datum:

	Drilling Method	Sampler
Type	Hollow Stem Auger	Split-Spoon
Size ID (in.)	4 1/4"	
Advancement		140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
07/16/14	07:25	9.31			

Depth (ft.)	SAMPLE INFORMATION Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	PID (ppm)	Ground Water	LITHOLOGY Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified ASTM)
1	S-1	18	0-2	3 10	<1				S-1: Brown, dry, 10% Coarse Sand, 50% Medium Sand, 30% Fine Sand. 20% Gravel.
2				13 10					
3	S-2	20	2-4	12 11	<1				S-2: Brownish gray, moist, 50% Medium Sand, 30% Fine Sand. 10% Gravel, 10% Silt.
4				13 15					
5	S-3	20	4-6	2 6	<1				S-3: Brownish gray, moist, 50% Medium Sand, 30% Fine Sand. 10% Gravel, 10% Silt.
6				8 6					
7	S-4	20	6-8	3 5	<1				S-4: Gray, wet, 20% Coarse Sand, 20% Medium Sand, 40% Fine Sand. 20% Silt.
8				16 22					
9	S-5	18	8-10	5 5	<1				S-5: Gray, wet, 20% Coarse Sand, 20% Medium Sand, 40% Fine Sand. 20% Silt.
10				6 10					
11									
12									Boring terminated at 12 feet.
13									
14									
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18									
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21									
22									
23									
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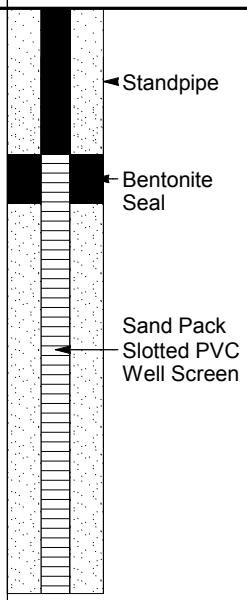
25									

WELL DETAIL



NOTES

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little	10 - 20	few
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and	35 - 50	numerous

NOTES:

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BORING LOG

Nobis — Engineering a Sustainable Future

Project: Tsunis Property Phase I/II ESA
Location: Concord NH
Nobis Project No.: 88310.00

Boring No.: **MW-4**
Boring Location: Refer to Site Sketch
Checked by:
Date Start: July 2, 2014
Date Finish: July 2, 2014

Contractor: New England Boring, Inc.
Driller: W. Hoeckle
Nobis Rep.: K. Asmundsson

Rig Type / Model: ATV / Diedrich D-50
Hammer Type:
Hammer Hoist:

Ground Surface Elev.:
Datum:

	Drilling Method	Sampler
Type	Hollow Stem Auger	Split-Spoon
Size ID (in.)	4 1/4"	
Advancement		140-lb Hammer

Groundwater Observations

Date	Time	Depth Below Ground (ft.)	Depth of Casing (ft.)	Depth to Bottom of Hole (ft.)	Stabilization Time
07/16/14	07:35	9.53			

Depth (ft.)	Type & No.	Rec (in.)	Depth (ft.)	Blows/ 6 in.	PID (ppm)	Ground Water	Graphic	Stratum Elev. / Depth (ft.)	SAMPLE DESCRIPTION AND REMARKS (Classification System: Modified ASTM)
1	S-1	24	0-2	2	<1				S-1A (12"): Topsoil mixed with Coal Ash.
				16					
				20					S-1B (12"): Black / brown, 50% Medium Sand, 20% Fine Sand. 10% Gravel, 20% Silt.
2				18					
3	S-2	24	2-4	10	<1				S-2: Gray, moist, 40% Medium Sand, 30% Fine Sand. 10% Gravel, 20% Silt (no odor).
				18					
				20					
4				21					
5	S-3	18	4-6	6	<1				S-3: Gray, moist, 30% Medium Sand, 40% Fine Sand. 30% Silt.
				8					
				13					
6				12					
7	S-4	16	6-8	12	<1				S-4: Brownish gray, wet, 30% Coarse Sand, 20% Medium Sand, 40% Fine Sand. 10% Silt.
				14					
				19					
8				19					
9	S-5	10	8-10	20	<1				S-5: Gray, wet, 10% Coarse Sand, 40% Fine Sand. 50% Silt.
				19					
				15					
10				16					
11									
12									
13									
14									
15									Boring terminated at 15 feet.
16									
17									
18									
19									
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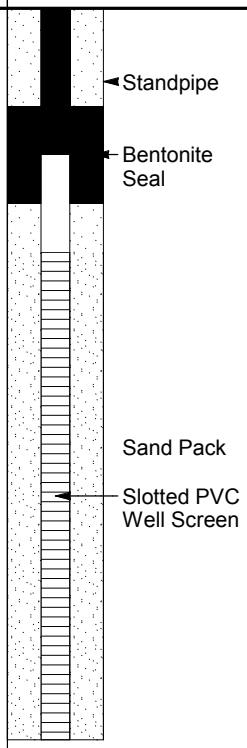
21									
22									
23									
24									
25									



WELL DETAIL

NOTES

Soil	Percentage	Non-Soil
trace	5 - 10	very few
little	10 - 20	few
some	20 - 35	several
and	35 - 50	numerous

NOTES:

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BOREHOLE LOG - NOBIS GINT DATA TEMPLATE OCT 7 2011.GDT - 8/29/14 09:55 - J:\88310.00 TSUNIS ASSESSMENT\BORING LOGS\BORING LOGS.GPJ

Memorandum

To: Benjamin Blunt
Concord Coach &
VHB File

Date: October 30, 2025

Project #: 176455.00

From: Kristopher Wilkes, NH CWS, CPESC
Natural Sciences and Energy Team Lead

Re: Natural Resource Field Assessment
Concord Coach Parking Lot Expansion

Introduction

In support of Concord Coach's proposal to expand their existing parking facility onto an adjacent parcel owned by the City of Concord and located near 30 Stickney Avenue in Concord, New Hampshire, VHB Wetland Scientists completed a natural resource field assessment of the expansion area on October 30, 2025. The proposed parking lot is expected to last between 5 and 8 years as part of a lease agreement between Concord Coach and the City of Concord. VHB's natural resource field assessment was targeted within a mostly undeveloped and previously disturbed area of land totaling approximately 4.7 acres as depicted in the graphic below.

During VHB's field natural resource field work, the target area was assessed for the presence of state and federally jurisdictional wetlands, streams and vernal pools in accordance with NH Chapter RSA-482-A: Fill and Dredge in Wetlands and Section 404 of the Clean Water Act.

Methodology

Natural resource field assessments were performed in accordance with the technical criteria contained in the Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), the 1987 Corps Wetland Delineation Manual, the Northcentral and Northeast Regional Wetland Plant List, the USDA Field Indicators of Hydric Soils in the United States (Version 9.0), and the Field Indicators for Identifying Hydric Soils in New England (NEIWPCC, Version 5, 2025). Surface waters were assessed in accordance with definitions in the NHDES Rules (Env-Wt 102.15) and NH Statutes (NH RSA 483-B:4 (XI-e)). Lastly, VHB surveyed the target area for potential vernal pool habitat in accordance with the New Hampshire Fish and Game Vernal Pool Manual (Third Edition, 2016).

Results

VHB did not identify any wetlands, streams or vernal pools within the target area during the course of the natural resource field assessment work on October 30, 2025. A single vegetated depressional swale was identified within the southern half of the target area by VHB and was further investigated both in the field and via the desktop following field work to determine its origin and jurisdictional applicability. The swale measures approximately 100 feet long by

Memorandum

12 feet wide and is densely vegetated with staghorn sumac (*Rhus typhina*), species of goldenrod (Solidago spp.), American pokeweed (*Phytolacca americana*), various sedges (*Carex* spp.), poison ivy (*Toxicodendron radicans*), raspberry (*Rubus idaeus*), and other weedy species. A large amount of trash and debris is present within the bottom of the swale. No culverts were located in the field at either end of the swale; however, the swale appears based on field observations to be a previously excavated non-natural drainage feature. The limits of the swale were flagged in the field and located via traditional survey by VHB. The swale is depicted in **Photos 1** and **2** below.

Figure 1: Looking northwest at man-made drainage swale.

Figure 2: Looking south at man-made drainage swale.

Following field work, VHB conducted a desktop review of the target area to confirm VHB's field observations that the swale is not natural and was previously constructed. VHB was able to uncover previous Site Plans developed by Holden Engineering & Surveying and recorded with the City of Concord on September 26, 1988. These plans depict a proposed parking lot within the target area including construction of a feature defined as a stormwater treatment swale on the plans in the location of the linear feature observed in the field. The plans also show a network of underground drainage pipes and catch basins which connect to the proposed treatment swale. Furthermore, VHB examined aerial imagery in Google Earth dating back to 2011. Multiple catch basins within proximity of the swale corresponding to the 1988 Site Plans are evident in the imagery. Additionally, site disturbance including logging and significant grading is evident within the target area and swale between 2014 and 2016.

Conclusion

It is unclear when exactly the treatment swale, catch basins and piping were installed within the target area, however the evidence is definitive that the feature was in fact previously constructed/excavated for the purpose of stormwater treatment during initial phases to develop a parking lot within the target area. As such, the feature is not considered a natural wetland and does not have connectivity to other natural resource features which would be considered jurisdictional. Therefore, the feature is considered a non-jurisdictional isolated man-made drainage swale not subject to permitting under state and federal wetland regulations.