

**Town of Kittery  
Planning Board Meeting  
October 26, 2023**

**ITEM 4 – 77 Bartlett Road – Conservation Subdivision Plan – Preliminary Review**

Action: Hold public hearing. Approve plan or continue review. Michael Tadema-Wielandt, on behalf of owner/applicant Geoff Bowley, is proposing to divide a 19.11-acre parcel into a conservation subdivision of 9 single-family residential building lots, a private street system, and an open space plot around identified wetlands, vernal pools, and a pre-existing cemetery. The proposed subdivision is located on the property of 77 Bartlett Road, Map 62 Lot 26, in the Residential-Rural (R-RL) and Resource Protection Overlay (OZ-RP) Zones.

**PROCESS SUMMARY**

REQ'D	ACTION	COMMENTS	STATUS
YES	Sketch Plan Acceptance/Approval	5/11/23	Accepted
YES	Planning board determination of completeness	8/24/23	Pending
NO	Site Visit	8/21/23	Held
YES	Public Hearing	Scheduled for 9/28/23 Continued to 10/26/23	Pending
YES	Preliminary Plan Approval		TBD
YES	Final Plan Review and Decision		TBD
<p><b>Applicant: Prior to the signing of the approved Plan any Conditions of Approval related to the Findings of Fact along with waivers and variances (by the BOA) must be placed on the Final Plan and, when applicable, recorded at the York County Registry of Deeds. PLACE THE MAP AND LOT NUMBER IN 1/4" HIGH LETTERS AT LOWER RIGHT BORDER OF ALL PLAN SHEETS. <u>As per Section 16.4.4.L - Grading/Construction Final Plan Required. - Grading or construction of roads, grading of land or lots, or construction of buildings is prohibited until the original copy of the approved final plan endorsed has been duly recorded in the York County registry of deeds when applicable.</u></b></p>			

**PROJECT INTRODUCTION**

This is the third preliminary review for a proposed 9-lot conservation subdivision located at 77 Bartlett Road in the R-RL (Residential-Rural) zoning district and partially within the OZ-RP Resource Protection Overlay Zone. The lots are proposed to be accessed from Bartlett Road through a private street system ending in one cul-de-sac, designed to meet the standards of a Class II private street with a 3-foot widened shoulder and a painted strip on the west side for pedestrian movement. Nine proposed lots will all be accessed from the new road. Lot sizes range from approximately 21,000 square feet to 34,000 square feet. The property currently contains a single residential dwelling; the structure will remain on the lot after renovations, and the driveway currently providing access to Bartlett Road will be removed.

A private cemetery, located between proposed lots 1 and 2, will be maintained as open space with public access provided. Public water and sewage are unavailable to the property; the developer proposes installing private septic systems and wells for each individual lot. The site contains wetland areas around the proposed subdivision, including two vernal pools (that have not been deemed of significant size by the state) located east of the proposed development, and an area containing a wetland of special significance as well as a floodplain abutting the proposed subdivision to the southwest.

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35 The planning board first reviewed this application on August 24<sup>th</sup>, where they accepted the application as  
36 complete, scheduled a site walk for September 21<sup>st</sup>, and scheduled a public hearing during the September  
37 28<sup>th</sup> planning board meeting. After plan acceptance, a third-party engineer review of the drainage analysis  
38 identified several concerns and deemed the stormwater management report would have to be resubmitted,  
39 noting that additional stormwater treatment would likely be required.

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41 During the planning board's second review on September 28<sup>th</sup>, the planning board moved to continue the  
42 public hearing to the meeting of October 26<sup>th</sup>. The applicant has submitted a revised site plan and  
43 stormwater management report incorporating the peer review engineer's feedback, which is currently  
44 pending and expected to be completed on October 30<sup>th</sup>. Once the hearing has been completed, staff  
45 suggest the planning board advise the applicant based on the feedback provided by the public and peer  
46 review (if received in time).

#### 47 48 **WAIVERS REQUESTED**

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51 1. Sidewalk modification request: Sidewalks are required for all Class II private streets. The applicant  
52 is proposing a modification to allow a paved pedestrian travel way along one side of the road  
53 instead.  
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#### 55 **STAFF COMMENTS**

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58 1. Following feedback from the public hearing, the applicant has extended the vegetated buffer  
59 between Lot 9 and Bartlett Road. The setback area between Lot 5, Lot 8, and the abutting wetland  
60 is now designated a forested stormwater buffer area.  
61 2. At the public hearing, a resident expressed concerns that the disturbed soil calculations appeared  
62 inaccurate. The planning board requested revised calculations to determine whether the proposal  
63 meets the 1-acre threshold of disturbed soil to require a permit from Maine DEP.  
64 3. At the first preliminary review, the planning board requested the applicant show proof that a  
65 community water system was too costly to provide instead of private wells for each individual lot.  
66 4. A 40-foot right-of-way is proposed, with a 5-foot grading and drainage easement along both sides  
67 of the ROW. The proposed road shall be private and maintained by a homeowner's association.  
68 5. Part of the cul-de-sac is within 100 feet of the wetland. §16.5.30 requires traveled ways greater than  
69 18 feet in width only maintain a 30-foot setback, or 10 feet from the toe of the slope, whichever is  
70 greater.  
71 6. The water report confirms the recharge capacity of the aquifer is greater than the anticipated water  
72 usage of the proposed wells, and the bedrock is a good site for wells to be dug.  
73 7. The Maine Department of Inland Fisheries and Wildlife does not anticipate essential habitats to be  
74 directly affected by the project. Endangered, threatened, and significant wildlife have not been  
75 identified in the parcel area, and impact to nearby identified habitats is not anticipated.  
76 8. Because the conservation subdivision ordinance strongly recommends all buildings within the  
77 subdivision be designed for maximum energy efficiency per §16.10.6.A.(4), it is suggested that  
78 buildings be designed as south-facing whenever possible in this subdivision.  
79 9. The conservation subdivision requires low impact development wherever possible. The proposal  
80 plans to reuse the materials from the portions of the stone wall to be dismantled and is proposing a  
81 forested stormwater buffer adjacent to lots 4, 5, and 8. Staff believe these examples show the  
82 applicant has met this requirement.

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**PROJECT ANALYSIS**

Code Ref.	§16.4 Land Use Zone Standards	
	Standard	Determination
§16.4.10.B	Permitted/Special Exception Uses	The proposed subdivision is a permitted use
§16.4.10.E.(2).(a).	Minimum area per dwelling: 40,000 sq ft.	It appears the standard is satisfied.
§16.4.10.E.(2).(b).	Lot size: 40,000 sq ft minimum	Not all lots meet this standard. Requirements need not be met in a conservation subdivision
§16.4.10.E.(2).(c).	Street frontage: 150 ft minimum	Not all lots meet this standard. Requirements may be modified in a conservation subdivision.
§16.4.10.E.(2).(d).	Front setback: 40 ft minimum	Not all lots meet this standard. Requirements may be modified in a conservation subdivision.
§16.4.10.E.(2).(e).	Building coverage: 15% maximum	Not all lots meet this standard. Requirements may be modified in a conservation subdivision.
§16.4.10.E.(2).(f).	Rear and side setbacks: 20 ft minimum.	Not all lots meet this standard. Requirements may be modified in a conservation subdivision.
§16.4.10.E.(2).(g).	Building height: 35 ft maximum	It appears the standard is satisfied.
§16.4.10.E.(2).(i).	Minimum water-body setbacks: up to 100 feet from high-water line of identified wetlands	It appears the standard is satisfied.
Code Ref.	§16.5 Performance Standards	
	Standard	Determination
§16.5.4	Affordable housing requirements	Not applicable, as the subdivision has less than 10 lots.

§16.5.9	Conservation of vernal pools	Identified vernal pools were not deemed significant. Standard setback applies determined by size.
§16.5.10	Essential services	Test pits and well locations have been notated. Underground utilities are proposed. Standards appear to be met
§16.5.11	Floodplain Management	The proposed development is outside of the indicated floodplain. Standards appear to be met.
§16.5.14.B	Lots	The flag-shaped lot proposed in the sketch review has been removed. Lot standards appear to be met, save for issues noted in the table above.
§16.5.18.	Net residential acreage	The standard appears to be satisfied.
§16.5.27	Street Standards	The proposed road appears to meet the standards of a class II private street. The proposed "pedestrian way" is a modification which will require planning board approval.
§16.5.30	All wetlands of 501 sq ft. or greater trigger setbacks for certain uses	Delineation was submitted, and wetlands of special significance have been identified. Standards appear to be met, save for the missing setback mentioned above.
Code Ref.	§16.10 Additional Requirements for Conservation Subdivision	
	Standard	Determination
§16.10.4.B	Indicate any proposed public open space and Town Council approval	Standard is not required. Public access is not proposed by applicant, and the cemetery on the property would not be considered a public park.

§16.10.5.C	<p>Proposed private and water systems must show:</p> <ul style="list-style-type: none"> <li>• adequate groundwater is available.</li> <li>• Proposed groundwater sources are safe from on-site and off-site contamination.</li> <li>• Proposed individual septic systems will not endanger drinking water supply.</li> <li>• The costs of a community water or wastewater system is prohibitively expensive</li> </ul>	Standards appear to be met.
§16.10.5.D	Designated open space to be permanently preserved	Appears to meet minimum open space standards. Proposed configuration requires planning board approval
§16.10.5.E	Minimum lot size with private water/wastewater: 20,000 sq ft	The standard appears to be met
§16.10.5.F	No individual lot may have direct vehicular access onto a public road	All proposed lots will access the proposed private way. The driveway of the existing dwelling currently connecting to Bartlett Road will be removed. Standard appears to be met.
§16.10.5.G	All areas designated as Resource Protection must be protected as open space	The standard appears to be met.
§16.10.5.I	Wetlands designated as open space to have a “no-cut, no disturb” buffer	Staff suggest adding a note in the site plan indicating the identified wetland setbacks will be “no cut, no disturbance” areas, as that is a code requirement.
§16.10.5.J	All utilities must be installed underground	The standard appears to be met.

§16.10.5.K	All subsurface wastewater disposal areas to be indicated on plan	The standard appears to be met
§16.10.6.F	Vegetated buffer located on front lot line, a minimum width of 40 feet	The standard appears to be met.
§16.10.6.H	Low-impact design must be incorporated into the plan whenever possible	The stormwater drainage plan proposes a forested stormwater buffer on Lot 4. The standard appears to be met.
§16.10.7.A	<p>Open space minimum: 60% of lot, with 40% of that consisting of net residential acreage.</p> <p>Example: in a parcel of 1,000,000 sq ft, 600,000 sq ft (60%) must be open space. Of that 600,000 sq ft, 240,000 (40% of open space, or 24% of total lot) must be included in the net residential acreage calculations.</p>	<p>The open space requirement calculations appear to be off. 40% of the required minimum open space would be 201,754 sq ft. 40% of the proposed open space provided would be 229,014 sq ft. The notes show neither of these numbers. The application appears to have enough land to meet requirements but should revise calculations.</p>
§16.10.7.B	All wetlands, water bodies, and floodplains must be located within open space boundaries	This standard appears to be met.
§16.10.7.C	Significant natural resources or wildlife habitat areas must be designated as open space	This standard appears to be met.
§16.10.7.D	Open space must include any notable features	This standard appears to be met.
§16.10.7.E	All historic, cultural, or archaeological resources must be included as open space	The Payne Cemetery is designated as open space. The standard appears to be met.

§16.10.7.F	Open space areas must be made contiguous to the greatest extent possible	Staff believe this standard has been met, but open space configuration is up to the decision of the planning board.
§16.10.7.G	Open space may not be mowed unless part of a public park/trail	This standard will be met with the addition of the above mentioned “no cut” buffers.
§16.10.10	The homeowner's association will be held responsible for: <ul style="list-style-type: none"> <li>• Maintenance of open space</li> <li>• Maintenance public facilities such as road and stormwater systems</li> <li>• An initial capital fund required to cover expenses</li> <li>• Maintenance and replacement of plantings, including additional plantings required by the planning board</li> </ul>	The plan indicates the subdivision will be maintained by a Homeowner’s Association
§16.10.11	Prior to the beginning of any site work, the applicant must: <ul style="list-style-type: none"> <li>• Define the limits of any proposed clearings.</li> <li>• File all required performance guarantees and inspection escrows in forms acceptable to the Town Manager</li> </ul>	Not applicable at preliminary stage
Code Ref.	§16.8.9.C Preliminary Subdivision Plan Requirements	
	Standard	Determination
§16.8.9.C.(5).(a-i).	<ul style="list-style-type: none"> <li>* Paper plan sheets no smaller than 11” x 17”</li> <li>* Scale of drawing no greater than 1 inch = 30 feet</li> <li>* Code block in right-hand corner</li> <li>* Standard boundary survey of existing conditions</li> <li>* Compass with arrow pointing true north</li> <li>* Locus map of property</li> <li>* Vicinity map and aerial photograph</li> <li>* Surveyed acreage of parcel(s), rights-of-way, wetlands, and amount of street frontage</li> <li>* Names and addresses of owners of record abutting property</li> </ul>	Provided
§16.8.9.C.(5).(j).	Existing conditions survey including all identified structures, natural resources, rights-of-way, and utilities located on and within 100 feet of the property	Provided

§16.8.9.C.(5).(k).	Proposed development area including: * Location and detail of proposed structures and signs * Proposed utilities including power, water, and sewer * Sewage facilities type and placement * Domestic water source * Lot lines, rights-of-way, and street alignments * Road and other paved area plans * Existing and proposed setbacks * Storage areas for waste or hazardous materials * Topographic contours of existing contours and finished grade elevations * Locations and dimensions of artificial features such as pedestrian ways, sidewalks, curb cuts, driveways, fences, retaining walls,	Provided
§16.8.9.C.(6).(a).	Documents showing legal interest in the property	Provided
§16.8.9.C.(6).(b).	Identified property encumbrances	Provided
§16.8.9.C.(6).(c).	Kittery Water District approval letter	Private water proposed: hydrogeologist letter has been provided.
§16.8.9.C.(6).(d).	Erosion and sedimentation control plan	Provided
§16.8.9.C.(6).(e).	Stormwater management plan and drainage analysis	Provided
§16.8.9.C.(6).(f).	Soil survey	Provided
§16.8.9.C.(6).(g).	Vehicular traffic report	Provided
§16.8.9.C.(6).(h).	Traffic impact analysis	Not deemed applicable due to low traffic volume
§16.8.9.C.(6).(i).	Test pit analysis for proposed septic systems	Provided
§16.8.9.C.(6).(j).	Town sewage department confirmation	Not applicable.
§16.8.10.C.(6).(k).	Evaluation of development by Police, Fire, and Public Works department heads	Provided
§16.8.10.C.(6).(l).	Additional submissions as required	None proposed at this time

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91 **DISCUSSION, NEXT STEPS, AND RECOMMENDATIONS**

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93 The purpose of a public hearing is to gather feedback from abutters, residents, and interested parties that  
94 may identify potential conflicts or suggestions to the proposed development. The applicant has revised their  
95 application, and a peer review is pending. If the engineer review concludes there are no significant issues  
96 with the revised stormwater management report, staff consider the application ready for preliminary  
97 approval on the condition that all identified minor issues be resolved as a part of the final plan application.  
98 After holding the hearing, staff suggest the planning board discuss the feedback gathered by the public and  
99 advise the applicant on next steps.

100 **RECOMMENDED MOTIONS**

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102 Below are recommended motions for the Board's use and consideration:

103 ***Motion to conditionally approve the application***

104 Move to approve the site plan (with conditions listed above) by Michael Tadema-Wielandt, on behalf of  
105 owner/applicant Geoff Bowley, proposing to divide a 19.11-acre parcel into a conservation subdivision of  
106 9 single-family residential building lots, a private street system, and an open space plot around identified  
107 wetlands, vernal pools, and a pre-existing cemetery on the property of 77 Bartlett Road, Map 62 Lot 26,  
108 in the Residential-Rural (R-RL) and Resource Protection Overlay (OZ-RP) Zones.

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110 ***Motion to continue the application***

111 Move to continue review of the site plan by Michael Tadema-Wielandt, on behalf of owner/applicant  
112 Geoff Bowley, proposing to divide a 19.11-acre parcel into a conservation subdivision of 9 single-family  
113 residential building lots, a private street system, and an open space plot around identified wetlands, vernal  
114 pools, and a pre-existing cemetery on the property of 77 Bartlett Road, Map 62 Lot 26, in the Residential-  
115 Rural (R-RL) and Resource Protection Overlay (OZ-RP) Zones.

**APPLICANT/OWNER:**  
 BEACHWOOD DEVELOPMENT FUND LP  
 P.O. BOX 261  
 KENNEBUNK, MAINE 04043

**PROJECT PARCEL SITE**  
 TOWN OF KITTEERY TAX ASSESSOR'S MAP,  
 LOT NUMBERS & ZONING DISTRICTS

MAP	LOT	ZONING DISTRICTS
62	26	RESIDENTIAL-RURAL

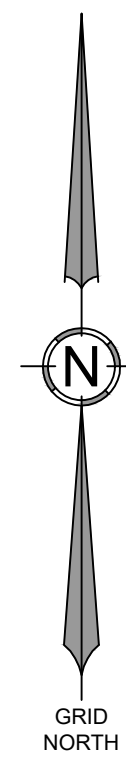
# SUBDIVISION PLANS

## BARTLETT ROAD SUBDIVISION

### BARTLETT ROAD - KITTEERY, MAINE



**LOCATION MAP**  
 SCALE: 1"=500'



**UTILITIES**

**SEWER**  
 PRIVATE ONSITE SUBSURFACE  
 WASTEWATER DISPOSAL

**WATER**  
 PRIVATE ONSITE WELLS

**ELECTRIC**  
 CENTRAL MAINE POWER CO.  
 162 CANCO ROAD  
 PORTLAND, ME 04103  
 (207) 842-2367

**TELEPHONE**  
 FAIRPOINT COMMUNICATIONS  
 P.O. BOX 11560  
 PORTLAND, MAINE 04104  
 1-888-984-1515

**CABLE**  
 CONSOLIDATED COMMUNICATIONS  
 24 HERSEY STREET  
 PORTLAND, MAINE 04103  
 (844) 986-7224

**DIG SAFE SYSTEM, INC.**  
 TEL. 1-888-DIG-SAFE (344-7233)  
 FAX 1-781-721-0047  
 WWW.DIGSAFE.COM

**PERMITS**

TYPE OF PERMIT	GOVERNING BODY	STATUS
SUBDIVISION APPROVAL	TOWN OF KITTEERY, MAINE PLANNING BOARD 200 ROGERS ROAD KITTEERY, ME 03904 TEL. 207-439-0452	PENDING PRELIMINARY APPROVAL
STORMWATER PERMIT-BY RULE	MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION 312 CANCO ROAD PORTLAND, ME 04103 TEL: 207-822-6300	PENDING

**GENERAL NOTES**

- THE PROJECT WILL BE SUBJECT TO THE TERMS AND CONDITIONS OF ALL PERMITS ISSUED BY THE TOWN OF KITTEERY, THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, AND THE LOCAL UTILITY COMPANIES.
- ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY THE TOWN OF KITTEERY OR THE LOCAL UTILITY COMPANIES SHALL BE COORDINATED BY THE CONTRACTOR.
- THE LOCATION AND/OR ELEVATIONS OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION. IT SHALL BE THE RESPONSIBLE OF THE CONTRACTOR TO RELOCATE ANY EXISTING UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL EROSION CONTROL MEASURES SHOWN ON THE PLANS. THE EROSION CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIRED TO PREVENT EROSION AND SEDIMENTATION. ADDITIONAL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY THE OWNER, ENGINEER, OR REGULATING AGENCIES.
- ALL MATERIAL SCHEDULES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL PREPARE HIS OWN MATERIAL SCHEDULES BASED UPON HIS PLAN REVIEW. ALL SCHEDULES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS OR PERFORMING WORK.
- ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE STRICTEST STANDARDS CONTAINED IN THE MAINE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, THE PROJECT SPECIFICATIONS, AND THE UTILITY COMPANY AND TOWN OF KITTEERY REQUIREMENTS.
- ALL DIMENSIONS, UNLESS OTHERWISE NOTED ARE TO THE EDGE OF PAVEMENT, FACE OF CURB, OR THE FACE OF THE BUILDING.
- ALL SIGNAGE SHALL BE SUPPLIED AND INSTALLED IN COMPLIANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

**UTILITY NOTES**

- THE PROJECT WILL BE SERVED BY INDIVIDUAL WELLS AND SUBSURFACE WASTEWATER DISPOSAL SYSTEMS.
- ALL STORM DRAIN PIPE SHALL BE SMOOTH BORE INTERIOR PROVIDING A MANNINGS ROUGHNESS COEFFICIENT OF n=0.012 OR LESS.

**SHEET INDEX**

C-1.0	COVER SHEET
1	EXISTING CONDITIONS PLAN
C-2.0	EXISTING CONDITIONS & CLEARING PLAN
C-3.0	SUBDIVISION PLAN
C-3.1	PLAN & PROFILE, UTILITY, & EROSION CONTROL PLAN
C-4.0	EROSION CONTROL NOTES & DETAILS
C-4.1	SITE DETAILS
C-4.2	DRAINAGE & UTILITY DETAILS

**PREPARED BY:**

**CIVIL ENGINEER:**  
 TERRADYN CONSULTANTS, LLC  
 565 CONGRESS STREET, SUITE 201  
 PORTLAND, MAINE 04101  
 (207) 926-5111

**SURVEYOR:**  
 TERRADYN CONSULTANTS, LLC  
 79 MAIN STREET, SUITE 300  
 AUBURN, MAINE 04210  
 (207) 946-4480

**SOIL SCIENTIST:**  
 LONGVIEW PARTNERS, LLC  
 6 SECOND STREET  
 BUXTON, MAINE 04093  
 (207) 807-1739

**GEOLOGIST:**  
 MARK CENCI GEOLOGIC, INC.  
 93 MILL ROAD  
 NORTH YARMOUTH, MAINE 04097  
 (207) 329-3524

**LEGEND**

---	EXISTING PROPERTY LINE
---	PROJECT SITE BOUNDARY
---	EXISTING SETBACK LINE
---	PROPOSED EASEMENT
---	EXISTING MINOR CONTOUR
---	EXISTING MAJOR CONTOUR
---	PROPOSED CONTOUR
---	EXISTING STORMDRAIN
---	PROPOSED STORMDRAIN
---	EXISTING UNDERDRAIN
---	PROPOSED UNDERDRAIN
---	EXISTING OVERHEAD ELECTRIC & TELEPHONE
---	PROPOSED OVERHEAD ELECTRIC & TELEPHONE
---	EXISTING UNDERGROUND ELECTRIC & TELEPHONE
---	PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
---	EXISTING EDGE OF PAVEMENT
---	PROPOSED EDGE OF PAVEMENT
---	EXISTING EDGE OF GRAVEL
---	PROPOSED EDGE OF GRAVEL
---	EXISTING CURB
---	PROPOSED CURB
---	PROPOSED FENCE
---	SILT FENCE
---	TEST PIT
---	EXISTING VALVE
---	PROPOSED VALVE
---	EXISTING HYDRANT
---	EXISTING LIGHT POLE
---	PROPOSED LIGHT POLE
---	EXISTING UTILITY POLE
---	EXISTING CATCH BASIN
---	PROPOSED CATCH BASIN
---	EXISTING DRAIN MANHOLE
---	PROPOSED DRAIN MANHOLE
---	EXISTING SEWER MANHOLE
---	PROPOSED SEWER MANHOLE
---	EXISTING SPOT GRADE
---	PROPOSED SPOT GRADE
---	SURVEY CONTROL POINT
---	EXISTING MONUMENT
---	EXISTING IRON PIPE
---	EXISTING SIGN
---	PROPOSED SIGN
---	EXISTING BUILDING
---	PROPOSED BUILDING
---	PROPOSED CONCRETE
---	PROPOSED PAVEMENT
---	PROPOSED BUFFER

STATE OF MAINE  
 MICHAEL E. TADEMA-WIELANDT  
 LICENSED PROFESSIONAL ENGINEER

DATE: 10/10/2023  
 P.E.: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
2	8/3/2023	SUBMITTED TO KITTEERY FOR PRELIMINARY SUBDIVISION REVIEW

565 CONGRESS STREET  
 SUITE 201  
 PORTLAND, ME 04102

41 CAMPUS DRIVE  
 SUITE 301  
 NEW GLOUCESTER, ME 04260

OFFICE: (207) 926-5111 FAX: (207) 221-1317  
 www.terradynconsultants.com

**TERRADYN**  
 CONSULTANTS, LLC

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING  
 NOT FOR CONSTRUCTION

PROJECT: BARTLETT ROAD SUBDIVISION  
 KITTEERY, MAINE

SHEET TITLE: COVER SHEET

CLIENT: BEACHWOOD DEVELOPMENT FUND  
 P.O. BOX 261  
 KENNEBUNK, MAINE 04043

DATE: 5/18/2023  
 SCALE: AS NOTED  
 DESIGNED: MTW  
 JOB NO.: 22-145  
 SHEET: C-1.0

C:\ODI\TerraDyn\_Consultants\Project\_Folders - Documents\2021 Jobs\2022 Jobs\22-145 Bartlett Road Subdivision\CAD\Permitting\22-145 C.dwg

**Plan References:**

- A. "Right of Way Map" Maine State Highway Commission, State Aid Highway No. 10, S.H.C File No. S-16-340, Dated December 1970 and recorded in Plan Book 57, Page 7.
- B. "Plan Showing Land Surveyed for Barbara R Brown" by Rodger E Malmgren, drawn on January 17, 1980 and recorded in Plan Book 104, Page 8.
- C. "Division of Land, Bartlett Road" for Dewain L & Gloria Jean Wallace, by Anderson Associates, dated September 1985 and recorded in Plan Book 143, Page 3.
- D. "Plan of Lots, Bartlett Road" for Daniel O Lynch, by Anderson Associates, dated July 1985 and recorded in Plan Book 145, Page 8.
- E. "Plan of Revised Road Right of Way for the Estate of Daniel O Lynch" by Anderson-Livingston, dated October 1991 and recorded in Plan Book 204, Page 10.
- F. "Subdivision of Land for Charles S Lynch" by Anderson Livingston Engineers, Inc., dated March 1992 and recorded in Plan Book 208, Page 49.
- G. "Standard Boundary Survey for Charles S Lynch" by Anderson Livingston Engineers, Inc., dated March 1999 and recorded in Plan Book 230, Page 39.

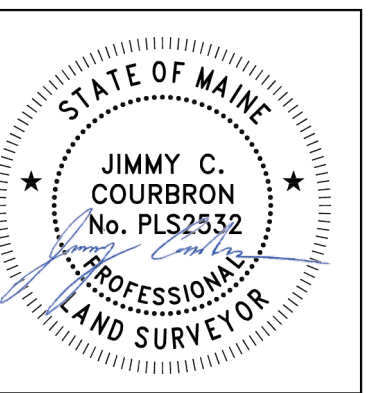
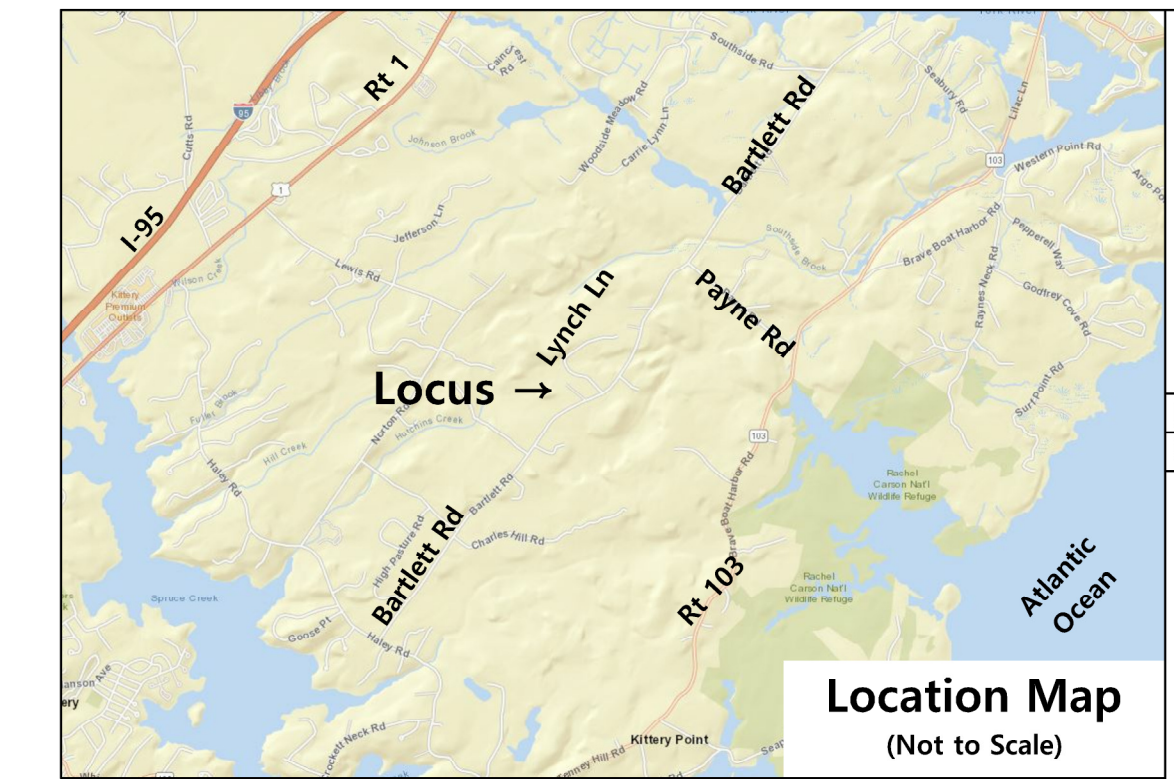
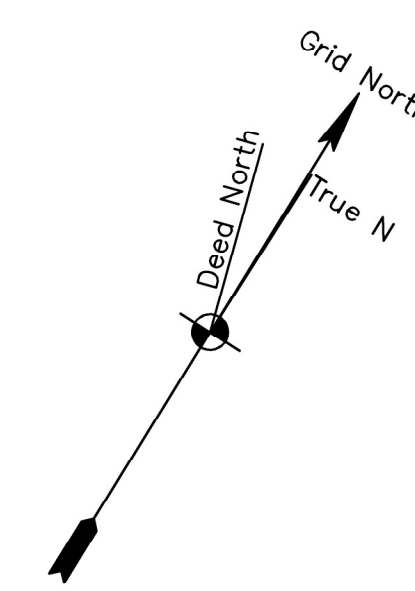
**Surveyor's Certification**

To the best of my knowledge, I have used ordinary and prudent conduct expected of Professional Land Surveyors and the results shown here represent the licensee's responsibility to the public as required under the Standards of Practice as defined by the Board of Licensure for Professional Land Surveyors (M.R.S.A Title 32, Chapter 141, Dated April 2001).

Except as Follows:

- 1. Survey Report Limited to Notes on the Plan
- 2. No Deed Description to Date
- 3. No Monuments Set

Plan Prepared by: *Jimmy C. Courbron* 10/10/23  
Jimmy C. Courbron PLS # 2532



DATE: \_\_\_\_\_ DATE: \_\_\_\_\_  
PLS: \_\_\_\_\_ PLS: \_\_\_\_\_

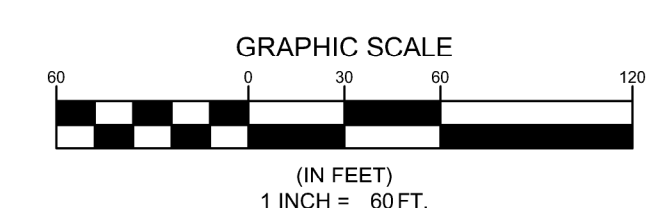
**General Notes:**

1. The purpose of this plan is to depict the results of a Boundary Retracement Survey of the subject parcel.
2. All Book and Page numbers refer to the York County Registry of Deeds, unless otherwise noted.
3. The record owner of the subject parcel is Beachwood Development Fund LP by a deed dated August 29, 2022 and recorded in Book 19102 Page 372.
4. The subject parcel is shown on the Town of Kittery Tax Map 62 as Lot 26 and is located in the Residential- Rural (R-RL) District and Resource Protection Overlay Zone (OZ-RP).
5. Space and bulk standards for the R-RL District as of the date of this plan are as follows:
  - Min. Lot Size: 40,000 sq ft
  - Min. Frontage: 150 ft
  - Min. Front Yard: 40 ft
  - Min. Side Yard: 20 ft
  - Min. Rear Yard: 20 ft
  - Max. Building Height: 35 ft
  - Max. Building Coverage: 15%
6. Total area of the subject parcel is 19.30 acres.
7. Boundary and topographic information shown hereon is based on an on the ground survey conducted by Terradyn Consultants, LLC in October 2022. Lidar data was used to supplement topographic information in the undeveloped areas.
8. Plan orientation is Grid North, Maine State Plane Coordinate System, West Zone 1802-NAD83. Elevations depicted hereon are NAVD88, based on dual-frequency GPS observations.
9. A portion of the subject parcel is located within Zone A, a Special Flood Hazard Area Without Base Flood Elevation (BFE), as delineated on the Flood Insurance Rate Map for the Town of Kittery, York County, Community-Panel Number 2301710002C, having an Effective Date of July 5, 1984. The remainder of the subject parcel is located within Zone C, Areas of Minimal Flood Hazard.
10. A wetland delineation was performed on this project site by Longview Partners, LLC on August 31, 2021. Wetlands flags were located using submeter Global Positioning System (GPS) technology.
11. The depth, size, location, existence or nonexistence of underground utilities and/or structures were not investigated as part of this survey. Utilities depicted hereon may not necessarily represent all existing utilities. Owners, contractors, and/or designers need to contact Dig-Safe-Systems, Inc. (call 611) and field verify existing utilities prior to digging or breaking ground.



**Legend:**

	Record Property Line/R.O.W.
	Abutter Line/R.O.W.
	Deed/Plan Line/R.O.W.
	Building
	Deck/Steps
	Edge of Wetland
	Edge of Pavement
	Major Contour
	Minor Contour
	Spot Elevation
	Stone Wall
	Overhead Utilities
	Monument (as noted)
	Iron Pipe/Rod (as noted)
	Wetlands
	Potential Vernal Pool
	Test Pit
	Post
	Well
	Electric Meter
	Utility Pole
	Cuy Wire
	Mailbox



ADDRESS: 41 CAMPUS DRIVE, SUITE 301  
NEW GLOUCESTER, ME 04260

PHONE: (207) 926-5111

WEB SITE: www.terradynconsultants.com

**TERRADYN**  
CONSULTANTS, LLC  
Civil Engineering | Land Surveying | Geomatics  
Stormwater Design | Land Planning | Environmental Permitting

PERMIT DRAWING  
NOT FOR CONSTRUCTION

PROJECT: BARTLETT ROAD SUBDIVISION  
77 BARTLETT ROAD, KITTERY MAINE

SHEET TITLE: EXISTING CONDITIONS PLAN

FOR RECORD OWNER: BEACHWOOD DEVELOPMENT FUND LP  
PO BOX 260  
KENNEBUNK, ME 04043

DATE: 10/13/2022

SCALE: 1" = 60'

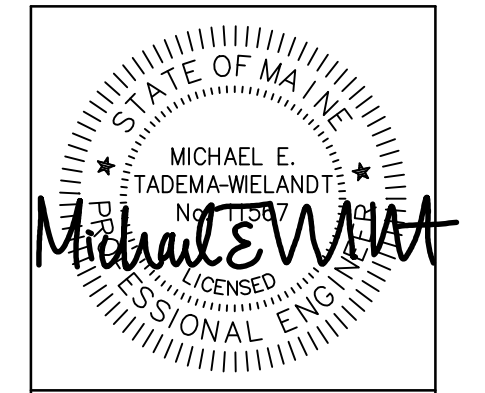
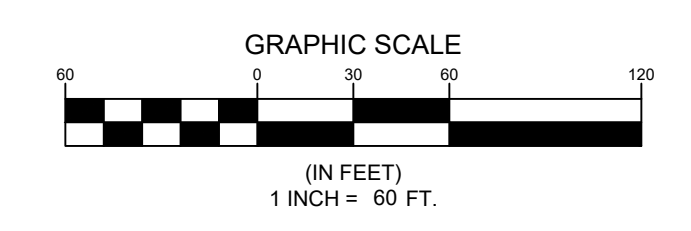
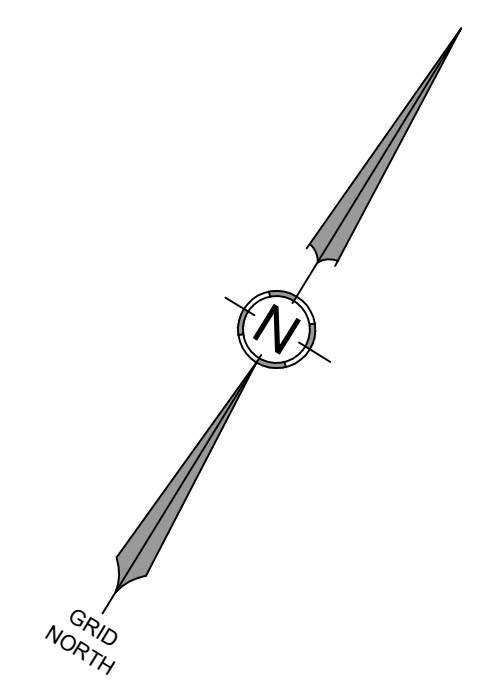
JOB NO: 22-145

SHEET: 1 of 1

Sheet Size: 24" X 36"



1. MINIMIZE IMPACT TO STONE WALLS. ALL REMOVED STONES TO REMAIN ON SITE.



DATE: 10/10/2023  
P.E.: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	8/3/2023	MTW APPD BY
2	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS SUBMITTED TO KITTEERY FOR PRELIMINARY SUBDIVISION REVIEW

565 CONGRESS STREET  
SUITE 201  
PORTLAND, ME 04102

41 CAMPUS DRIVE  
SUITE 301  
NEW GLoucester, ME 04260

OFFICE: (207) 926-5111 FAX: (207) 221-1317  
www.terradynconsultants.com



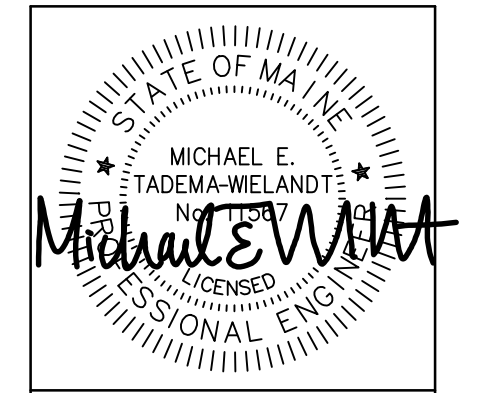
PERMIT DRAWING  
NOT FOR CONSTRUCTION

PROJECT: BARTLETT ROAD SUBDIVISION  
KITTEERY, MAINE

SHEET TITLE: EXISTING CONDITIONS & CLEARING PLAN

CLIENT: BEACHWOOD DEVELOPMENT FUND  
P.O. BOX 281  
KENNEBUNK, MAINE 04043

DATE: 5/18/2023  
SCALE: 1" = 60'  
DESIGNED: MTW  
JOB NO.: 22-145  
SHEET: C-2.0



DATE: 10/10/2023  
 P.E.: MICHAEL TADEMARA-WIELANDT

NO.	DATE	REVISIONS
1	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
2	8/3/2023	SUBMITTED TO KITTERY FOR PRELIMINARY SUBDIVISION REVIEW
		APPROVED BY
		DATE

565 CONGRESS STREET  
 SUITE 201  
 PORTLAND, ME 04102  
 OFFICE: (207) 926-5111 FAX: (207) 221-1317  
 www.terradynconsultants.com



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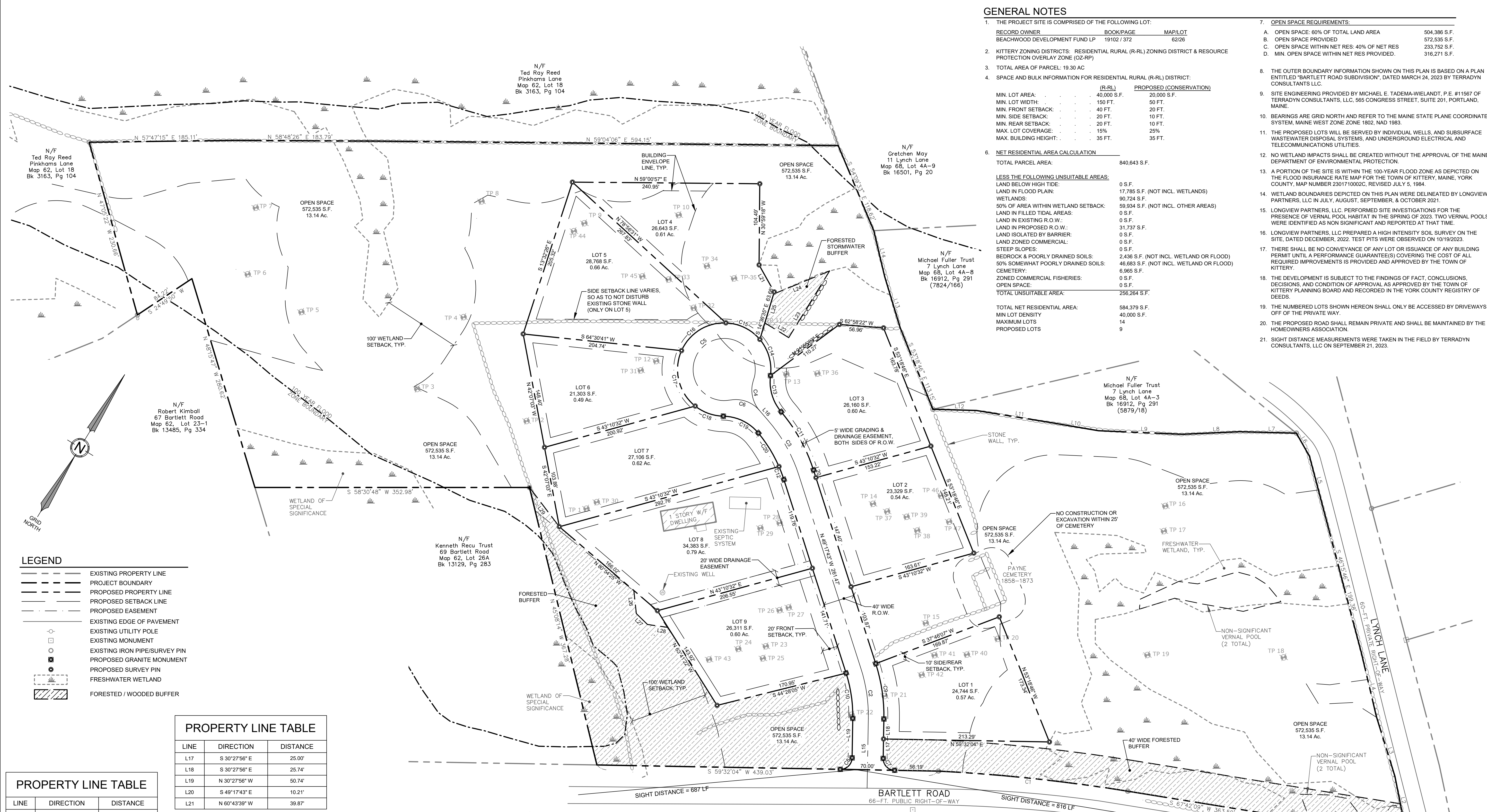
PROJECT: BARTLETT ROAD SUBDIVISION  
 KITTERY, MAINE  
 SHEET TITLE: SUBDIVISION PLAN  
 CLIENT: BEACHWOOD DEVELOPMENT FUND  
 KENNEBUNK, MAINE 04043

DATE: 5/18/2023  
 SCALE: 1" = 60'  
 DESIGNED: MTW  
 JOB NO: 22-145  
 SHEET: C-3.0

**GENERAL NOTES**

- THE PROJECT SITE IS COMPRISED OF THE FOLLOWING LOT:  
 RECORD OWNER BOOK/PAGE MAP/LOT  
 BEACHWOOD DEVELOPMENT FUND LP 19102 / 372 62/26
- KITTERY ZONING DISTRICTS: RESIDENTIAL RURAL (R-RL) ZONING DISTRICT & RESOURCE PROTECTION OVERLAY ZONE (OZ-RP)
- TOTAL AREA OF PARCEL: 19.30 AC
- SPACE AND BULK INFORMATION FOR RESIDENTIAL RURAL (R-RL) DISTRICT:  

(R-RL)	PROPOSED (CONSERVATION)	
MIN. LOT AREA:	40,000 S.F.	20,000 S.F.
MIN. LOT WIDTH:	150 FT.	50 FT.
MIN. FRONT SETBACK:	40 FT.	20 FT.
MIN. SIDE SETBACK:	20 FT.	10 FT.
MIN. REAR SETBACK:	20 FT.	10 FT.
MAX. LOT COVERAGE:	15%	25%
MAX. BUILDING HEIGHT:	35 FT.	35 FT.
- NET RESIDENTIAL AREA CALCULATION  
 TOTAL PARCEL AREA: 840,643 S.F.  
 LESS THE FOLLOWING UNSUITABLE AREAS:  
 LAND BELOW HIGH TIDE: 0 S.F.  
 LAND IN FLOOD PLAIN: 17,785 S.F. (NOT INCL. WETLANDS)  
 WETLANDS: 90,724 S.F.  
 50% OF AREA WITHIN WETLAND SETBACK: 59,934 S.F. (NOT INCL. OTHER AREAS)  
 LAND IN FILLED TIDAL AREAS: 0 S.F.  
 LAND IN EXISTING R.O.W.: 31,737 S.F.  
 LAND ISOLATED BY BARRIER: 0 S.F.  
 LAND ZONED COMMERCIAL: 0 S.F.  
 STEEP SLOPES: 0 S.F.  
 BEDROCK & POORLY DRAINED SOILS: 2,436 S.F. (NOT INCL. WETLAND OR FLOOD)  
 50% SOMEWHAT POORLY DRAINED SOILS: 46,683 S.F. (NOT INCL. WETLAND OR FLOOD)  
 CEMETERY: 6,966 S.F.  
 ZONED COMMERCIAL FISHERIES: 0 S.F.  
 OPEN SPACE: 0 S.F.  
 TOTAL UNSUITABLE AREA: 256,264 S.F.  
 TOTAL NET RESIDENTIAL AREA: 584,379 S.F.  
 MIN LOT DENSITY: 40,000 S.F.  
 MAXIMUM LOTS: 14  
 PROPOSED LOTS: 9
- OPEN SPACE REQUIREMENTS:  
 A. OPEN SPACE: 60% OF TOTAL LAND AREA 504,366 S.F.  
 B. OPEN SPACE PROVIDED 572,535 S.F.  
 C. OPEN SPACE WITHIN NET RES: 40% OF NET RES 233,752 S.F.  
 D. MIN. OPEN SPACE WITHIN NET RES PROVIDED 316,271 S.F.
- THE OUTER BOUNDARY INFORMATION SHOWN ON THIS PLAN IS BASED ON A PLAN ENTITLED "BARTLETT ROAD SUBDIVISION", DATED MARCH 24, 2023 BY TERRADYN CONSULTANTS, LLC.
- SITE ENGINEERING PROVIDED BY MICHAEL E. TADEMARA-WIELANDT, P.E. #11567 OF TERRADYN CONSULTANTS, LLC, 565 CONGRESS STREET, SUITE 201, PORTLAND, MAINE.
- BEARINGS ARE GRID NORTH AND REFER TO THE MAINE STATE PLANE COORDINATE SYSTEM, MAINE WEST ZONE ZONE 1802, NAD 1983.
- THE PROPOSED LOTS WILL BE SERVED BY INDIVIDUAL WELLS, AND SUBSURFACE WASTEWATER DISPOSAL SYSTEMS, AND UNDERGROUND ELECTRICAL AND TELECOMMUNICATIONS UTILITIES.
- NO WETLAND IMPACTS SHALL BE CREATED WITHOUT THE APPROVAL OF THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- A PORTION OF THE SITE IS WITHIN THE 100-YEAR FLOOD ZONE AS DEPICTED ON THE FLOOD INSURANCE RATE MAP FOR THE TOWN OF KITTERY, MAINE, YORK COUNTY, MAP NUMBER 2301710002C, REVISED JULY 5, 1984.
- WETLAND BOUNDARIES DEPICTED ON THIS PLAN WERE DELINEATED BY LONGVIEW PARTNERS, LLC IN JULY, AUGUST, SEPTEMBER, & OCTOBER 2021.
- LONGVIEW PARTNERS, LLC PERFORMED SITE INVESTIGATIONS FOR THE PRESENCE OF VERNAL POOL HABITAT IN THE SPRING OF 2023. TWO VERNAL POOLS WERE IDENTIFIED AS NON-SIGNIFICANT AND REPORTED AT THAT TIME.
- LONGVIEW PARTNERS, LLC PREPARED A HIGH INTENSITY SOIL SURVEY ON THE SITE, DATED DECEMBER, 2022. TEST PITS WERE OBSERVED ON 10/19/2023.
- THERE SHALL BE NO CONVEYANCE OF ANY LOT OR ISSUANCE OF ANY BUILDING PERMIT UNTIL A PERFORMANCE GUARANTEE(S) COVERING THE COST OF ALL REQUIRED IMPROVEMENTS IS PROVIDED AND APPROVED BY THE TOWN OF KITTERY.
- THE DEVELOPMENT IS SUBJECT TO THE FINDINGS OF FACT, CONCLUSIONS, DECISIONS, AND CONDITION OF APPROVAL AS APPROVED BY THE TOWN OF KITTERY PLANNING BOARD AND RECORDED IN THE YORK COUNTY REGISTRY OF DEEDS.
- THE UNNUMBERED LOTS SHOWN HEREON SHALL ONLY BE ACCESSED BY DRIVEWAYS OFF OF THE PRIVATE WAY.
- THE PROPOSED ROAD SHALL REMAIN PRIVATE AND SHALL BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- SIGHT DISTANCE MEASUREMENTS WERE TAKEN IN THE FIELD BY TERRADYN CONSULTANTS, LLC ON SEPTEMBER 21, 2023.



**LEGEND**

- EXISTING PROPERTY LINE
- PROJECT BOUNDARY
- PROPOSED PROPERTY LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- EXISTING EDGE OF PAVEMENT
- EXISTING UTILITY POLE
- EXISTING MONUMENT
- EXISTING IRON PIPE/SURVEY PIN
- PROPOSED GRANITE MONUMENT
- PROPOSED SURVEY PIN
- FRESHWATER WETLAND
- FORESTED / WOODED BUFFER

**PROPERTY LINE TABLE**

LINE	DIRECTION	DISTANCE
L17	S 30°27'56" E	25.00'
L18	S 30°27'56" E	25.74'
L19	N 30°27'56" W	50.74'
L20	S 49°17'43" E	10.21'
L21	N 60°43'39" W	39.87'

**BUFFER LINE TABLE**

LINE	DISTANCE	DIRECTION
L22	36.03'	S89°47'34"E
L23	100.60'	N0°03'10"E
L24	77.85'	S36°08'52"W
L25	38.87'	S14°36'35"E
L26	29.90'	N37°40'51"W
L27	20.00'	N77°01'39"W
L28	26.66'	N66°36'06"E
L29	63.43'	N68°46'06"W

**PROPERTY CURVE TABLE**

CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C7	23.56'	15.00'	S 75°27'56" E	21.21'
C8	23.56'	15.00'	N 14°32'04" E	21.21'
C9	72.30'	220.00'	N 39°52'49" W	71.98'
C10	59.16'	180.00'	N 39°52'49" W	58.89'
C11	86.27'	220.00'	N 60°31'46" W	85.72'
C12	17.94'	180.00'	N 52°08'59" W	17.93'
C13	50.00'	60.00'	S 47°53'29" E	48.56'
C14	49.92'	60.00'	N 47°51'14" W	48.49'
C15	50.02'	60.00'	S 84°25'50" W	48.58'
C16	71.32'	60.00'	S 26°29'40" W	67.20'
C17	79.03'	60.00'	S 45°17'39" E	73.44'
C18	39.13'	60.00'	N 78°17'25" E	38.44'
C19	51.54'	60.00'	S 84°13'01" W	49.97'
C20	50.80'	180.00'	N 63°05'23" W	50.63'

**CENTERLINE CURVE TABLE**

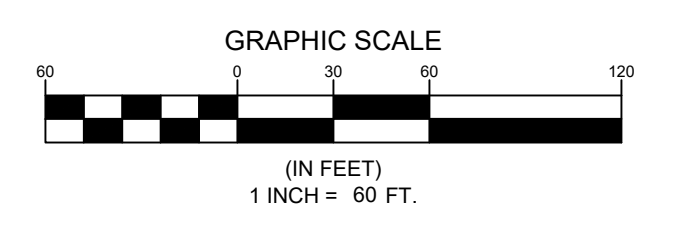
CURVE	LENGTH	RADIUS	CRD. BEARING	CRD. DIST.
C2	65.73'	200.00'	N 39°52'49" W	65.43'
C3	80.00'	200.00'	N 60°45'17" W	79.47'
C4	41.89'	40.00'	S 42°12'51" E	40.00'
C5	209.44'	40.00'	S 17°47'09" W	40.00'
C6	41.89'	40.00'	S 77°47'09" W	40.00'

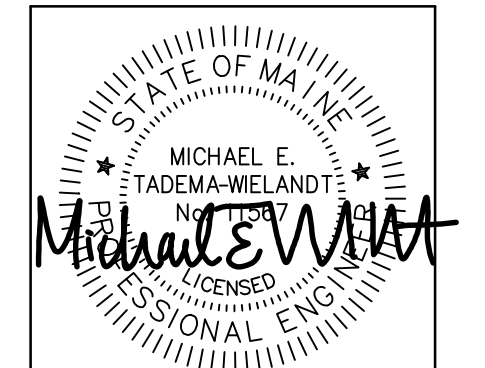
**PROPERTY LINE TABLE**

LINE	DIRECTION	DISTANCE
L1	S 42°45'08" E	16.81'
L2	S 42°45'08" E	62.01'
L3	S 48°40'57" E	80.69'
L4	S 44°44'02" E	83.14'
L5	S 46°17'15" E	62.80'
L6	S 61°06'08" E	34.24'
L7	N 59°58'44" E	73.19'
L8	N 55°55'00" E	73.40'
L9	N 60°56'58" E	108.00'
L10	N 68°09'56" E	61.78'
L11	N 67°46'22" E	97.16'
L12	N 60°08'50" E	56.11'
L13	S 48°19'26" E	68.63'
L14	S 44°51'57" E	60.60'

**CENTERLINE TABLE**

LINE	DIRECTION	DISTANCE
L15	N 30°27'56" W	89.44'
L16	S 72°12'51" E	17.97'





DATE: 10/10/2023  
 P.E.: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
2	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
1	8/3/2023	SUBMITTED TO KITTEERY FOR PRELIMINARY SUBDIVISION REVIEW
		APP'D
		BY

565 CONGRESS STREET  
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 PORTLAND, ME 04102

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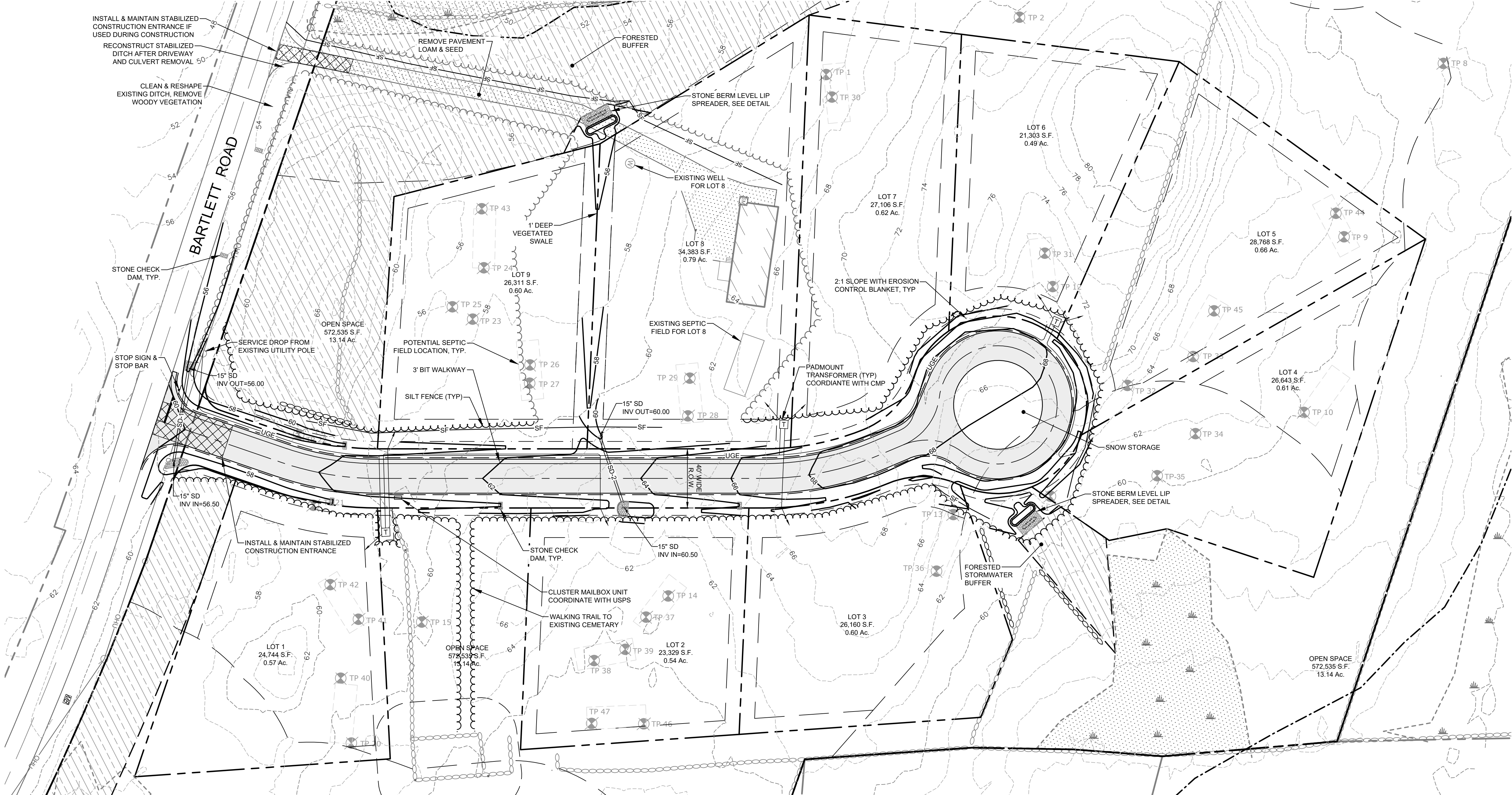
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PROJECT: BARTLETT ROAD SUBDIVISION  
 KITTEERY, MAINE

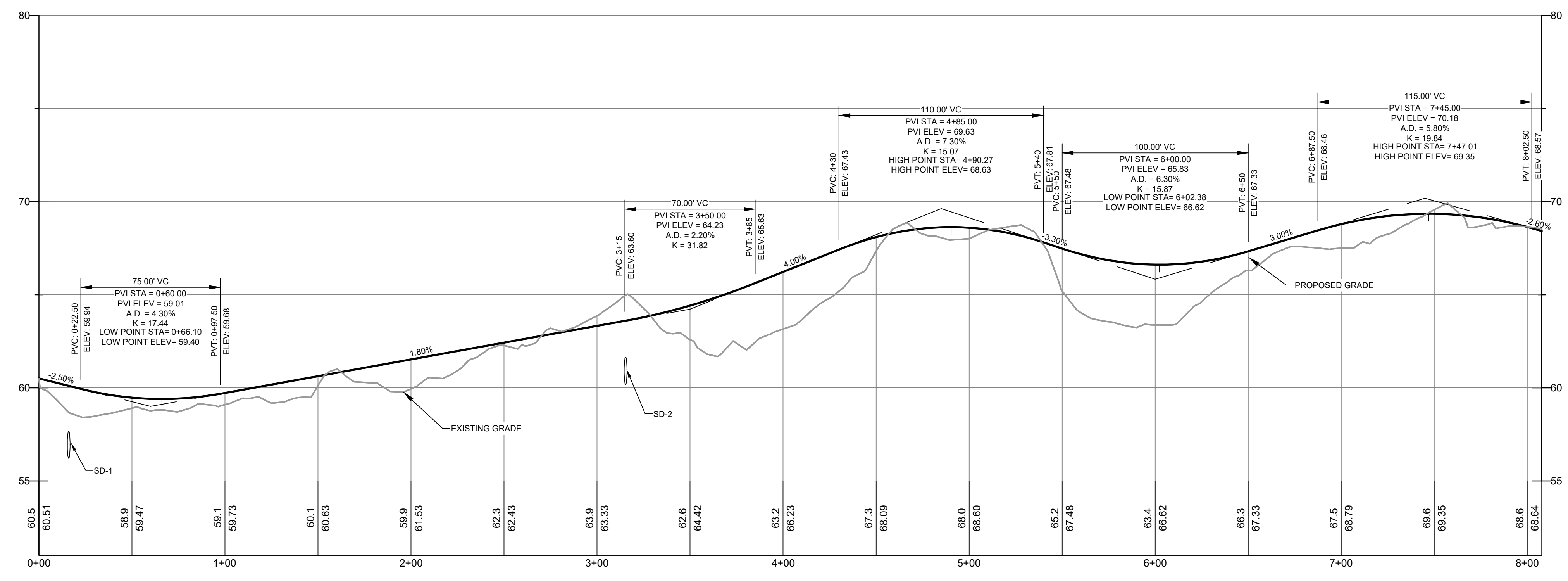
SHEET TITLE: PLAN & PROFILE, UTILITY, & EROSION CONTROL PLAN

CLIENT: BEACHWOOD DEVELOPMENT FUND  
 KENNEBUNK, MAINE 04043

DATE: 5/18/2023  
 SCALE: 1" = 40'  
 DESIGNED: MTW  
 JOB NO.: 22-145  
 SHEET: C-3.1

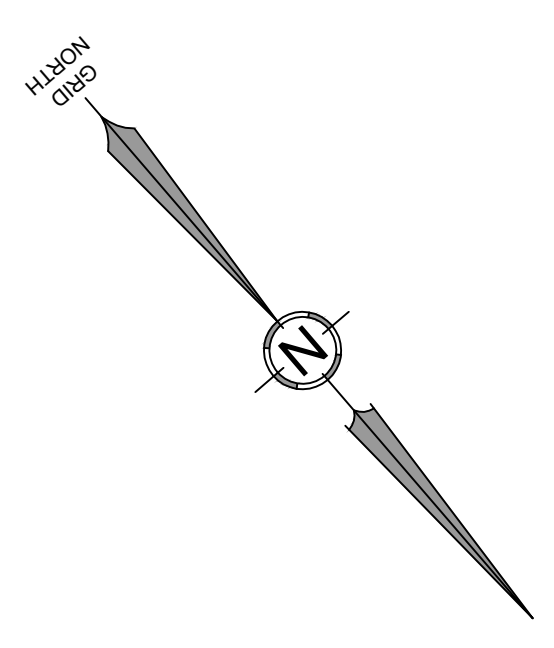
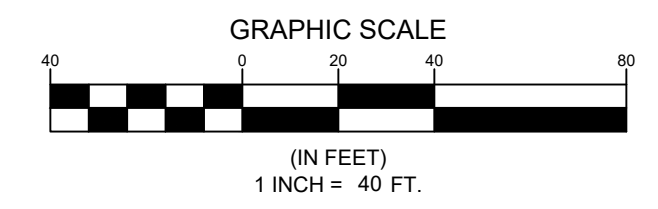


PLAN VIEW - PROPOSED ROAD STA. 0+00 TO 8+08  
 SCALE: 1" = 40'



PROFILE - PROPOSED ROAD STA. 0+00 TO 8+08  
 SCALE: 1" = 40' HORIZ.  
 1" = 4' VERT.

GENERAL NOTES  
 1. SITE DISTANCE FROM THE PROPOSED ENTRANCE ONTO BARTLETT ROAD WAS OBSERVED AS 816' (LEFT) AND 687' (RIGHT) BY TERRADYN CONSULTANTS ON SEPTEMBER 21, 2023.



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# EROSION AND SEDIMENT CONTROL PLAN

## PRE-CONSTRUCTION PHASE

A PERSON WHO CONDUCTS, OR CAUSES TO BE CONDUCTED, AN ACTIVITY THAT INVOLVES FILLING, DISPLACING OR EXPOSING SOIL OR OTHER EARTHEN MATERIALS SHALL TAKE MEASURES TO PREVENT UNREASONABLE EROSION OF SOIL OR SEDIMENT BEYOND THE PROJECT SITE OR INTO A PROTECTED NATURAL RESOURCE AS DEFINED IN 38 M.R.S. § 480-B. EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE THE ACTIVITY BEGINS. MEASURES MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL THE SITE IS PERMANENTLY STABILIZED. ADEQUATE AND TIMELY TEMPORARY AND PERMANENT STABILIZATION MEASURES MUST BE TAKEN. THE SITE MUST BE MAINTAINED TO PREVENT UNREASONABLE EROSION AND SEDIMENTATION. MINIMIZE DISTURBED AREAS AND PROTECT NATURAL DOWNGRADE BUFFER AREAS TO THE EXTENT PRACTICABLE.

## BMP CONSTRUCTION PHASE

A. SEDIMENT BARRIERS. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, PROPERLY INSTALL SEDIMENT BARRIERS AT THE EDGE OF ANY DOWNGRADIENT DISTURBED AREA AND ADJACENT TO ANY DRAINAGE CHANNELS WITHIN THE PROPOSED DISTURBED AREA. MAINTAIN THE SEDIMENT BARRIERS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

B. CONSTRUCTION ENTRANCE. PRIOR TO ANY CLEARING OR GRUBBING, A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT THE INTERSECTION WITH THE PROPOSED ACCESS DRIVE AND THE EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM THE SITE. TRACKED MUD OR SEDIMENT SHALL BE REMOVED PRIOR TO A STORM EVENT BY VACUUM SWEEPING.

C. RIPRAP. SINCE RIPRAP IS USED WHERE EROSION POTENTIAL IS HIGH, CONSTRUCTION MUST BE SEQUENCED SO THAT THE RIPRAP IS PUT IN PLACE WITH THE MINIMUM DELAY. DISTURBANCE OF AREAS WHERE RIPRAP IS TO BE PLACED SHOULD BE UNDERTAKEN ONLY WHEN FINAL PREPARATION AND PLACEMENT OF THE RIPRAP CAN FOLLOW IMMEDIATELY BEHIND THE INITIAL DISTURBANCE. WHERE RIPRAP IS USED FOR OUTLET PROTECTION, THE RIPRAP SHOULD BE PLACED BEFORE OR IN CONJUNCTION WITH THE CONSTRUCTION OF THE PIPE OR CHANNEL, SO THAT IT IS IN PLACE WHEN THE PIPE OR CHANNEL BEGINS TO OPERATE. MAINTAIN TEMPORARY RIPRAP, SUCH AS TEMPORARY CHECK DAMS UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.

D. TEMPORARY STABILIZATION. STABILIZE WITH TEMPORARY SEEDING, MULCH, OR OTHER NON-ERODIBLE COVER ANY EXPOSED SOILS THAT WILL REMAIN UNWORKED FOR MORE THAN 14 DAYS EXCEPT. STABILIZE AREAS WITHIN 100 FEET OF A WETLAND OR WATERBODY WITHIN 7 DAYS OR PRIOR TO A PROTECTED STORM EVENT, WHICHEVER COMES FIRST. IF HAY OR STRAW MULCH IS USED, THE APPLICATION RATE MUST BE 2 BALES (70-90 POUNDS) PER 1000 SF OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. HAY MULCH MUST BE KEPT MOIST OR ANCHORED TO PREVENT WIND BLOWING. AN EROSION CONTROL BLANKET OR MAT SHALL BE USED AT THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER) AND ON ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS AND WETLANDS. GRADING SHALL BE PLANNED SO AS TO MINIMIZE THE LENGTH OF TIME BETWEEN INITIAL SOIL EXPOSURE AND FINAL GRADING. ON LARGE PROJECTS THIS SHOULD BE ACCOMPLISHED BY PHASING THE OPERATION AND COMPLETING THE FIRST PHASE UP TO FINAL GRADING AND SEEDING BEFORE STARTING THE SECOND PHASE, AND SO ON.

E. EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX SHOULD BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH SUCH AS FLY ASH OR YARD SCRAPING. LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX. THE MIX COMPOSITION SHOULD MEET THE FOLLOWING STANDARDS:

- THE ORGANIC MATTER CONTENT SHOULD BE BETWEEN 80% AND 100%, DRY WEIGHT BASIS.
- PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING A 6" SCREEN AND 70% TO 85% PASSING A 0.75" SCREEN
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
- SOLUBLE SALTS CONTENT SHALL BE <4.0 MMHOS/CM
- THE PH SHALL BE BETWEEN 5.0 AND 8.0

F. VEGETATED WATERWAY. UPON FINAL GRADING, THE DISTURBED AREAS SHALL BE IMMEDIATELY SEEDED TO PERMANENT VEGETATION AND MULCHED AND WILL NOT BE USED AS OUTLETS UNTIL A DENSE, VIGOROUS VEGETATIVE COVER HAS BEEN OBTAINED. ONCE SOIL IS EXPOSED FOR WATERWAY CONSTRUCTION, IT SHOULD BE IMMEDIATELY GRADED AND STABILIZED. VEGETATED WATERWAYS NEED TO BE STABILIZED EARLY DURING THE GROWING SEASON (PRIOR TO SEPTEMBER 15). IF FINAL SEEDING OF WATERWAYS IS DELAYED PAST SEPTEMBER 15, EMERGENCY PROVISIONS SUCH AS SOD OR RIPRAP MAY BE REQUIRED TO STABILIZE THE CHANNEL. WATERWAYS SHOULD BE FULLY STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.

## PERMANENT STABILIZATION DEFINED

A. SEEDED AREAS. FOR SEEDED AREAS, PERMANENT STABILIZATION MEANS AN 90% COVER OF THE DISTURBED AREA WITH MATURE, HEALTHY PLANTS WITH NO EVIDENCE OF WASHING OR RILLING OF THE TOPSOIL.

B. SODDED AREAS. FOR SODDED AREAS, PERMANENT STABILIZATION MEANS THE COMPLETE BINDING OF THE SOD ROOTS INTO THE UNDERLYING SOIL WITH NO SLUMPING OF THE SOD OR DIE-OFF.

C. PERMANENT MULCH. FOR MULCHED AREAS, PERMANENT MULCHING MEANS TOTAL COVERAGE OF THE EXPOSED AREA WITH AN APPROVED MULCH MATERIAL. EROSION CONTROL MIX MAY BE USED AS MULCH FOR PERMANENT STABILIZATION ACCORDING TO THE APPROVED APPLICATION RATES AND LIMITATIONS.

D. RIPRAP. FOR AREAS STABILIZED WITH RIPRAP, PERMANENT STABILIZATION MEANS THAT SLOPES STABILIZED WITH RIPRAP HAVE AN APPROPRIATE BACKING OF A WELL-GRADED GRAVEL OR APPROVED GEOTEXTILE TO PREVENT SOIL MOVEMENT FROM BEHIND THE RIPRAP. STONE MUST BE SIZED APPROPRIATELY. IT IS RECOMMENDED THAT ANGULAR STONE BE USED.

E. AGRICULTURAL USE. FOR CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURAL PURPOSES (E.G., PIPELINES ACROSS CROP LAND), PERMANENT STABILIZATION MAY BE ACCOMPLISHED BY RETURNING THE DISTURBED LAND TO AGRICULTURAL USE.

F. PAVED AREAS. FOR PAVED AREAS, PERMANENT STABILIZATION MEANS THE PLACEMENT OF THE COMPACTED GRAVEL SUBBASE IS COMPLETED.

G. DITCHES, CHANNELS, AND SWALES. FOR OPEN CHANNELS, PERMANENT STABILIZATION MEANS THE CHANNEL IS STABILIZED WITH MATURE VEGETATION AT LEAST THREE INCHES IN HEIGHT, WITH WELL-GRADED RIPRAP, OR WITH ANOTHER NON-EROSIVE LINING CAPABLE OF WITHSTANDING THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHOUT RELIANCE ON CHECK DAMS TO SLOW FLOW. THERE MUST BE NO EVIDENCE OF SLUMPING OF THE LINING, UNDERCUTTING OF THE BANKS, OR DOWN-CUTTING OF THE CHANNEL.

## GENERAL CONSTRUCTION PHASE

THE FOLLOWING EROSION CONTROL MEASURES SHALL BE FOLLOWED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION OF THIS PROJECT:

A. ALL TOPSOIL SHALL BE COLLECTED, STOCKPILED, SEEDED WITH RYE AT 3 POUNDS/1,000 SF AND MULCHED, AND REUSED AS REQUIRED. SILT FENCING SHALL BE PLACED DOWN GRADIENT FROM THE STOCKPILED LOAM. STOCKPILE TO BE LOCATED BY DESIGNATION OF THE OWNER AND INSPECTING ENGINEER.

B. THE INSPECTING ENGINEER AT HIS/HER DISCRETION, MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AND/OR SUPPLEMENTAL VEGETATIVE PROVISIONS TO MAINTAIN STABILITY OF EARTHWORKS AND FINISH GRADED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY SUPPLEMENTAL MEASURES AS DIRECTED BY THE INSPECTING ENGINEER. FAILURE TO COMPLY WITH THE ENGINEER'S DIRECTIONS WILL RESULT IN DISCONTINUATION OF CONSTRUCTION ACTIVITIES.

C. EROSION CONTROL MESH SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS OVER ALL FINISH SEEDED AREAS AS SPECIFIED ON THE DESIGN PLANS.

D. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN UNTIL THEY ARE ADEQUATELY STABILIZED.

E. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

F. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIALS.

G. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 INCHES PRIOR TO PLACEMENT OF TOPSOIL.

H. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC., SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

I. ALL FILLS SHALL BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS.

J. EXCEPT FOR APPROVED LANDFILLS OR NON-STRUCTURAL FILLS, FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.

K. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILL SLOPES OR STRUCTURAL FILLS.

L. FILL SHALL NOT BE PLACED ON A FROZEN FOUNDATION.

M. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED APPROPRIATELY.

N. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.

O. REMOVE ANY TEMPORARY CONTROL MEASURES, SUCH AS SILT FENCE, WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED. REMOVE ANY ACCUMULATED SEDIMENTS AND STABILIZE.

## PERMANENT VEGETATION

PERMANENT VEGETATIVE COVER SHOULD BE ESTABLISHED ON DISTURBED AREAS WHERE PERMANENT, LONG LIVED VEGETATIVE COVER IS NEEDED TO STABILIZE THE SOIL, TO REDUCE DAMAGES FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE ENVIRONMENT.

## SEEDBED PREPARATION

A. GRADE AS FEASIBLE TO PERMIT THE USE OF CONVENTIONAL EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION AND ANCHORING, AND MAINTENANCE.

B. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TESTS SUCH AS THOSE OFFERED BY THE UNIVERSITY OF MAINE SOIL TESTING LABORATORY. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL COOPERATIVE EXTENSION SERVICE OFFICE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 18.4 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P205-K20) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB. PER 1,000 SQ. FT.).

C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR, CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE. D. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLOUDS, LUMPS OR OTHER UNSUITABLE MATERIAL.

E. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED, THE AREA MUST BE TILLED AND FIRMED AS ABOVE.

F. PERMANENT SEEDING SHOULD BE MADE 45 DAYS PRIOR TO THE FIRST KILLING FROST OR AS A DOMINANT SEEDING WITH MULCH AFTER THE FIRST KILLING FROST AND BEFORE SNOWFALL. WHEN CROWN WETCH IS SEEDING IN LATER SUMMER, AT LEAST 35% OF THE SEED SHOULD BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SEEDING DATES, MULCH ACCORDING TO THE TEMPORARY MULCHING BMP AND OVERWINTER STABILIZATION AND CONSTRUCTION TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

G. FOLLOWING SEED BED PREPARATION, SWALE AREAS, FILL AREAS AND BACK SLOPES SHALL BE SEEDED AT A RATE OF 3 LBS./1,000 S.F. WITH A MIXTURE OF 25% PERENNIAL RYEGRASS, 20% ANNUAL RYEGRASS AND 5% WHITE DUTCH CLOVER.

I. AREAS WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING.

J. AREAS WHICH CANNOT BE SEEDED WITHIN THE GROWING SEASON SHALL BE MULCHED FOR OVER-WINTER PROTECTION AND THE AREA SHOULD BE SEEDED AT THE BEGINNING OF THE GROWING SEASON.

## WINTER CONSTRUCTION PHASE

IF AN AREA IS NOT STABILIZED WITH TEMPORARY OR PERMANENT MEASURES BY NOVEMBER 15, THEN THE SITE MUST BE PROTECTED WITH ADDITIONAL STABILIZATION MEASURES.

A. PERMANENT STABILIZATION CONSISTS OF AT LEAST 90% VEGETATION, PAVEMENT/GRAVEL BASE OR RIPRAP.

B. DO NOT EXPOSE SLOPES OR LEAVE SLOPES EXPOSED OVER THE WINTER OR FOR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY PROTECTED WITH MULCH.

C. APPLY HAY MULCH AT TWICE THE STANDARD RATE (150 LBS. PER 1,000 SF). THE MULCH MUST BE THICK ENOUGH SUCH THAT THE GROUND SURFACE WILL NOT BE VISIBLE AND MUST BE ANCHORED.

D. USE MULCH AND MULCH NETTING OR AN EROSION CONTROL MULCH BLANKET ON ALL SLOPES GREATER THAN 8% OR OTHER AREAS EXPOSED TO DIRECT WIND.

E. INSTALL AN EROSION CONTROL BLANKET IN ALL DRAINAGEWAYS (BOTTOM AND SIDES) WITH A SLOPE GREATER THAN 3%.

F. SEE THE VEGETATION MEASURES FOR MORE INFORMATION ON SEEDING DATES AND TYPES.

G. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SO THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

H. AN AREA WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIER.

I. TEMPORARY MULCH MUST BE APPLIED WITHIN 7 DAYS OF SOIL EXPOSURE OR PRIOR TO ANY STORM EVENT, BUT AFTER EVERY WORKDAY IN AREAS WITHIN 100 FEET FROM A PROTECTED NATURAL RESOURCE.

J. AREAS THAT HAVE BEEN BROUGHT TO FINAL GRADE MUST BE PERMANENTLY MULCHED THAT SAME DAY.

K. IF SNOWFALL IS GREATER THAN 1 INCH (FRESH OR CUMULATIVE), THE SNOW SHALL BE REMOVED FROM THE AREAS DUE TO BE SEEDED AND MULCHED.

L. LOAM SHALL BE FREE OF FROZEN CLUMPS BEFORE IT IS APPLIED.

M. ALL VEGETATED DITCH LINES THAT HAVE NOT BEEN STABILIZED BY NOVEMBER 1, OR WILL BE WORKED DURING THE WINTER CONSTRUCTION PERIOD, MUST BE STABILIZED WITH AN APPROPRIATE STONE LINING BACKED BY AN APPROPRIATE GRAVEL BED OR GEOTEXTILE UNLESS SPECIFICALLY RELEASED FROM THIS STANDARD BY THE DEPARTMENT.

N. EROSION CONTROL MUST BE INSPECTED AFTER EACH RAINFALL, SNOW STORM, OR THAWING EVENT AND AT LEAST ONCE A WEEK BETWEEN NOVEMBER 15 AND APRIL 15.

## MAINTENANCE AND INSPECTION PHASE

A. MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED, HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE.

B. A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROL MEASURES. MAJOR OBSERVATIONS MUST INCLUDE: Bmps THAT NEED TO BE MAINTAINED, LOCATION(S) OF Bmps THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL Bmps ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION. FOLLOW-UP TO CORRECT DEFICIENCIES OR ENHANCE CONTROLS MUST ALSO BE INDICATED IN THE LOG AND DATED, INCLUDING WHAT ACTION WAS TAKEN AND WHEN.

## DEWATERING

A DEWATERING PLAN IS NEEDED TO ADDRESS EXCAVATION DE-WATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE COLLECTED WATER NEEDS TREATMENT AND A DISCHARGE POINT THAT WILL NOT CAUSE DOWNGRADE EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE.

## GOOD HOUSEKEEPING NOTES:

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM CONSTRUCTION AND WASTE MATERIALS STORED ON SITE TO ENTER STORMWATER, WHICH INCLUDES STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, THE SITE CONTRACTOR OR OPERATOR MUST DEVELOP, AND IMPLEMENT AS NECESSARY, APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING MEASURES.

NOTE: ANY SPILL OR RELEASE OF TOXIC OR HAZARDOUS SUBSTANCES MUST BE REPORTED TO THE DEPARTMENT. FOR OIL SPILLS, CALL 1-800-482-0777 WHICH IS AVAILABLE 24 HOURS A DAY. FOR SPILLS OF TOXIC OR HAZARDOUS MATERIAL, CALL 1-800-452-4864 WHICH IS AVAILABLE 24 HOURS A DAY. FOR MORE INFORMATION, VISIT THE DEPARTMENT'S WEBSITE AT: HTTP://WWW.MAINE.GOV/DEP/SPILLS/EMERGENSPILLRESP/

2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN 'INFILTRATION AREA' IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL, DIKES, BERMS, SLUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS. ANY PROJECT PROPOSING INFILTRATION OF STORMWATER MUST PROVIDE ADEQUATE PRE-TREATMENT OF STORMWATER PRIOR TO DISCHARGE OF STORMWATER TO THE INFILTRATION AREA, OR PROVIDE FOR TREATMENT WITHIN THE INFILTRATION AREA, IN ORDER TO PREVENT THE ACCUMULATION OF FINES, REDUCTION IN INFILTRATION RATE, AND CONSEQUENT FLOODING AND DESTABILIZATION.

SEE MAINE DEP CHAPTER 500 APPENDIX D FOR LICENSE BY RULE STANDARDS FOR INFILTRATION OF STORMWATER.

NOTE: LACK OF APPROPRIATE POLLUTANT REMOVAL BEST MANAGEMENT PRACTICES (Bmps) MAY RESULT IN VIOLATIONS OF THE GROUNDWATER QUALITY STANDARD ESTABLISHED BY 38 M.R.S.A. §465-C(1).

3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL, BUT OTHER WATER ADDITIVES MAY BE CONSIDERED AS NEEDED. A STABILIZED CONSTRUCTION ENTRANCE (SCE) SHOULD BE INCLUDED TO MINIMIZE TRACKING OF MUD AND SEDIMENT. IF OFF-SITE TRACKING OCCURS, PUBLIC ROADS SHOULD BE SWEEP IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE TO SUPPRESS FUGITIVE SEDIMENT AND DUST.

NOTE: DEWATERING A STREAM WITHOUT A PERMIT FROM THE DEPARTMENT MAY VIOLATE STATE WATER QUALITY STANDARDS AND THE NATURAL RESOURCES PROTECTION ACT.

4. DEBRIS AND OTHER MATERIALS. MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

NOTE: TO PREVENT THESE MATERIALS FROM BECOMING A SOURCE OF POLLUTANTS, CONSTRUCTION AND POST-CONSTRUCTION ACTIVITIES RELATED TO A PROJECT MAY BE REQUIRED TO COMPLY WITH APPLICABLE PROVISIONS OF RULES RELATED TO SOLID, UNIVERSAL, AND HAZARDOUS WASTE, INCLUDING, BUT NOT LIMITED TO: THE MAINE SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT RULES; MAINE HAZARDOUS WASTE MANAGEMENT RULES; MAINE OIL CONVEYANCE AND STORAGE RULES; AND MAINE PESTICIDE REQUIREMENTS.

5. EXCAVATION DE-WATERING. EXCAVATION DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, MUST BE SPREAD THROUGH NATURAL WOODS BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.

NOTE: DEWATERING CONTROLS ARE DISCUSSED IN THE 'MAINE EROSION AND SEDIMENT CONTROL Bmps, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.'

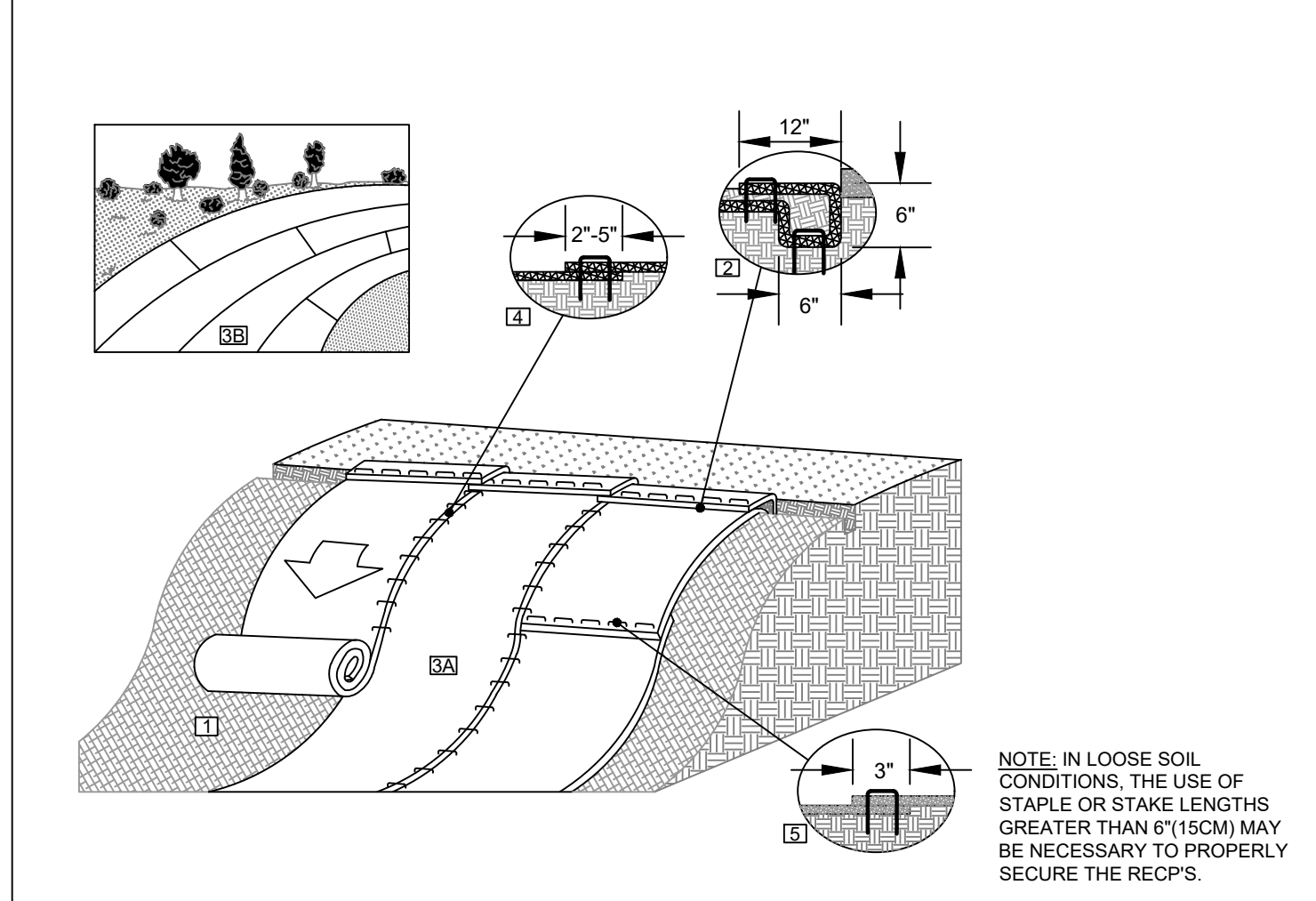
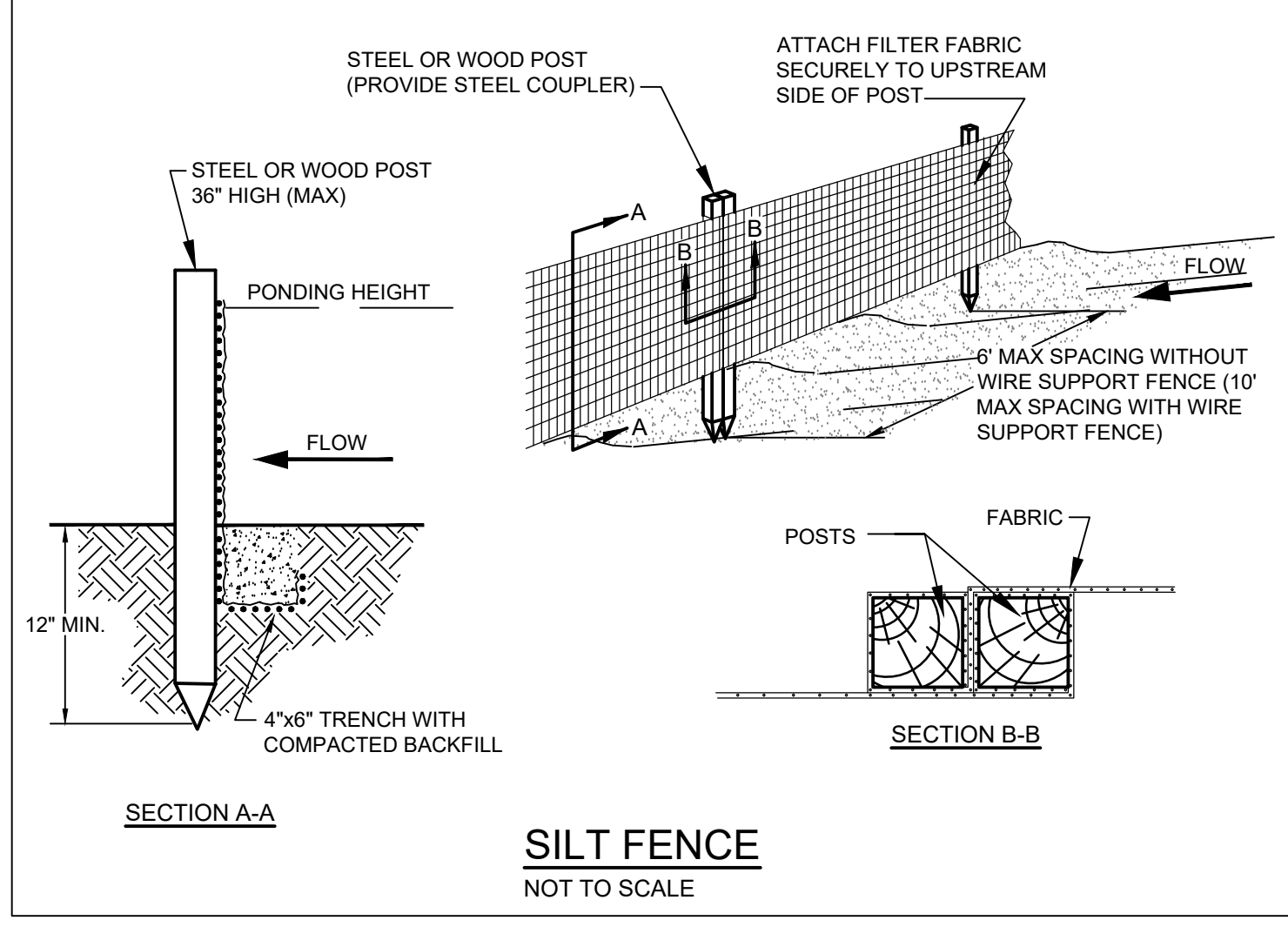
6. AUTHORIZED NON-STORMWATER DISCHARGES. IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED. NON-STORMWATER DISCHARGES, WHICH MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:

- (a) DISCHARGES FROM FIREFIGHTING ACTIVITY:
- (b) FIRE HYDRANT FLUSHINGS;
- (c) VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
- (d) DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3);
- (e) ROUTINE EXTERNAL BUILDING SHOWDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
- (f) PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;
- (g) UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
- (h) UNCONTAMINATED GROUNDWATER OR SPRING WATER;
- (i) FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
- (j) UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5));
- (k) POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
- (l) LANDSCAPE IRRIGATION.

7. UNAUTHORIZED NON-STORMWATER DISCHARGES. THE DEPARTMENT'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C (6), SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:

- (a) WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
- (b) FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
- (c) SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
- (d) TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

8. ADDITIONAL REQUIREMENTS. ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

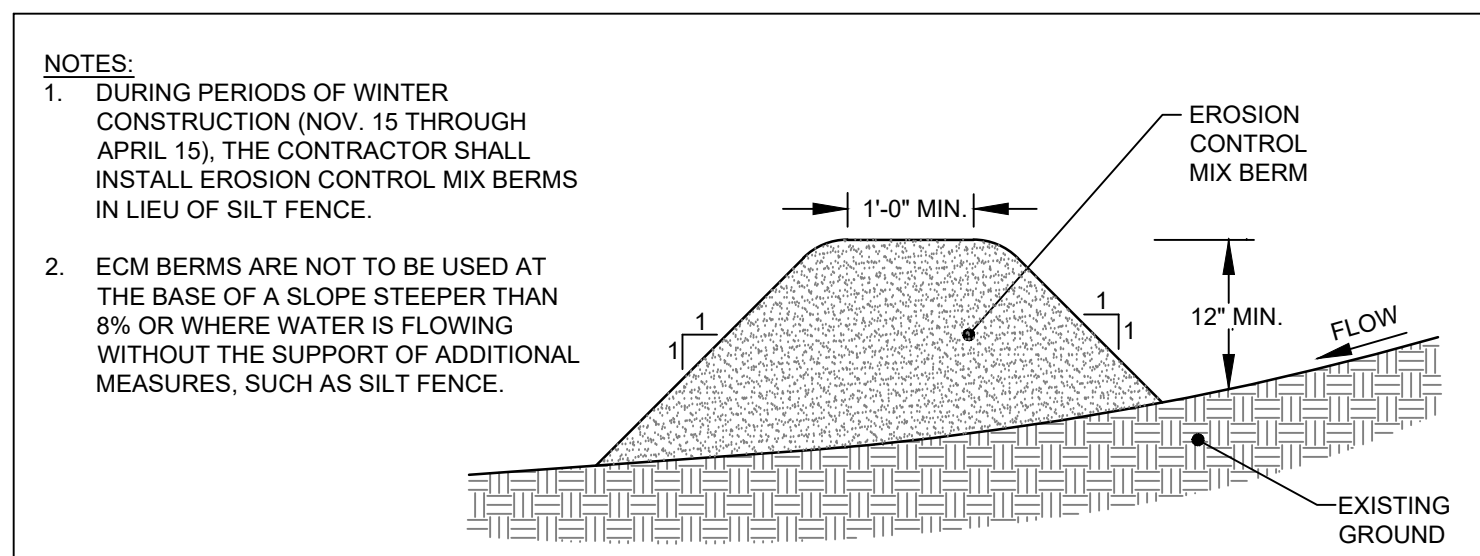


PHOTODEGRADABLE EROSION CONTROL BLANKET SELECTION		
6:1 > 3:1 SLOPES	3:1 > 2:1 SLOPES	2:1 SLOPES
NA GREEN DS75	NA GREEN S150	NA GREEN SC150

- NOTES:
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (REPCS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE REPCS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF REPCS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE REPCS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF REPCS BACK OVER THE SEED AND COMPACTED SOIL. SECURE REPCS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE REPCS.
  3. ROLL THE REPCS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. REPCS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL REPCS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
  4. THE EDGES OF PARALLEL REPCS MUST BE STAPLED WITH APPROXIMATELY 2" - 5" OVERLAP DEPENDING ON THE REPCS TYPE.
  5. CONSECUTIVE REPCS SPICED DOWN THE SLOPE MUST BE END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE REPCS WIDTH.

## EROSION CONTROL FABRIC SLOPE INSTALLATION

NOT TO SCALE

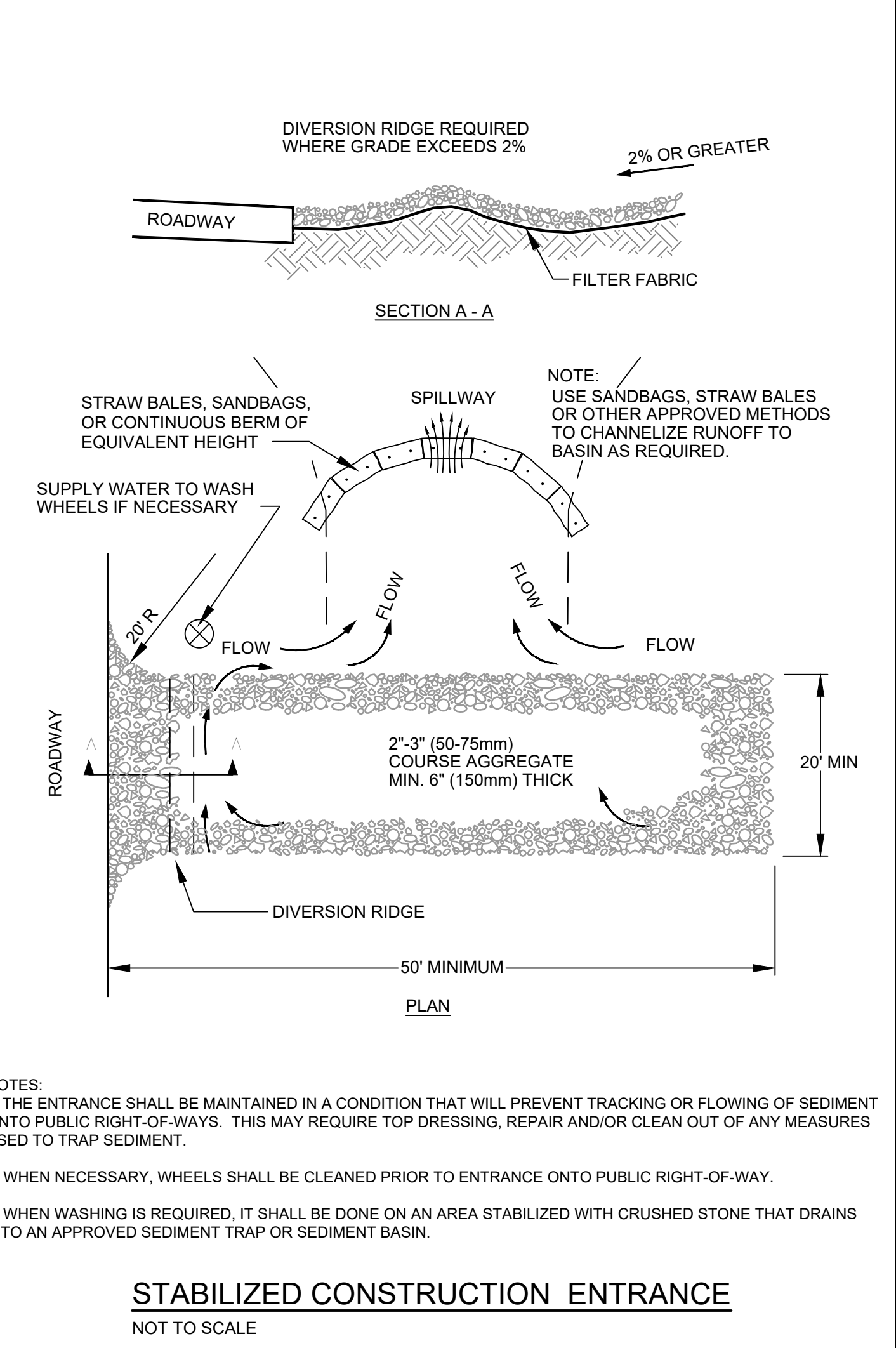


EROSION CONTROL MIX: EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES & MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:

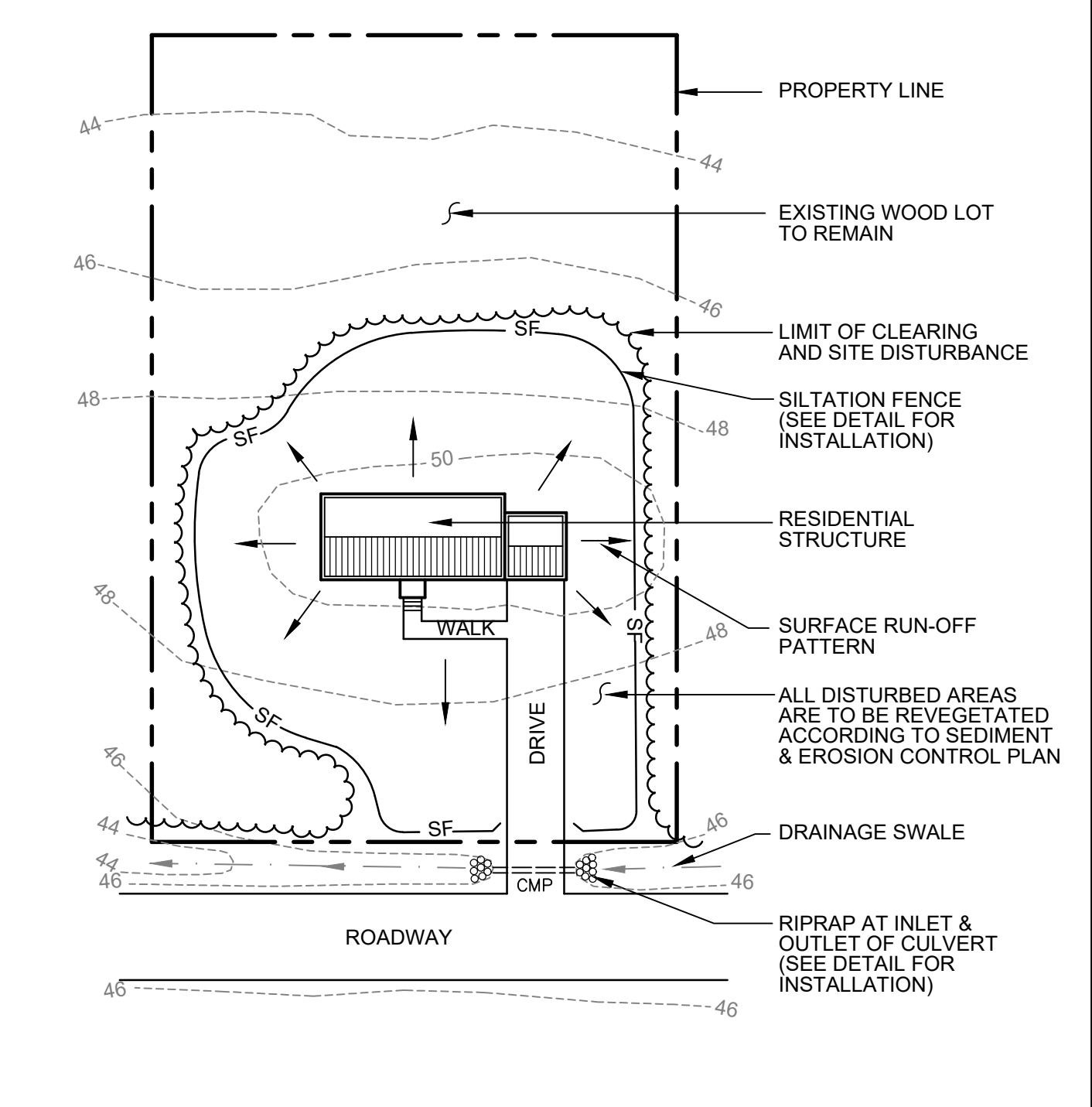
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80% - 100% DRY WEIGHT BASIS
- PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85% PASSING A 0.75" SCREEN
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 mmhos/cm.
- pH SHALL FALL BETWEEN 5.0 - 8.0.

## EROSION CONTROL MIX BERM

NOT TO SCALE



- NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
  2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
  3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.



Inspection Notes for Lot Grading and Driveway location inspections by a professional engineer shall consist of a visit to the site prior to construction to consult with the earthwork contractor and a post construction meeting to confirm grading on lots and for all driveways to ensure runoff is directed according to plans and to oversee the re-stabilization of the lot into a vegetated cover.

## TYPICAL EROSION CONTROL MEASURES FOR DWELLING UNITS

NOT TO SCALE



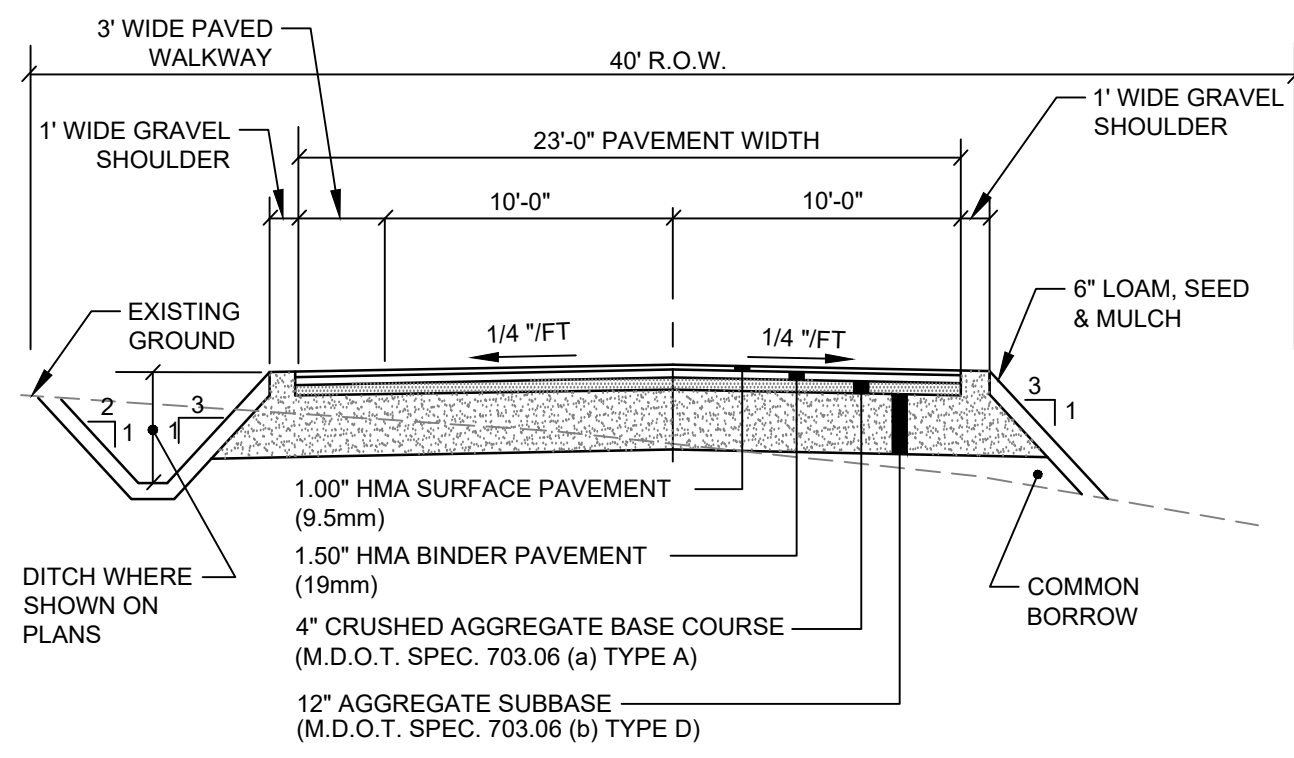
DATE: 10/10/2023

P.E.: MICHAEL TADEMAWIELAND

REVISIONS

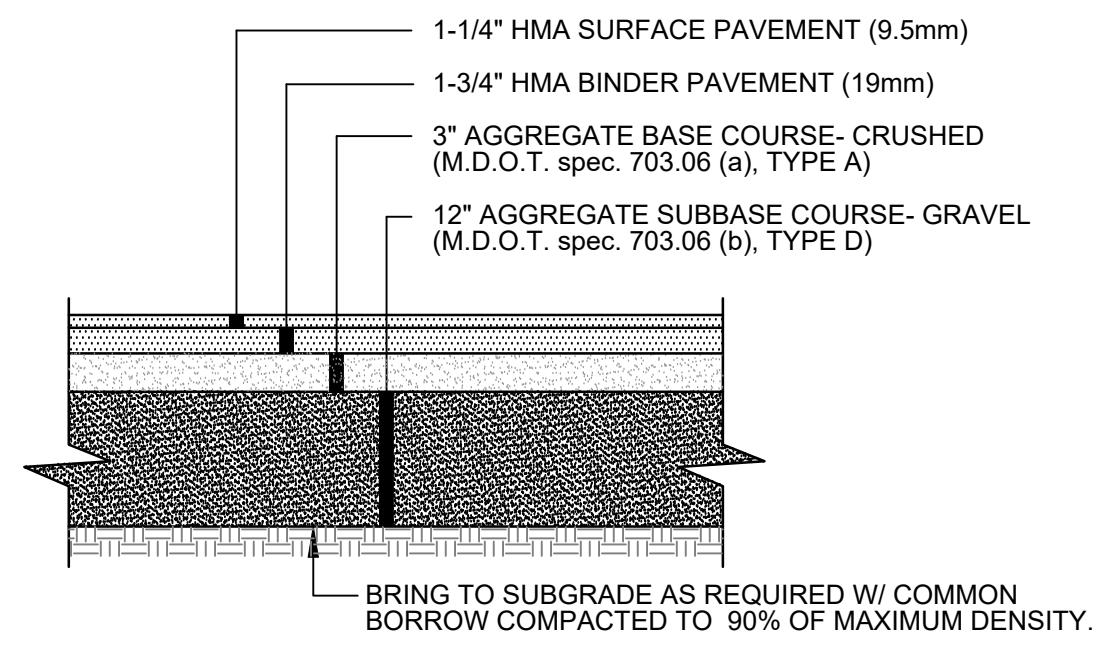
NO.	DATE	REVISIONS
1	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
2	8/3/2023	SUBMITTED TO KITTERY FOR PRELIMINARY SUBDIVISION REVIEW
		APPROVED BY
		DATE
		NO.

565 CONGRESS STREET  
SUITE 301  
PORTLAND, ME 04102



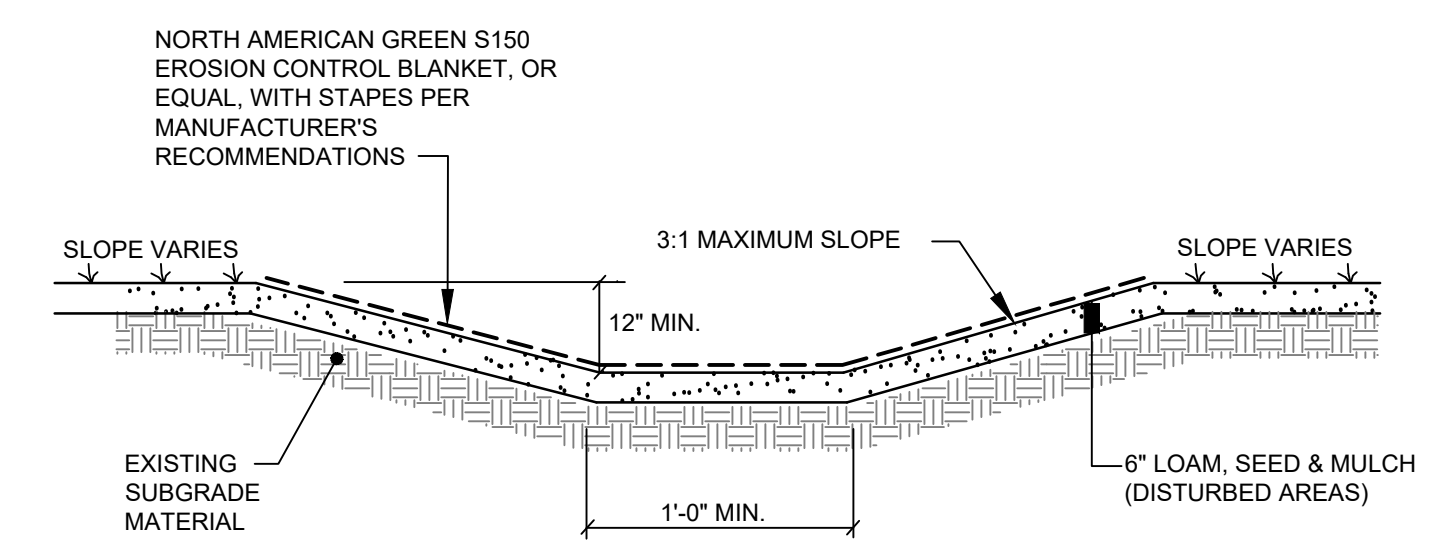
- NOTES:
- ROAD DESIGN ADAPTED FROM CLASS II PRIVATE STREET REQUIREMENTS IN TABLE 1 - "DESIGN AND CONSTRUCTION STANDARDS FOR STREETS AND PEDESTRIAN WAYS" LOCATED IN SECTION 16.8 OF THE KITTERY SUBDIVISION ORDINANCE.
  - SEE PLAN & PROFILE SHEETS FOR DEVIATIONS FROM TYPICAL SECTION.
  - A WHITE LINE SHALL BE PAINTED TO DELINEATE THE 3' WIDE PAVED WALKWAY.
  - ALL CONSTRUCTION MATERIALS AND METHODS SHALL ADHERE TO ARTICLE 16 OF THE TOWN OF KITTERY SUBDIVISION REGULATIONS AND MAINE DOT STANDARD SPECIFICATIONS.

**TYPICAL ROAD SECTION**  
NOT TO SCALE



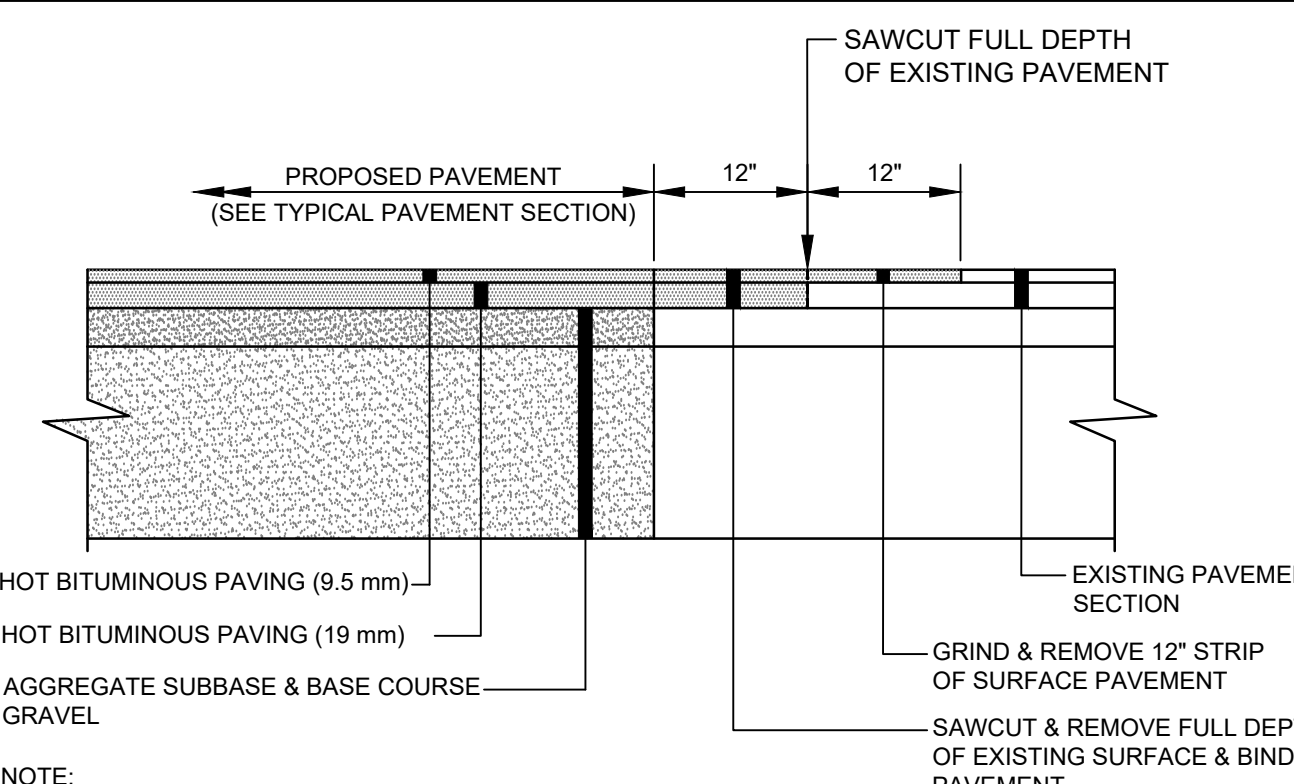
- NOTES:
- MDOT TYPE D AGGREGATE GRADATION SHALL BE MODIFIED FOR A MAXIMUM 4" STONE AND LIMIT #200 SIEVE TO 5% PASSING.

**TYP. DRIVEWAY PAVEMENT SECTION**  
NOT TO SCALE



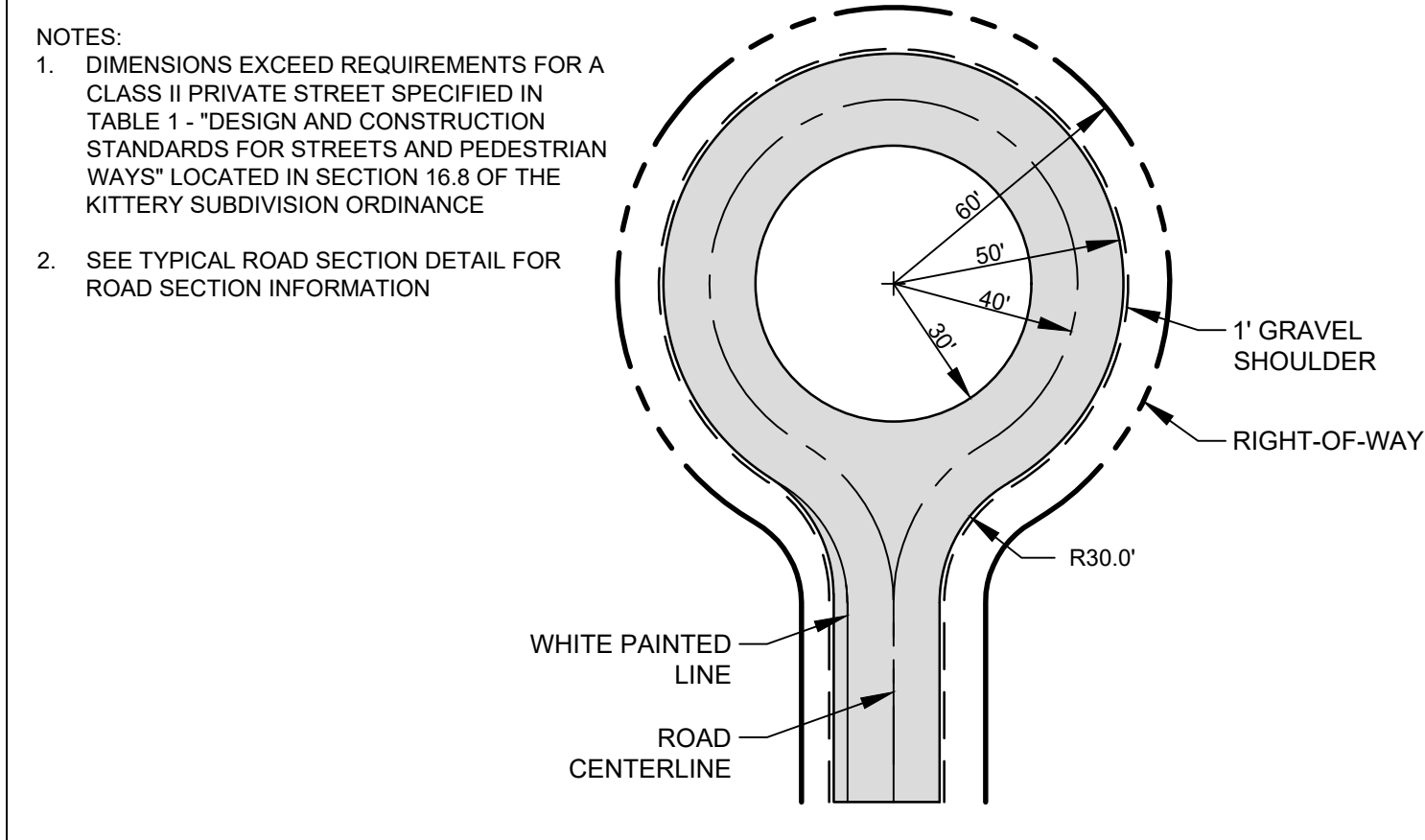
NOTE: REFER TO GRADING PLAN FOR DITCH WIDTH AND SIDE SLOPES

**GRASSED SWALE**  
NOT TO SCALE



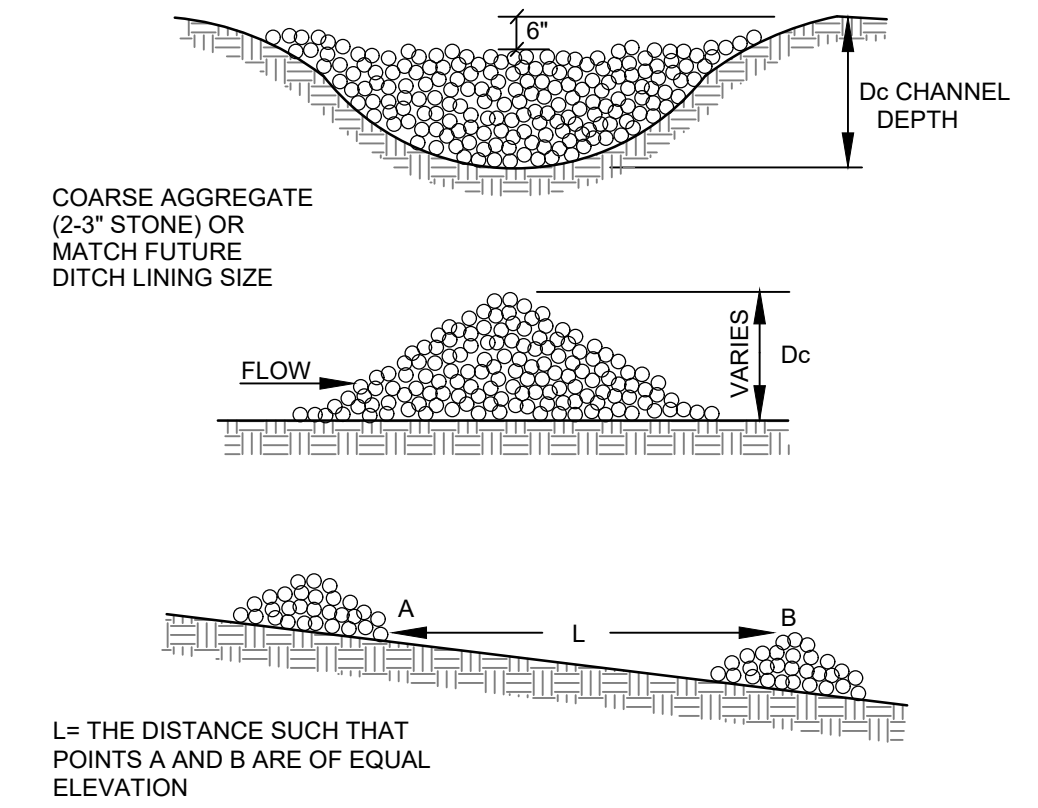
NOTE: CLEAN & APPLY TACK COAT TO SURFACES WHERE NEW BIT. PAVEMENT IS INSTALLED

**TYPICAL PAVEMENT JOINT**  
NOT TO SCALE



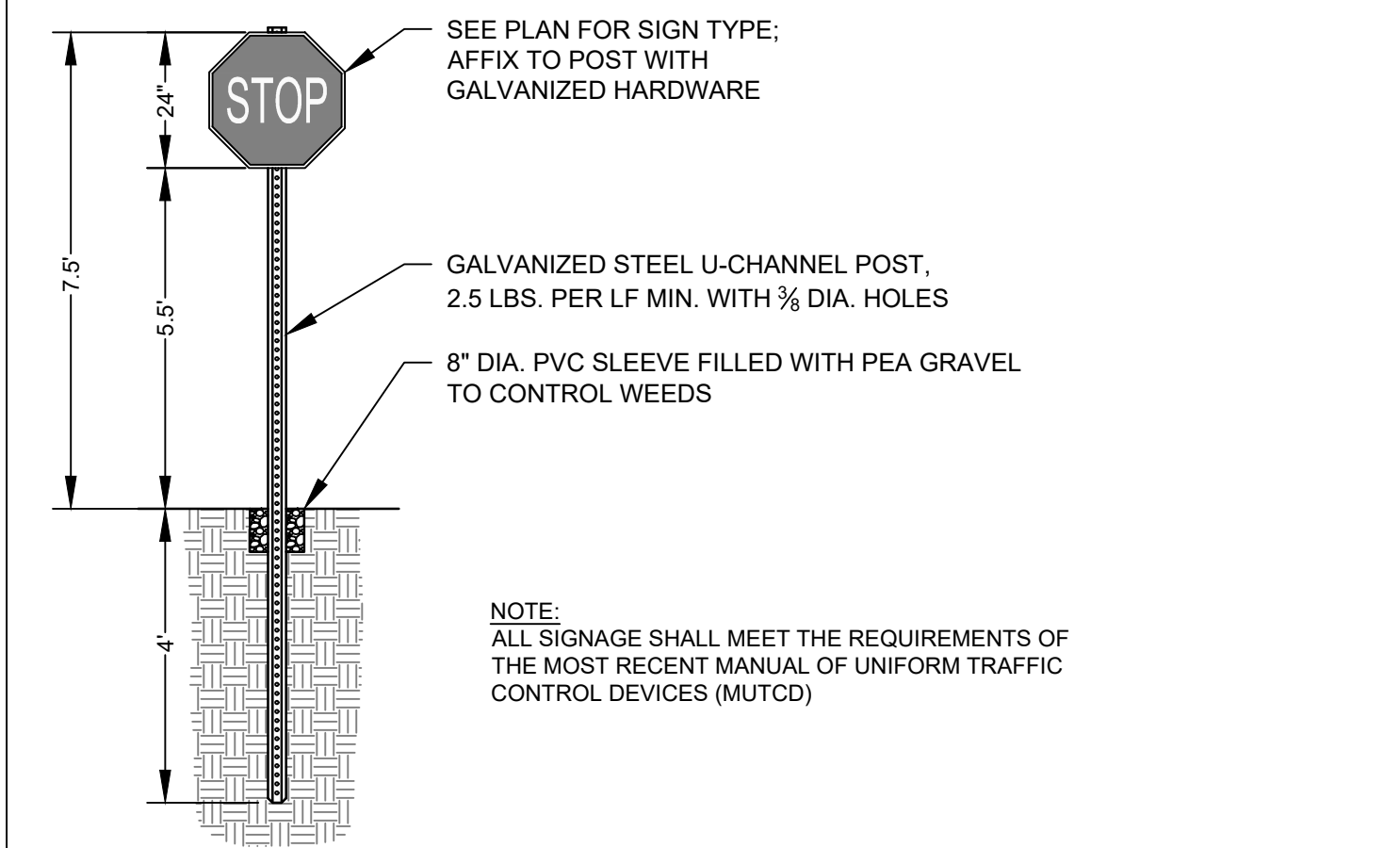
- NOTES:
- DIMENSIONS EXCEED REQUIREMENTS FOR A CLASS II PRIVATE STREET SPECIFIED IN TABLE 1 - "DESIGN AND CONSTRUCTION STANDARDS FOR STREETS AND PEDESTRIAN WAYS" LOCATED IN SECTION 16.8 OF THE KITTERY SUBDIVISION ORDINANCE
  - SEE TYPICAL ROAD SECTION DETAIL FOR ROAD SECTION INFORMATION

**CUL-DE-SAC DIMENSIONS**  
NOT TO SCALE



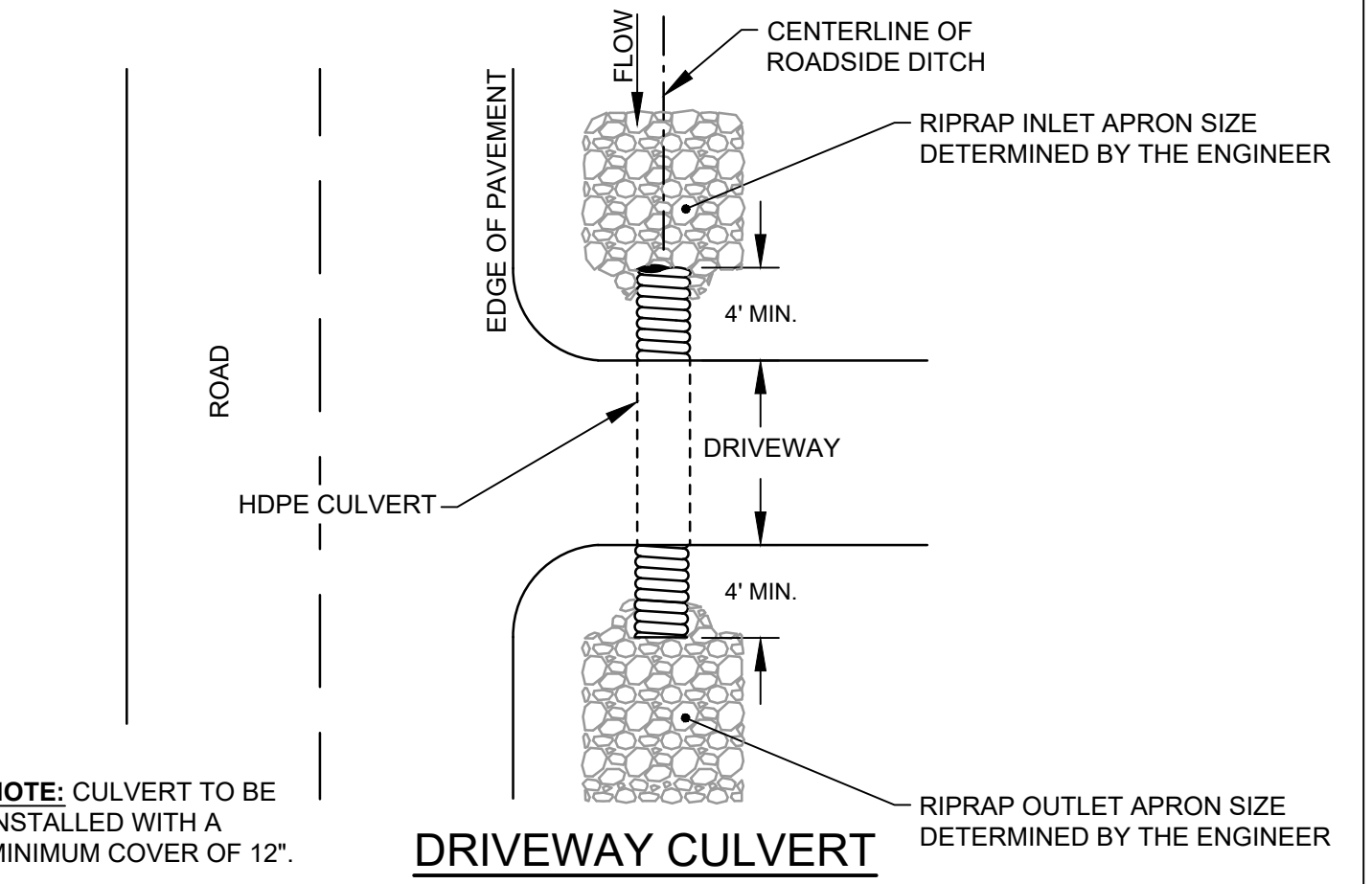
L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

**STONE CHECK DAM**  
NOT TO SCALE



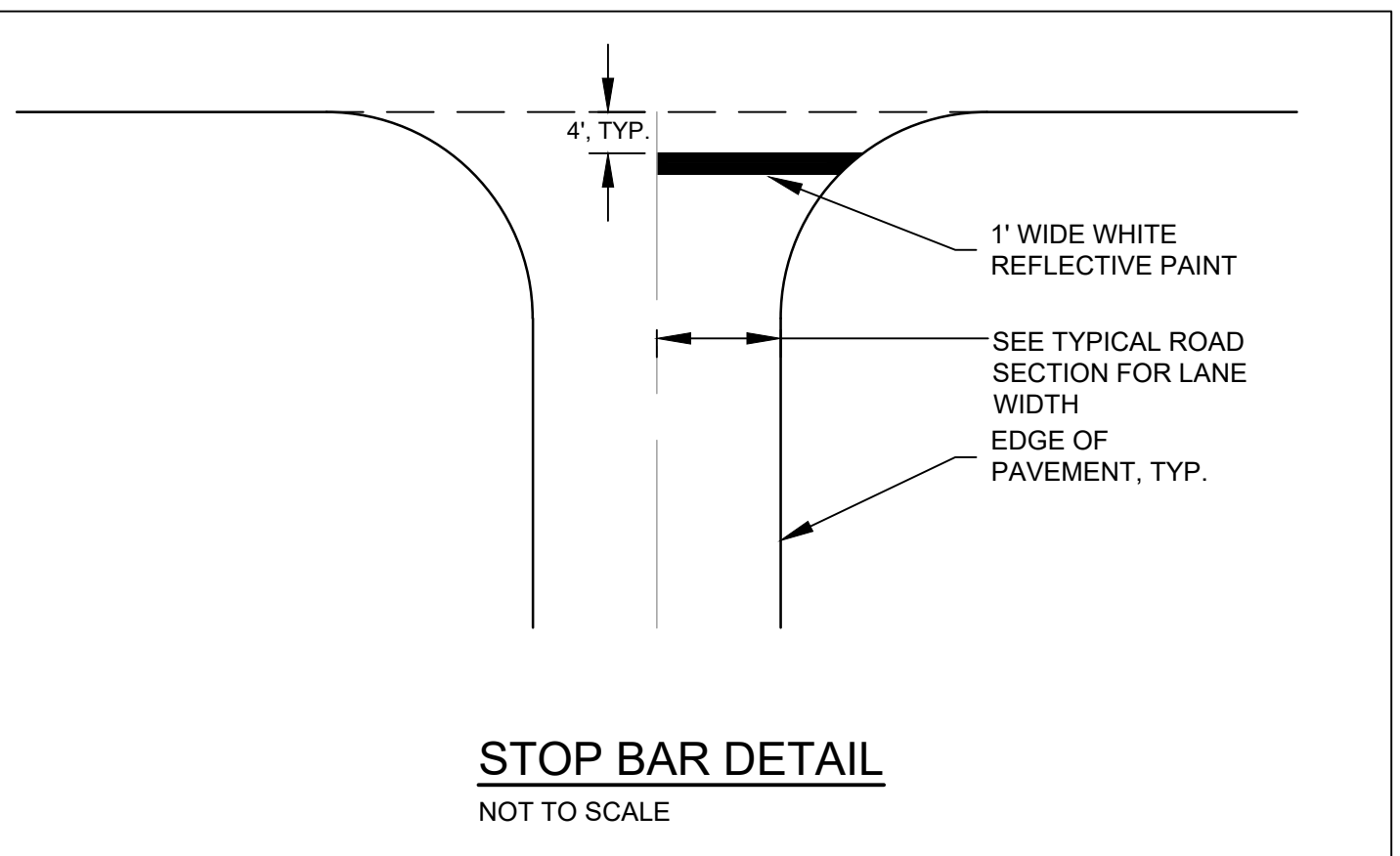
NOTE: ALL SIGNAGE SHALL MEET THE REQUIREMENTS OF THE MOST RECENT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

**STREET SIGN**  
NOT TO SCALE

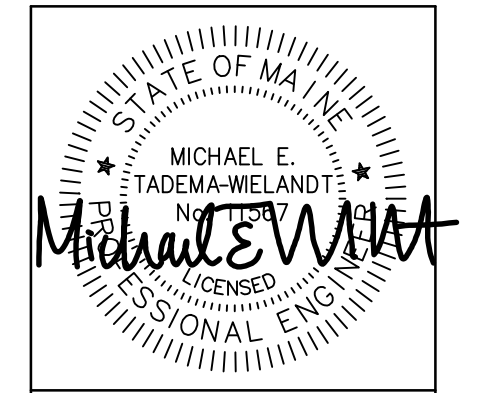


NOTE: CULVERT TO BE INSTALLED WITH A MINIMUM COVER OF 12".

**DRIVEWAY CULVERT**  
NOT TO SCALE



**STOP BAR DETAIL**  
NOT TO SCALE



DATE: 10/10/2023  
P.E.: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
2	8/3/2023	SUBMITTED TO KITTERY FOR PRELIMINARY SUBDIVISION REVIEW

565 CONGRESS STREET  
SUITE 201  
PORTLAND, ME 04102

41 CAMPUS DRIVE  
SUITE 301  
NEW GLOUCESTER, ME 04260

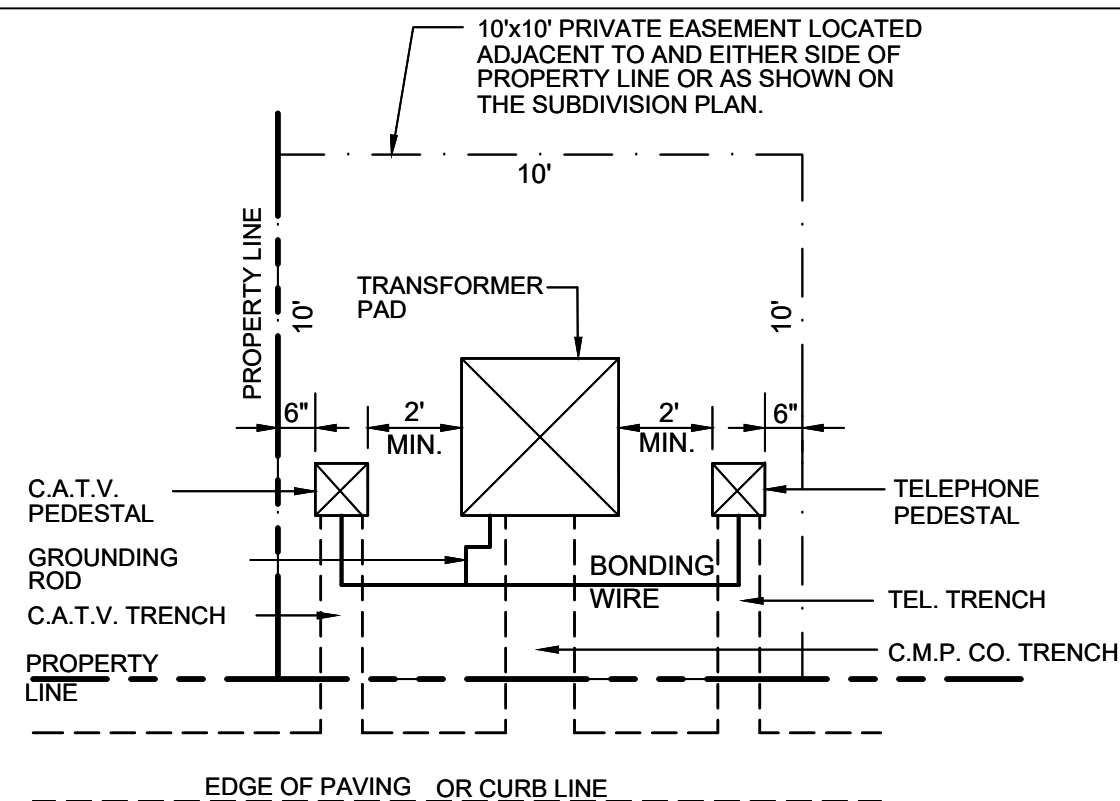
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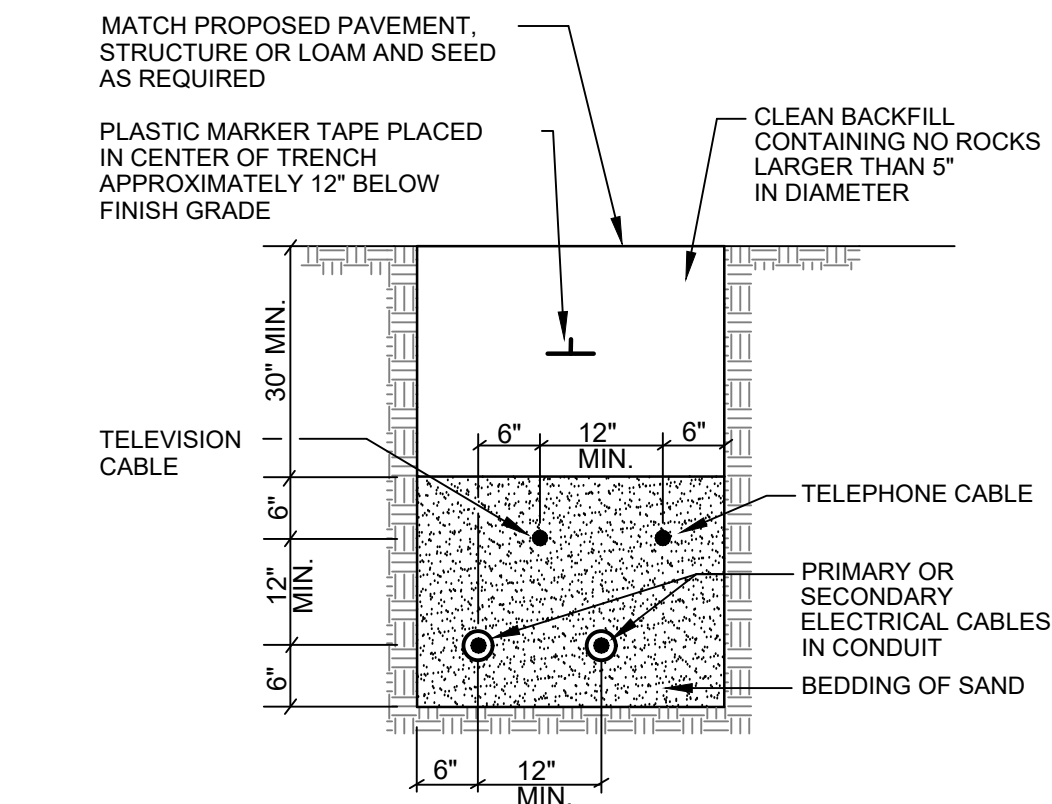
PERMIT DRAWING  
NOT FOR CONSTRUCTION

PROJECT:	BARTLETT ROAD SUBDIVISION KITTERY, MAINE
SHEET TITLE:	SITE DETAILS
CLIENT:	BEACHWOOD DEVELOPMENT FUND P.O. BOX 281 KENNEBUNK, MAINE 04043
DATE:	5/18/2023
SCALE:	AS NOTED
DESIGNED:	MTW
JOB NO.:	22-145
SHEET	C-4.1

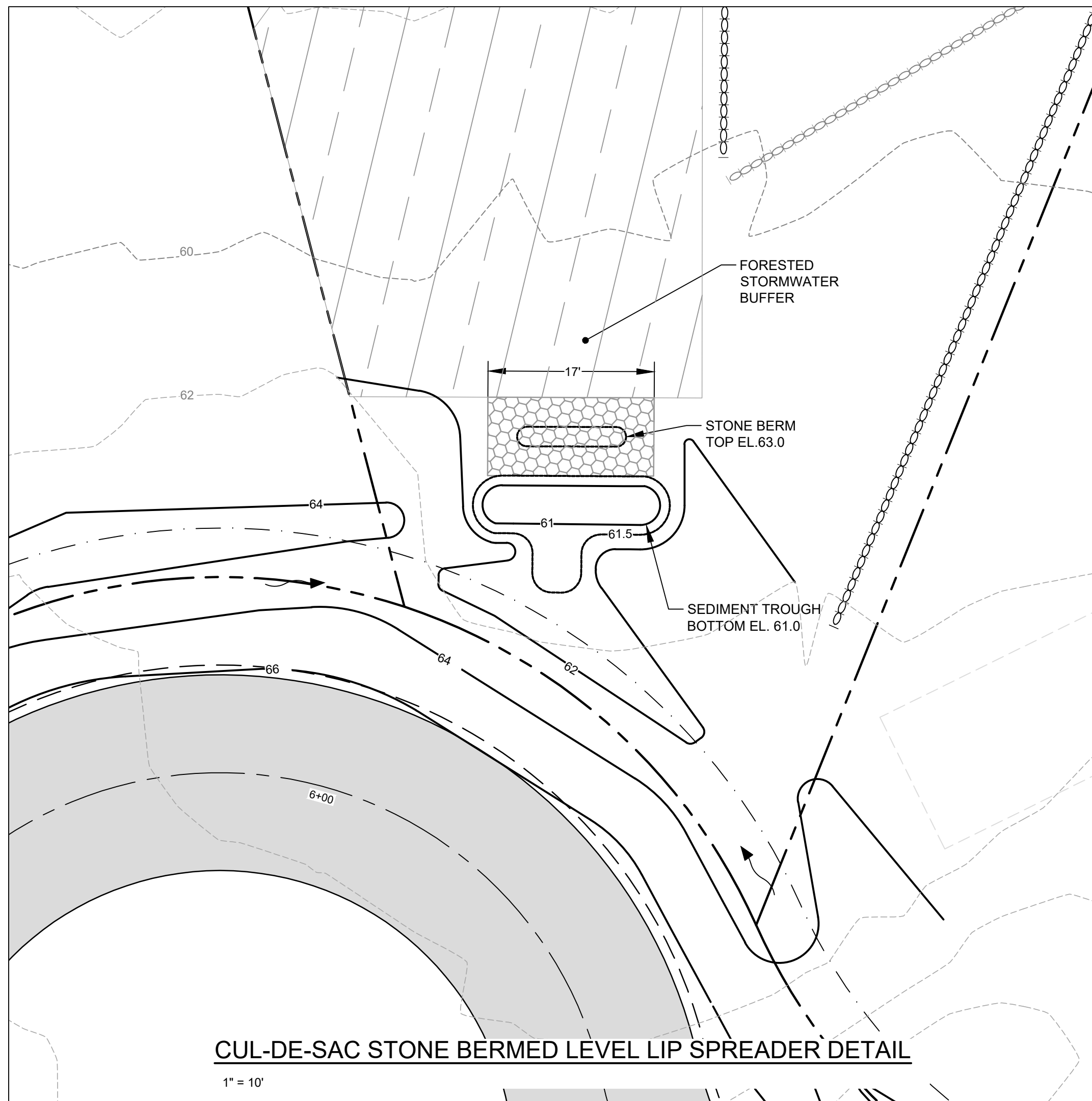




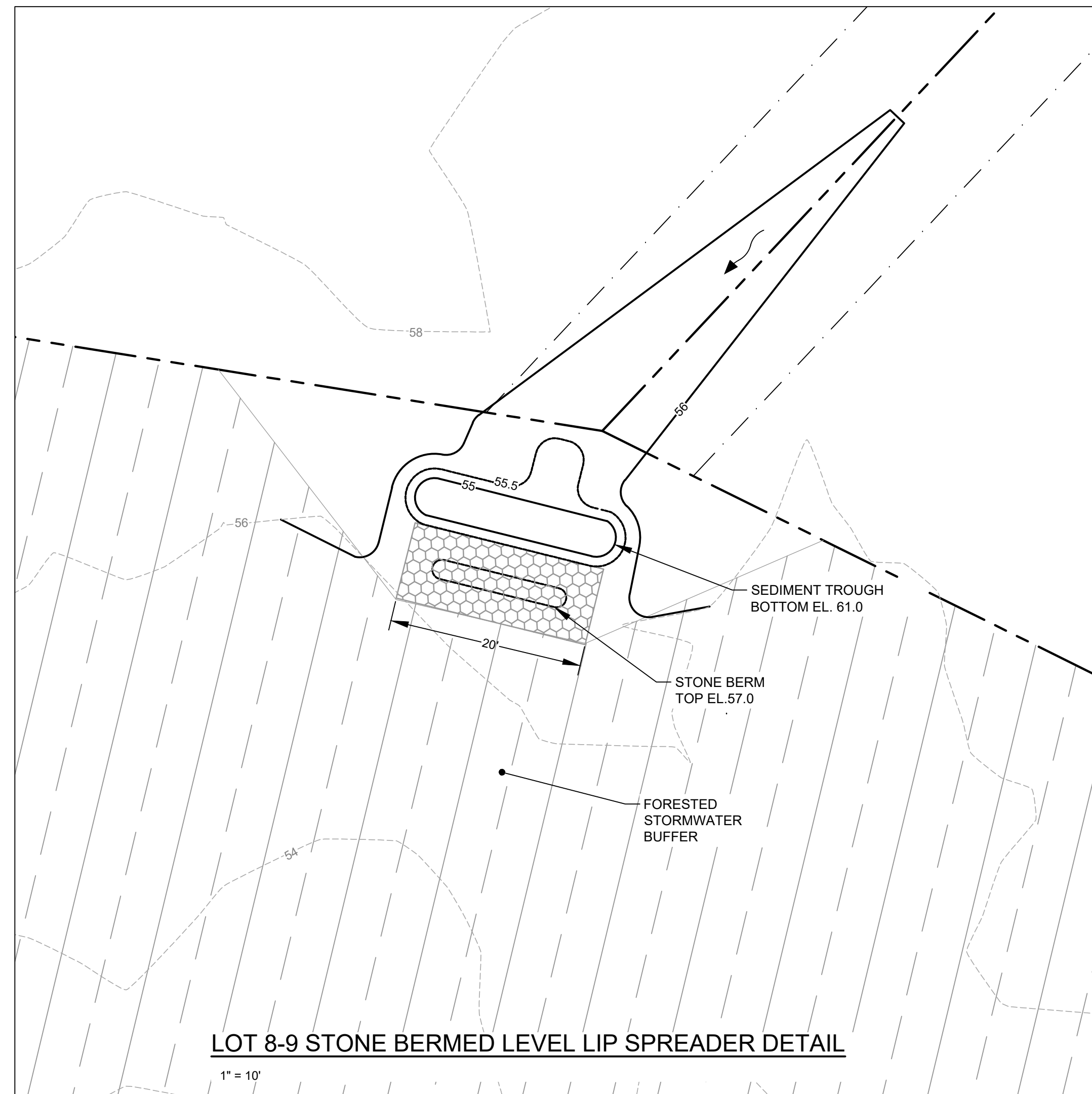
**TRANSFORMER DETAIL**  
NOT TO SCALE



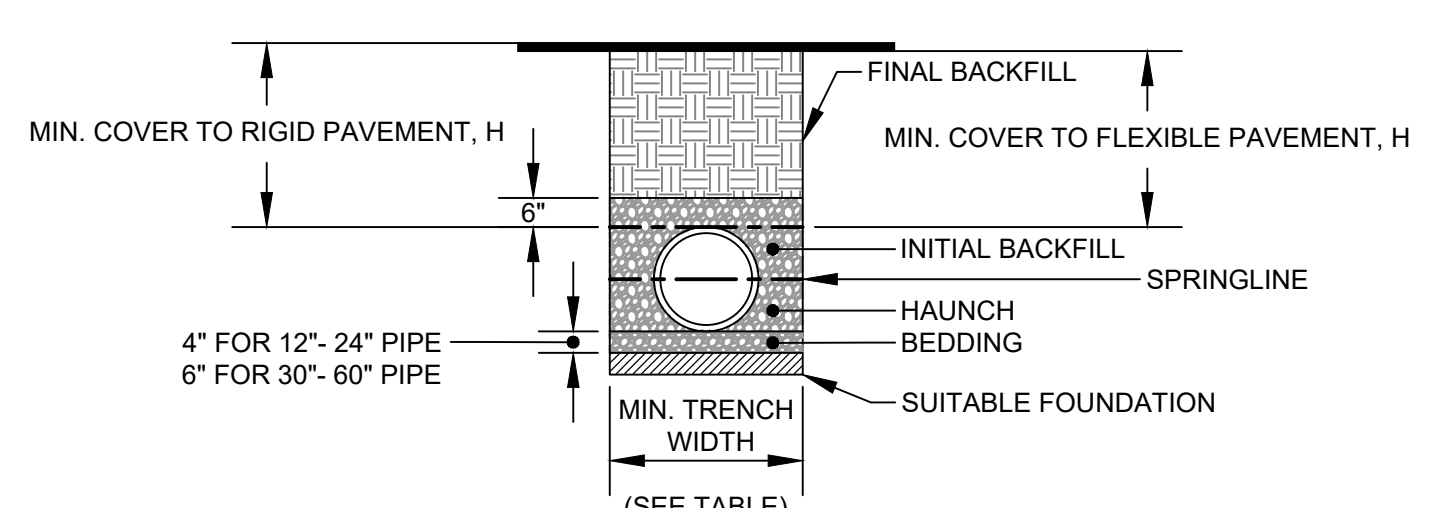
**TYPICAL UNDERGROUND CABLE INSTALLATION**  
NOT TO SCALE



**CUL-DE-SAC STONE BERMED LEVEL LIP SPREADER DETAIL**  
1" = 10'



**LOT 8-9 STONE BERMED LEVEL LIP SPREADER DETAIL**  
1" = 10'



**NOTES:**

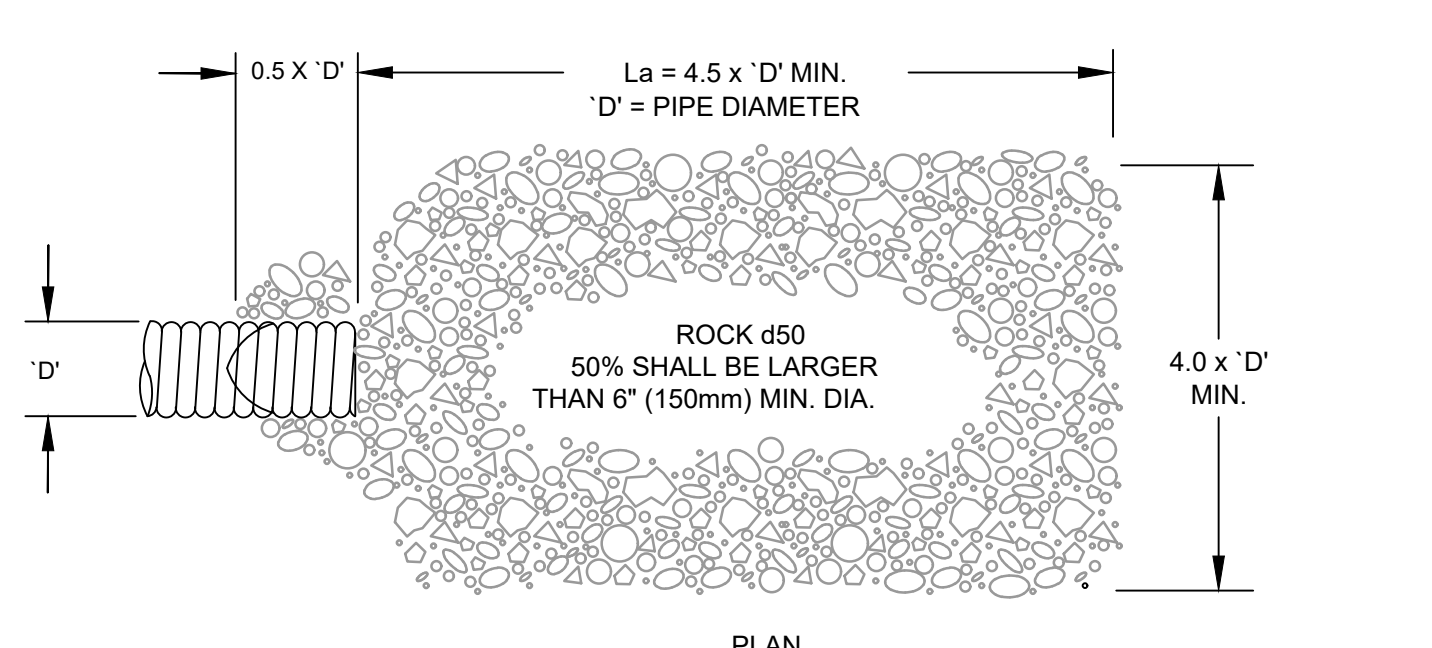
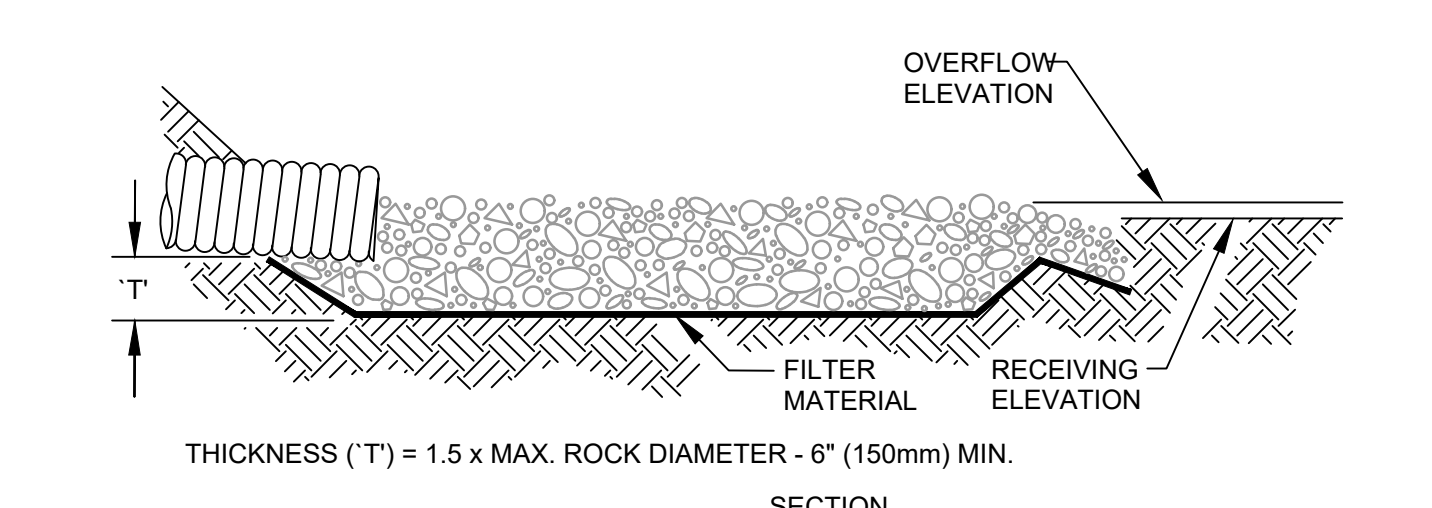
- ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
- MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
- FOUNDATION:** WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
- BEDDING:** SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm), 6" (150mm) FOR 30"-60" (750mm-900mm).
- INITIAL BACKFILL:** SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
- MINIMUM COVER:** MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

SURFACE LIVE LOADING CONDITION		HEAVY CONSTRUCTION (75T AXLE LOAD)*	
PIPE DIAM.	H-25	12"	48"
12" - 48"	12"	12"	48"
54" - 60"	24"	24"	60"

\* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

**TYPICAL TRENCH DETAIL**  
NOT TO SCALE



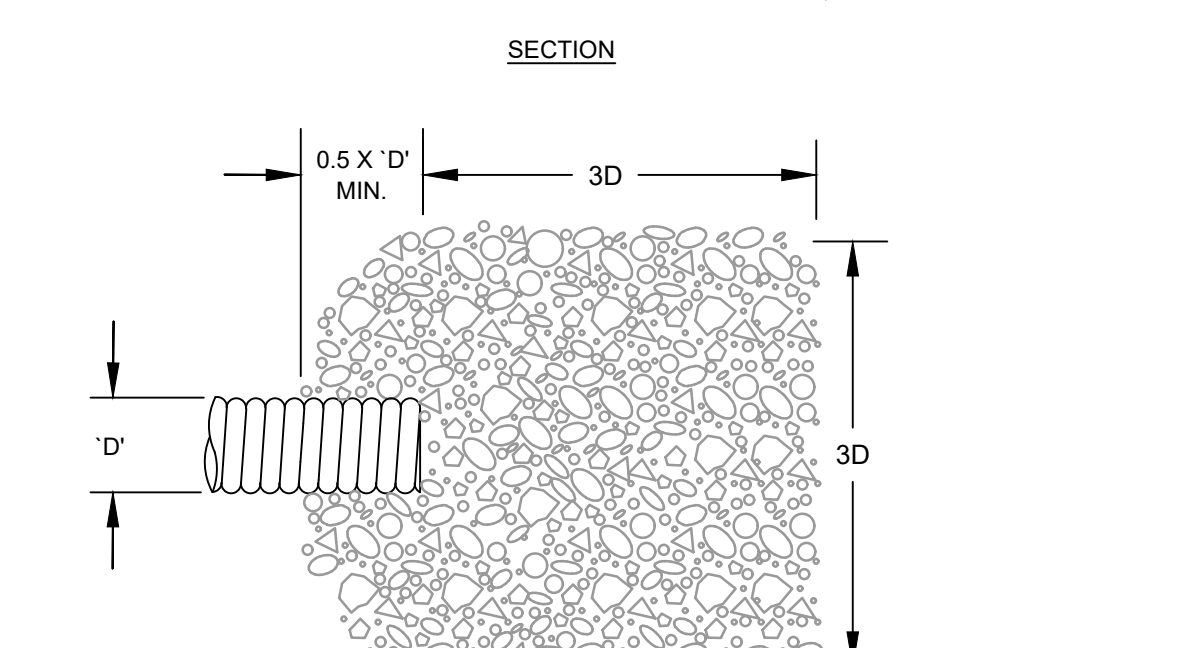
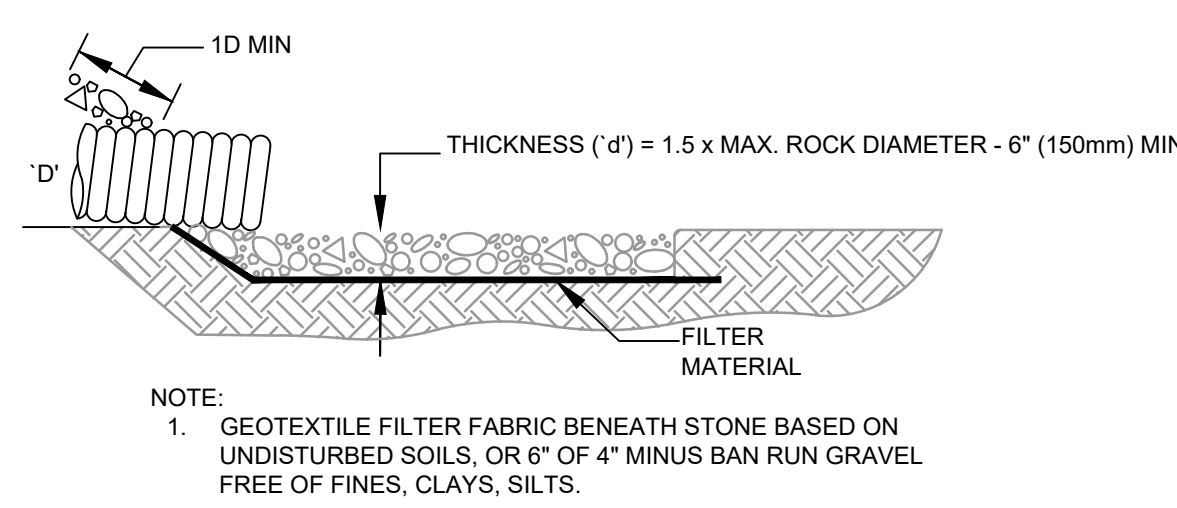
**PIPE OUTLET PROTECTION SIZING TABLE**

PIPE SIZE (IN)	LENGTH (FT)	WIDTH (FT)
6	2.5	2.0
12	5.0	4.0
15	6.25	5.0
18	7.5	6.0
24	10.0	8.0
30	13.0	10.0
36	15.0	12.0
42	17.5	14.0
48	20.0	16.0
60	25.0	20.0

**NOTES:**

- 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
- APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.
- FILTER MATERIAL SHALL BE FILTER FABRIC (MIRAFI 600X OR APPROVED EQUAL) OR 6" (150mm) THICK MINIMUM GRADED GRAVEL LAYER.

**PIPE OUTLET PROTECTION**  
NOT TO SCALE



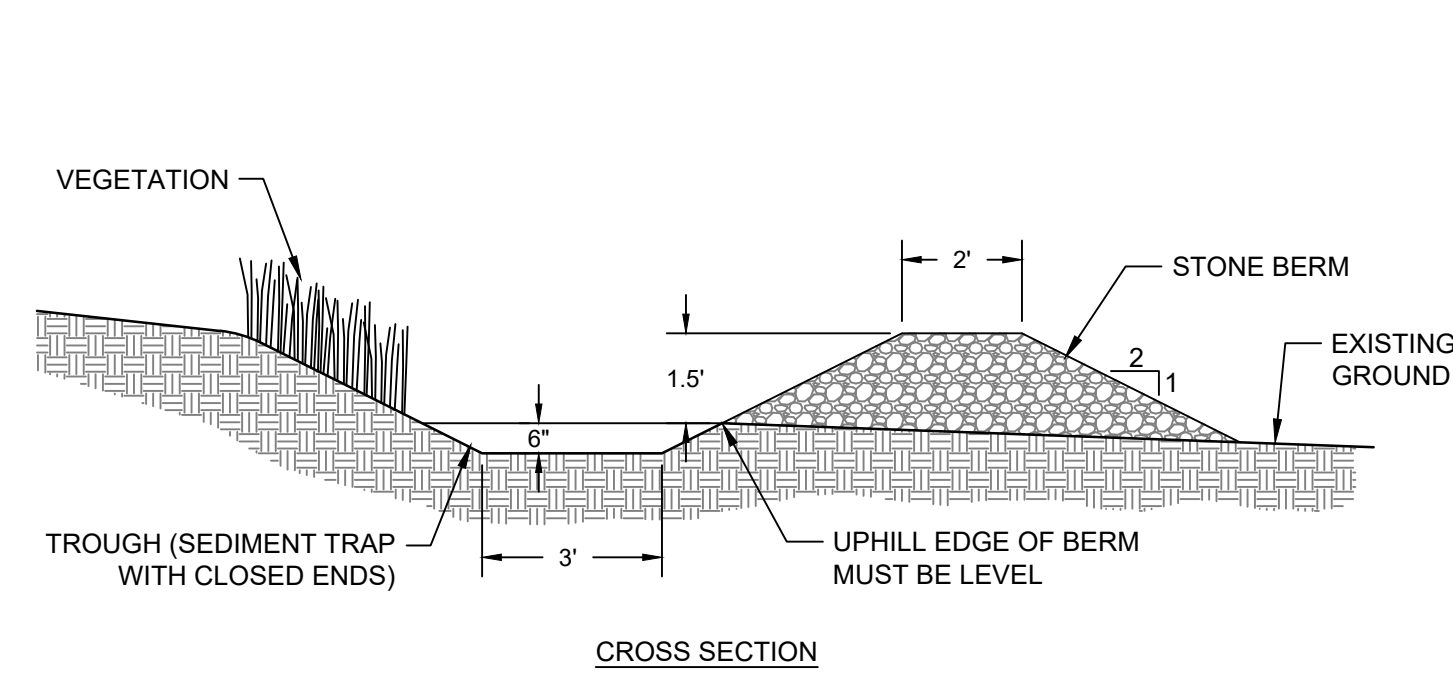
**PIPE INLET PROTECTION SIZING TABLE**

PIPE SIZE (IN)	LENGTH (FT)	WIDTH (FT)
6	2.0	1.5
12	3.5	3.0
15	4.5	3.75
18	5.25	4.5
24	7.0	6.0
30	8.75	7.5
36	10.5	9.0
42	12.25	10.5
48	14.0	12.0
60	17.5	15.0

**NOTES:**

- IN DEFINED CHANNELS, APRON SHALL EXTEND FULL WIDTH OF BOTTOM AND ONE FOOT ABOVE MAX. HEADWATER OR UP TO BANK FULL, WHICHEVER IS LESS.

**PIPE INLET PROTECTION**  
NOT TO SCALE



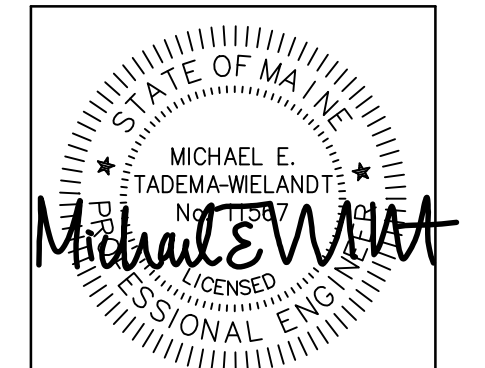
**BERM CONSTRUCTION**

- THE BERM MUST BE WELL-GRADED AND CONTAIN SOME SMALL STONE AND GRAVEL SO THAT FLOW THROUGH THE BERM WILL BE RESTRICTED ENOUGH TO CAUSE IT TO SPREAD OUT BEHIND THE BERM.
- A 6 INCH DEEP TRAPEZOIDAL TROUGH WITH A MINIMUM BOTTOM WIDTH OF 3 FEET MUST BE CONSTRUCTED WITH A LEVEL DOWNHILL EDGE EXCAVATED ALONG THE CONTOUR ON THE UPHILL EDGE OF THE STONE BERM.
- THE STONE MUST BE COARSE ENOUGH THAT IT WILL NOT CLOG WITH SEDIMENT. STONE MUST CONSIST OF SOUND DURABLE ROCK THAT WILL NOT DISINTEGRATE BY EXPOSURE TO WATER OR WEATHER. FIELDSTONE, ROUGH QUARRIED STONE, BLASTED LEDE ROCK OR TAILINGS MAY BE USED. THE ROCK MUST BE WELL GRADED WITH A MEDIAN SIZE OF APPROXIMATELY 3 INCHES AND A MAXIMUM SIZE OF 6 INCHES PER THE FOLLOWING TABLE.

**BERM STONE SIZE**

SIEVE	% PASSING BY WEIGHT
12"	100%
6"	84% - 100%
3"	68% - 83%
1"	42% - 55%
NO. 4	8% - 12%

**STONE BERMED LEVEL LIP SPREADER**  
NOT TO SCALE



DATE: 10/10/2023  
P.E. MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
2	10/10/2023	REVISED BASED ON PEER REVIEW COMMENTS
1	8/3/2023	SUBMITTED TO KITTERY FOR PRELIMINARY SUBDIVISION REVIEW
		APP'D BY
		MTW
		APP'D BY
		NO.

565 CONGRESS STREET  
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41 CAMPUS DRIVE  
SUITE 301  
NEW GLOUCESTER, ME 04260



PERMIT DRAWING  
NOT FOR CONSTRUCTION

PROJECT: BARTLETT ROAD SUBDIVISION  
KITTERY, MAINE  
SHEET TITLE: DRAINAGE & UTILITY DETAILS  
CLIENT: BEACHWOOD DEVELOPMENT FUND  
P.O. BOX 261  
KENNEBUNK, MAINE 04043

DATE: 5/18/2023  
SCALE: AS NOTED  
DESIGNED: MTW  
JOB NO.: 22-145  
SHEET: C-4.2



10/10/2023

Project #22-145

Maxim Zakian  
Town of Kittery  
200 Rogers Road  
Kittery, Maine 03904

**SUBJECT: BARTLETT ROAD SUBDIVISION  
RESPONSE TO PEER REVIEW COMMENTS**

Dear Max:

Our office received review comments for the above referenced project from Jodie Bray Strickland, P.E., peer review engineer, dated September 2023. We have reviewed the comments and have prepared the following responses. For clarity, each comment is repeated in italics, followed by our response.

**16.4 Zoning Regulations**

*Comment 1: 16.4.13 Residential-Urban(R-U)  
The proposed use (dwelling, single family) is a permitted use, and a conservation residential development is specifically included in the permitted uses.*

*The project conforms to all zoning standards.*

Response: No Response Necessary

**16.5 General Development Requirements**

*Comment 2: 16.5.9 Conservation of Wetlands Including Vernal Pools*

*The vernal pools on site are not significant per a letter from Maine Department of Environmental Protection dated July 5, 2023. There are no proposed alterations to the wetlands on site. A portion of the cul-de-sac is constructed within the wetland buffer. We note that if the cul-de-sac were shifted west then the setback to the wetland could be increased.*

Response: Terradyn Consultants studied the possibility of shifting the cul-de-sac to the west to increase the setback to the wetland, but this would negatively impact the viability of Lots 6 and 7.

**Comment 3:** 16.5.18 Net Residential Acreage

*The applicant has presented calculations to show that the net residential acreage allows 14 dwelling units. The applicant is proposing 9 dwelling units.*

**Response:** No Response Necessary.

### **16.5.27 Streets and Pedestrianways/Sidewalks Site Design Standards**

**Comment 4:** 16.5.27.H.(4) *The site distance in both directions on Bartlett Road should be indicated on the plans.*

**Response:** Site distance information for the proposed road has been added to the Subdivision Plan (Sheet C-3.0) and the Plan & Profile (Sheet C-3.1).

## **16.8 SUBDIVISION REVIEW**

### **16.8.10 Performance Standards and Approval Criteria**

#### **16.8.10.D. Sewage Disposal**

**Comment 5:** 16.8.10.D.2.(a) *The developer Will need to submit plans for the subsurface wastewater disposal systems.*

**Response:** Additional information on proposed wastewater disposal systems will be provided under separate cover.

**Comment 6:** 16.8.10.D.2.(d)[1]. *Test pits on Lots 3,4,6 and 7, have limiting factors within 24". Reserve disposal locations should be shown on each lot*

**Response:** Additional information on proposed wastewater disposal systems will be provided under separate cover.

#### **16.8.10.E. Stormwater and Surface Drainage**

**Comment 7:** *The nodes on the pre- and post-development routing diagrams should be labeled to be consistent with watershed plan notes. For example, the notes describe study points flowing to Brave Boat Harbor and Spruce Creek, but it's unclear in the routing diagram which nodes correspond to which outlets.*

**Response:** The pre- and post-development models have been updated to correspond with the notes on the watershed plans.

**Comment 8:** *Pre-development and post-development curve numbers are both 76. With the proposed houses, driveways, and road, the post-development curve number should be higher.*

**Response:** The Post-development model was reviewed, and several areas of proposed lot development were adjusted to more accurately reflect the proposed condition. The curve number of the overall study area increases from 76 in the pre-development model to 77 in the post-development model. The small increase is due to the fact that the proposed development area (4.9 acres including lot development) is small compared to the overall study area (55.3 acres).

**Comment 9:** *The post-construction peak rates of runoff appear to be mitigated by the inaccurate use of reaches in the form of large swales. The plans do not show any proposed swales where reaches are called for, so they cannot be used to lower peak rates.*

**Response:** Several areas of proposed development were delineated as separate subcatchments because they are hydrologically dissimilar to the larger, undeveloped subcatchments that make up much of the perimeter of the area included in the study. The overland flow from these upstream subcatchments is modeled using reaches with wide bottoms and very low side slopes. This is a common method of modeling that is supported by the HydroCAD reference documentation. The reach definitions were reviewed and revised to better reflect the on-site conditions.

**Comment 10:** *The drainage design should be revised to model pipe SD-1, which flows under the proposed road at its intersection with Bartlett Road.*

**Response:** Pipes SD-1 and SD-2 were not included in the post-development stormwater model, as they will have a negligible effect on the post-development peak rates of runoff, and adding complexity to the model affect its accuracy. However, capacity of the pipes was verified using HY-8 software. Calculations for both pipes are included in the updated stormwater report.

#### **16.8.10.G. Vehicular Traffic**

**Comment 11:** *16.8.10.G.(3)(a) The sight distances on Bartlett Road should be shown on the plans.*

**Response:** Site distance information for the proposed road has been added to the Subdivision Plan (Sheet C-3.0) and the Plan & Profile (Sheet C-3.1).

#### **16.8.10.J. Prevention of Erosion**

**Comment 12:** *16.8.10.J.(1)(a) Does excavation occur in the Resource protection overland zone? If so, a responsible person for management of erosion and sedimentation control practices will need to be defined during construction.*

**Response:** Excavation is not expected to occur in the Resource Protection Overland Zone.

## **PLANS**

### **Cover Sheet**

*Comment 13: General Note 6 has a spelling error in the word "Maine".*

Response: General Note 6 has been updated to correct the spelling error.

*Comment 14: General Note 7 has a grammatical error with the word "is".*

Response: General Note 7 has been updated to correct the grammatical error.

*Comment 15: Several of the plan set names in the Sheet Index are different than those listed on the plans.*

Response: Sheet Index names have been updated

### **Existing Conditions Plan**

*Comment 16: The test pit locations should be numbered. Where is the corresponding test pit information?*

Response: All current test pits and labels have been added to the Existing Conditions Plan, corresponding to the Test Pit Logs previously submitted in Attachment 4 of the preliminary subdivision application.

*Comment 17: There are items in the legend that do not apply to the plan.*

Response: No Response Necessary

*Comment 18: The Resource Protection Overlay Zone should be shown on the plan.*

Response: The Resource Protection Overlay Zone has been added to the plan.

*Comment 19: The plan should be stamped by the wetland delineation professional.*

Response: The wetland delineation was certified by the wetland delineation professional and provided in attachment 6 of the preliminary application package. Reference to the wetland delineation is made in Note 10 of the plan.

### **Sheet C-2.0 Existing Conditions & Demolition Plan**

*Comment 20: The wetland boundary on Lot 26A should be shown.*

Response: Lot 26A is private property not controlled by the applicant. No permission has been granted by the landowner to access their land.

*Comment 21: Based on proposed grading and utilities on Sheet C-3.1, more than 46 feet of stone wall will need to be removed.*

Response: The extent of stone wall removal has been revised and is noted on sheet C-2.0.

#### Sheet C-3.0 Subdivision Plan

*Comment 22: The lines of sight should be shown on the Plan.*

Response: The lines of sight for the proposed road have been added to the Subdivision Plan.

*Comment 23: Note 4 lists the proposed minimum lot area as 25,000 SF but Lots 1, 2 and 6 are less than that. Please clarify.*

Response: The proposed minimum lot size has been changed to 20,000 SF. Per section 16.10.3 of the Kittery Land Use and Development Code for a Conservation Subdivision, the Planning Board has the ability to modify dimensional standards including lot area.

*Comment 24: The Open Space Requirements calculations in Note 7 do not add up or correspond to calculations in Note 6. Please clarify.*

Response: The open space requirement calculations in Note 7 have been updated.

#### Sheet C-3.1 Plan & Profile

*Comment 25: The test pit numbers and locations appear to be different than those in the Class A High Intensity Soil Survey. Please clarify.*

Response: Test pits TP-1 through TP-24 were performed for the High Intensity Soil Survey. Test pits TP-25 through TP-46 were performed to provide additional soils data to show adequacy of soils to support subsurface wastewater disposal on proposed lots.

*Comment 26: Test pits on Lots 3, 4, 6 and 7, have limiting factors within 24". A second disposal location should be shown on each lot.*

Response: Additional information on wastewater disposal will be provided under a separate cover.

*Comment 27: The right-of-way width should be shown on the plan.*

Response: The right-of-way width is noted on sheet C-3.0

*Comment 28: The lines of sight on Bartlett Road should be shown.*

Response: Site distance information for the proposed road has been added to the Subdivision Plan (Sheet C-3.0) and the Plan & Profile (Sheet C-3.1).

*Comment 29: Proposed well locations and protective well radii should be shown on the plan.*

Response: Additional information on wastewater disposal and well locations will be provided under a separate cover.

*Comment 30: Silt fence and proposed tree lines run through the proposed level spreader. Adjust both lines so they go around the proposed work.*

Response: The silt fence and proposed tree line have been adjusted in the area of the proposed level spreader.

*Comment 31: This plan has multiple purposes (plan and profile, grading and drainage, erosion control and utilities) with overlapping linetypes that make it difficult to read. Separating these onto several plans would make the plans more legible.*

Response: The plan and line types have been updated to make the plan more legible.

#### Sheet C-4.0 Erosion Control Notes & Details

*Comment 32: General Housekeeping Note 7 references the “department” and “Appendix C”. Do these apply to this project?*

Response: The applicant will file a Stormwater Permit-by-Rule with the Maine Department of Environmental Protection (MDEP) for the project. The “department” refers to the MDEP and “Appendix C” refers to MDEP Chapter 500.

#### Sheet C-4.1 Site Details

*Comment 33: The Typical Road Section and Typ. Driveway Pavement Section reference different pavement mixes. Is this the intent?*

Response: This detail has been updated for both sections to use the same mix.

*Comment 34: Does the Town of Kittery require lane joint adhesive at the pavement joint in Bartlett Road (only tack coat is specified)?*

Response: The contractor will follow all roadway construction requirements of the Town of Kittery.

*Comment 35: "Installed" is misspelled in the Driveway Culvert detail.*

Response: This has been updated.

*Comment 16: The plans should provide a stop signal.*

Response: A stop sign detail has been added to Sheet C-4.1

*Comment 37: The plans should provide a striping detail.*

Response: A stop bar stripe detail has been added to sheet C-4.1

We trust that the above responses and attached materials address the comments. Please contact me directly with additional questions or concerns.

Sincerely,  
**TERRADYN CONSULTANTS LLC**



Michael E. Tadema-Wielandt, P.E.  
Vice President

cc. Geoff Bowley, Beachwood Development Fund, LP





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info@terradynconsultants.com  
www.terradynconsultants.com

**BARTLETT ROAD SUBDIVISION**  
77 BARTLETT ROAD, KITTERY, MAINE

# **STORMWATER MANAGEMENT REPORT**

**PREPARED FOR:**

BEACHWOOD DEVELOPMENT FUND LP  
P.O. BOX 261  
KENNEBUNK, MAINE 04043

**PREPARED BY:**

TERRADYN CONSULTANTS LLC  
565 CONGRESS STREET, SUITE 201  
PORTLAND, MAINE 04101

October 2023

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**Pineland**  
41 Campus Drive, Suite 301  
New Gloucester, ME 04260

**Portland**  
565 Congress Street, Suite 201  
Portland, ME 04101

**Auburn**  
95 Main Street, 2<sup>nd</sup> Floor  
Auburn, ME 04210

## **Introduction**

The following Stormwater Management Plan has been prepared for Bartlett Road Subdivision to evaluate stormwater runoff and erosion control for the proposed 9-lot subdivision.

## **Site Calculations**

Below is a summary of existing and proposed impervious and developed areas on the project site.

Total Property Area	19.30 Ac (+/-)
Existing Impervious Area	0.18 Ac
Existing Developed Area	0.44 Ac
Proposed New Impervious	0.43 Ac
Proposed New Developed	0.93 Ac
Total Impervious Area	0.56 Ac
Total Developed Area	1.19 Ac

## **Existing Conditions**

The project site is approximately 19.30 acres in size and is identified as Lot 26 on Kittery Tax Map 62. The site is located in the Residential-Rural District with a small area in the Resource Protection Overlay Zone.

The parcel contains an existing single-family home with a paved driveway connecting to Bartlett Road and a small cemetery in the eastern part of the site. Most of the parcel is undeveloped woodland with pockets of freshwater wetlands. Several stone walls are located throughout the site.

A wetland and vernal pool study was conducted on the site by Longview Partners in the summer of 2022. There are approximately 2 acres of forested freshwater wetlands on the site. A wetland on the southern site boundary meets the Maine DEP's criteria for a "Wetland of Special Significance". This wetland also has a mapped flood zone associated with it.

Two potential vernal pools were identified on the site and studied in the spring of 2023 to determine if they have characteristics to be considered significant wildlife habitat by the Maine Department of Environmental Protection. The vernal pools were determined to be not significant and are regulated as freshwater wetlands.

Longview Partners also conducted a High Intensity Soil Survey of the site. Native soils are primarily loamy glacial till and bedrock outcrops in upland areas with wetland soils in low-lying areas. A copy of the High Intensity Soil Survey is attached herein.

The site is generally bisected by two ridgelines, sloping gradually at approximately 2%. Stormwater from the site is split by the ridges and flows in four directions toward the on site wetlands.

The following existing conditions figures are provided in Appendix 1:

Figure 1	USGS Topographic Map
Figure 2	Aerial Photograph
Figure 3	NRCS Medium Intensity Soil Survey
Figure 4	Federal Insurance Rate Map
Figure 5	Aquifer Map

### **Proposed Project**

The proposed project includes of a 808' long dead-end road with 9 proposed house lots. The project will have 13.14 acres of open space surrounding the development. Each proposed lot ranges in size from 0.49 acres to 0.79 acres and meets all dimensional standards of the town's zoning ordinance. The existing house will occupy Lot 8 and will be accessed from the proposed road.

Lots will be served by public water and individual subsurface wastewater disposal systems.

### **Applicable Design Standards**

The Town of Kittery's Ordinance Title 16, Part E, Section 4-a Stormwater runoff requires: *All components of the stormwater management system must be designed to limit peak discharge to predevelopment levels for the two-year and twenty-five-year, twenty-four-hour duration, frequencies, based on the rainfall data for Portsmouth, NH.*

The project includes 0.43 Ac. of new impervious area and 0.93 Ac. of new developed area and does not require a stormwater permit-by rule in compliance with MDEP Chapter 500.

### **Stormwater Quantity Control**

Stormwater Quantity control is required as part of town requirements for this project; the proposed development has been designed to minimize stormwater runoff from the site in excess of the natural pre-development conditions. A hydrologic analysis of pre-development and post-development conditions was conducted based upon the methodology contained in the USDA Soil Conservation Service's Technical Releases No. 20 and 55 (SCS TR-20 and TR-55). For Portsmouth, New Hampshire a 24-hour SCS Type III Storm distribution was used for the analysis using the following storm frequencies and rainfall amounts, per Maine DEP Chapter 500:

<b>Storm Event</b>	<b>24-Hour Rainfall</b>
2-Year Storm	3.3 inches
10-Year Storm	4.9 inches
25-Year Storm	6.2 inches

Runoff curve numbers, time of concentration, and travel time data were established based on methods outlined in the USDA TR-55 manual.

A minimum time of concentration of 5 minutes and a maximum sheet flow distance of 150 linear feet was used in the models.

### **Pre-Development Conditions**

The pre-development HydroCAD model includes five (5) subcatchments and five (5) study points. Below is a summary of the study points:

Study Point SP1 – Study Point 1 is the eastern parcel boundary where on site flow travels through culvert under the southern section of Lynch Lane and to Brave Boat Harbor.

Study Point SP2 – Study Point 2 is the southern parcel boundary outletting through a culvert under Bartlett Road, to Smith Brook and to Brave Boat Harbor.

Study Point SP3 – Study Point 3 is the southern boundary where on site flow collects in a wetland and travels through a culvert under Bartlett Road and to Brave Boat Harbor.

Study Point SP4 – Study Point 4 is the western site boundary where on site flow collects in a wetland and travels to Spruce Creek.

Study Point SP5 – Study Point 5 is the eastern parcel boundary where on site flow travels through culvert under the northern section of Lynch Lane and to Brave Boat Harbor.

A Pre-Development Watershed Map, showing sub-watershed boundaries, time of concentration flow paths, and Study Points is provided in Appendix 5. The Pre-development HydroCAD model is attached in Appendix 6.

Existing condition peak rates of runoff at the Study Points are as follows:

<b>Pre-Development Peak Rates of Runoff (cfs)</b>			
	<b>2-Year</b>	<b>10-Year</b>	<b>25-Year</b>
SP1	1.98	4.21	5.60
SP2	2.52	5.49	7.35
SP3	8.49	18.53	24.81
SP4	5.90	12.92	17.33
SP5	5.18	11.02	14.64

The pre-development peak rates of runoff are a baseline used for comparison to the post-development condition.

#### Post-Development Conditions

Stormwater runoff from the roadway will be managed with open ditches and level lip spreaders. The project was designed to meet the stormwater performance standards of the Town of Kittery Subdivision Regulations. Runoff from the cul-de-sac will be discharged to a level spreader and forested stormwater buffer for treatment. From the high point located at the cul-de-sac runoff down to approximate station 3+15 stormwater is treated by a level spreader, distributing flow to a forested buffer. The remainder of the proposed road will drain to vegetated swales located on either side of the road, which will provide an opportunity for sediment capture and runoff absorption. The stormwater management system will attenuate peak flow rates from the developed areas so peak discharge rates from the site will be limited to pre-development levels.

The proposed post-development HydroCAD model includes fourteen (14) subcatchments and five (5) study points. The study points remain the same from the pre-development model. A Post-development Watershed Map showing sub-watershed boundaries, time of concentration flow paths, and Study Points is provided in Appendix 5. The Post-development HydroCAD model is attached in Appendix 7.

Post-development peak rates of runoff at the Study Points are as follows:

<b>Post-Development Peak Rates of Runoff (cfs)</b>			
	<b>2-Year</b>	<b>10-Year</b>	<b>25-Year</b>
SP1	1.81	4.11	5.57
SP2	2.51	5.24	6.92
SP3	8.41	17.97	23.91
SP4	5.87	12.68	16.94
SP5	4.56	10.22	13.97

### Peak Flow Analysis

The results of the pre-development and post-development models were analyzed at the defined Study Points described above. The direct comparison of the pre-development and post-development conditions at the Study Points are as follows:

<b>Peak Runoff Flow Rates Comparison</b>		
<b>Storm Event</b>	<b>Pre-Development (cfs)</b>	<b>Post-Development (cfs)</b>
<b>Study Point SP1</b>		
2-Year	1.98	1.81
10-Year	4.21	4.11
25-Year	5.60	5.57
<b>Study Point SP2</b>		
2-Year	2.52	2.51
10-Year	5.49	5.24
25-Year	7.35	6.92
<b>Study Point SP3</b>		
2-Year	8.49	8.41
10-Year	18.53	17.97
25-Year	24.81	23.91
<b>Study Point SP4</b>		
2-Year	5.90	5.87
10-Year	12.92	12.68
25-Year	17.33	16.94
<b>Study Point SP5</b>		
2-Year	5.18	4.56
10-Year	11.02	10.22
25-Year	14.64	13.97

The peak rates of runoff at all five study points are expected to decrease slightly in the 2, 10 & 25-year storm events. The reduction in peak flow rates is believed to be the result of modified timing of the peak rates of runoff from different tributary areas resulting from the proposed development. The relatively small amount of impervious area to be constructed, and the

associated increase in runoff volume and peak runoff rates from these areas of the site, is expected to be offset by the modified timing of peak runoff rates.

### **Summary**

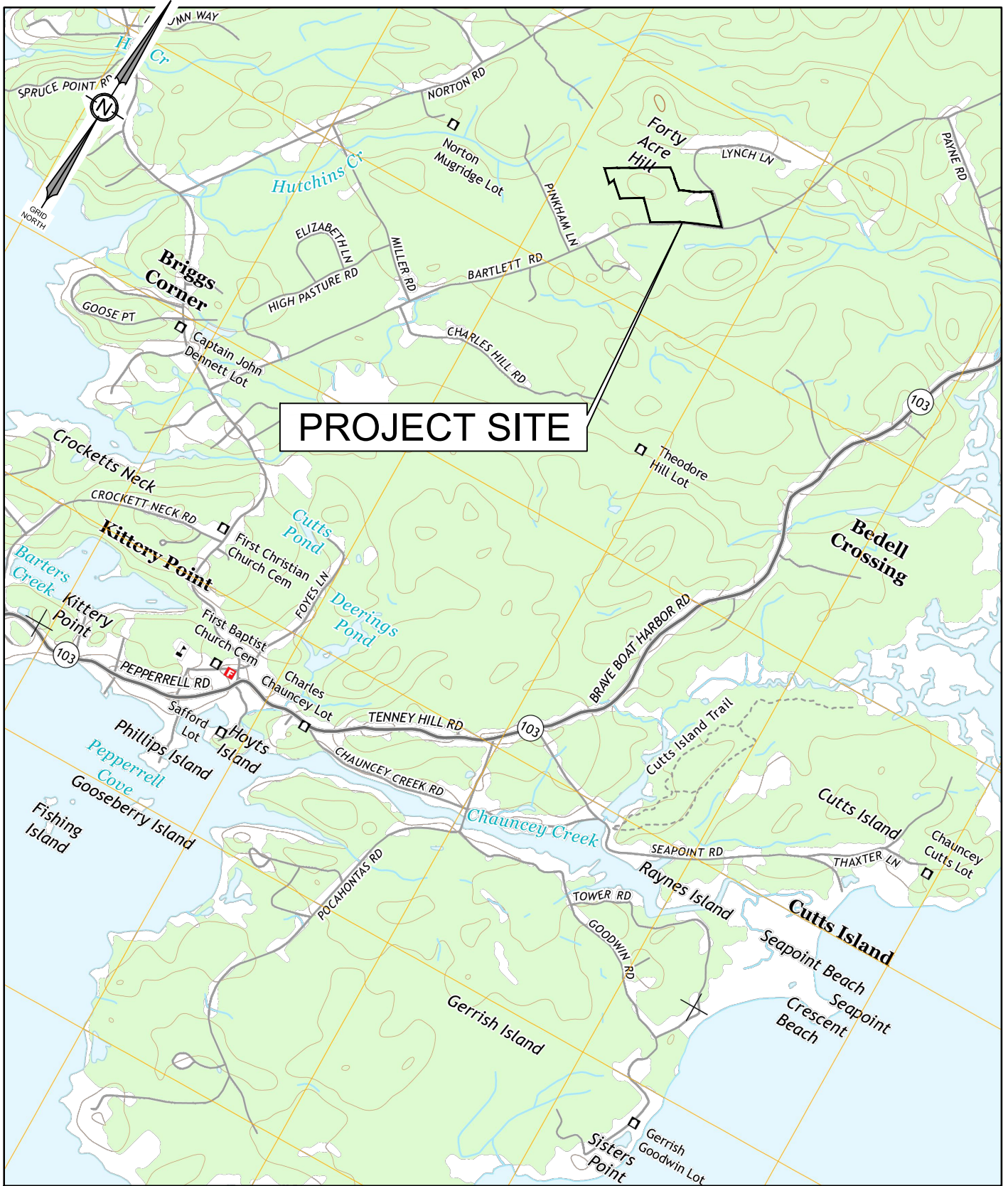
Based upon the results of this evaluation, the proposed project is not expected to cause flooding, erosion, or other significant adverse effects downstream of the site.

### **Appendices**

- 1 – Existing Conditions Figures
- 2 – Watershed Maps
- 3 – Pre-Development HydroCAD Model
- 4 – Post-Development HydroCAD Model
- 5 – Cross Culvert Sizing Calculations
- 6 – Housekeeping
- 7 – Inspection and Maintenance Manual

**APPENDIX 1**

**EXISTING CONDITIONS FIGURES**



**PROJECT SITE**

**USGS KITTERY QUADRANGLE**

**PROJECT:**  
 BARTLETT ROAD SUBDIVISION  
 77 BARTLETT ROAD, KITTERY, MAINE

**PREPARED FOR:**  
 BEACHWOOD DEVELOPMENT FUND LP  
 PO BOX 260  
 KENNEBUNK, MAINE 04043



**ADDRESS:**  
 41 CAMPUS DRIVE, SUITE 301  
 NEW GLOUCESTER, ME 04260

**PHONE:**  
 (207) 926-5111

**WEB SITE:**  
[www.terradynconsultants.com](http://www.terradynconsultants.com)

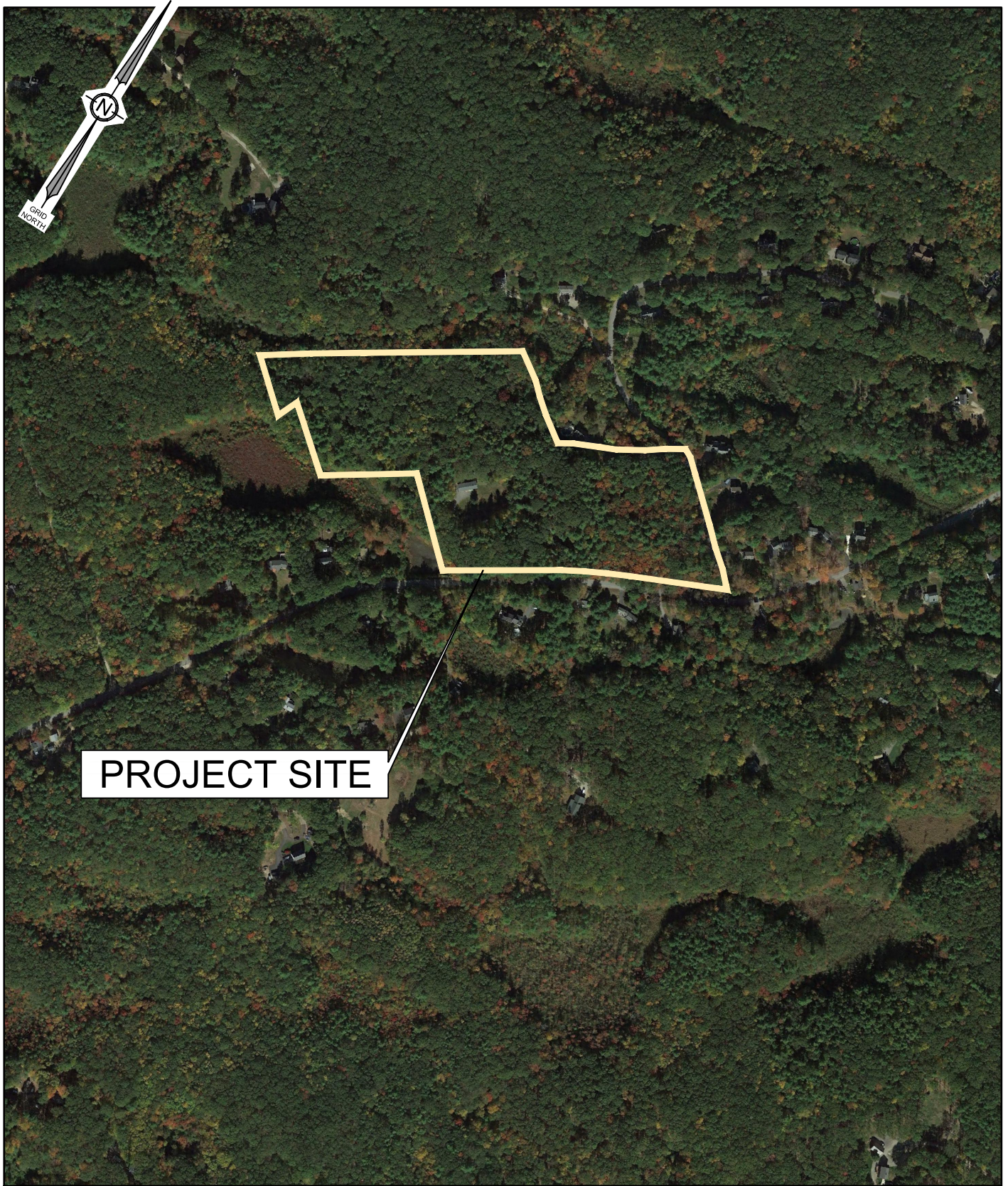
**PROJECT NO.**  
 22-145

**DATE**  
 3/20/2023

**SCALE**  
 1" = 2,000'

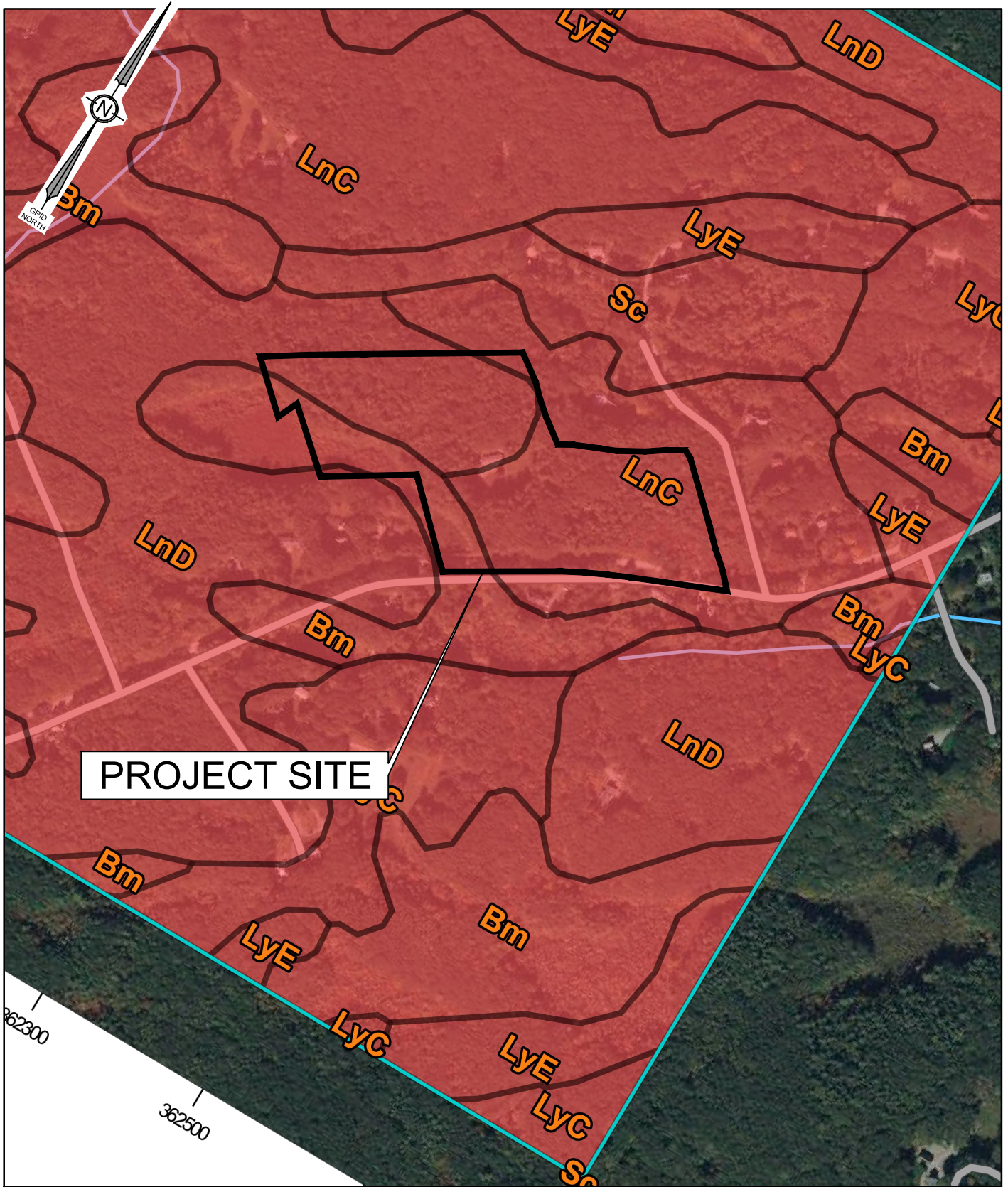
**SHEET**  
 1  
 OF  
 5





**PROJECT SITE**

<p><b>AERIAL MAP</b></p>	 <p><b>TERRADYN CONSULTANTS, LLC</b></p>	<p><b>ADDRESS:</b> 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 <b>PHONE:</b> (207) 926-5111 <b>WEB SITE:</b> <a href="http://www.terradync consultants.com">www.terradync consultants.com</a></p>	<p><b>PROJECT NO.</b> 22-145</p>	<p><b>SHEET</b> 2 OF</p>
<p><b>PROJECT:</b> BARTLETT ROAD SUBDIVISION 77 BARTLETT ROAD, KITTERY, MAINE</p>		<p><b>DATE</b> 3/20/2023</p>	<p>5</p>	
<p><b>PREPARED FOR:</b> BEACHWOOD DEVELOPMENT FUND LP PO BOX 260 KENNEBUNK, MAINE 04043</p>		<p>Civil Engineering   Land Surveying   Geomatics Stormwater Design   Land Planning   Environmental Permitting</p>		<p><b>SCALE</b> 1" = 500'</p>



**MEDIUM INTENSITY SOIL SURVEY**

PROJECT:  
 BARTLETT ROAD SUBDIVISION  
 77 BARTLETT ROAD, KITTERY, MAINE  
 PREPARED FOR:  
 BEACHWOOD DEVELOPMENT FUND LP  
 PO BOX 260  
 KENNEBUNK, MAINE 04043



Civil Engineering | Land Surveying | Geomatics  
 Stormwater Design | Land Planning | Environmental Permitting

ADDRESS:  
 41 CAMPUS DRIVE, SUITE 301  
 NEW GLOUCESTER, ME 04260  
 PHONE:  
 (207) 926-5111  
 WEB SITE:  
 www.terradync consultants.com

PROJECT NO.

22-145

DATE

3/20/2023

SCALE

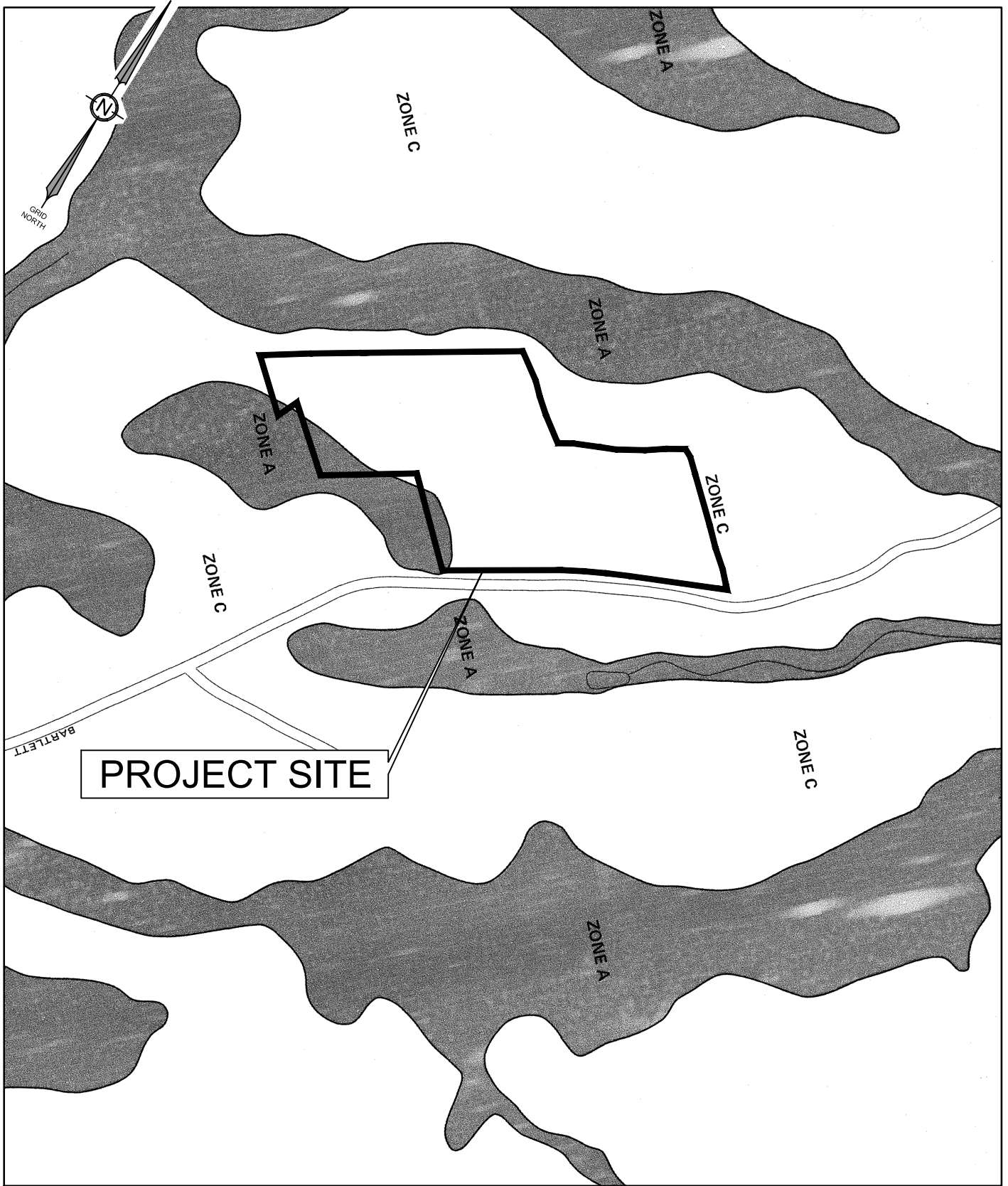
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SHEET

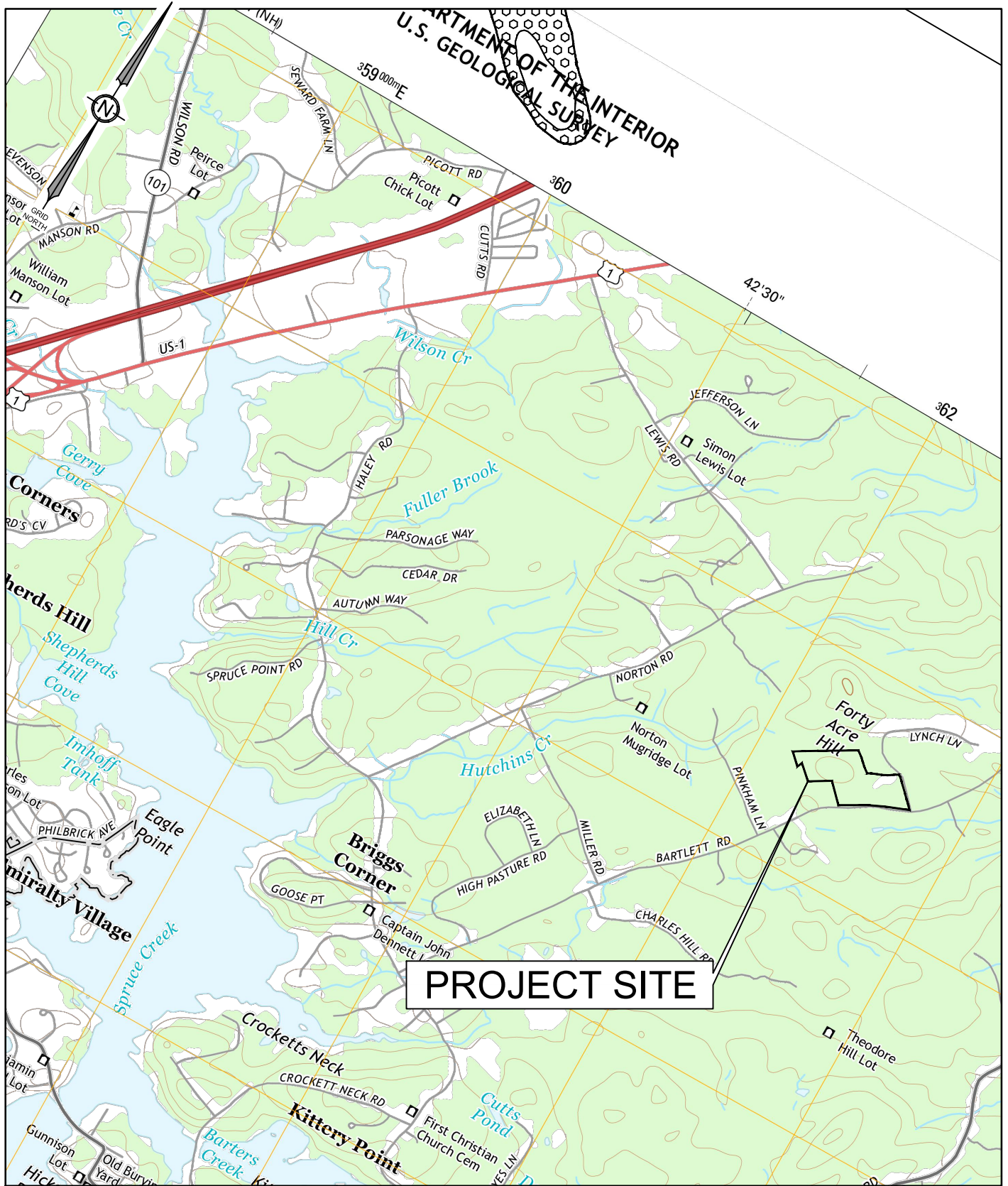
3

OF


5



<p><b>FLOOD INSURANCE RATE MAP</b></p>	 <p><b>TERRADYN CONSULTANTS, LLC</b></p> <p>Civil Engineering   Land Surveying   Geomatics Stormwater Design   Land Planning   Environmental Permitting</p>	<p>ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 PHONE: (207) 926-5111 WEB SITE: <a href="http://www.terradyndesign.com">www.terradyndesign.com</a></p>	<p>PROJECT NO. 22-145 DATE 3/20/2023 SCALE 1" = 500'</p>	<p>SHEET 4 OF 5</p>
<p>PROJECT: BARTLETT ROAD SUBDIVISION 77 BARTLETT ROAD, KITTEERY, MAINE</p>				
<p>PREPARED FOR: BEACHWOOD DEVELOPMENT FUND LP PO BOX 260 KENNEBUNK, MAINE 04043</p>				



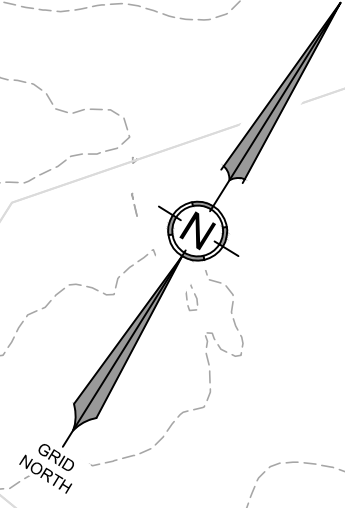
**PROJECT SITE**

SIGNIFICANT SAND & GRAVEL AQUIFER MAP	 <p>ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260 PHONE: (207) 926-5111 WEB SITE: www.terradyndynconsultants.com</p>	PROJECT NO. 22-145	SHEET 5
PROJECT: BARTLETT ROAD SUBDIVISION 77 BARTLETT ROAD, KITTERY, MAINE		DATE 3/20/2023	OF 5
PREPARED FOR: BEACHWOOD DEVELOPMENT FUND LP PO BOX 260 KENNEBUNK, MAINE 04043		SCALE 1" = 500'	
Civil Engineering   Land Surveying   Geomatics Stormwater Design   Land Planning   Environmental Permitting			

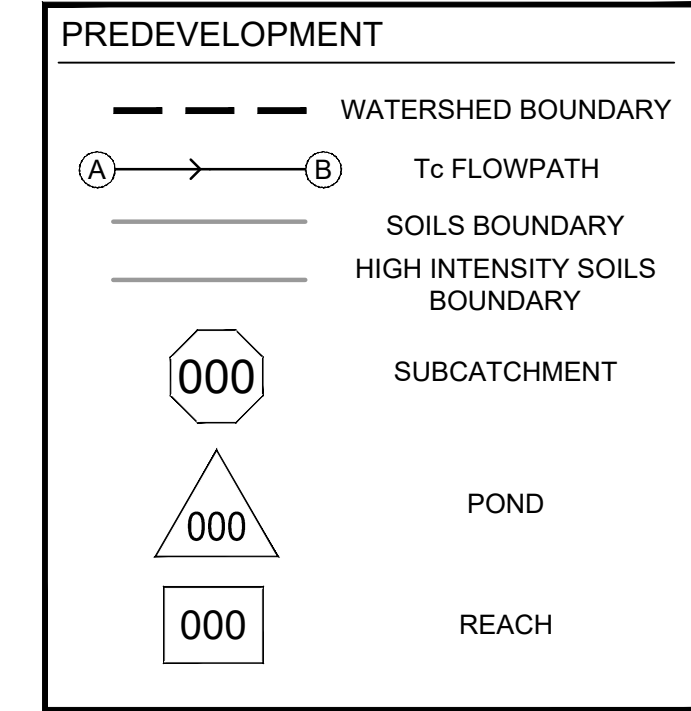
**APPENDIX 2**

**WATERSHED MAPS**

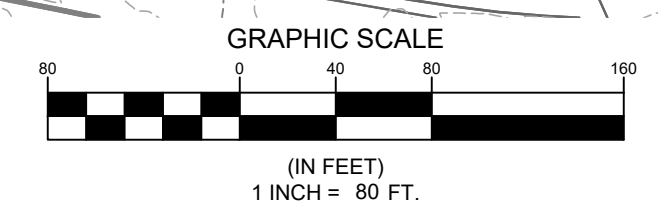
WATERSHED 1			
TYPE	LENGTH (FT)	SLOPE	
A-B	SF	150	0.01
B-C	SCF	159	0.04
WATERSHED 2			
TYPE	LENGTH (FT)	SLOPE	
A-B	SF	150	0.01
B-C	SCF	328	0.02
WATERSHED 3			
TYPE	LENGTH (FT)	SLOPE	
A-B	SF	150	0.01
B-C	CF	1,212	0.01
WATERSHED 4			
TYPE	LENGTH (FT)	SLOPE	
A-B	SF	150	0.005
B-C	CF	702	0.01
WATERSHED 5			
TYPE	LENGTH (FT)	SLOPE	
A-B	SF	150	0.01
B-C	CF	175	0.01



**WATERSHED LEGEND**



- NOTES:**
- SOILS WITHIN THE WATERSHED AREAS ARE PRIMARILY MAPPED AS LYMAN-TUNBRIDGE COMPLEX (HSG C/D) & NASKEAG (HSG C) BY A CLASS A HIGH INTENSITY SOIL SURVEY CONDUCTED BY LONGVIEW PARTNERS IN OCTOBER 2022.
  - STUDY POINT 1 IS THE EASTERN PARCEL BOUNDARY WHERE ON SITE FLOW TRAVELS THROUGH CULVERTS UNDER LYNCH LANE AND TO BRAVE BOAT HARBOR.
  - STUDY POINT 2 IS THE SOUTHERN PARCEL BOUNDARY OUTLETING THROUGH A CULVERT UNDER BARTLETT ROAD TO SMITH BROOK AND TO BRAVE BOAT HARBOR.
  - STUDY POINT 3 IS THE SOUTHERN BOUNDARY WHERE ON SITE FLOW COLLECTS IN A WETLAND AND TRAVELS THROUGH A CULVERT UNDER BARTLETT ROAD TO BRAVE BOAT HARBOR.
  - STUDY POINT 4 IS THE WESTERN SITE BOUNDARY WHERE ON SITE FLOW COLLECTS IN A WETLAND AND TRAVELS TO SPRUCE CREEK.
  - STUDY POINT 5 IS THE EASTERN PARCEL BOUNDARY WHERE ON SITE FLOW TRAVELS THROUGH CULVERTS UNDER LYNCH LANE AND TO BRAVE BOAT HARBOR.



DATE: 10/10/2023  
P.E.: MICHAEL TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	8/3/2023	MTW APPD BY
2	10/10/2023	REVISOR COMMENTS
		SUBMITTED TO KITTEERY FOR PRELIMINARY SUBDIVISION REVIEW

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

565 CONGRESS STREET  
SUITE 201  
PORTLAND, ME 04102

41 CAMPUS DRIVE  
SUITE 301  
NEW GLOUCESTER, ME 04260

OFFICE: (207) 926-5111 FAX: (207) 221-1317  
www.terradynconsultants.com

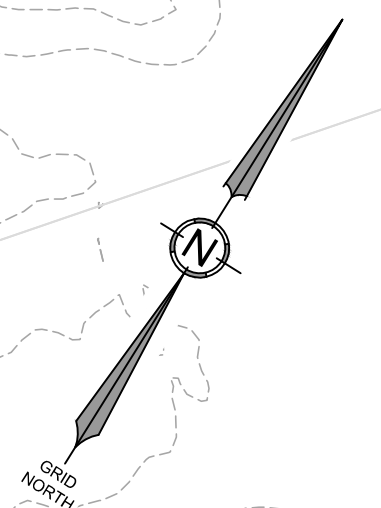
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NOT FOR CONSTRUCTION

PROJECT: BARTLETT ROAD SUBDIVISION  
KITTEERY, MAINE  
SHEET TITLE: PREDEVELOPMENT WATERSHED PLAN  
CLIENT: BEACHWOOD DEVELOPMENT FUND  
P.O. BOX 281  
KENNEBUNK, MAINE 04043

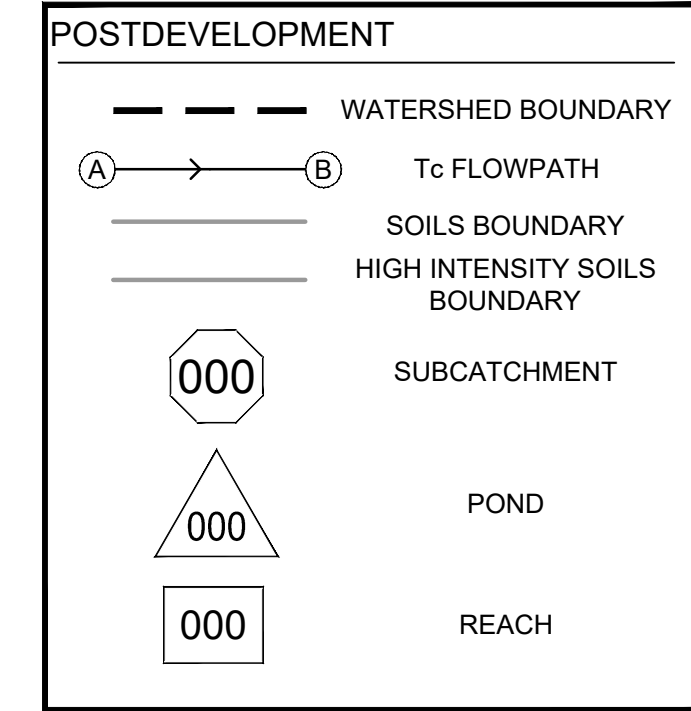
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JOB NO.: 22-145  
SHEET: WS-1.0

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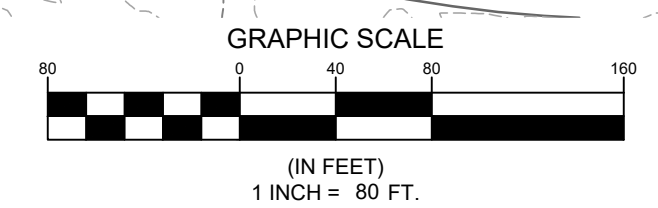
POST DEVELOPMENT TIME OF CONCENTRATION			
WATERSHED	TYPE	LENGTH (FT)	SLOPE
WATERSHED 10			
A-B	SF	150	0.02
B-C	SCF	159	0.02
WATERSHED 11			
A-B	SF	150	0.02
WATERSHED 20			
A-B	SF	150	0.01
B-C	SCF	328	0.01
WATERSHED 21			
MINIMUM 5 MINUTES			
WATERSHED 30			
A-B	SF	150	0.01
B-C	CF	1,212	0.01
WATERSHED 31			
A-B	SF	150	0.02
B-C	CF	120	0.02
WATERSHED 32			
A-B	SF	150	0.02
WATERSHED 33			
A-B	SF	80	0.02
B-C	CF	147	0.02
WATERSHED 34			
MINIMUM 5 MINUTES			
WATERSHED 40			
A-B	SF	150	0.005
B-C	CF	702	0.01
WATERSHED 41			
A-B	SF	117	0.05



**WATERSHED LEGEND**



- NOTES:**
- SOILS WITHIN THE WATERSHED AREAS ARE PRIMARILY MAPPED AS LYMAN-TUNBRIDGE COMPLEX (HSG C/D) & NASKEAG (HSG C) BY A CLASS A HIGH INTENSITY SOIL SURVEY CONDUCTED BY LONGVIEW PARTNERS IN OCTOBER 2022.
  - STUDY POINT 1 IS THE EASTERN PARCEL BOUNDARY WHERE ON SITE FLOW TRAVELS THROUGH CULVERTS UNDER LYNCH LANE AND TO BRAVE BOAT HARBOR.
  - STUDY POINT 2 IS THE SOUTHERN PARCEL BOUNDARY OUTLETTING THROUGH A CULVERT UNDER BARTLETT ROAD TO SMITH BROOK AND TO BRAVE BOAT HARBOR.
  - STUDY POINT 3 IS THE SOUTHERN BOUNDARY WHERE ON SITE FLOW COLLECTS IN A WETLAND AND TRAVELS THROUGH A CULVERT UNDER BARTLETT ROAD TO BRAVE BOAT HARBOR.
  - STUDY POINT 4 IS THE WESTERN SITE BOUNDARY WHERE ON SITE FLOW COLLECTS IN A WETLAND AND TRAVELS TO SPRUCE CREEK.
  - STUDY POINT 5 IS THE EASTERN PARCEL BOUNDARY WHERE ON SITE FLOW TRAVELS THROUGH CULVERTS UNDER LYNCH LANE AND TO BRAVE BOAT HARBOR.



DATE: 10/10/2023  
P.E.: MICHAEL TADEMA-WIELEMA

NO.	DATE	REVISIONS
1	10/10/2023	MTW APPD
2	8/3/2023	REVISOR

PROJECT: BARTLETT ROAD SUBDIVISION  
KITTERY, MAINE

SHEET TITLE: POSTDEVELOPMENT WATERSHED MAP

CLIENT: BEACHWOOD DEVELOPMENT FUND  
P.O. BOX 281  
KENNEBUNK, MAINE 04043

565 CONGRESS STREET  
SUITE 201  
PORTLAND, ME 04102

41 CAMPUS DRIVE  
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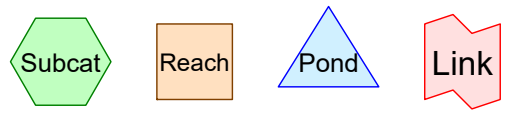
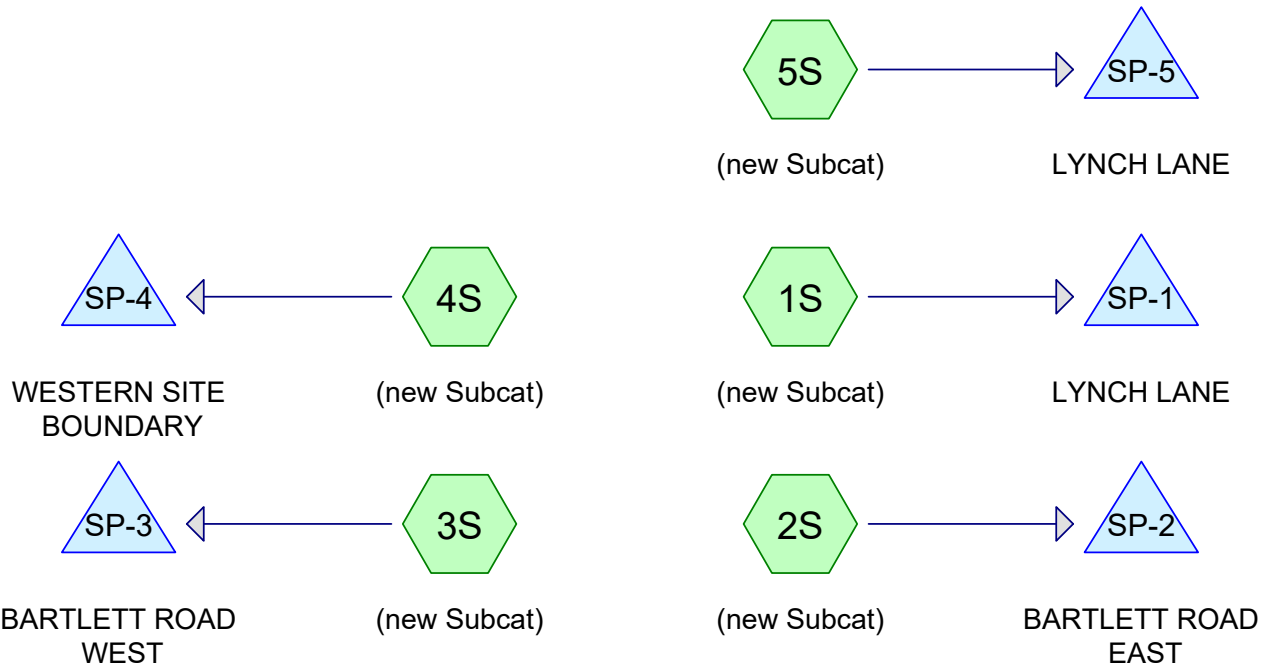
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JOB NO.:	22-145
SHEET	WS-2.0

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**APPENDIX 3**

**PRE-DEVELOPMENT HYDROCAD MODEL**





**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.230	80	1/2 acre lots, 25% imp, HSG C (1S)
1.607	85	1/2 acre lots, 25% imp, HSG D (3S, 5S)
0.375	98	BARTLETT ROAD (2S, 3S)
0.052	98	EXISTING HOUSE (3S)
0.126	98	LOT DRIVEWAY (3S)
0.171	98	Lynch Ln (1S, 2S, 5S)
11.056	70	Woods, Good, HSG C (1S, 2S, 3S, 4S, 5S)
41.658	77	Woods, Good, HSG D (1S, 2S, 3S, 4S, 5S)
<b>55.274</b>	<b>76</b>	<b>TOTAL AREA</b>

**PRE**

Prepared by Terradyn Consultants

HydroCAD® 10.10-6a s/n 12055 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 2-YR Rainfall=2.90"

Printed 10/6/2023

Page 3

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: (new Subcat)** Runoff Area=158,935 sf 3.69% Impervious Runoff Depth>0.90"  
Flow Length=309' Tc=41.3 min CN=77 Runoff=1.98 cfs 0.274 af

**Subcatchment 2S: (new Subcat)** Runoff Area=229,714 sf 3.99% Impervious Runoff Depth>0.85"  
Flow Length=478' Tc=46.3 min CN=76 Runoff=2.52 cfs 0.373 af

**Subcatchment 3S: (new Subcat)** Runoff Area=869,221 sf 3.04% Impervious Runoff Depth>0.84"  
Flow Length=1,362' Slope=0.0100 '/' Tc=56.8 min CN=76 Runoff=8.49 cfs 1.405 af

**Subcatchment 4S: (new Subcat)** Runoff Area=718,114 sf 0.00% Impervious Runoff Depth>0.84"  
Flow Length=852' Tc=74.3 min CN=76 Runoff=5.90 cfs 1.150 af

**Subcatchment 5S: (new Subcat)** Runoff Area=431,736 sf 2.34% Impervious Runoff Depth>0.90"  
Flow Length=325' Slope=0.0100 '/' Tc=44.4 min CN=77 Runoff=5.18 cfs 0.744 af

**Pond SP-1: LYNCH LANE** Inflow=1.98 cfs 0.274 af  
Primary=1.98 cfs 0.274 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=2.52 cfs 0.373 af  
Primary=2.52 cfs 0.373 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=8.49 cfs 1.405 af  
Primary=8.49 cfs 1.405 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=5.90 cfs 1.150 af  
Primary=5.90 cfs 1.150 af

**Pond SP-5: LYNCH LANE** Inflow=5.18 cfs 0.744 af  
Primary=5.18 cfs 0.744 af

**Total Runoff Area = 55.274 ac Runoff Volume = 3.947 af Average Runoff Depth = 0.86"**  
**97.86% Pervious = 54.091 ac 2.14% Impervious = 1.183 ac**

**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 1.98 cfs @ 12.61 hrs, Volume= 0.274 af, Depth> 0.90"  
 Routed to Pond SP-1 : LYNCH LANE

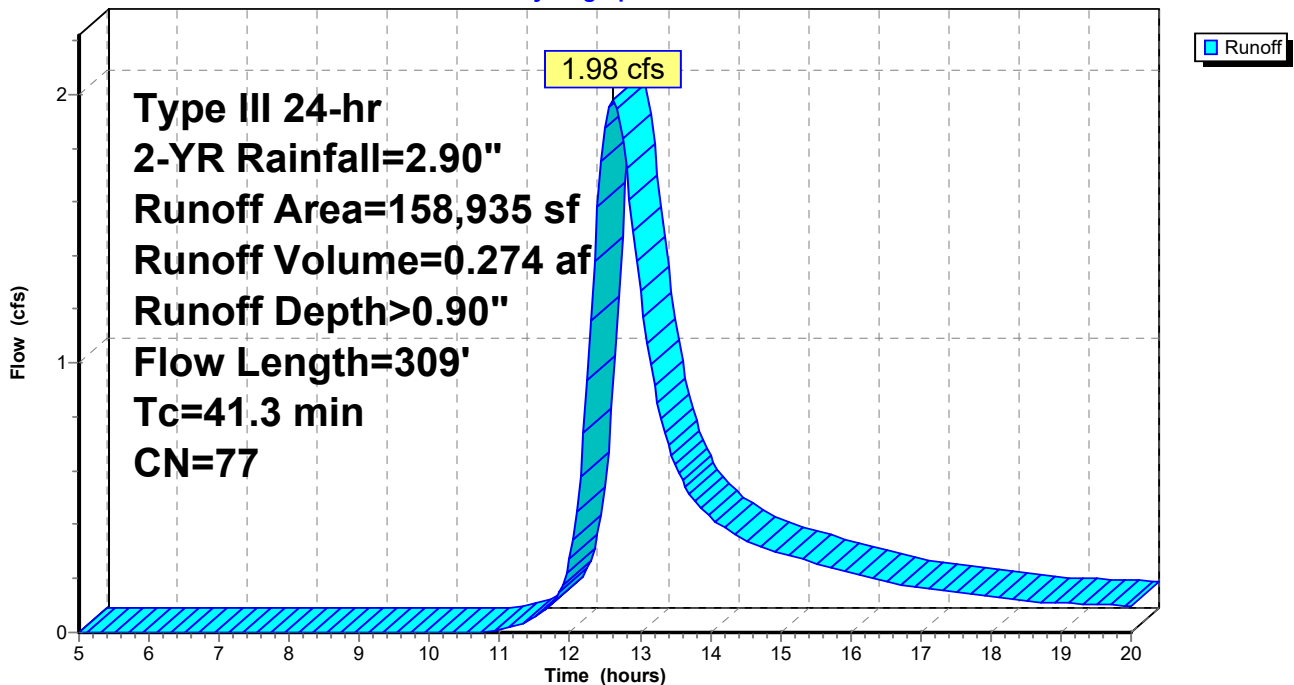
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 3,368	98	Lynch Ln
10,000	80	1/2 acre lots, 25% imp, HSG C
20,000	70	Woods, Good, HSG C
125,567	77	Woods, Good, HSG D
158,935	77	Weighted Average
153,067		96.31% Pervious Area
5,868		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
2.6	159	0.0400	1.00		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
41.3	309	Total			

**Subcatchment 1S: (new Subcat)**

Hydrograph



**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 2.52 cfs @ 12.69 hrs, Volume= 0.373 af, Depth> 0.85"  
 Routed to Pond SP-2 : BARTLETT ROAD EAST

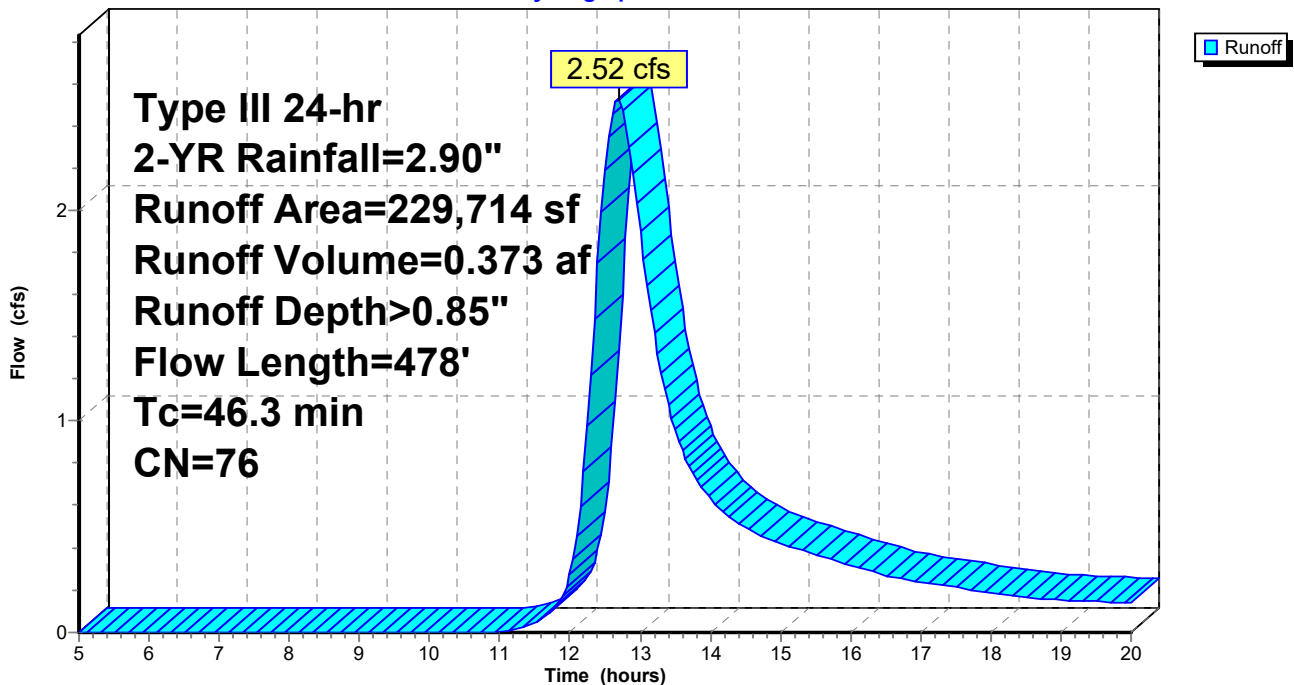
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 1,470	98	Lynch Ln
* 7,692	98	BARTLETT ROAD
52,000	70	Woods, Good, HSG C
168,552	77	Woods, Good, HSG D
229,714	76	Weighted Average
220,552		96.01% Pervious Area
9,162		3.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
7.7	328	0.0200	0.71		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
46.3	478	Total			

**Subcatchment 2S: (new Subcat)**

Hydrograph



**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 8.49 cfs @ 12.82 hrs, Volume= 1.405 af, Depth> 0.84"  
 Routed to Pond SP-3 : BARTLETT ROAD WEST

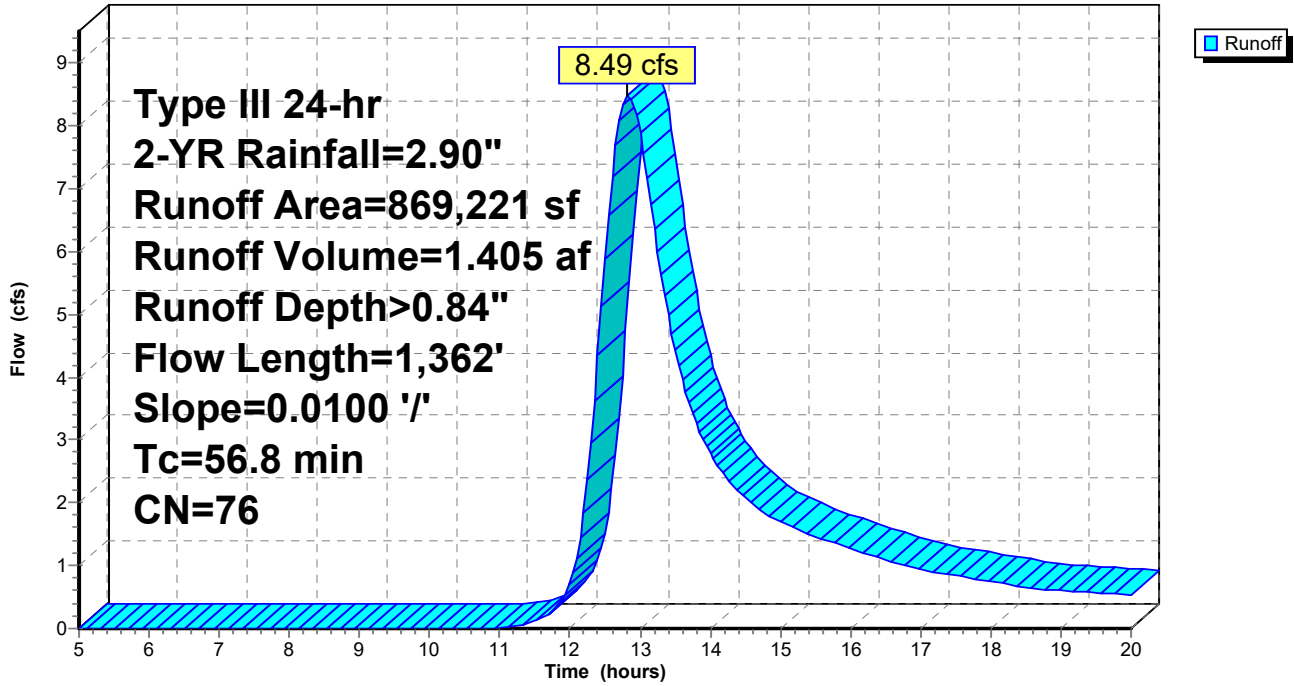
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
569,212	77	Woods, Good, HSG D
243,626	70	Woods, Good, HSG C
* 5,490	98	LOT DRIVEWAY
* 8,628	98	BARTLETT ROAD
* 2,265	98	EXISTING HOUSE
40,000	85	1/2 acre lots, 25% imp, HSG D
869,221	76	Weighted Average
842,838		96.96% Pervious Area
26,383		3.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
18.2	1,212	0.0100	1.11	18.06	<b>Trap/Vee/Rect Channel Flow, B-C</b> Bot.W=30.00' D=0.50' Z= 5.0 '/' Top.W=35.00' n= 0.080 Earth, long dense weeds
56.8	1,362	Total			

### Subcatchment 3S: (new Subcat)

Hydrograph



**Summary for Subcatchment 4S: (new Subcat)**

Runoff = 5.90 cfs @ 13.07 hrs, Volume= 1.150 af, Depth> 0.84"  
 Routed to Pond SP-4 : WESTERN SITE BOUNDARY

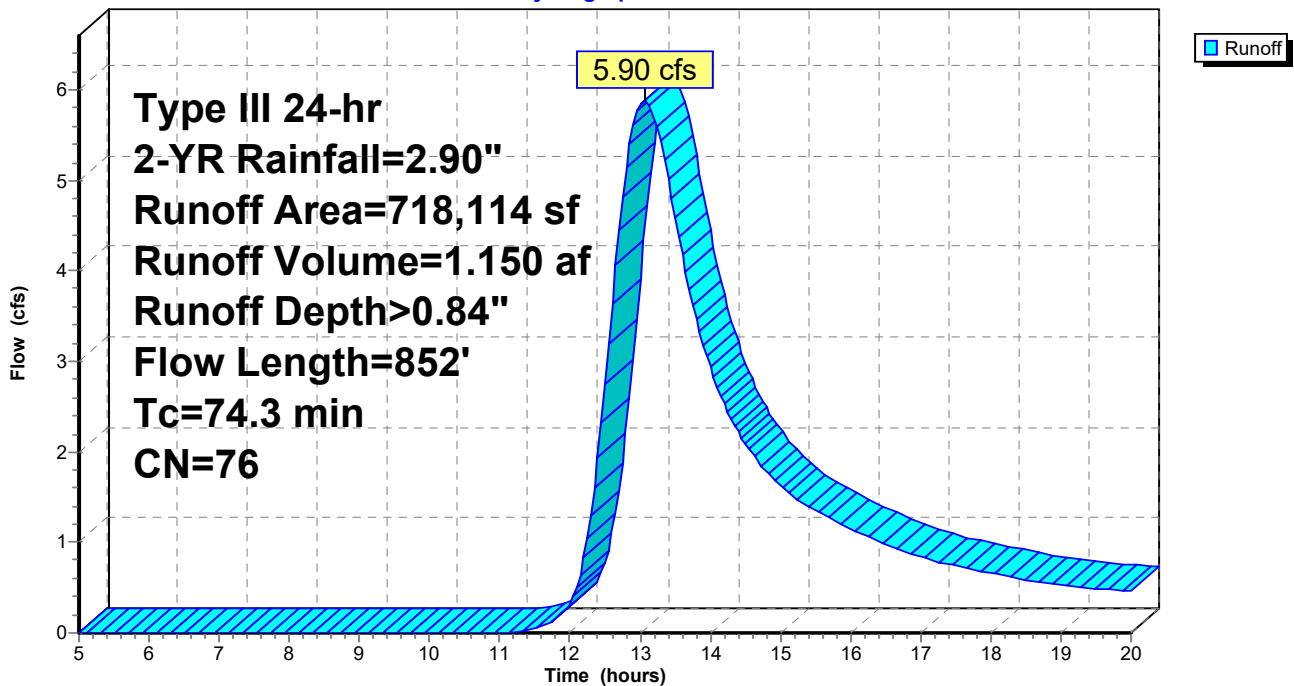
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
592,160	77	Woods, Good, HSG D
125,954	70	Woods, Good, HSG C
718,114	76	Weighted Average
718,114		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
23.4	702	0.0100	0.50		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
74.3	852	Total			

**Subcatchment 4S: (new Subcat)**

Hydrograph





**Summary for Subcatchment 5S: (new Subcat)**

Runoff = 5.18 cfs @ 12.65 hrs, Volume= 0.744 af, Depth> 0.90"  
 Routed to Pond SP-5 : LYNCH LANE

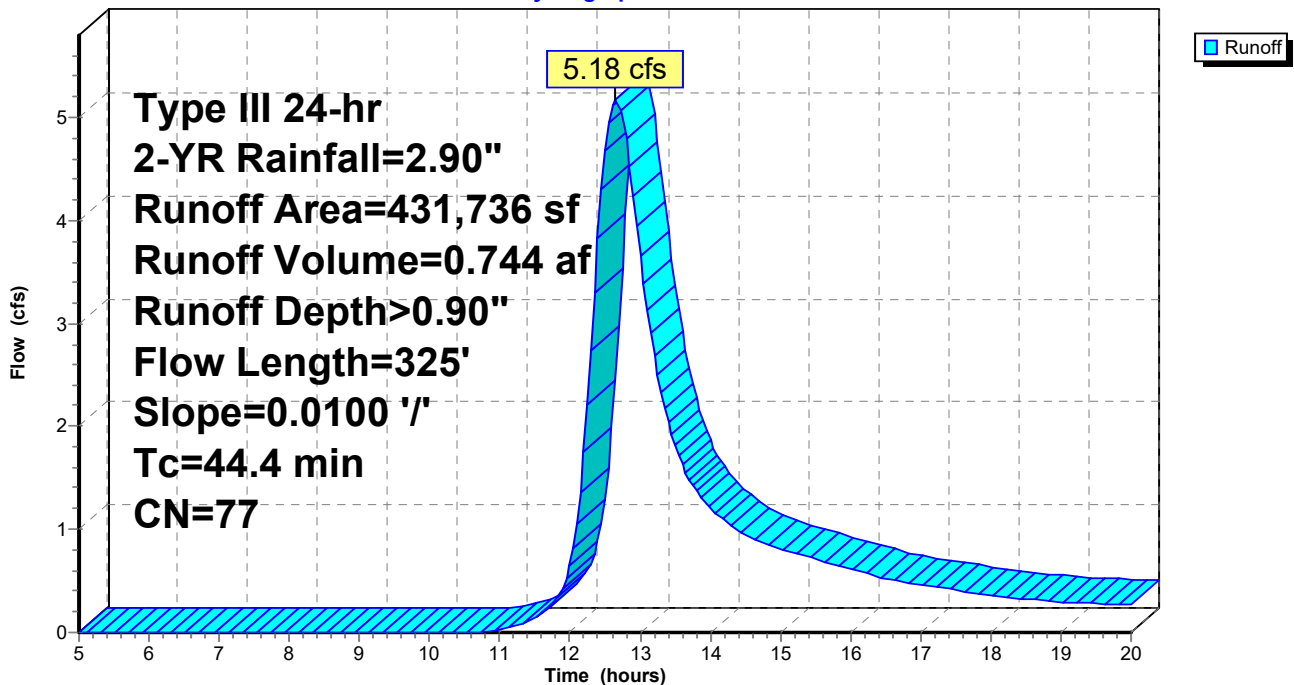
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
30,000	85	1/2 acre lots, 25% imp, HSG D
40,000	70	Woods, Good, HSG C
* 2,600	98	Lynch Ln
359,136	77	Woods, Good, HSG D
431,736	77	Weighted Average
421,636		97.66% Pervious Area
10,100		2.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
5.8	175	0.0100	0.50		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
44.4	325	Total			

**Subcatchment 5S: (new Subcat)**

Hydrograph



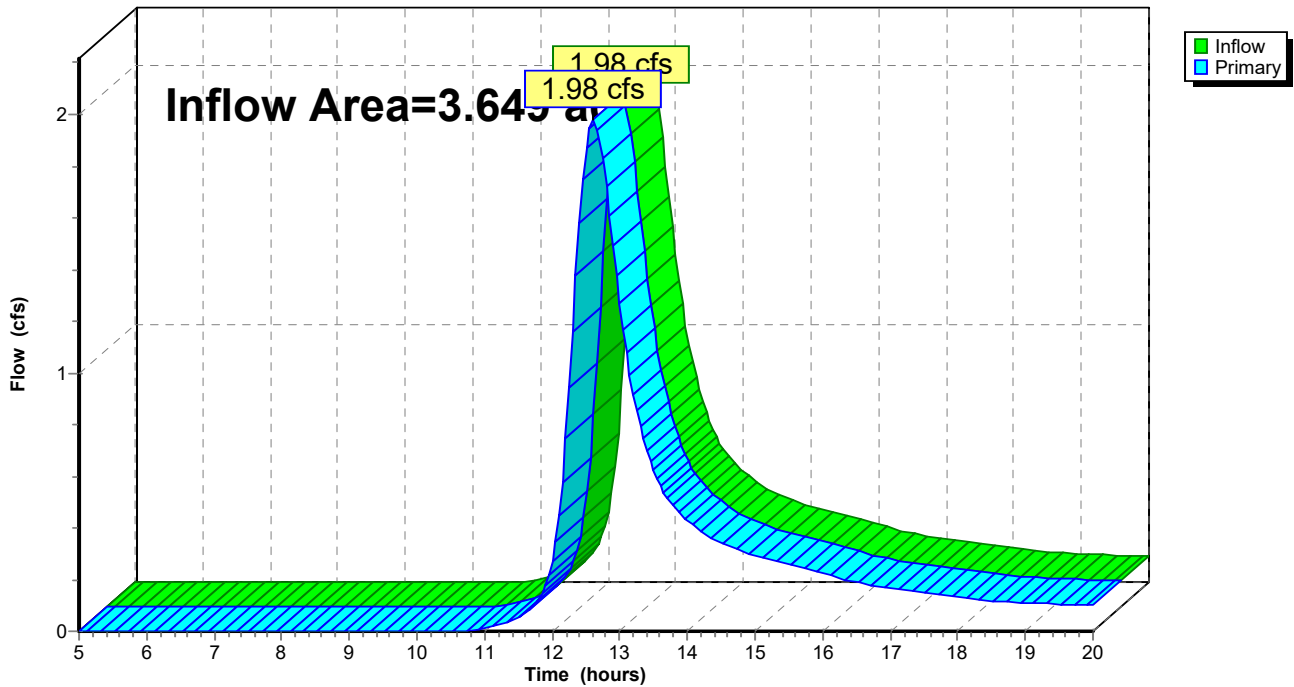
### Summary for Pond SP-1: LYNCH LANE

Inflow Area = 3.649 ac, 3.69% Impervious, Inflow Depth > 0.90" for 2-YR event  
Inflow = 1.98 cfs @ 12.61 hrs, Volume= 0.274 af  
Primary = 1.98 cfs @ 12.61 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node D2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-1: LYNCH LANE

Hydrograph

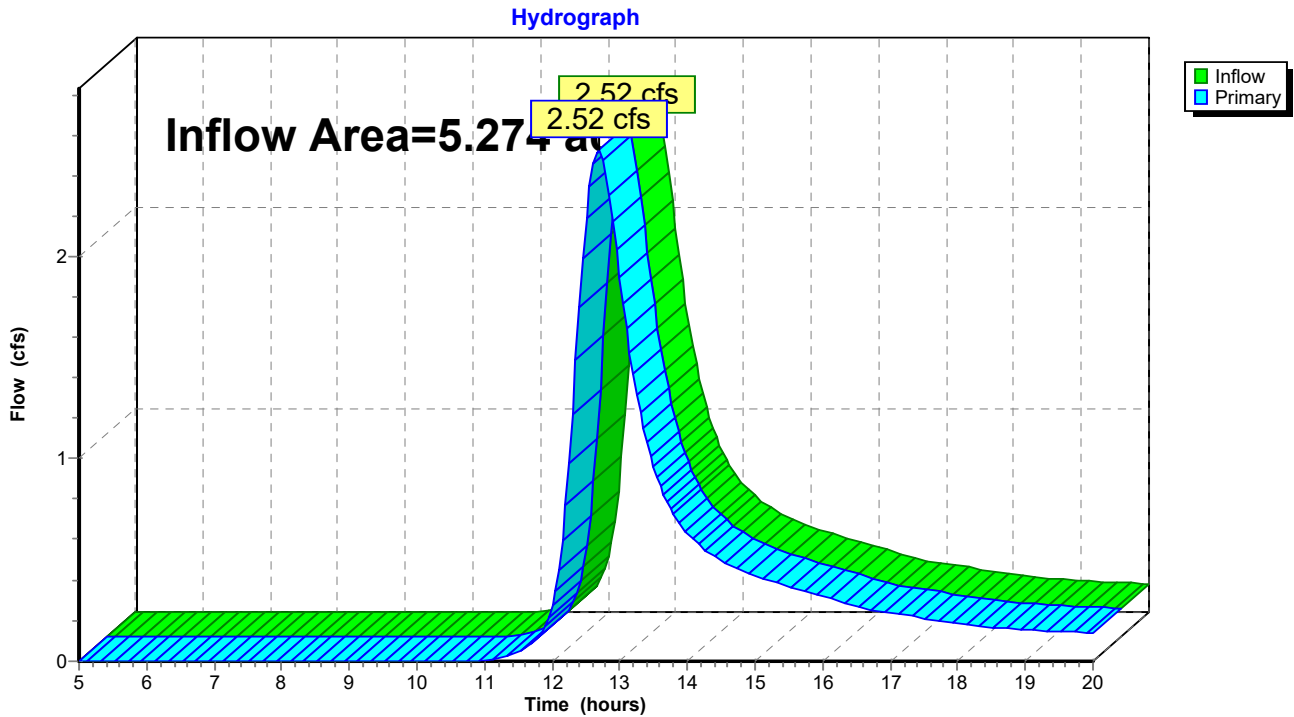


### Summary for Pond SP-2: BARTLETT ROAD EAST

Inflow Area = 5.274 ac, 3.99% Impervious, Inflow Depth > 0.85" for 2-YR event  
Inflow = 2.52 cfs @ 12.69 hrs, Volume= 0.373 af  
Primary = 2.52 cfs @ 12.69 hrs, Volume= 0.373 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node D2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-2: BARTLETT ROAD EAST



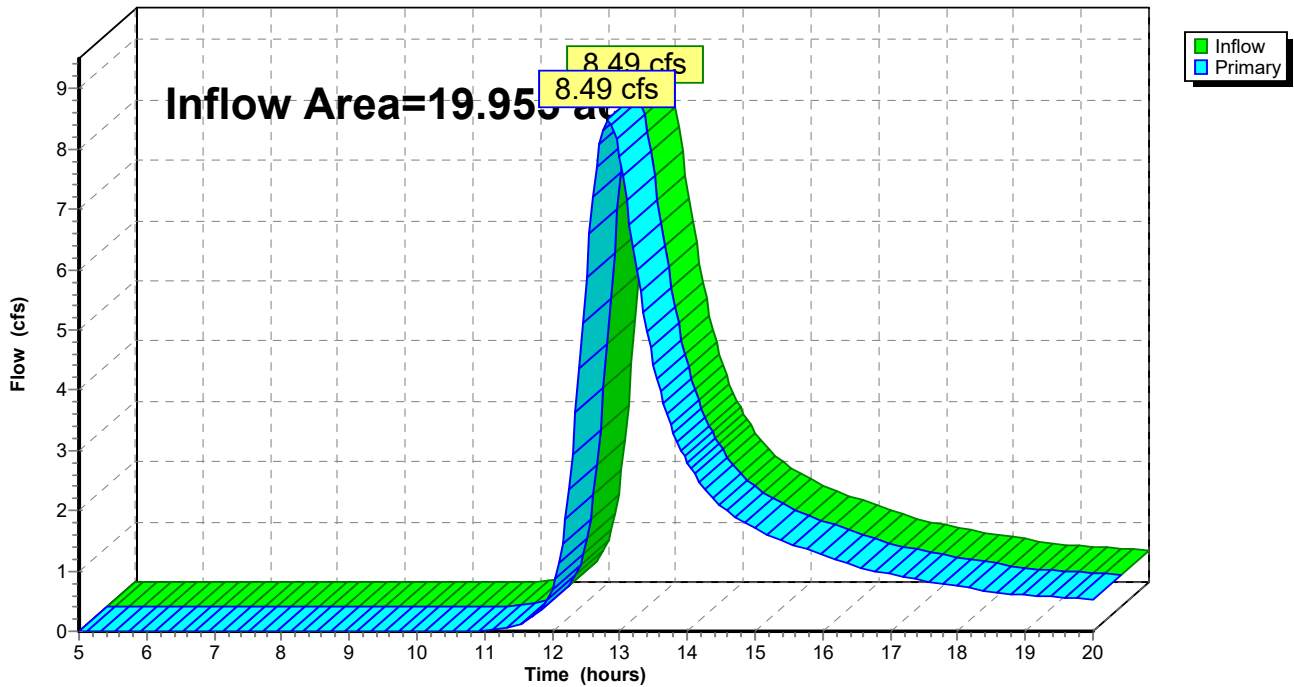
### Summary for Pond SP-3: BARTLETT ROAD WEST

Inflow Area = 19.955 ac, 3.04% Impervious, Inflow Depth > 0.84" for 2-YR event  
Inflow = 8.49 cfs @ 12.82 hrs, Volume= 1.405 af  
Primary = 8.49 cfs @ 12.82 hrs, Volume= 1.405 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node D1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-3: BARTLETT ROAD WEST

Hydrograph



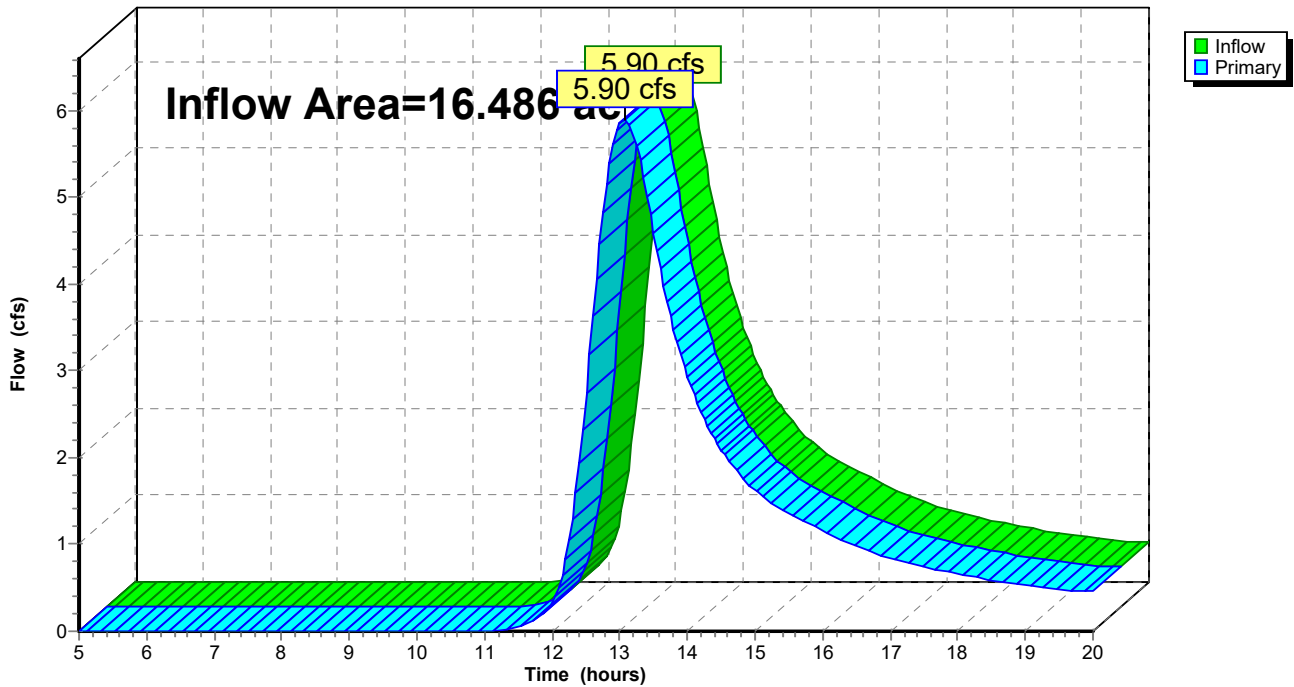
### Summary for Pond SP-4: WESTERN SITE BOUNDARY

Inflow Area = 16.486 ac, 0.00% Impervious, Inflow Depth > 0.84" for 2-YR event  
Inflow = 5.90 cfs @ 13.07 hrs, Volume= 1.150 af  
Primary = 5.90 cfs @ 13.07 hrs, Volume= 1.150 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node D1

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-4: WESTERN SITE BOUNDARY

Hydrograph



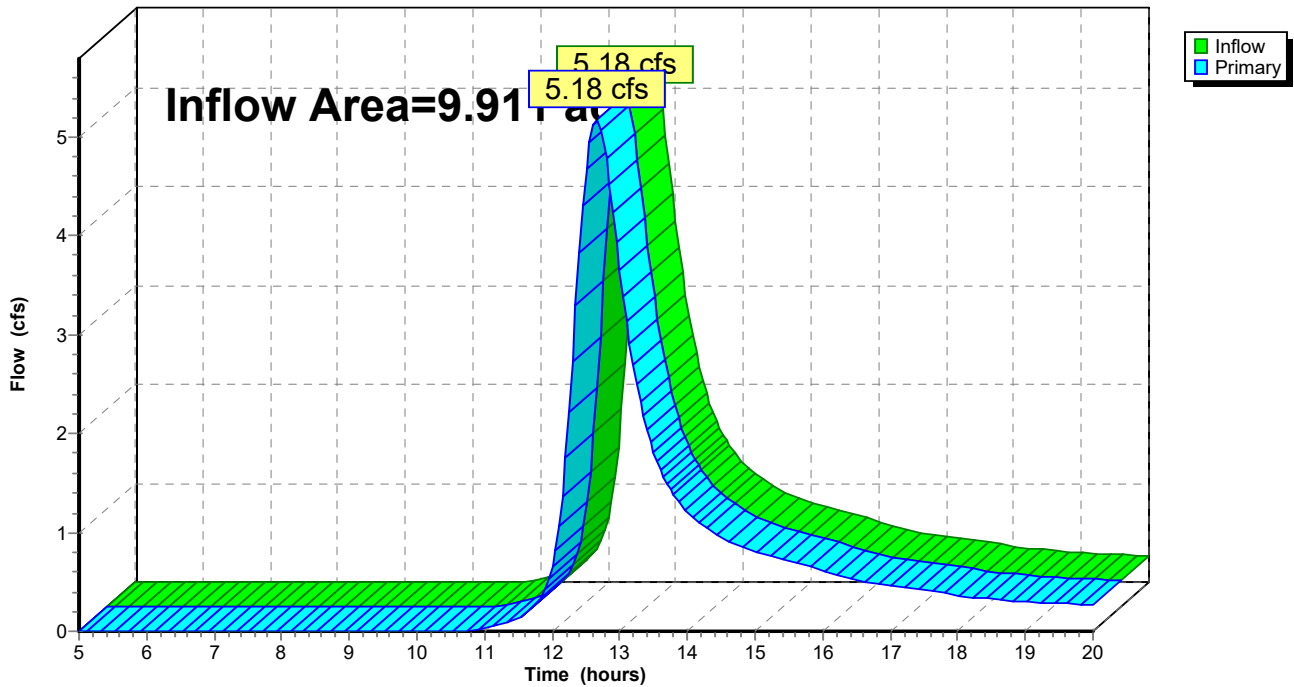
### Summary for Pond SP-5: LYNCH LANE

Inflow Area = 9.911 ac, 2.34% Impervious, Inflow Depth > 0.90" for 2-YR event  
Inflow = 5.18 cfs @ 12.65 hrs, Volume= 0.744 af  
Primary = 5.18 cfs @ 12.65 hrs, Volume= 0.744 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node D2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-5: LYNCH LANE

Hydrograph



**PRE**

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Type III 24-hr 10-YR Rainfall=4.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: (new Subcat)** Runoff Area=158,935 sf 3.69% Impervious Runoff Depth>1.87"  
Flow Length=309' Tc=41.3 min CN=77 Runoff=4.21 cfs 0.570 af

**Subcatchment 2S: (new Subcat)** Runoff Area=229,714 sf 3.99% Impervious Runoff Depth>1.80"  
Flow Length=478' Tc=46.3 min CN=76 Runoff=5.49 cfs 0.789 af

**Subcatchment 3S: (new Subcat)** Runoff Area=869,221 sf 3.04% Impervious Runoff Depth>1.79"  
Flow Length=1,362' Slope=0.0100 '/' Tc=56.8 min CN=76 Runoff=18.53 cfs 2.973 af

**Subcatchment 4S: (new Subcat)** Runoff Area=718,114 sf 0.00% Impervious Runoff Depth>1.77"  
Flow Length=852' Tc=74.3 min CN=76 Runoff=12.92 cfs 2.438 af

**Subcatchment 5S: (new Subcat)** Runoff Area=431,736 sf 2.34% Impervious Runoff Depth>1.87"  
Flow Length=325' Slope=0.0100 '/' Tc=44.4 min CN=77 Runoff=11.02 cfs 1.546 af

**Pond SP-1: LYNCH LANE** Inflow=4.21 cfs 0.570 af  
Primary=4.21 cfs 0.570 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=5.49 cfs 0.789 af  
Primary=5.49 cfs 0.789 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=18.53 cfs 2.973 af  
Primary=18.53 cfs 2.973 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=12.92 cfs 2.438 af  
Primary=12.92 cfs 2.438 af

**Pond SP-5: LYNCH LANE** Inflow=11.02 cfs 1.546 af  
Primary=11.02 cfs 1.546 af

**Total Runoff Area = 55.274 ac Runoff Volume = 8.317 af Average Runoff Depth = 1.81"**  
**97.86% Pervious = 54.091 ac 2.14% Impervious = 1.183 ac**

**PRE**

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Type III 24-hr 25-YR Rainfall=5.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: (new Subcat)** Runoff Area=158,935 sf 3.69% Impervious Runoff Depth>2.49"  
Flow Length=309' Tc=41.3 min CN=77 Runoff=5.60 cfs 0.757 af

**Subcatchment 2S: (new Subcat)** Runoff Area=229,714 sf 3.99% Impervious Runoff Depth>2.40"  
Flow Length=478' Tc=46.3 min CN=76 Runoff=7.35 cfs 1.054 af

**Subcatchment 3S: (new Subcat)** Runoff Area=869,221 sf 3.04% Impervious Runoff Depth>2.39"  
Flow Length=1,362' Slope=0.0100 '/' Tc=56.8 min CN=76 Runoff=24.81 cfs 3.972 af

**Subcatchment 4S: (new Subcat)** Runoff Area=718,114 sf 0.00% Impervious Runoff Depth>2.37"  
Flow Length=852' Tc=74.3 min CN=76 Runoff=17.33 cfs 3.258 af

**Subcatchment 5S: (new Subcat)** Runoff Area=431,736 sf 2.34% Impervious Runoff Depth>2.49"  
Flow Length=325' Slope=0.0100 '/' Tc=44.4 min CN=77 Runoff=14.64 cfs 2.053 af

**Pond SP-1: LYNCH LANE** Inflow=5.60 cfs 0.757 af  
Primary=5.60 cfs 0.757 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=7.35 cfs 1.054 af  
Primary=7.35 cfs 1.054 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=24.81 cfs 3.972 af  
Primary=24.81 cfs 3.972 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=17.33 cfs 3.258 af  
Primary=17.33 cfs 3.258 af

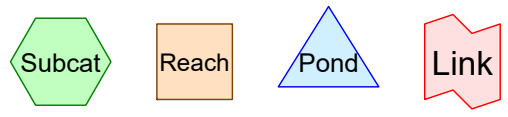
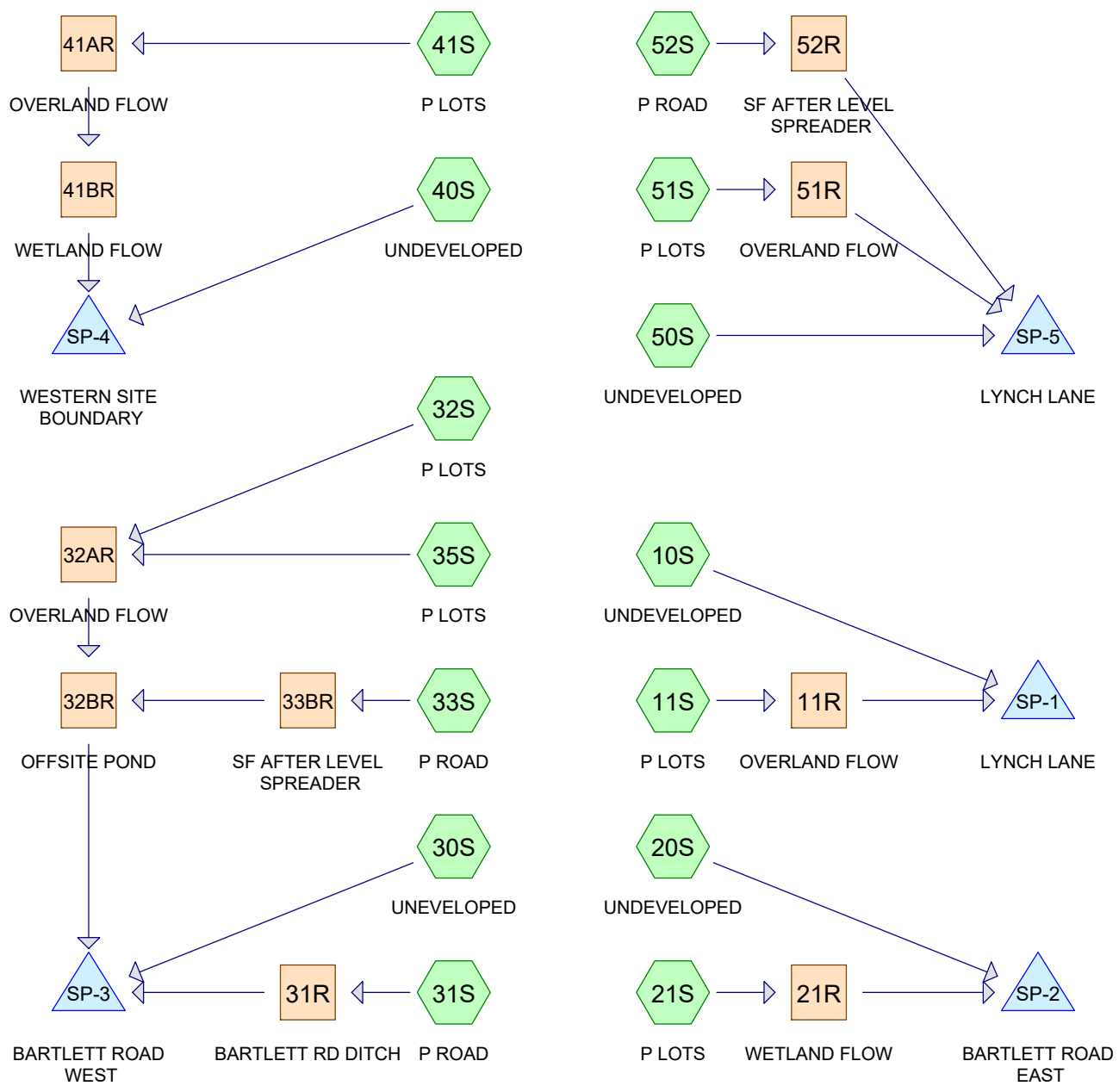
**Pond SP-5: LYNCH LANE** Inflow=14.64 cfs 2.053 af  
Primary=14.64 cfs 2.053 af

**Total Runoff Area = 55.274 ac Runoff Volume = 11.093 af Average Runoff Depth = 2.41"**  
**97.86% Pervious = 54.091 ac 2.14% Impervious = 1.183 ac**



**APPENDIX 4**

**POST-DEVELOPMENT HYDROCAD MODEL**



**Routing Diagram for POST**  
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# POST

Prepared by Terradyn Consultants

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## Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.377	80	1/2 acre lots, 25% imp, HSG C (50S)
1.377	85	1/2 acre lots, 25% imp, HSG D (10S, 30S)
0.166	74	>75% Grass cover, Good, HSG C (52S)
0.375	98	BARTLETT ROAD (20S, 30S, 31S)
1.039	98	LOT IMP (11S, 21S, 31S, 32S, 33S, 35S, 41S, 51S)
3.077	74	LOT LS (11S, 21S, 31S, 32S, 33S, 35S, 41S, 51S)
0.171	98	Lynch Ln (10S, 20S, 50S)
0.440	98	PROPOSED ROAD IMP (31S, 33S, 52S)
0.320	74	PROPOSED ROAD LS (31S, 33S)
10.211	70	Woods, Good, HSG C (10S, 20S, 30S, 31S, 32S, 33S, 40S, 41S, 50S, 51S)
36.720	77	Woods, Good, HSG D (10S, 20S, 30S, 40S, 50S)
<b>55.274</b>	<b>77</b>	<b>TOTAL AREA</b>

**POST**

Prepared by Terradyn Consultants

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Type III 24-hr 2-YR Rainfall=2.90"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 10S: UNDEVELOPED** Runoff Area=126,255 sf 6.69% Impervious Runoff Depth>0.91"  
 Flow Length=309' Slope=0.0200 '/ Tc=32.9 min CN=77 Runoff=1.76 cfs 0.219 af

**Subcatchment 11S: P LOTS** Runoff Area=15,000 sf 25.00% Impervious Runoff Depth>1.08"  
 Flow Length=77' Slope=0.0200 '/ Tc=7.8 min CN=80 Runoff=0.43 cfs 0.031 af

**Subcatchment 20S: UNDEVELOPED** Runoff Area=205,594 sf 4.24% Impervious Runoff Depth>0.90"  
 Flow Length=478' Slope=0.0100 '/ Tc=49.5 min CN=77 Runoff=2.33 cfs 0.354 af

**Subcatchment 21S: P LOTS** Runoff Area=14,022 sf 26.74% Impervious Runoff Depth>1.08"  
 Tc=5.0 min CN=80 Runoff=0.44 cfs 0.029 af

**Subcatchment 30S: UNDEVELOPED** Runoff Area=746,720 sf 2.40% Impervious Runoff Depth>0.84"  
 Flow Length=1,362' Slope=0.0100 '/ Tc=56.8 min CN=76 Runoff=7.29 cfs 1.207 af

**Subcatchment 31S: P ROAD** Runoff Area=48,417 sf 23.89% Impervious Runoff Depth>0.97"  
 Flow Length=220' Slope=0.0200 '/ Tc=9.8 min CN=78 Runoff=1.16 cfs 0.090 af

**Subcatchment 32S: P LOTS** Runoff Area=32,685 sf 19.89% Impervious Runoff Depth>0.96"  
 Flow Length=145' Slope=0.0200 '/ Tc=18.9 min CN=78 Runoff=0.61 cfs 0.060 af

**Subcatchment 33S: P ROAD** Runoff Area=66,727 sf 27.87% Impervious Runoff Depth>1.08"  
 Flow Length=227' Slope=0.0200 '/ Tc=8.3 min CN=80 Runoff=1.88 cfs 0.138 af

**Subcatchment 35S: P LOTS** Runoff Area=20,000 sf 25.00% Impervious Runoff Depth>1.08"  
 Tc=5.0 min CN=80 Runoff=0.62 cfs 0.041 af

**Subcatchment 40S: UNDEVELOPED** Runoff Area=676,897 sf 0.00% Impervious Runoff Depth>0.84"  
 Flow Length=852' Tc=74.3 min CN=76 Runoff=5.56 cfs 1.084 af

**Subcatchment 41S: P LOTS** Runoff Area=37,214 sf 20.15% Impervious Runoff Depth>0.97"  
 Flow Length=117' Slope=0.0500 '/ Tc=7.6 min CN=78 Runoff=0.96 cfs 0.069 af

**Subcatchment 50S: UNDEVELOPED** Runoff Area=373,177 sf 4.70% Impervious Runoff Depth>0.85"  
 Flow Length=309' Tc=41.3 min CN=76 Runoff=4.36 cfs 0.608 af

**Subcatchment 51S: P LOTS** Runoff Area=32,629 sf 11.49% Impervious Runoff Depth>0.82"  
 Flow Length=101' Slope=0.0600 '/ Tc=6.3 min CN=75 Runoff=0.72 cfs 0.051 af

**Subcatchment 52S: P ROAD** Runoff Area=12,377 sf 41.45% Impervious Runoff Depth>1.33"  
 Tc=5.0 min CN=84 Runoff=0.48 cfs 0.032 af

**Reach 11R: OVERLAND FLOW** Avg. Flow Depth=0.01' Max Vel=0.21 fps Inflow=0.43 cfs 0.031 af  
 n=0.050 L=387.0' S=0.0258 '/ Capacity=186.32 cfs Outflow=0.20 cfs 0.030 af

**Reach 21R: WETLAND FLOW** Avg. Flow Depth=0.05' Max Vel=0.57 fps Inflow=0.44 cfs 0.029 af  
 n=0.050 L=460.0' S=0.0228 '/ Capacity=68.38 cfs Outflow=0.28 cfs 0.028 af

**POST**

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Type III 24-hr 2-YR Rainfall=2.90"

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**Reach 31R: BARTLETT RD DITCH** Avg. Flow Depth=0.19' Max Vel=2.32 fps Inflow=1.16 cfs 0.090 af  
n=0.035 L=268.0' S=0.0373 '/' Capacity=139.17 cfs Outflow=1.11 cfs 0.089 af

**Reach 32AR: OVERLAND FLOW** Avg. Flow Depth=0.01' Max Vel=0.76 fps Inflow=0.96 cfs 0.102 af  
n=0.050 L=20.0' S=0.5000 '/' Capacity=1,465.43 cfs Outflow=0.94 cfs 0.102 af

**Reach 32BR: OFFSITE POND** Avg. Flow Depth=0.12' Max Vel=0.69 fps Inflow=2.52 cfs 0.238 af  
n=0.050 L=103.0' S=0.0097 '/' Capacity=28.48 cfs Outflow=2.47 cfs 0.237 af

**Reach 33BR: SF AFTER LEVEL** Avg. Flow Depth=0.18' Max Vel=0.25 fps Inflow=1.88 cfs 0.138 af  
n=0.400 L=80.0' S=0.0750 '/' Capacity=81.50 cfs Outflow=1.60 cfs 0.137 af

**Reach 41AR: OVERLAND FLOW** Avg. Flow Depth=0.02' Max Vel=0.56 fps Inflow=0.96 cfs 0.069 af  
n=0.050 L=110.0' S=0.0909 '/' Capacity=349.48 cfs Outflow=0.89 cfs 0.069 af

**Reach 41BR: WETLAND FLOW** Avg. Flow Depth=0.10' Max Vel=0.68 fps Inflow=0.89 cfs 0.069 af  
n=0.050 L=648.0' S=0.0123 '/' Capacity=34.31 cfs Outflow=0.58 cfs 0.066 af

**Reach 51R: OVERLAND FLOW** Avg. Flow Depth=0.02' Max Vel=0.14 fps Inflow=0.72 cfs 0.051 af  
n=0.050 L=389.0' S=0.0051 '/' Capacity=83.11 cfs Outflow=0.25 cfs 0.046 af

**Reach 52R: SF AFTER LEVEL** Avg. Flow Depth=0.09' Max Vel=0.16 fps Inflow=0.48 cfs 0.032 af  
n=0.400 L=83.0' S=0.0723 '/' Capacity=14.54 cfs Outflow=0.36 cfs 0.031 af

**Pond SP-1: LYNCH LANE** Inflow=1.81 cfs 0.249 af  
Primary=1.81 cfs 0.249 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=2.51 cfs 0.382 af  
Primary=2.51 cfs 0.382 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=8.41 cfs 1.533 af  
Primary=8.41 cfs 1.533 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=5.87 cfs 1.151 af  
Primary=5.87 cfs 1.151 af

**Pond SP-5: LYNCH LANE** Inflow=4.56 cfs 0.685 af  
Primary=4.56 cfs 0.685 af

**Total Runoff Area = 55.274 ac Runoff Volume = 4.012 af Average Runoff Depth = 0.87"**  
**95.09% Pervious = 52.560 ac 4.91% Impervious = 2.713 ac**

**POST**

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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 10S: UNDEVELOPED**

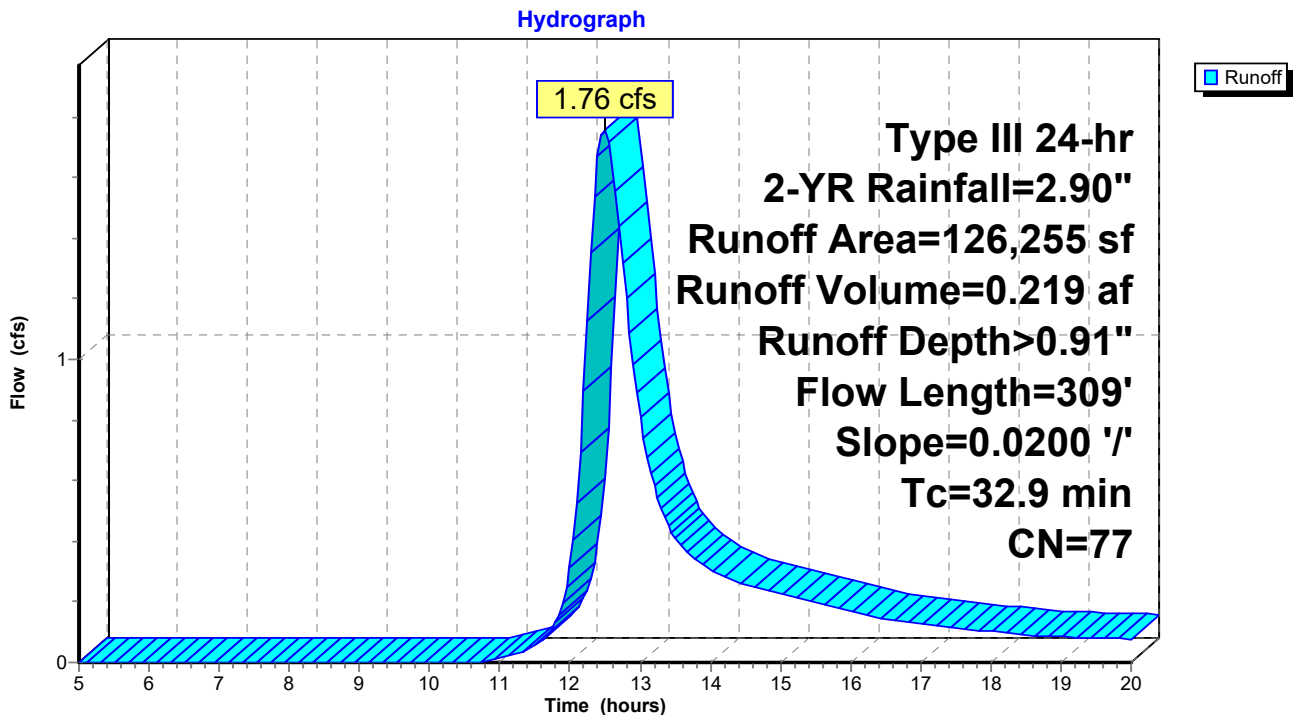
Runoff = 1.76 cfs @ 12.49 hrs, Volume= 0.219 af, Depth> 0.91"  
 Routed to Pond SP-1 : LYNCH LANE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
20,000	85	1/2 acre lots, 25% imp, HSG D
25,000	70	Woods, Good, HSG C
77,814	77	Woods, Good, HSG D
* 3,441	98	Lynch Ln
126,255	77	Weighted Average
117,814		93.31% Pervious Area
8,441		6.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
3.7	159	0.0200	0.71		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
32.9	309	Total			

**Subcatchment 10S: UNDEVELOPED**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 11S: P LOTS**

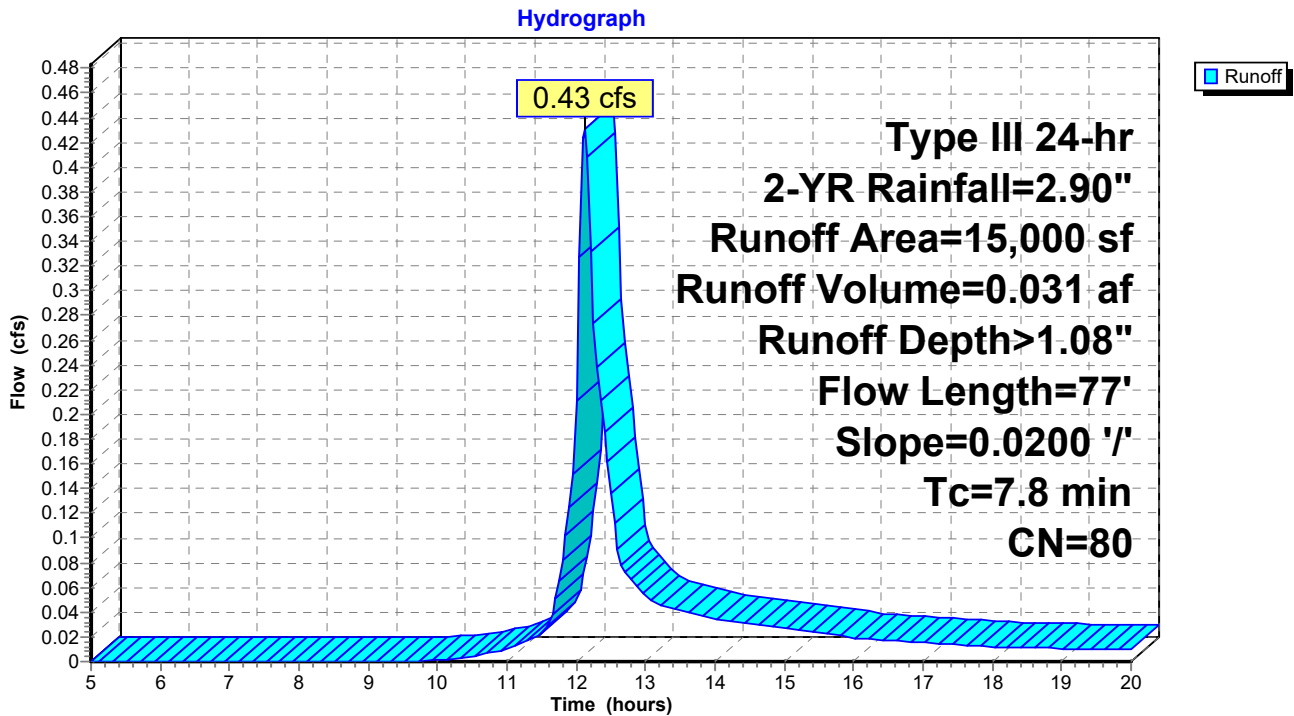
Runoff = 0.43 cfs @ 12.12 hrs, Volume= 0.031 af, Depth> 1.08"  
 Routed to Reach 11R : OVERLAND FLOW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	3,750	98	LOT IMP
*	11,250	74	LOT LS
	15,000	80	Weighted Average
	11,250		75.00% Pervious Area
	3,750		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	77	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.30"

**Subcatchment 11S: P LOTS**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 20S: UNDEVELOPED**

Runoff = 2.33 cfs @ 12.72 hrs, Volume= 0.354 af, Depth> 0.90"  
 Routed to Pond SP-2 : BARTLETT ROAD EAST

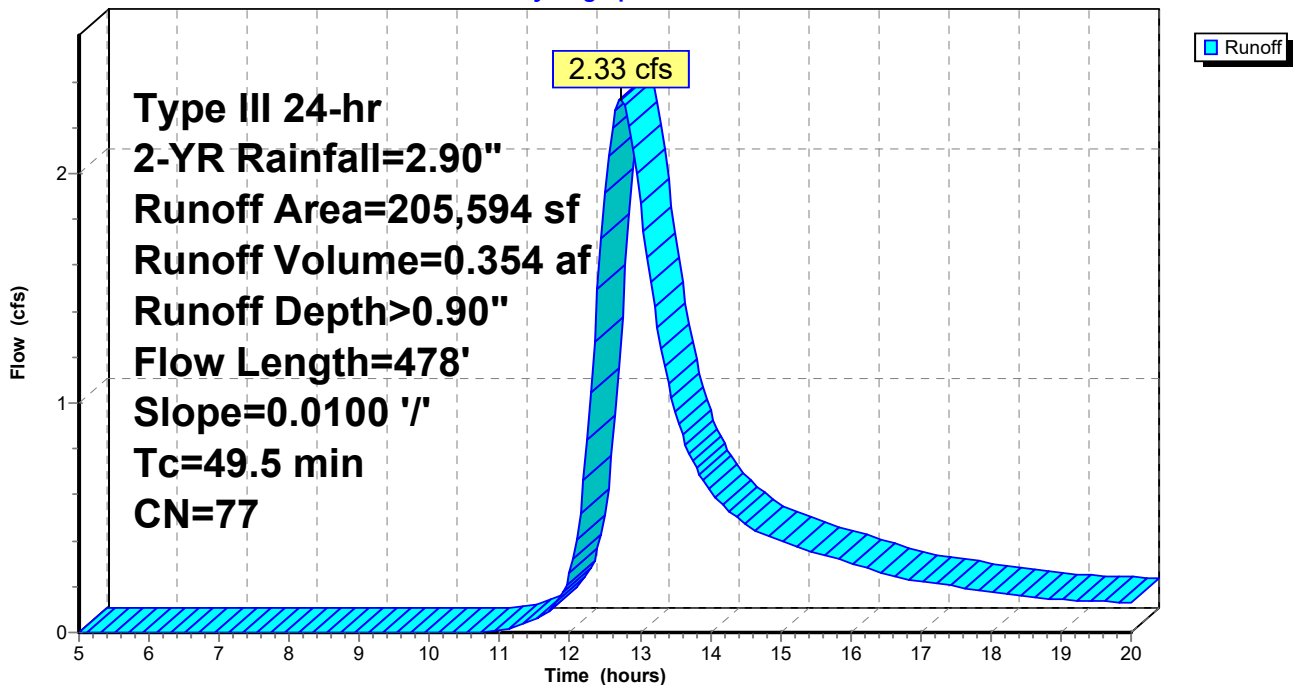
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 1,470	98	Lynch Ln
* 7,256	98	BARTLETT ROAD
27,243	70	Woods, Good, HSG C
169,625	77	Woods, Good, HSG D
205,594	77	Weighted Average
196,868		95.76% Pervious Area
8,726		4.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
10.9	328	0.0100	0.50		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
49.5	478	Total			

**Subcatchment 20S: UNDEVELOPED**

Hydrograph





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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 21S: P LOTS**

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 0.029 af, Depth> 1.08"  
 Routed to Reach 21R : WETLAND FLOW

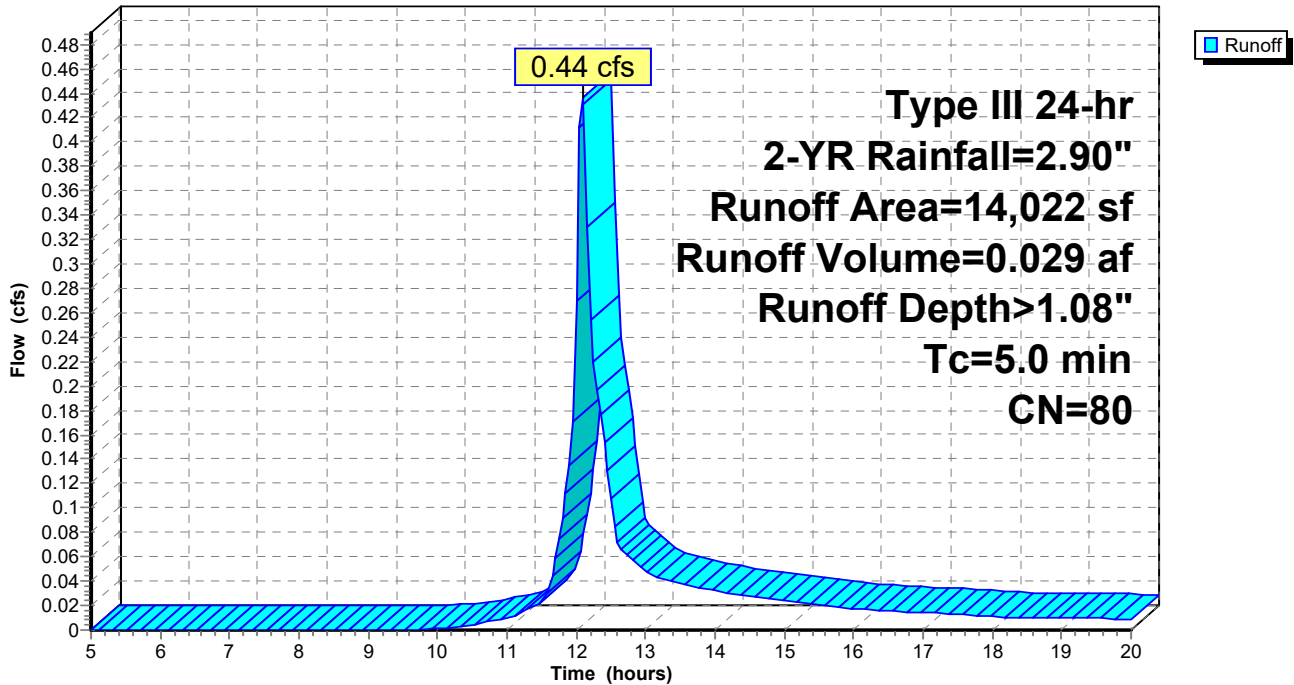
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	3,750	98	LOT IMP
*	10,272	74	LOT LS
	14,022	80	Weighted Average
	10,272		73.26% Pervious Area
	3,750		26.74% Impervious Area

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

**Subcatchment 21S: P LOTS**

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 30S: UNEVELOPED**

Runoff = 7.29 cfs @ 12.82 hrs, Volume= 1.207 af, Depth> 0.84"  
 Routed to Pond SP-3 : BARTLETT ROAD WEST

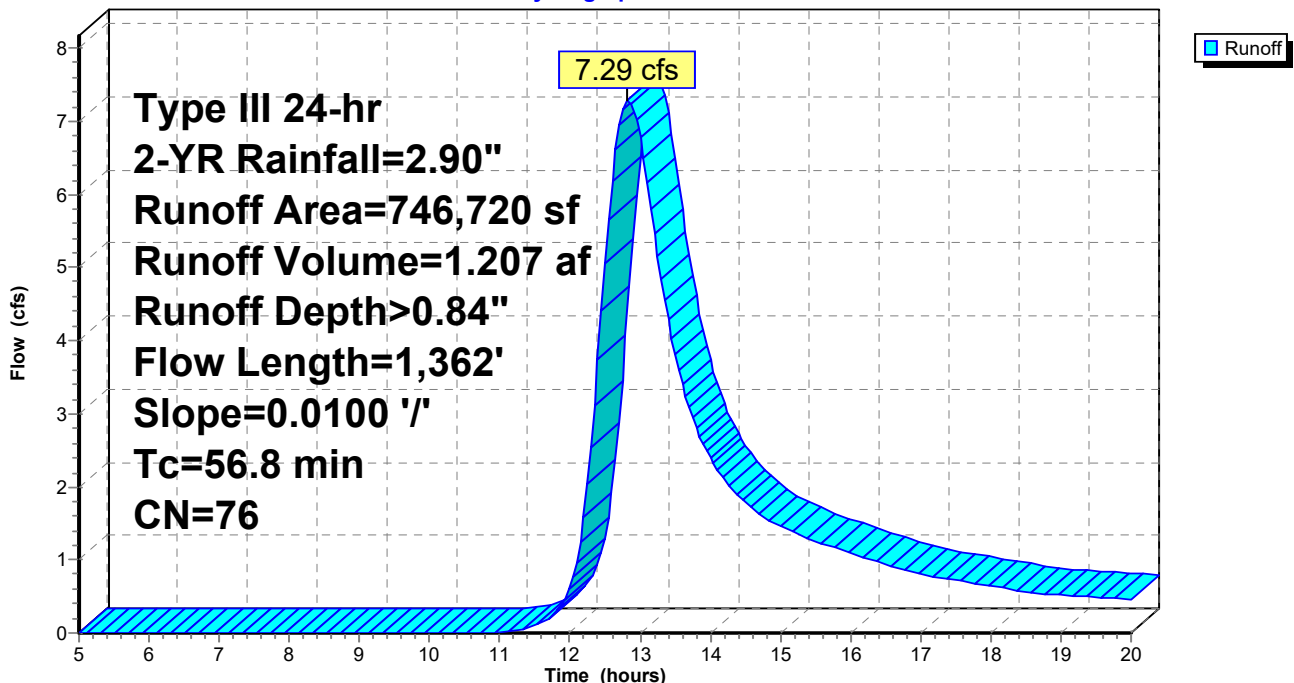
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
573,893	77	Woods, Good, HSG D
124,871	70	Woods, Good, HSG C
* 7,956	98	BARTLETT ROAD
40,000	85	1/2 acre lots, 25% imp, HSG D
746,720	76	Weighted Average
728,764		97.60% Pervious Area
17,956		2.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
18.2	1,212	0.0100	1.11	18.06	<b>Trap/Vee/Rect Channel Flow, B-C</b> Bot.W=30.00' D=0.50' Z= 5.0 '/' Top.W=35.00' n= 0.080 Earth, long dense weeds
56.8	1,362	Total			

**Subcatchment 30S: UNEVELOPED**

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 31S: P ROAD**

Runoff = 1.16 cfs @ 12.15 hrs, Volume= 0.090 af, Depth> 0.97"

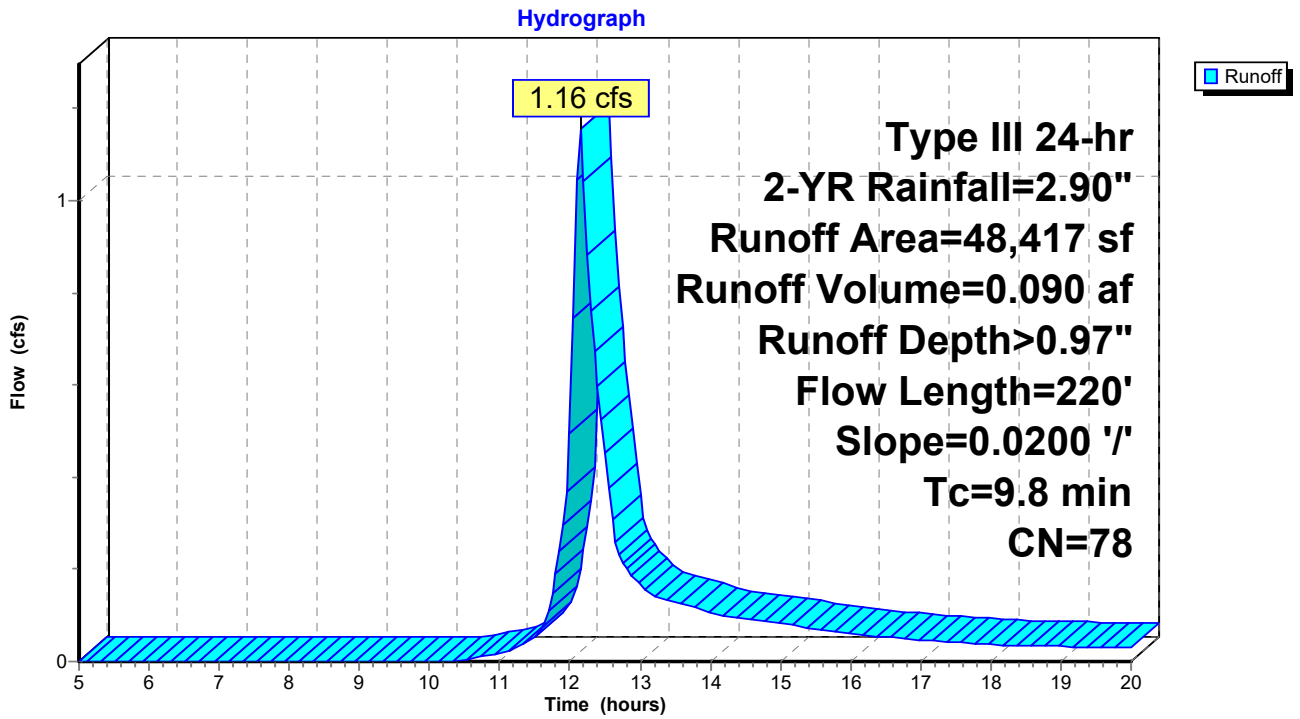
Routed to Reach 31R : BARTLETT RD DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 1,119	98	BARTLETT ROAD
* 7,948	98	PROPOSED ROAD IMP
* 10,365	74	PROPOSED ROAD LS
* 2,500	98	LOT IMP
* 7,500	74	LOT LS
18,985	70	Woods, Good, HSG C
48,417	78	Weighted Average
36,850		76.11% Pervious Area
11,567		23.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0200	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 3.30"
0.2	120	0.0200	9.72	136.02	<b>Trap/Vee/Rect Channel Flow, B-C</b> Bot.W=1.00' D=2.00' Z= 3.0 '/' Top.W=13.00' n= 0.022 Earth, clean & straight
9.8	220	Total			

Subcatchment 31S: P ROAD



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 32S: P LOTS**

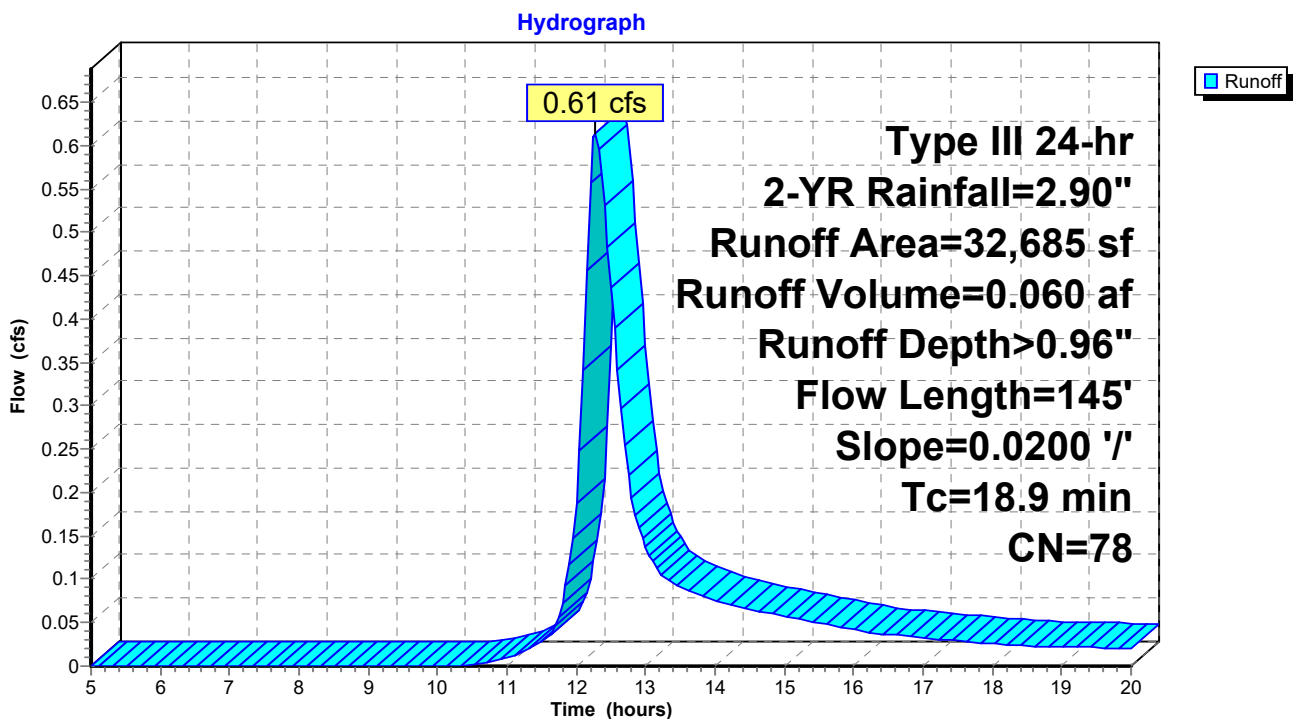
Runoff = 0.61 cfs @ 12.28 hrs, Volume= 0.060 af, Depth> 0.96"  
Routed to Reach 32AR : OVERLAND FLOW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 6,500	98	LOT IMP
* 18,750	74	LOT LS
7,435	70	Woods, Good, HSG C
32,685	78	Weighted Average
26,185		80.11% Pervious Area
6,500		19.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.9	145	0.0200	0.13		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.30"

**Subcatchment 32S: P LOTS**



**POST**

**Summary for Subcatchment 33S: P ROAD**

Runoff = 1.88 cfs @ 12.12 hrs, Volume= 0.138 af, Depth> 1.08"  
 Routed to Reach 33BR : SF AFTER LEVEL SPREADER

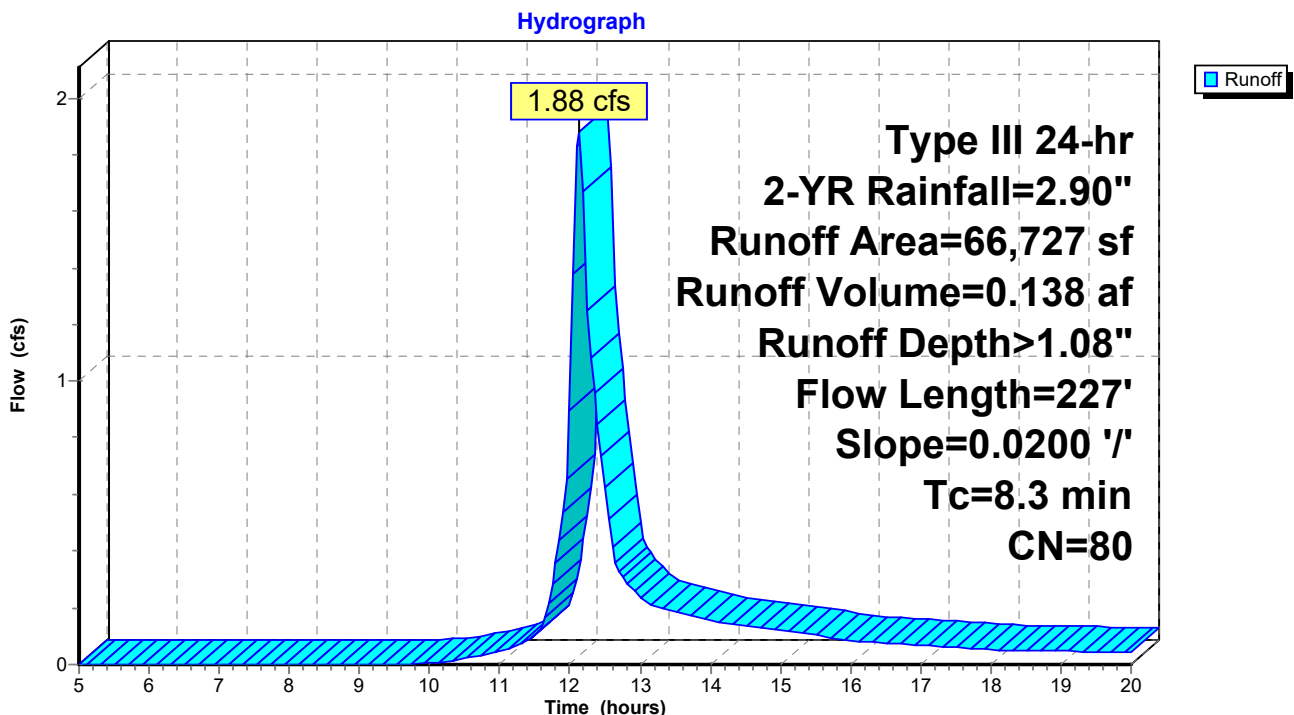
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 6,095	98	PROPOSED ROAD IMP
* 3,563	74	PROPOSED ROAD LS
* 12,500	98	LOT IMP
* 37,500	74	LOT LS
7,069	70	Woods, Good, HSG C
66,727	80	Weighted Average
48,132		72.13% Pervious Area
18,595		27.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	80	0.0200	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 3.30"
0.2	147	0.0200	10.13	162.10	<b>Trap/Vee/Rect Channel Flow, B-C</b> Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
8.3	227	Total			

**Subcatchment 33S: P ROAD**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 35S: P LOTS**

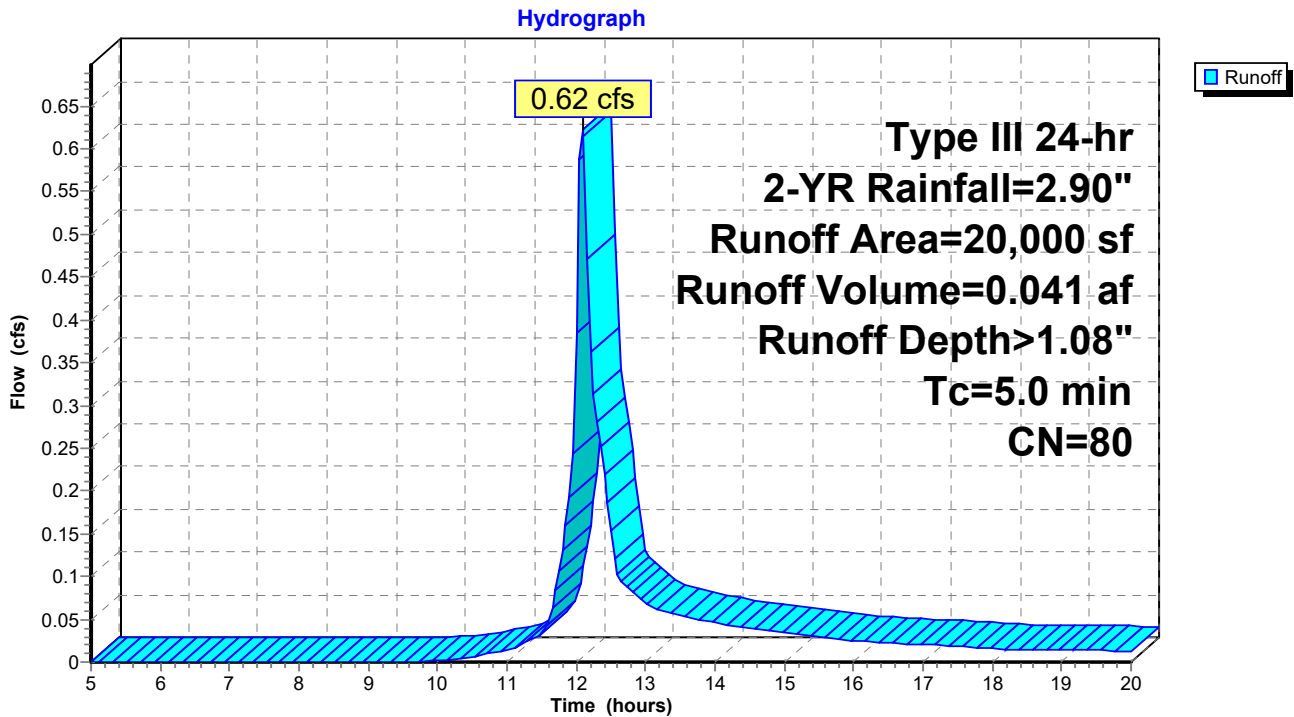
Runoff = 0.62 cfs @ 12.08 hrs, Volume= 0.041 af, Depth> 1.08"  
Routed to Reach 32AR : OVERLAND FLOW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	15,000	74	LOT LS
*	5,000	98	LOT IMP
	20,000	80	Weighted Average
	15,000		75.00% Pervious Area
	5,000		25.00% Impervious Area

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

**Subcatchment 35S: P LOTS**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 40S: UNDEVELOPED**

Runoff = 5.56 cfs @ 13.07 hrs, Volume= 1.084 af, Depth> 0.84"

Routed to Pond SP-4 : WESTERN SITE BOUNDARY

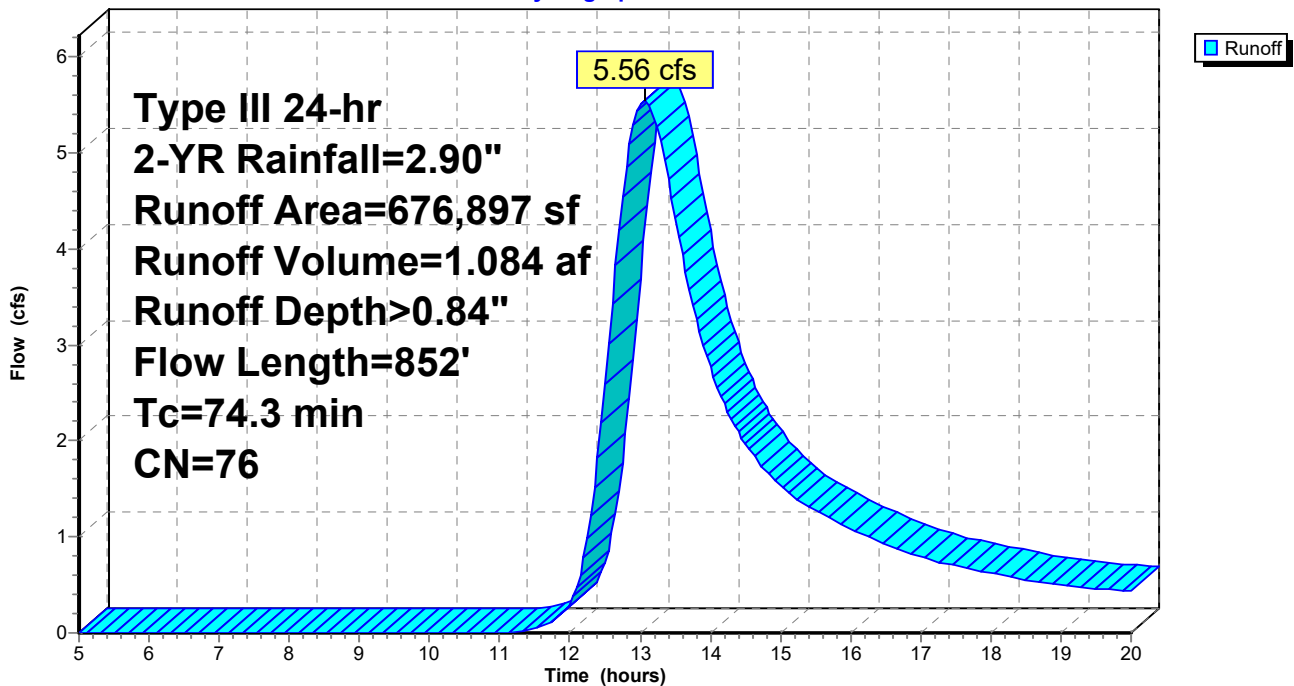
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
560,943	77	Woods, Good, HSG D
115,954	70	Woods, Good, HSG C
676,897	76	Weighted Average
676,897		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
23.4	702	0.0100	0.50		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
74.3	852	Total			

**Subcatchment 40S: UNDEVELOPED**

Hydrograph





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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 41S: P LOTS**

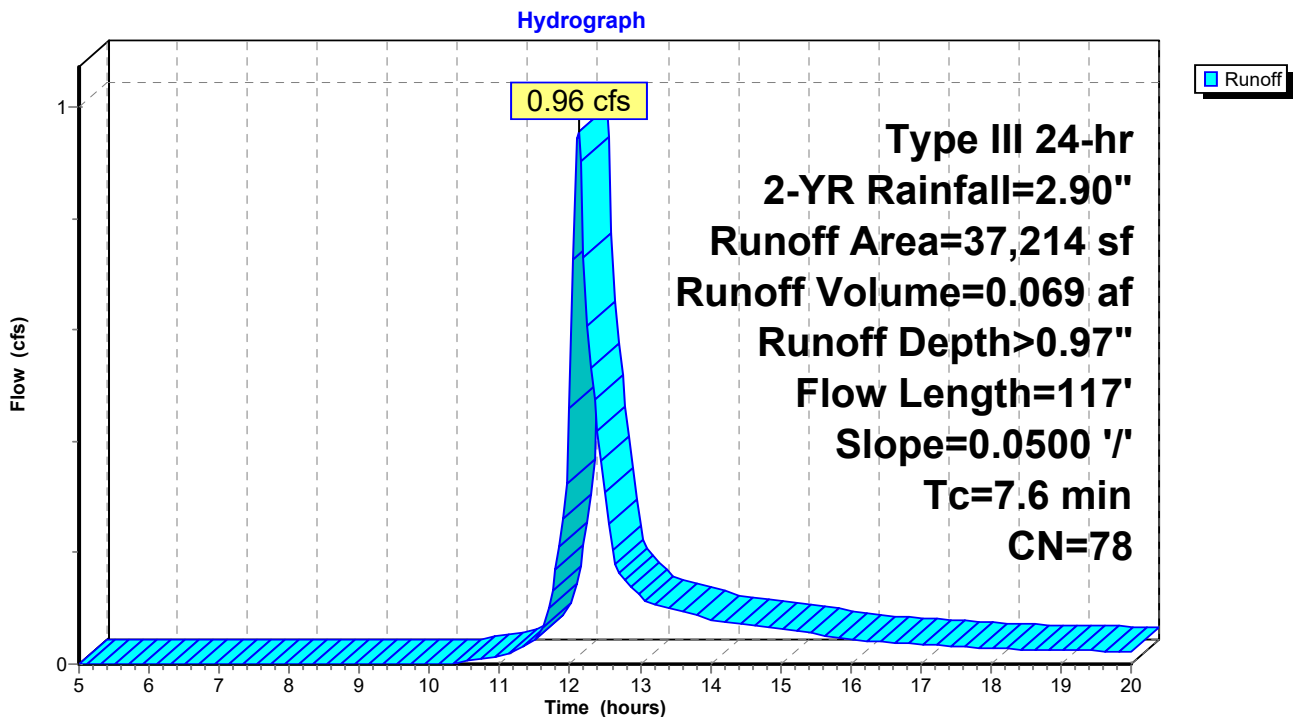
Runoff = 0.96 cfs @ 12.12 hrs, Volume= 0.069 af, Depth> 0.97"  
Routed to Reach 41AR : OVERLAND FLOW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	7,500	98	LOT IMP
*	22,500	74	LOT LS
	7,214	70	Woods, Good, HSG C
	37,214	78	Weighted Average
	29,714		79.85% Pervious Area
	7,500		20.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	117	0.0500	0.26		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.30"

**Subcatchment 41S: P LOTS**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 50S: UNDEVELOPED**

Runoff = 4.36 cfs @ 12.62 hrs, Volume= 0.608 af, Depth> 0.85"  
 Routed to Pond SP-5 : LYNCH LANE

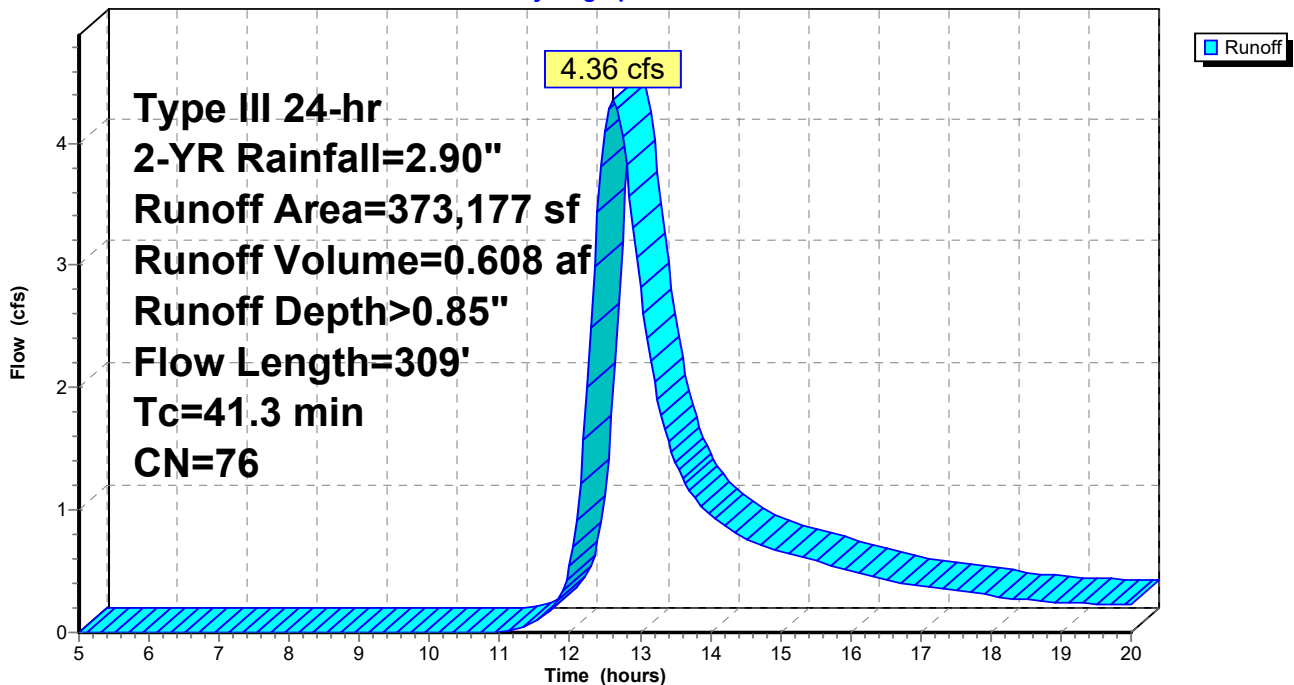
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

Area (sf)	CN	Description
* 2,528	98	Lynch Ln
60,000	80	1/2 acre lots, 25% imp, HSG C
93,383	70	Woods, Good, HSG C
217,266	77	Woods, Good, HSG D
373,177	76	Weighted Average
355,649		95.30% Pervious Area
17,528		4.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.30"
2.6	159	0.0400	1.00		<b>Shallow Concentrated Flow, B-C</b> Woodland Kv= 5.0 fps
41.3	309	Total			

**Subcatchment 50S: UNDEVELOPED**

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 51S: P LOTS**

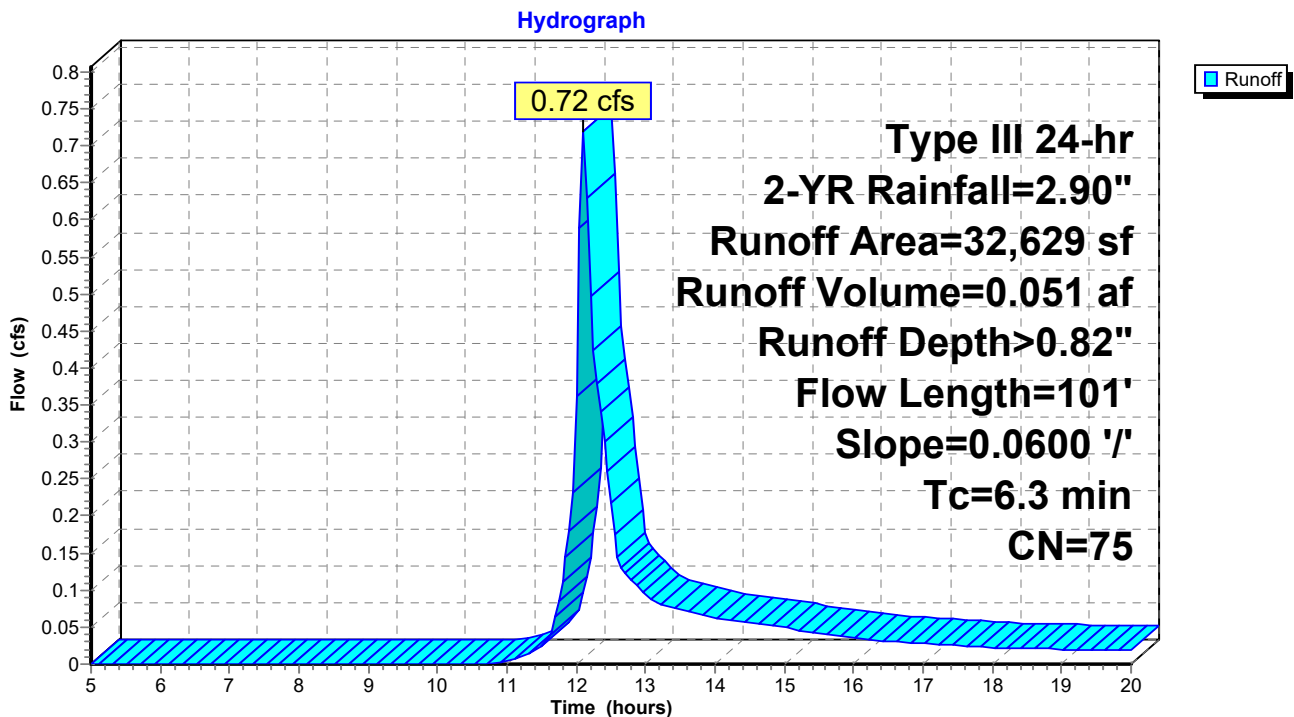
Runoff = 0.72 cfs @ 12.10 hrs, Volume= 0.051 af, Depth> 0.82"  
 Routed to Reach 51R : OVERLAND FLOW

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	11,250	74	LOT LS
*	3,750	98	LOT IMP
	17,629	70	Woods, Good, HSG C
	32,629	75	Weighted Average
	28,879		88.51% Pervious Area
	3,750		11.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	101	0.0600	0.27		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.30"

**Subcatchment 51S: P LOTS**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Subcatchment 52S: P ROAD**

Runoff = 0.48 cfs @ 12.08 hrs, Volume= 0.032 af, Depth> 1.33"

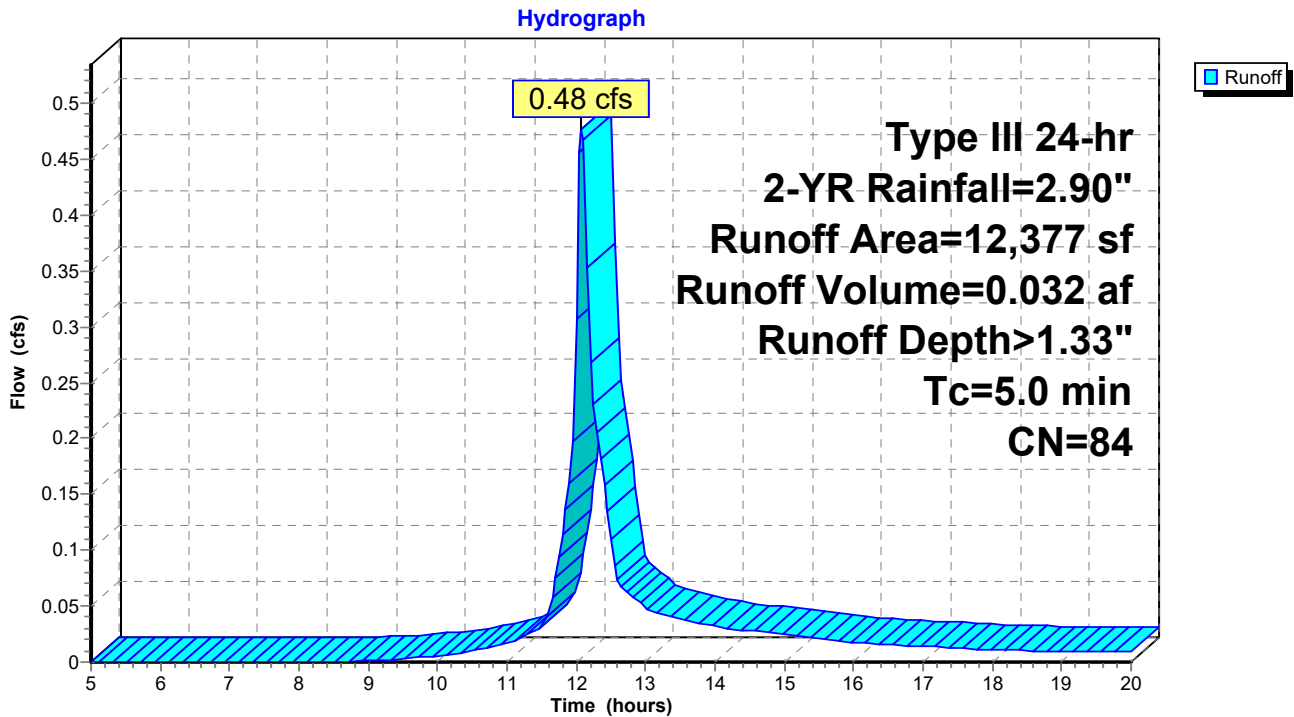
Routed to Reach 52R : SF AFTER LEVEL SPREADER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=2.90"

	Area (sf)	CN	Description
*	5,130	98	PROPOSED ROAD IMP
	7,247	74	>75% Grass cover, Good, HSG C
	12,377	84	Weighted Average
	7,247		58.55% Pervious Area
	5,130		41.45% Impervious Area

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

**Subcatchment 52S: P ROAD**



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 11R: OVERLAND FLOW**

Inflow Area = 0.344 ac, 25.00% Impervious, Inflow Depth > 1.08" for 2-YR event  
Inflow = 0.43 cfs @ 12.12 hrs, Volume= 0.031 af  
Outflow = 0.20 cfs @ 12.88 hrs, Volume= 0.030 af, Atten= 54%, Lag= 45.9 min  
Routed to Pond SP-1 : LYNCH LANE

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Max. Velocity= 0.21 fps, Min. Travel Time= 30.3 min  
Avg. Velocity = 0.14 fps, Avg. Travel Time= 44.6 min

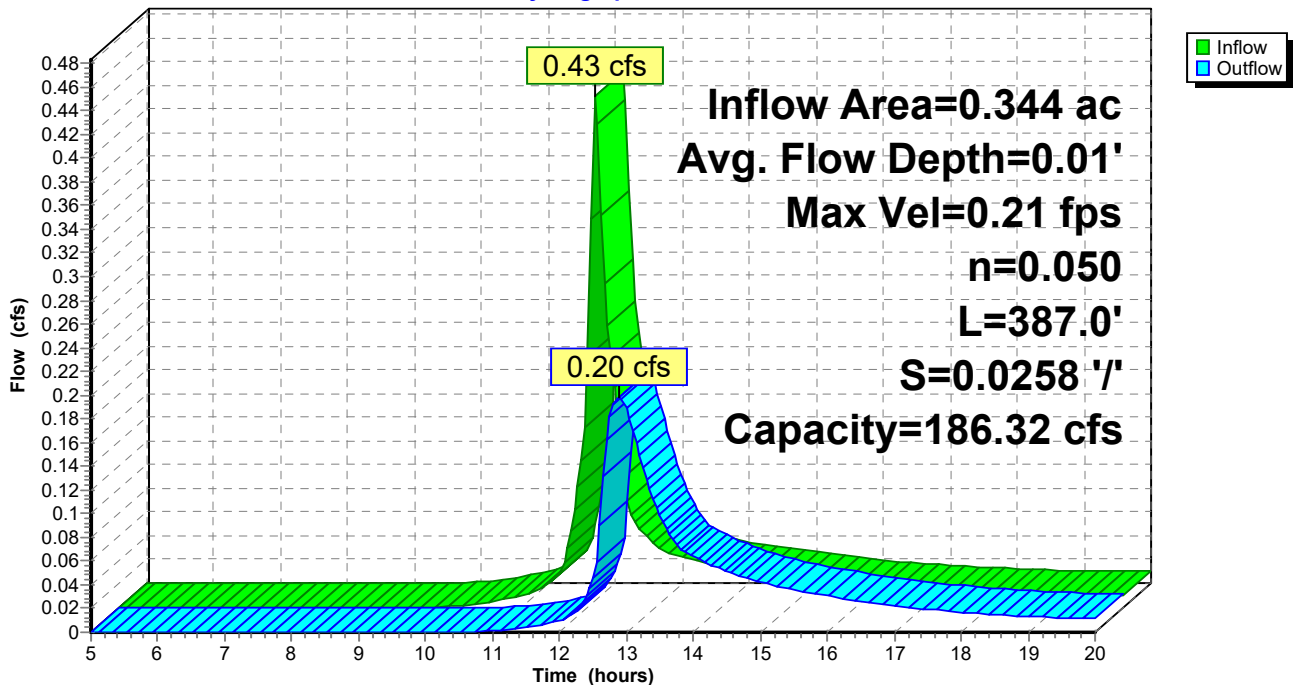
Peak Storage= 359 cf @ 12.38 hrs  
Average Depth at Peak Storage= 0.01' , Surface Width= 101.84'  
Bank-Full Depth= 0.50' Flow Area= 75.0 sf, Capacity= 186.32 cfs

100.00' x 0.50' deep channel, n= 0.050 Scattered brush, heavy weeds  
Side Slope Z-value= 100.0 ' / ' Top Width= 200.00'  
Length= 387.0' Slope= 0.0258 ' / '  
Inlet Invert= 62.00', Outlet Invert= 52.00'



**Reach 11R: OVERLAND FLOW**

Hydrograph



### Summary for Reach 21R: WETLAND FLOW

Inflow Area = 0.322 ac, 26.74% Impervious, Inflow Depth > 1.08" for 2-YR event  
 Inflow = 0.44 cfs @ 12.08 hrs, Volume= 0.029 af  
 Outflow = 0.28 cfs @ 12.42 hrs, Volume= 0.028 af, Atten= 36%, Lag= 20.1 min  
 Routed to Pond SP-2 : BARTLETT ROAD EAST

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 0.57 fps, Min. Travel Time= 13.4 min  
 Avg. Velocity = 0.25 fps, Avg. Travel Time= 31.0 min

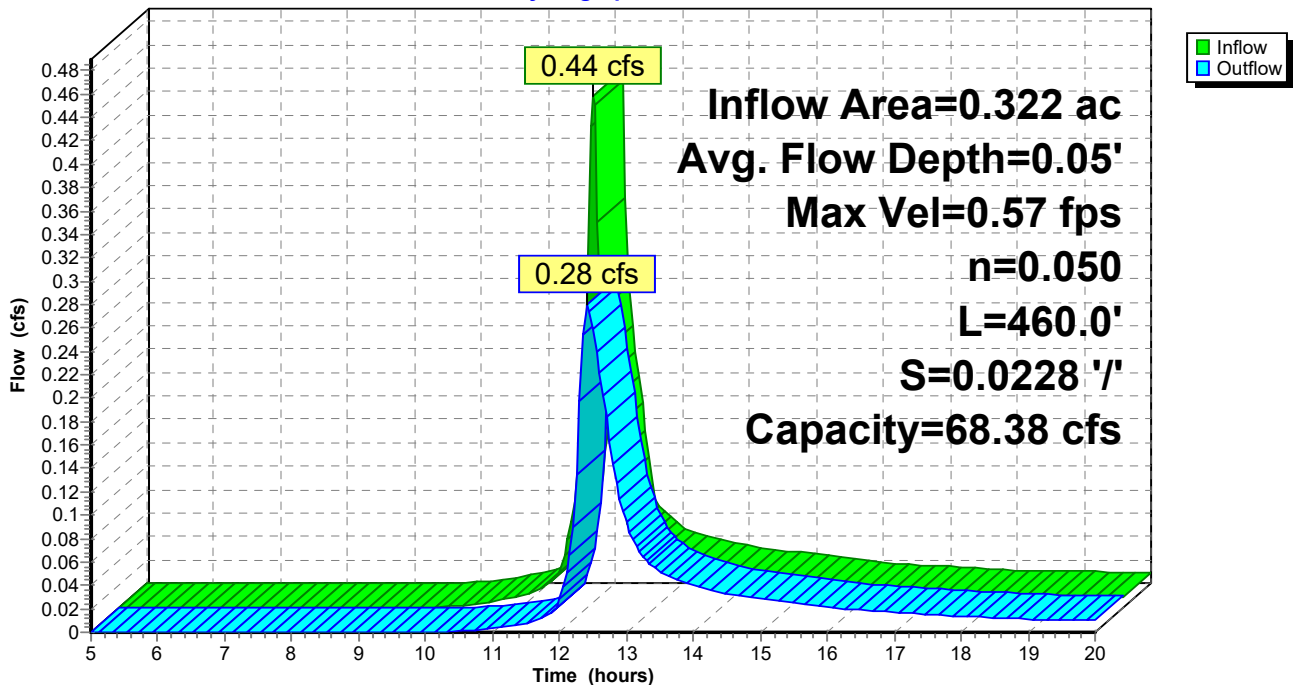
Peak Storage= 226 cf @ 12.19 hrs  
 Average Depth at Peak Storage= 0.05' , Surface Width= 10.94'  
 Bank-Full Depth= 1.00' Flow Area= 20.0 sf, Capacity= 68.38 cfs

10.00' x 1.00' deep channel, n= 0.050 Scattered brush, heavy weeds  
 Side Slope Z-value= 10.0 ' / ' Top Width= 30.00'  
 Length= 460.0' Slope= 0.0228 ' / '  
 Inlet Invert= 57.50', Outlet Invert= 47.00'



### Reach 21R: WETLAND FLOW

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 31R: BARTLETT RD DITCH**

Inflow Area = 1.112 ac, 23.89% Impervious, Inflow Depth > 0.97" for 2-YR event  
Inflow = 1.16 cfs @ 12.15 hrs, Volume= 0.090 af  
Outflow = 1.11 cfs @ 12.21 hrs, Volume= 0.089 af, Atten= 4%, Lag= 3.6 min  
Routed to Pond SP-3 : BARTLETT ROAD WEST

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Max. Velocity= 2.32 fps, Min. Travel Time= 1.9 min  
Avg. Velocity = 0.93 fps, Avg. Travel Time= 4.8 min

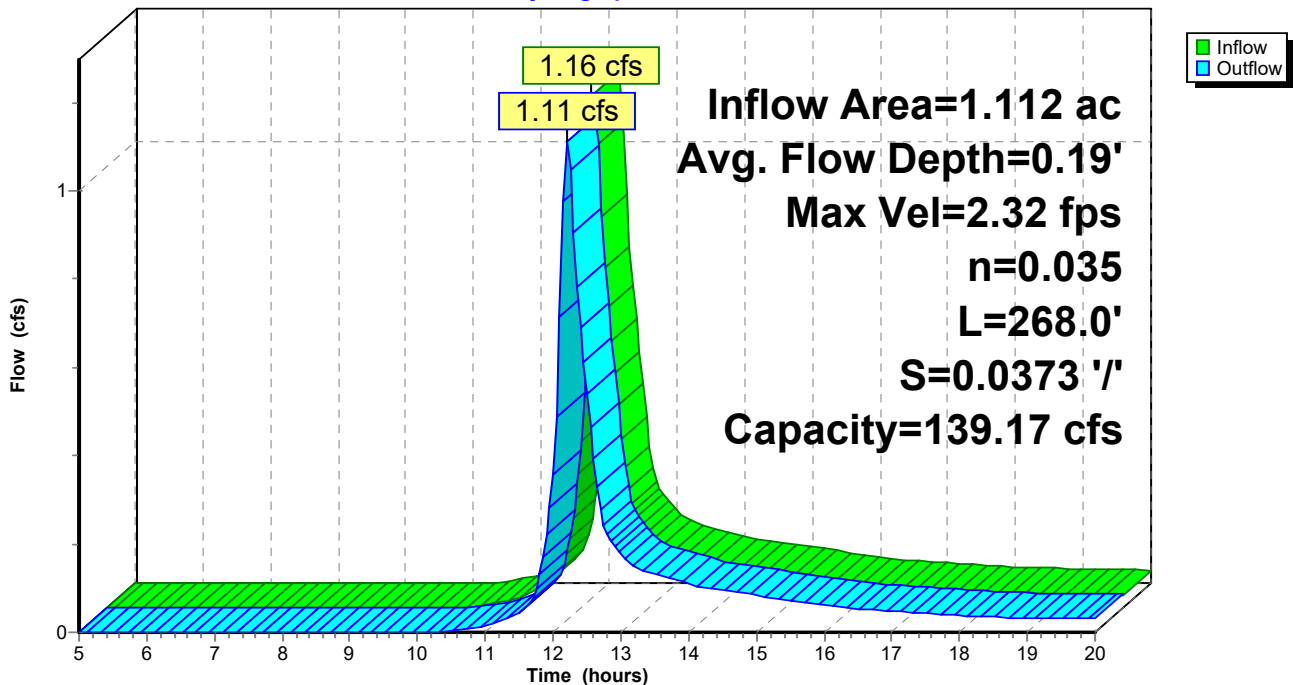
Peak Storage= 130 cf @ 12.17 hrs  
Average Depth at Peak Storage= 0.19' , Surface Width= 3.13'  
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 139.17 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds  
Side Slope Z-value= 3.0 '/' Top Width= 14.00'  
Length= 268.0' Slope= 0.0373 '/'  
Inlet Invert= 58.00', Outlet Invert= 48.00'



**Reach 31R: BARTLETT RD DITCH**

Hydrograph



Summary for Reach 32AR: OVERLAND FLOW

Inflow Area = 1.209 ac, 21.83% Impervious, Inflow Depth > 1.01" for 2-YR event
Inflow = 0.96 cfs @ 12.12 hrs, Volume= 0.102 af
Outflow = 0.94 cfs @ 12.13 hrs, Volume= 0.102 af, Atten= 3%, Lag= 0.9 min
Routed to Reach 32BR : OFFSITE POND

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.76 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 0.5 min

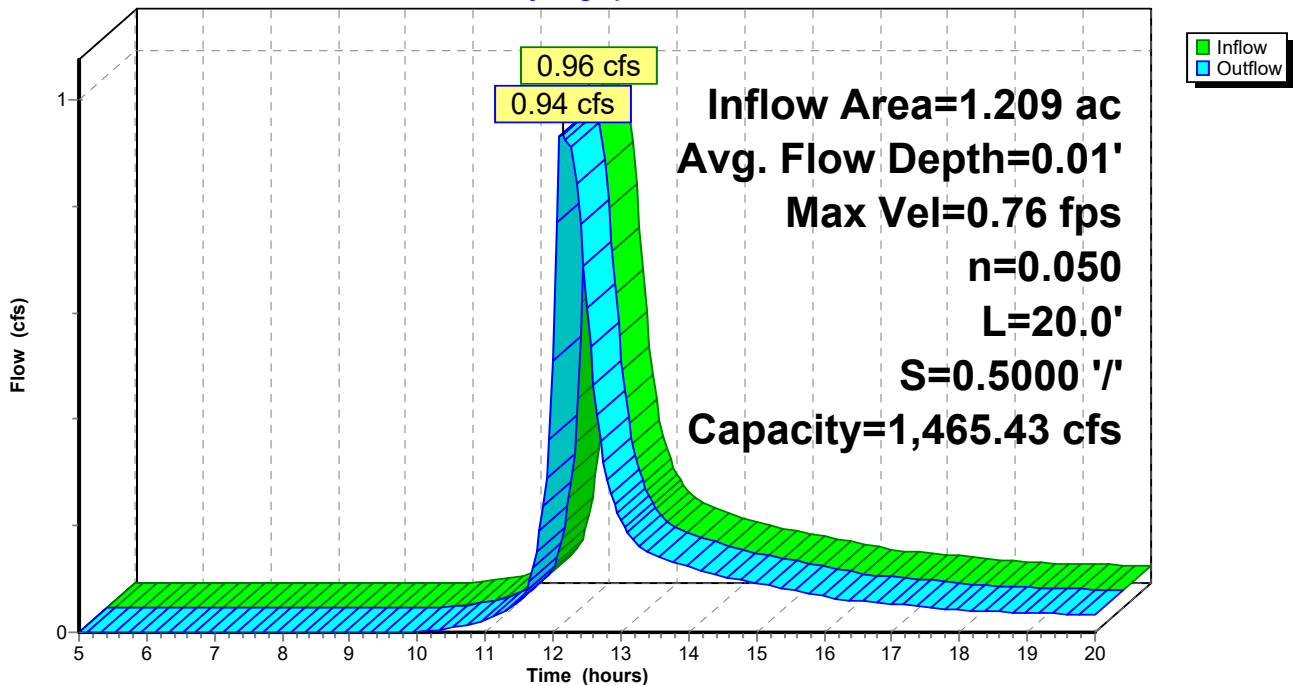
Peak Storage= 25 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 201.26'
Bank-Full Depth= 0.50' Flow Area= 125.0 sf, Capacity= 1,465.43 cfs

200.00' x 0.50' deep channel, n= 0.050 Scattered brush, heavy weeds
Side Slope Z-value= 100.0 '/' Top Width= 300.00'
Length= 20.0' Slope= 0.5000 '/'
Inlet Invert= 58.00', Outlet Invert= 48.00'



Reach 32AR: OVERLAND FLOW

Hydrograph





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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 32BR: OFFSITE POND**

Inflow Area = 2.741 ac, 25.20% Impervious, Inflow Depth > 1.04" for 2-YR event  
 Inflow = 2.52 cfs @ 12.28 hrs, Volume= 0.238 af  
 Outflow = 2.47 cfs @ 12.35 hrs, Volume= 0.237 af, Atten= 2%, Lag= 4.4 min  
 Routed to Pond SP-3 : BARTLETT ROAD WEST

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 0.69 fps, Min. Travel Time= 2.5 min  
 Avg. Velocity = 0.25 fps, Avg. Travel Time= 6.9 min

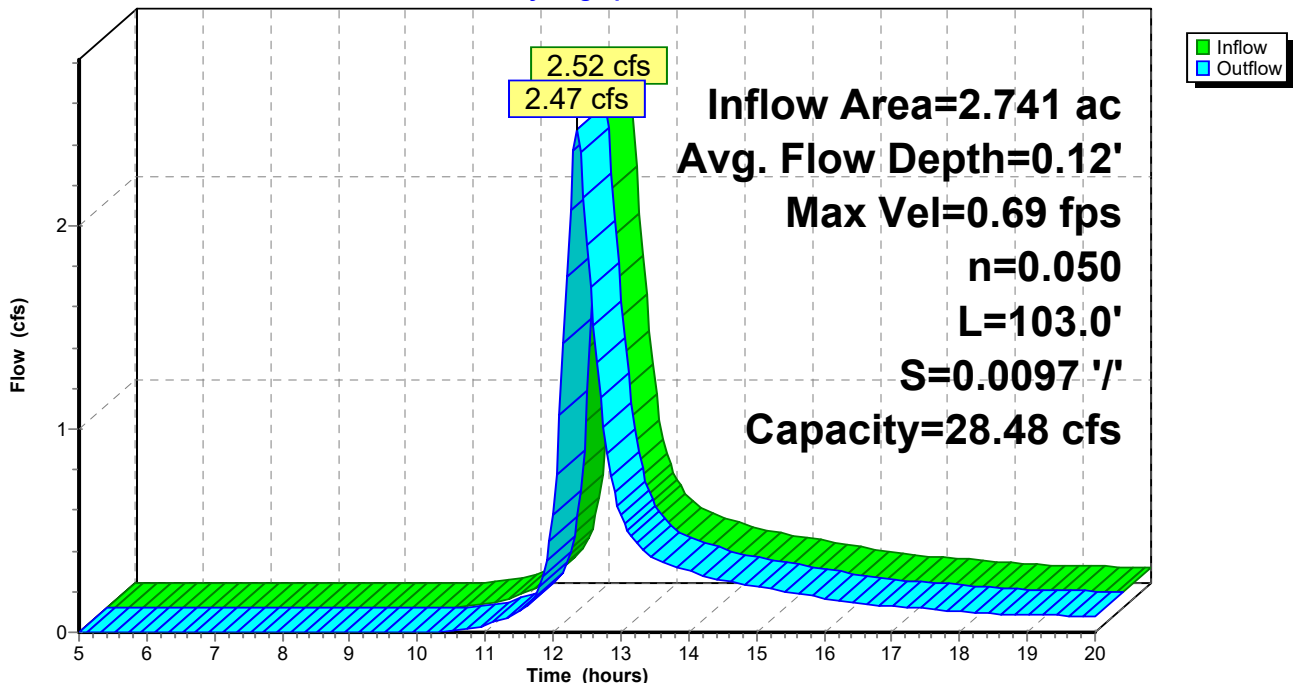
Peak Storage= 370 cf @ 12.31 hrs  
 Average Depth at Peak Storage= 0.12' , Surface Width= 31.17'  
 Bank-Full Depth= 0.50' Flow Area= 16.3 sf, Capacity= 28.48 cfs

30.00' x 0.50' deep channel, n= 0.050 Scattered brush, heavy weeds  
 Side Slope Z-value= 5.0 '/' Top Width= 35.00'  
 Length= 103.0' Slope= 0.0097 '/'  
 Inlet Invert= 48.00', Outlet Invert= 47.00'



**Reach 32BR: OFFSITE POND**

Hydrograph



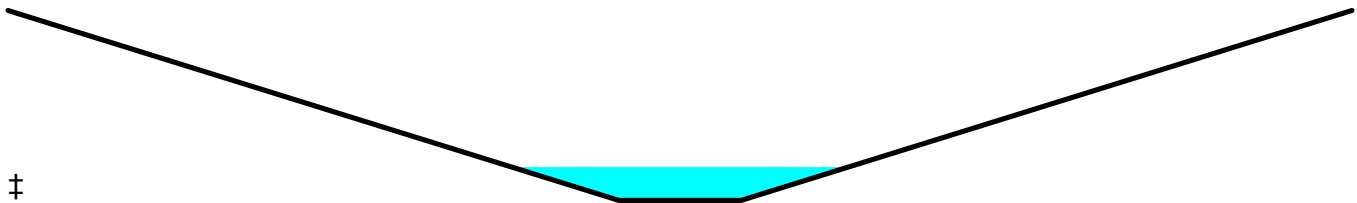
### Summary for Reach 33BR: SF AFTER LEVEL SPREADER

Inflow Area = 1.532 ac, 27.87% Impervious, Inflow Depth > 1.08" for 2-YR event  
 Inflow = 1.88 cfs @ 12.12 hrs, Volume= 0.138 af  
 Outflow = 1.60 cfs @ 12.28 hrs, Volume= 0.137 af, Atten= 15%, Lag= 9.5 min  
 Routed to Reach 32BR : OFFSITE POND

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 0.25 fps, Min. Travel Time= 5.4 min  
 Avg. Velocity = 0.11 fps, Avg. Travel Time= 12.6 min

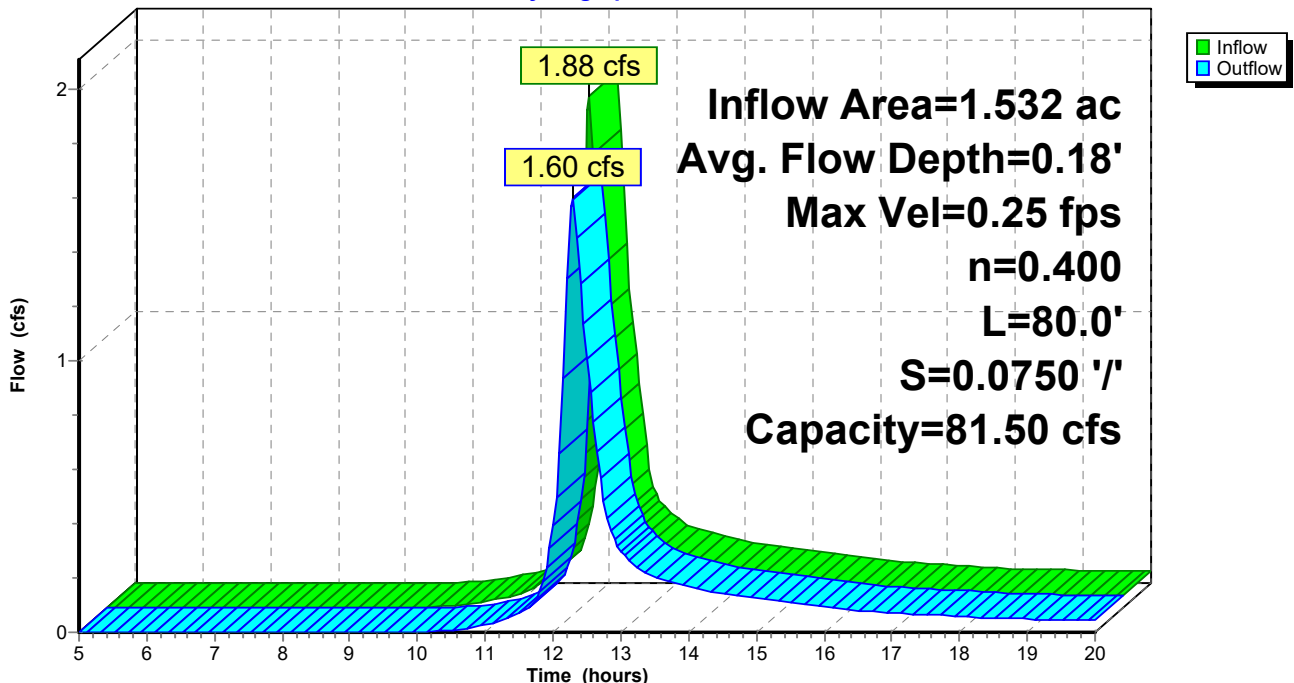
Peak Storage= 526 cf @ 12.19 hrs  
 Average Depth at Peak Storage= 0.18' , Surface Width= 55.02'  
 Bank-Full Depth= 1.00' Flow Area= 120.0 sf, Capacity= 81.50 cfs

20.00' x 1.00' deep channel, n= 0.400 Sheet flow: Woods+light brush  
 Side Slope Z-value= 100.0 '/' Top Width= 220.00'  
 Length= 80.0' Slope= 0.0750 '/'  
 Inlet Invert= 56.00', Outlet Invert= 50.00'



### Reach 33BR: SF AFTER LEVEL SPREADER

Hydrograph



### Summary for Reach 41AR: OVERLAND FLOW

Inflow Area = 0.854 ac, 20.15% Impervious, Inflow Depth > 0.97" for 2-YR event  
 Inflow = 0.96 cfs @ 12.12 hrs, Volume= 0.069 af  
 Outflow = 0.89 cfs @ 12.21 hrs, Volume= 0.069 af, Atten= 7%, Lag= 5.6 min  
 Routed to Reach 41BR : WETLAND FLOW

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 0.56 fps, Min. Travel Time= 3.3 min  
 Avg. Velocity = 0.28 fps, Avg. Travel Time= 6.6 min

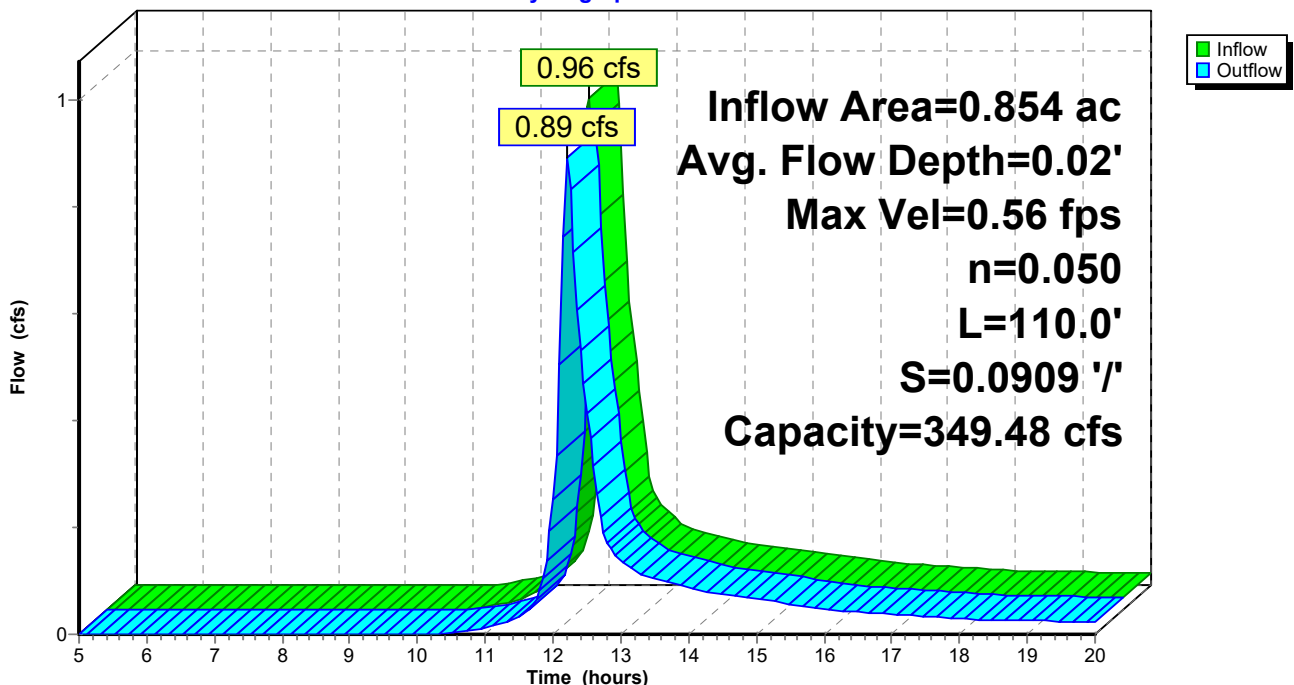
Peak Storage= 176 cf @ 12.16 hrs  
 Average Depth at Peak Storage= 0.02' , Surface Width= 103.15'  
 Bank-Full Depth= 0.50' Flow Area= 75.0 sf, Capacity= 349.48 cfs

100.00' x 0.50' deep channel, n= 0.050 Scattered brush, heavy weeds  
 Side Slope Z-value= 100.0 '/' Top Width= 200.00'  
 Length= 110.0' Slope= 0.0909 '/'  
 Inlet Invert= 58.00', Outlet Invert= 48.00'



### Reach 41AR: OVERLAND FLOW

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 41BR: WETLAND FLOW**

Inflow Area = 0.854 ac, 20.15% Impervious, Inflow Depth > 0.96" for 2-YR event  
Inflow = 0.89 cfs @ 12.21 hrs, Volume= 0.069 af  
Outflow = 0.58 cfs @ 12.64 hrs, Volume= 0.066 af, Atten= 35%, Lag= 25.5 min  
Routed to Pond SP-4 : WESTERN SITE BOUNDARY

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Max. Velocity= 0.68 fps, Min. Travel Time= 15.8 min  
Avg. Velocity = 0.29 fps, Avg. Travel Time= 37.4 min

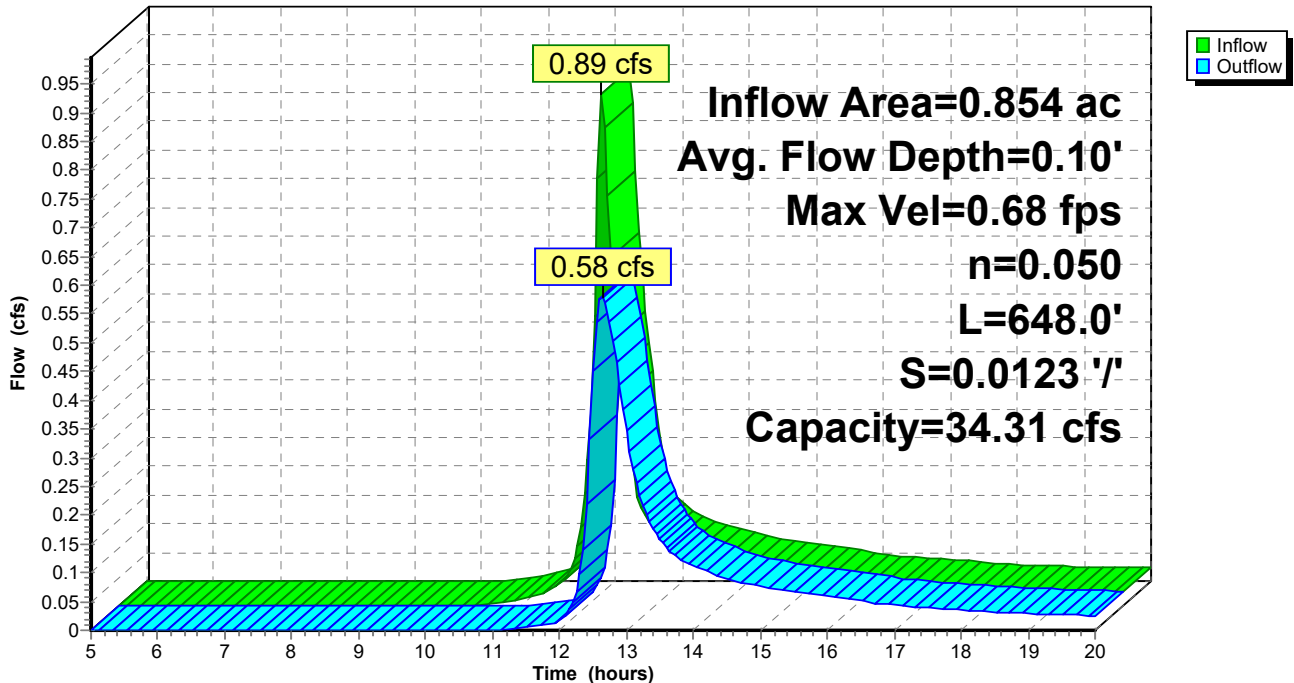
Peak Storage= 552 cf @ 12.37 hrs  
Average Depth at Peak Storage= 0.10' , Surface Width= 9.00'  
Bank-Full Depth= 1.00' Flow Area= 13.0 sf, Capacity= 34.31 cfs

8.00' x 1.00' deep channel, n= 0.050 Scattered brush, heavy weeds  
Side Slope Z-value= 5.0 '/' Top Width= 18.00'  
Length= 648.0' Slope= 0.0123 '/'  
Inlet Invert= 49.00', Outlet Invert= 41.00'



**Reach 41BR: WETLAND FLOW**

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 51R: OVERLAND FLOW**

Inflow Area = 0.749 ac, 11.49% Impervious, Inflow Depth > 0.82" for 2-YR event  
Inflow = 0.72 cfs @ 12.10 hrs, Volume= 0.051 af  
Outflow = 0.25 cfs @ 13.23 hrs, Volume= 0.046 af, Atten= 66%, Lag= 67.3 min  
Routed to Pond SP-5 : LYNCH LANE

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Max. Velocity= 0.14 fps, Min. Travel Time= 45.7 min  
Avg. Velocity = 0.08 fps, Avg. Travel Time= 80.8 min

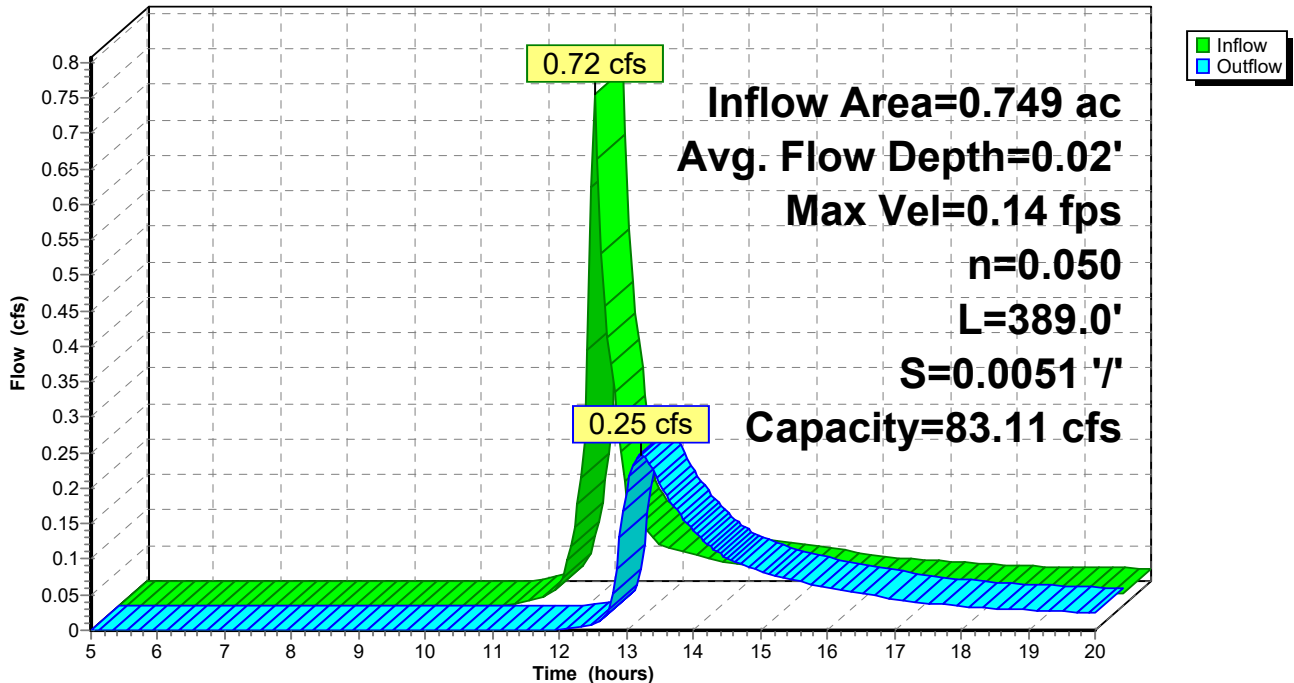
Peak Storage= 680 cf @ 12.47 hrs  
Average Depth at Peak Storage= 0.02' , Surface Width= 103.44'  
Bank-Full Depth= 0.50' Flow Area= 75.0 sf, Capacity= 83.11 cfs

100.00' x 0.50' deep channel, n= 0.050 Scattered brush, heavy weeds  
Side Slope Z-value= 100.0 ' / ' Top Width= 200.00'  
Length= 389.0' Slope= 0.0051 ' / '  
Inlet Invert= 52.00', Outlet Invert= 50.00'



**Reach 51R: OVERLAND FLOW**

Hydrograph



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Type III 24-hr 2-YR Rainfall=2.90"

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**Summary for Reach 52R: SF AFTER LEVEL SPREADER**

Inflow Area = 0.284 ac, 41.45% Impervious, Inflow Depth > 1.33" for 2-YR event  
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.032 af  
 Outflow = 0.36 cfs @ 12.30 hrs, Volume= 0.031 af, Atten= 26%, Lag= 13.4 min  
 Routed to Pond SP-5 : LYNCH LANE

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 0.16 fps, Min. Travel Time= 8.6 min  
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 22.0 min

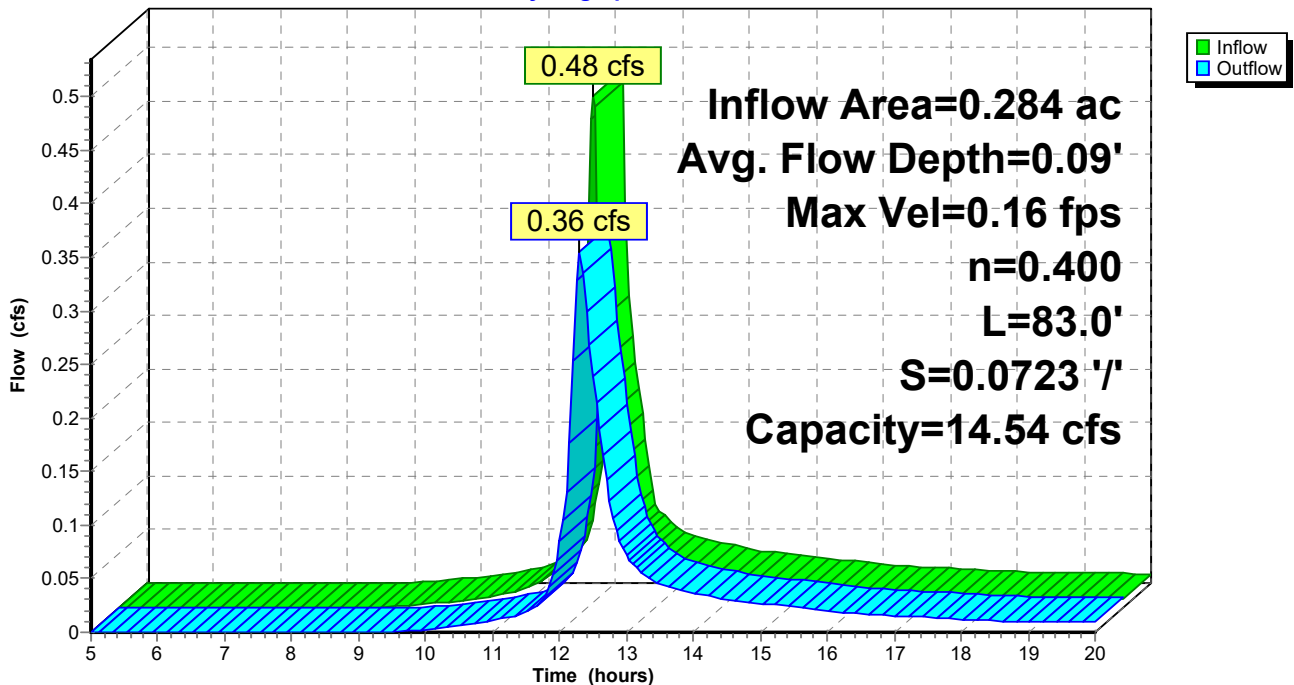
Peak Storage= 185 cf @ 12.16 hrs  
 Average Depth at Peak Storage= 0.09' , Surface Width= 34.33'  
 Bank-Full Depth= 0.50' Flow Area= 33.5 sf, Capacity= 14.54 cfs

17.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush  
 Side Slope Z-value= 100.0 ' / ' Top Width= 117.00'  
 Length= 83.0' Slope= 0.0723 ' / '  
 Inlet Invert= 62.00', Outlet Invert= 56.00'



**Reach 52R: SF AFTER LEVEL SPREADER**

Hydrograph

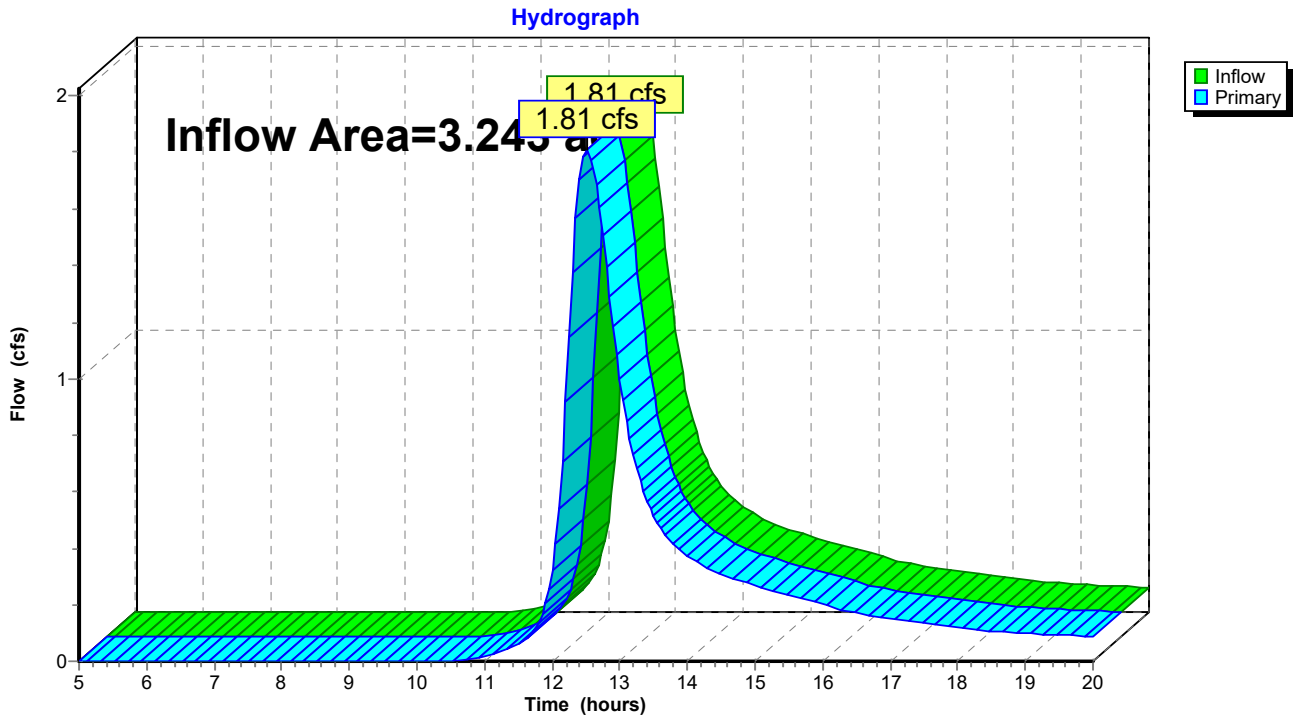


### Summary for Pond SP-1: LYNCH LANE

Inflow Area = 3.243 ac, 8.63% Impervious, Inflow Depth > 0.92" for 2-YR event  
Inflow = 1.81 cfs @ 12.51 hrs, Volume= 0.249 af  
Primary = 1.81 cfs @ 12.51 hrs, Volume= 0.249 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node 1P

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-1: LYNCH LANE

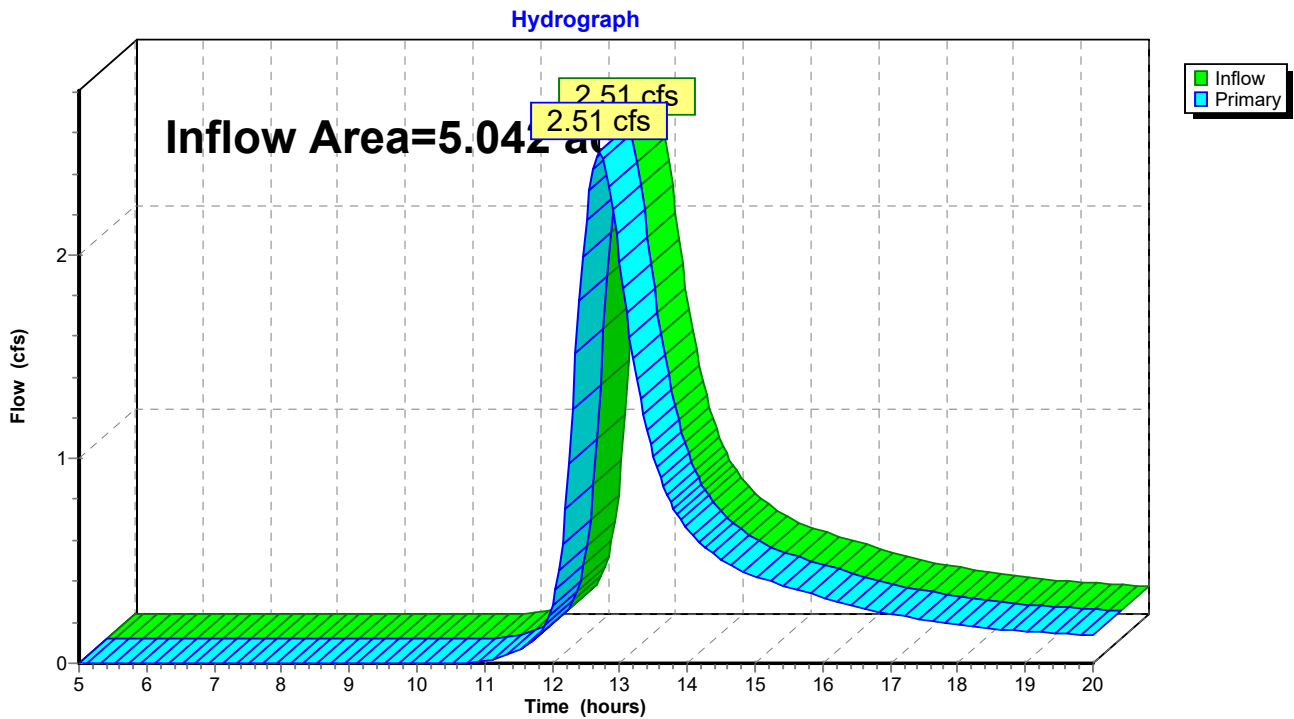


### Summary for Pond SP-2: BARTLETT ROAD EAST

Inflow Area = 5.042 ac, 5.68% Impervious, Inflow Depth > 0.91" for 2-YR event  
Inflow = 2.51 cfs @ 12.70 hrs, Volume= 0.382 af  
Primary = 2.51 cfs @ 12.70 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node 1P

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-2: BARTLETT ROAD EAST





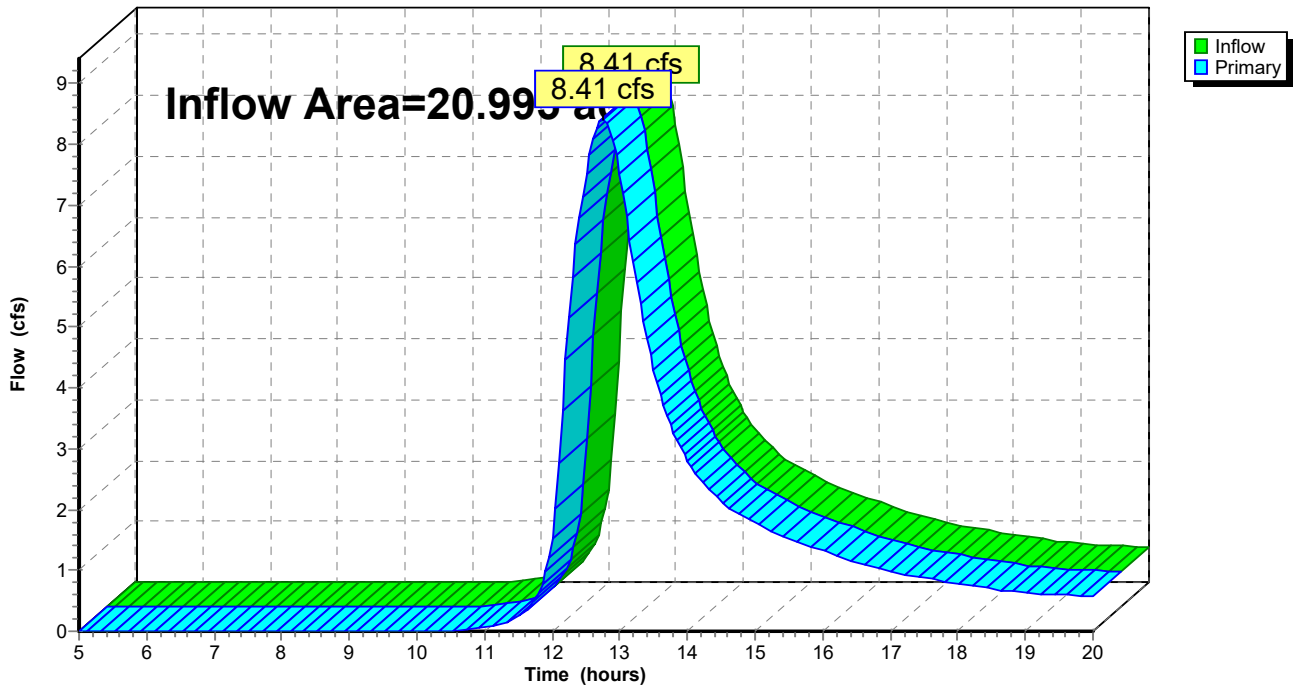
### Summary for Pond SP-3: BARTLETT ROAD WEST

Inflow Area = 20.995 ac, 6.52% Impervious, Inflow Depth > 0.88" for 2-YR event  
Inflow = 8.41 cfs @ 12.75 hrs, Volume= 1.533 af  
Primary = 8.41 cfs @ 12.75 hrs, Volume= 1.533 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node 1P

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-3: BARTLETT ROAD WEST

Hydrograph



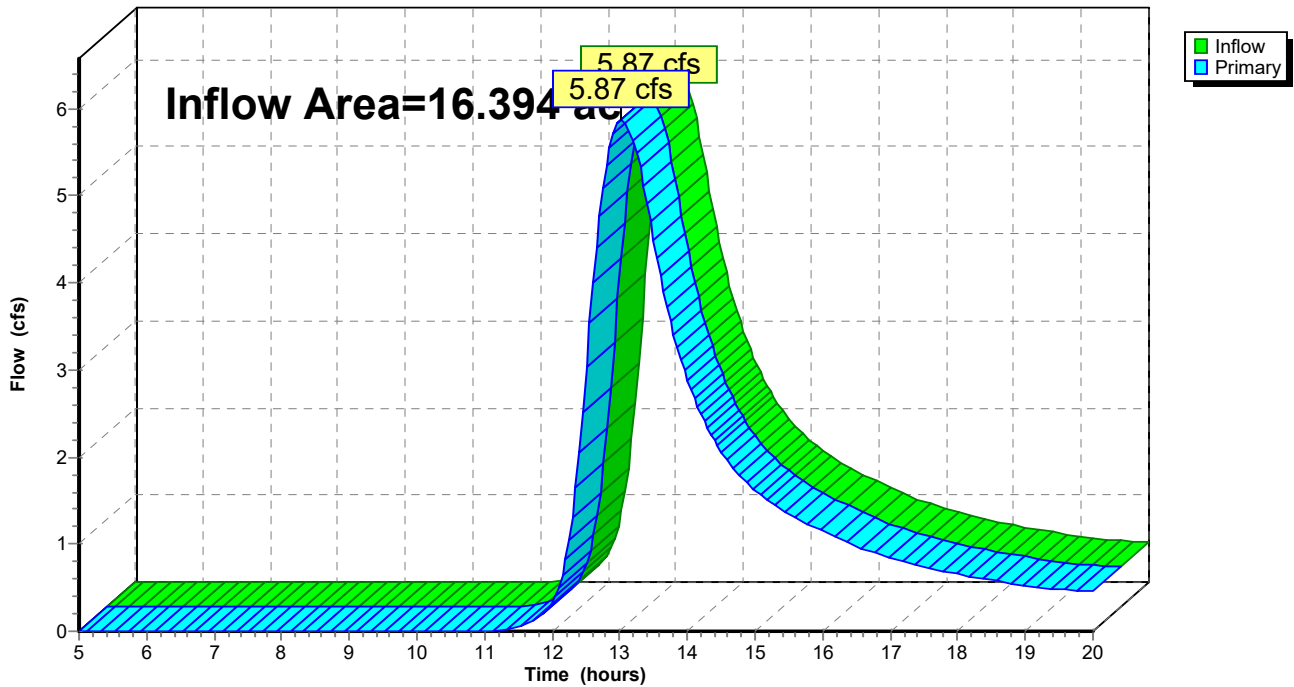
### Summary for Pond SP-4: WESTERN SITE BOUNDARY

Inflow Area = 16.394 ac, 1.05% Impervious, Inflow Depth > 0.84" for 2-YR event  
Inflow = 5.87 cfs @ 13.02 hrs, Volume= 1.151 af  
Primary = 5.87 cfs @ 13.02 hrs, Volume= 1.151 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node 1P

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-4: WESTERN SITE BOUNDARY

Hydrograph



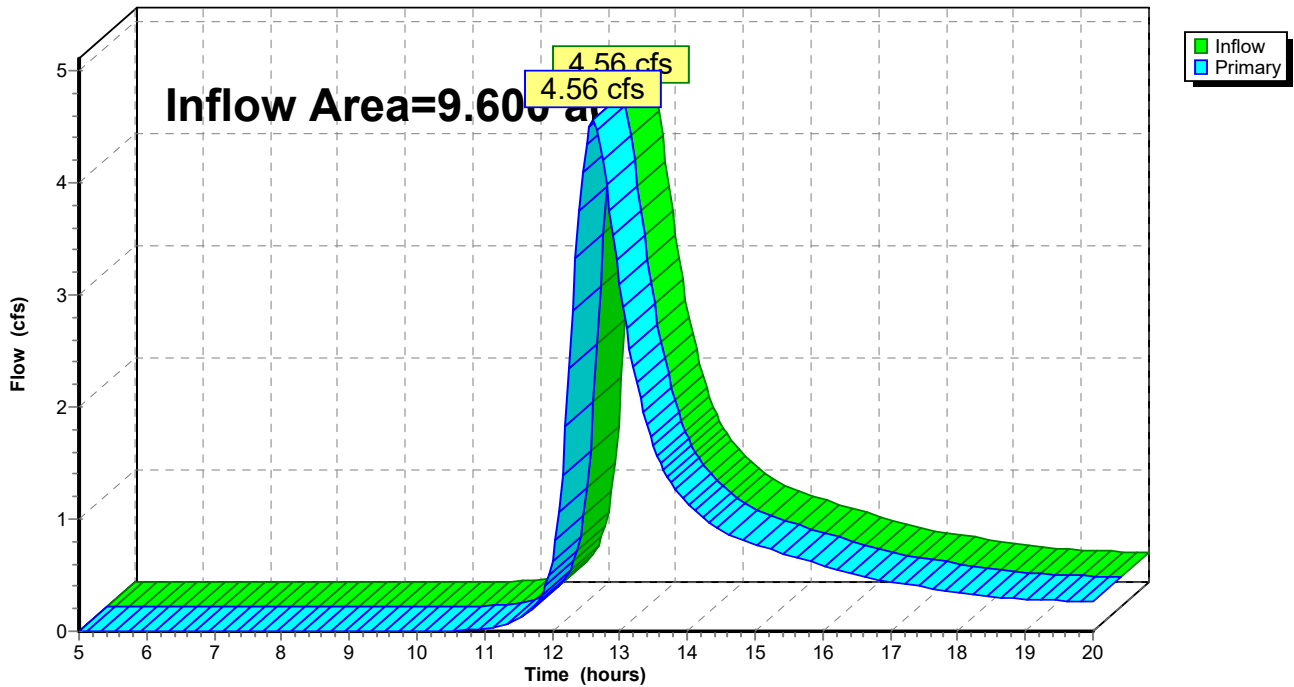
### Summary for Pond SP-5: LYNCH LANE

Inflow Area = 9.600 ac, 6.31% Impervious, Inflow Depth > 0.86" for 2-YR event  
Inflow = 4.56 cfs @ 12.61 hrs, Volume= 0.685 af  
Primary = 4.56 cfs @ 12.61 hrs, Volume= 0.685 af, Atten= 0%, Lag= 0.0 min  
Routed to nonexistent node 1P

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Pond SP-5: LYNCH LANE

Hydrograph



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Type III 24-hr 10-YR Rainfall=4.30"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 10S: UNDEVELOPED** Runoff Area=126,255 sf 6.69% Impervious Runoff Depth>1.88"  
 Flow Length=309' Slope=0.0200 '/ Tc=32.9 min CN=77 Runoff=3.75 cfs 0.454 af

**Subcatchment 11S: P LOTS** Runoff Area=15,000 sf 25.00% Impervious Runoff Depth>2.13"  
 Flow Length=77' Slope=0.0200 '/ Tc=7.8 min CN=80 Runoff=0.86 cfs 0.061 af

**Subcatchment 20S: UNDEVELOPED** Runoff Area=205,594 sf 4.24% Impervious Runoff Depth>1.87"  
 Flow Length=478' Slope=0.0100 '/ Tc=49.5 min CN=77 Runoff=4.95 cfs 0.735 af

**Subcatchment 21S: P LOTS** Runoff Area=14,022 sf 26.74% Impervious Runoff Depth>2.13"  
 Tc=5.0 min CN=80 Runoff=0.87 cfs 0.057 af

**Subcatchment 30S: UNDEVELOPED** Runoff Area=746,720 sf 2.40% Impervious Runoff Depth>1.79"  
 Flow Length=1,362' Slope=0.0100 '/ Tc=56.8 min CN=76 Runoff=15.92 cfs 2.554 af

**Subcatchment 31S: P ROAD** Runoff Area=48,417 sf 23.89% Impervious Runoff Depth>1.97"  
 Flow Length=220' Slope=0.0200 '/ Tc=9.8 min CN=78 Runoff=2.40 cfs 0.183 af

**Subcatchment 32S: P LOTS** Runoff Area=32,685 sf 19.89% Impervious Runoff Depth>1.97"  
 Flow Length=145' Slope=0.0200 '/ Tc=18.9 min CN=78 Runoff=1.28 cfs 0.123 af

**Subcatchment 33S: P ROAD** Runoff Area=66,727 sf 27.87% Impervious Runoff Depth>2.13"  
 Flow Length=227' Slope=0.0200 '/ Tc=8.3 min CN=80 Runoff=3.75 cfs 0.272 af

**Subcatchment 35S: P LOTS** Runoff Area=20,000 sf 25.00% Impervious Runoff Depth>2.13"  
 Tc=5.0 min CN=80 Runoff=1.23 cfs 0.082 af

**Subcatchment 40S: UNDEVELOPED** Runoff Area=676,897 sf 0.00% Impervious Runoff Depth>1.77"  
 Flow Length=852' Tc=74.3 min CN=76 Runoff=12.18 cfs 2.298 af

**Subcatchment 41S: P LOTS** Runoff Area=37,214 sf 20.15% Impervious Runoff Depth>1.97"  
 Flow Length=117' Slope=0.0500 '/ Tc=7.6 min CN=78 Runoff=1.99 cfs 0.141 af

**Subcatchment 50S: UNDEVELOPED** Runoff Area=373,177 sf 4.70% Impervious Runoff Depth>1.80"  
 Flow Length=309' Tc=41.3 min CN=76 Runoff=9.49 cfs 1.285 af

**Subcatchment 51S: P LOTS** Runoff Area=32,629 sf 11.49% Impervious Runoff Depth>1.75"  
 Flow Length=101' Slope=0.0600 '/ Tc=6.3 min CN=75 Runoff=1.61 cfs 0.109 af

**Subcatchment 52S: P ROAD** Runoff Area=12,377 sf 41.45% Impervious Runoff Depth>2.47"  
 Tc=5.0 min CN=84 Runoff=0.88 cfs 0.058 af

**Reach 11R: OVERLAND FLOW** Avg. Flow Depth=0.02' Max Vel=0.30 fps Inflow=0.86 cfs 0.061 af  
 n=0.050 L=387.0' S=0.0258 '/ Capacity=186.32 cfs Outflow=0.48 cfs 0.060 af

**Reach 21R: WETLAND FLOW** Avg. Flow Depth=0.08' Max Vel=0.77 fps Inflow=0.87 cfs 0.057 af  
 n=0.050 L=460.0' S=0.0228 '/ Capacity=68.38 cfs Outflow=0.63 cfs 0.056 af

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Type III 24-hr 10-YR Rainfall=4.30"

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**Reach 31R: BARTLETT RD DITCH** Avg. Flow Depth=0.28' Max Vel=2.92 fps Inflow=2.40 cfs 0.183 af  
n=0.035 L=268.0' S=0.0373 '/' Capacity=139.17 cfs Outflow=2.31 cfs 0.182 af

**Reach 32AR: OVERLAND FLOW** Avg. Flow Depth=0.01' Max Vel=0.98 fps Inflow=1.99 cfs 0.205 af  
n=0.050 L=20.0' S=0.5000 '/' Capacity=1,465.43 cfs Outflow=1.98 cfs 0.205 af

**Reach 32BR: OFFSITE POND** Avg. Flow Depth=0.18' Max Vel=0.91 fps Inflow=5.15 cfs 0.475 af  
n=0.050 L=103.0' S=0.0097 '/' Capacity=28.48 cfs Outflow=5.05 cfs 0.473 af

**Reach 33BR: SF AFTER LEVEL** Avg. Flow Depth=0.25' Max Vel=0.30 fps Inflow=3.75 cfs 0.272 af  
n=0.400 L=80.0' S=0.0750 '/' Capacity=81.50 cfs Outflow=3.28 cfs 0.270 af

**Reach 41AR: OVERLAND FLOW** Avg. Flow Depth=0.02' Max Vel=0.75 fps Inflow=1.99 cfs 0.141 af  
n=0.050 L=110.0' S=0.0909 '/' Capacity=349.48 cfs Outflow=1.87 cfs 0.140 af

**Reach 41BR: WETLAND FLOW** Avg. Flow Depth=0.17' Max Vel=0.94 fps Inflow=1.87 cfs 0.140 af  
n=0.050 L=648.0' S=0.0123 '/' Capacity=34.31 cfs Outflow=1.39 cfs 0.137 af

**Reach 51R: OVERLAND FLOW** Avg. Flow Depth=0.03' Max Vel=0.21 fps Inflow=1.61 cfs 0.109 af  
n=0.050 L=389.0' S=0.0051 '/' Capacity=83.11 cfs Outflow=0.73 cfs 0.103 af

**Reach 52R: SF AFTER LEVEL** Avg. Flow Depth=0.12' Max Vel=0.19 fps Inflow=0.88 cfs 0.058 af  
n=0.400 L=83.0' S=0.0723 '/' Capacity=14.54 cfs Outflow=0.68 cfs 0.058 af

**Pond SP-1: LYNCH LANE** Inflow=4.11 cfs 0.514 af  
Primary=4.11 cfs 0.514 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=5.24 cfs 0.791 af  
Primary=5.24 cfs 0.791 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=17.97 cfs 3.210 af  
Primary=17.97 cfs 3.210 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=12.68 cfs 2.435 af  
Primary=12.68 cfs 2.435 af

**Pond SP-5: LYNCH LANE** Inflow=10.22 cfs 1.445 af  
Primary=10.22 cfs 1.445 af

**Total Runoff Area = 55.274 ac Runoff Volume = 8.413 af Average Runoff Depth = 1.83"**  
**95.09% Pervious = 52.560 ac 4.91% Impervious = 2.713 ac**

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Type III 24-hr 25-YR Rainfall=5.10"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 10S: UNDEVELOPED** Runoff Area=126,255 sf 6.69% Impervious Runoff Depth>2.50"  
 Flow Length=309' Slope=0.0200 '/ Tc=32.9 min CN=77 Runoff=4.97 cfs 0.603 af

**Subcatchment 11S: P LOTS** Runoff Area=15,000 sf 25.00% Impervious Runoff Depth>2.78"  
 Flow Length=77' Slope=0.0200 '/ Tc=7.8 min CN=80 Runoff=1.12 cfs 0.080 af

**Subcatchment 20S: UNDEVELOPED** Runoff Area=205,594 sf 4.24% Impervious Runoff Depth>2.48"  
 Flow Length=478' Slope=0.0100 '/ Tc=49.5 min CN=77 Runoff=6.58 cfs 0.976 af

**Subcatchment 21S: P LOTS** Runoff Area=14,022 sf 26.74% Impervious Runoff Depth>2.79"  
 Tc=5.0 min CN=80 Runoff=1.12 cfs 0.075 af

**Subcatchment 30S: UNDEVELOPED** Runoff Area=746,720 sf 2.40% Impervious Runoff Depth>2.39"  
 Flow Length=1,362' Slope=0.0100 '/ Tc=56.8 min CN=76 Runoff=21.31 cfs 3.412 af

**Subcatchment 31S: P ROAD** Runoff Area=48,417 sf 23.89% Impervious Runoff Depth>2.60"  
 Flow Length=220' Slope=0.0200 '/ Tc=9.8 min CN=78 Runoff=3.16 cfs 0.241 af

**Subcatchment 32S: P LOTS** Runoff Area=32,685 sf 19.89% Impervious Runoff Depth>2.60"  
 Flow Length=145' Slope=0.0200 '/ Tc=18.9 min CN=78 Runoff=1.69 cfs 0.162 af

**Subcatchment 33S: P ROAD** Runoff Area=66,727 sf 27.87% Impervious Runoff Depth>2.78"  
 Flow Length=227' Slope=0.0200 '/ Tc=8.3 min CN=80 Runoff=4.88 cfs 0.355 af

**Subcatchment 35S: P LOTS** Runoff Area=20,000 sf 25.00% Impervious Runoff Depth>2.79"  
 Tc=5.0 min CN=80 Runoff=1.60 cfs 0.107 af

**Subcatchment 40S: UNDEVELOPED** Runoff Area=676,897 sf 0.00% Impervious Runoff Depth>2.37"  
 Flow Length=852' Tc=74.3 min CN=76 Runoff=16.33 cfs 3.071 af

**Subcatchment 41S: P LOTS** Runoff Area=37,214 sf 20.15% Impervious Runoff Depth>2.61"  
 Flow Length=117' Slope=0.0500 '/ Tc=7.6 min CN=78 Runoff=2.62 cfs 0.185 af

**Subcatchment 50S: UNDEVELOPED** Runoff Area=373,177 sf 4.70% Impervious Runoff Depth>2.40"  
 Flow Length=309' Tc=41.3 min CN=76 Runoff=12.69 cfs 1.715 af

**Subcatchment 51S: P LOTS** Runoff Area=32,629 sf 11.49% Impervious Runoff Depth>2.35"  
 Flow Length=101' Slope=0.0600 '/ Tc=6.3 min CN=75 Runoff=2.16 cfs 0.147 af

**Subcatchment 52S: P ROAD** Runoff Area=12,377 sf 41.45% Impervious Runoff Depth>3.16"  
 Tc=5.0 min CN=84 Runoff=1.12 cfs 0.075 af

**Reach 11R: OVERLAND FLOW** Avg. Flow Depth=0.02' Max Vel=0.34 fps Inflow=1.12 cfs 0.080 af  
 n=0.050 L=387.0' S=0.0258 '/ Capacity=186.32 cfs Outflow=0.67 cfs 0.078 af

**Reach 21R: WETLAND FLOW** Avg. Flow Depth=0.09' Max Vel=0.86 fps Inflow=1.12 cfs 0.075 af  
 n=0.050 L=460.0' S=0.0228 '/ Capacity=68.38 cfs Outflow=0.86 cfs 0.073 af

**POST**

Prepared by Terradyn Consultants

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Type III 24-hr 25-YR Rainfall=5.10"

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**Reach 31R: BARTLETT RD DITCH** Avg. Flow Depth=0.33' Max Vel=3.18 fps Inflow=3.16 cfs 0.241 af  
n=0.035 L=268.0' S=0.0373 '/' Capacity=139.17 cfs Outflow=3.04 cfs 0.241 af

**Reach 32AR: OVERLAND FLOW** Avg. Flow Depth=0.01' Max Vel=1.11 fps Inflow=2.62 cfs 0.269 af  
n=0.050 L=20.0' S=0.5000 '/' Capacity=1,465.43 cfs Outflow=2.61 cfs 0.269 af

**Reach 32BR: OFFSITE POND** Avg. Flow Depth=0.21' Max Vel=1.02 fps Inflow=6.75 cfs 0.622 af  
n=0.050 L=103.0' S=0.0097 '/' Capacity=28.48 cfs Outflow=6.62 cfs 0.620 af

**Reach 33BR: SF AFTER LEVEL** Avg. Flow Depth=0.28' Max Vel=0.32 fps Inflow=4.88 cfs 0.355 af  
n=0.400 L=80.0' S=0.0750 '/' Capacity=81.50 cfs Outflow=4.30 cfs 0.353 af

**Reach 41AR: OVERLAND FLOW** Avg. Flow Depth=0.03' Max Vel=0.84 fps Inflow=2.62 cfs 0.185 af  
n=0.050 L=110.0' S=0.0909 '/' Capacity=349.48 cfs Outflow=2.45 cfs 0.185 af

**Reach 41BR: WETLAND FLOW** Avg. Flow Depth=0.20' Max Vel=1.05 fps Inflow=2.45 cfs 0.185 af  
n=0.050 L=648.0' S=0.0123 '/' Capacity=34.31 cfs Outflow=1.89 cfs 0.181 af

**Reach 51R: OVERLAND FLOW** Avg. Flow Depth=0.04' Max Vel=0.25 fps Inflow=2.16 cfs 0.147 af  
n=0.050 L=389.0' S=0.0051 '/' Capacity=83.11 cfs Outflow=1.07 cfs 0.140 af

**Reach 52R: SF AFTER LEVEL** Avg. Flow Depth=0.14' Max Vel=0.21 fps Inflow=1.12 cfs 0.075 af  
n=0.400 L=83.0' S=0.0723 '/' Capacity=14.54 cfs Outflow=0.88 cfs 0.074 af

**Pond SP-1: LYNCH LANE** Inflow=5.57 cfs 0.681 af  
Primary=5.57 cfs 0.681 af

**Pond SP-2: BARTLETT ROAD EAST** Inflow=6.92 cfs 1.049 af  
Primary=6.92 cfs 1.049 af

**Pond SP-3: BARTLETT ROAD WEST** Inflow=23.91 cfs 4.273 af  
Primary=23.91 cfs 4.273 af

**Pond SP-4: WESTERN SITE BOUNDARY** Inflow=16.94 cfs 3.253 af  
Primary=16.94 cfs 3.253 af

**Pond SP-5: LYNCH LANE** Inflow=13.97 cfs 1.929 af  
Primary=13.97 cfs 1.929 af

**Total Runoff Area = 55.274 ac Runoff Volume = 11.204 af Average Runoff Depth = 2.43"**  
**95.09% Pervious = 52.560 ac 4.91% Impervious = 2.713 ac**

**APPENDIX 5**

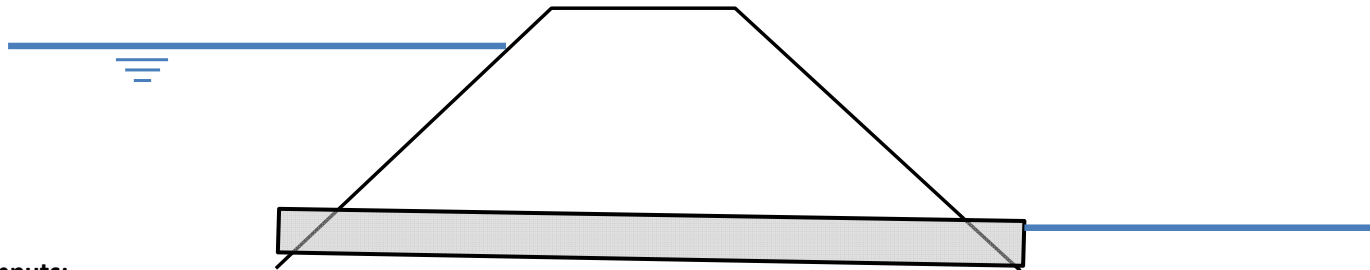
**CULVERT SIZING**



SD-1

## Culvert Analysis Spreadsheet

Landowner: *****	Project: *****	
County: *****	State: *****	Tract / Field ID: *****
Designed: *****	Date: *****	
Checked: *****	Date: *****	



**Inputs:**

Headwater (Upstream Water Surface) Elevation:	57.75	Feet
Culvert Inlet Invert Elevation:	56.50	Feet
Culvert Diameter:	15.00	Inches
Length of Culvert:	60.00	Feet
Culvert Outlet Invert Elevation:	56.00	Feet
Tailwater (Downstream) Elevation:	56.50	Feet

Select Culvert Material:	Smooth_HDPE
Select Culvert Inlet Type:	Projecting - Thin Edge

**Outputs:**

**CAPACITY = 8.5 cfs**

**INLET CONTROLS (Between Submerged and Unsubmer**

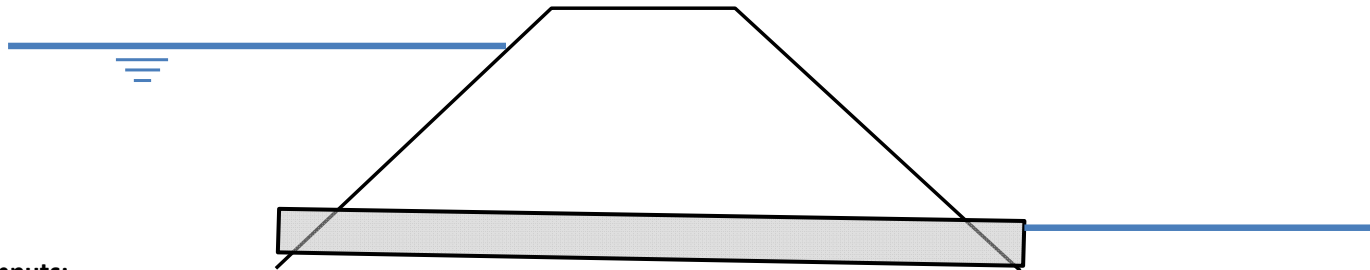
Manning's n value: 0.012  
 Entrance Coefficient, Ke: 0.9

Smooth\_HDPE  
 Projecting - Thin Edge

SD-2

## Culvert Analysis Spreadsheet

Landowner: *****	Project: *****	
County: *****	State: *****	Tract / Field ID: *****
Designed: *****	Date: *****	
Checked: *****	Date: *****	



**Inputs:**

Headwater (Upstream Water Surface) Elevation:	61.75	Feet
Culvert Inlet Invert Elevation:	60.50	Feet
Culvert Diameter:	15.00	Inches
Length of Culvert:	65.00	Feet
Culvert Outlet Invert Elevation:	60.00	Feet
Tailwater (Downstream) Elevation:	60.50	Feet

Select Culvert Material:	Smooth_HDPE
Select Culvert Inlet Type:	Projecting - Thin Edge

**Outputs:**

**CAPACITY = 8.5 cfs**

**INLET CONTROLS (Between Submerged and Unsubmer**

Manning's n value: 0.012  
 Entrance Coefficient, Ke: 0.9

Smooth\_HDPE  
 Projecting - Thin Edge

**APPENDIX 6**

**HOUSEKEEPING**

# HOUSEKEEPING PERFORMANCE STANDARDS

FOR:

**Bartlett Road Subdivision  
Kittery, MAINE**

**Project Developer:** Beachwood Development Fund  
P.O. Box 261  
Kennebunk, ME 04043

**Responsible Party:** Beachwood Development Fund  
P.O. Box 261  
Kennebunk, ME 04043

## **Introduction:**

The contractor shall be responsible for maintaining proper housekeeping standards throughout the construction phase of the project. After the construction phase has been completed, the owner or operator of the project will be responsible.

## **Standards:**

In accordance with the housekeeping performance standards required by MDEP chapter 500 stormwater regulations, the following standards shall be met:

- 1. Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
- 2. Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
- 3. Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.

- 4. Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable

provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

- 5. Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.
- 6. Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges.

**APPENDIX 7**

**STORMWATER INSPECTION & MAINTENENACE**



# **BARTLETT ROAD SUBDIVISION KITTERY, MAINE**

## **STORMWATER MANAGEMENT SYSTEM INSPECTION & MAINTENANCE PLAN**

**Project Owner/Developer:** Beachwood Development Fund  
P.O. Box 261  
Kennebunk, Maine 04043  
(207) 985-3646

**Responsible Party:** Owner or Homeowners Association

**Prepared By:** Terradyn Consultants, LLC  
565 Congress Street, Suite 201  
Portland, ME 04101  
(207) 926-5111

### **INTRODUCTION:**

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Regular inspection and maintenance of the entire stormwater management system is crucial to the long-term effectiveness of the system. The responsible party must provide regular inspection and maintenance of all permanent erosion control measures and stormwater management structures, establish any contract services required to implement the program, and keep records and a maintenance log book of inspection and maintenance activities. At a minimum, the inspection and maintenance activities outlined herein should be performed at the recommended intervals. A rainfall event of 1" in a 24 hour period would trigger a wet weather post-construction inspection.

All measures must be maintained in effective operating condition. A person with knowledge of erosion and sedimentation practices, stormwater management, and the standards and conditions of all local, state and federal permits for the project shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected.

## INSPECTION TASKS

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1. Inspect **vegetated areas**, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
2. Inspect **ditches, swales and other open stormwater channels** in the spring, late fall and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, control vegetated growth that could obstruct flow and repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.
3. Inspect **culverts** in the spring, in late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris at the inlet, the outlet and within the culvert. Repair any erosion damage at the culvert's inlet and outlet.
4. Clear accumulations of winter sand **along roadways** at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder.
5. Inspect **resource and treatment buffers** once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader or turnout lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

## DOCUMENTATION

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Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.



The log attached at the end of this plan is from the *Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers (May 2016)*. The log may be used or adapted for this project.

**ATTACHMENTS:**

Stormwater Management Facilities Inspection & Maintenance Log

