MEMORANDUM

PLANNING DEPARTMENT
TOWN OF CUMBERLAND, MAINE

Date: January 15, 2020

To: Cumberland Planning Board

From: Carla Nixon, Town Planner

Subject: Cumberland Crossing Phase 2 – Preliminary Major Subdivision and Site Plan Review

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There have been 2 pre-application (Sketch Plan Review) meetings with the Planning Board in February and April of 2019. This is the first formal review of the project. The application materials were not complete and so consideration of the plan for Preliminary Major Subdivision approval is not possible this month (there are no proposed Findings of Fact included). However, you will see that a lot of review work has been done and this will enable the Board to discuss the issues highlighted in the reviews and perhaps consider approving some of the requested waivers. This should set the applicant up well for preliminary approval at the next meeting then they will await their DEP permits and return to the Board in a few months for final review and approval.

Date	January 14, 2020
To	Town of Cumberland Planning Board
From	Carla Nixon, Town Planner
Subject	**Major (Preliminary) Subdivision and Site Plan Review: Cumberland Crossing, Phase 2 - Tuttle and Greely Roads.**

I. REQUEST/OVERVIEW:

The Applicant is Oceanview at Cumberland, LLC. The Applicant is requesting Preliminary Major Subdivision and Site Plan Review for an additional 52 lots and a community center on a 59.59 acre parcel that is connected to Phase 1 by a triangular piece of land in the southwest corner of Phase 1 into Phase 2.

Little Acres Drive which serves Phase 1 from Tuttle Road, will be extended 3300 +/- feet from the end of Phase 1 to an existing drive from Greely Road.

The project will be served by public water and sewer and natural gas. The parcel is shown on Tax Assessor Map R 04, lot 34 A in the Rural Residential 1 (RR 1) zoning district. Frederic Licht, P.E. of Licht Environmental Design, LLC is the Applicant's representative. Dan Diffin, P.E. of Sevee and Maher Engineers reviewed the plans and has provided comments for the Planning Board's consideration.

II. PROJECT HISTORY:

Sketch Plan Meetings with Planning Board in February and April, 2019.

III. DESCRIPTION:

Parcel size:	59.59 acres
Net Residential Density: Not required for developments in the SHC Overlay district.	
Proposed # of units:	52, plus a community center.
Zoning:	Rural Residential 1 with a Senior Housing Community Overlay
Development Type:	Clustered Subdivision Design
Min. Lot Size:	RR 1 requires a 4 acre minimum lot size; the SHC Overlay requires a 5 acres minimum lot size. The proposed project site is 59.59 acres.
Lot frontage:	50'
Setbacks:	Front: 25', Rear: 75', Side: 30' (combined = 75')
Parking:	2 spaces per unit

Buffering: 50' undisturbed buffer along entire perimeter of site.
Water & Sewer: Portland Water District
Electricity: Central Maine Power

Natural Gas: Summit Gas

Open Space: 20% required, 68% provided.

Wetlands:

Vernal Pools: None

Trails:

Utilities: Underground electric, telephone, cable, gas, water and sewer from Tuttle Road.

Street Lighting: For street intersections and along roadways at "key locations".

Traffic Impact Assessment: Traffic report shows no adverse effects.

Homeowners Association: Draft homeowners' documents are required for final submission.

Floodplain Map Classification: Not provided

Right, Title and Interest: Trustees' Deed of Sale. (See Planner's comment #3 below)

Fire Protection: Public water. 4 hydrant locations. Units will have sprinklers

Waiver Requests: See below.

Outside Agency Approvals Required:

Agency	Type of Permit	Status
MDEP	Site Location of Dev. Permit (SLODA)	Outstanding
MDEP	NRPA Tier 1 permit	Outstanding
US Army Corp of Engineers	(wetlands) permit	Outstanding
MDOT	Entrance Permit	Amendment Needed?
Maine Natural Areas Program	Rare Botanical Data	Letter dated 2/8/19
Maine Historic Preservation Commission	Historic Properties	Letter dated 2/19/19
Maine Dept. Inland Fisheries & Wildlife	Habitat Data	Letter dated 6/14/17 appears to be for Phase 1.
Portland Water District	Ability to Serve	Letter dated 12/2/19

IV. REVIEW COMMENTS:

DEPARTMENT HEAD REVIEWS:

William Longley, CEO: No comments
Police Chief Charles Rumsey: No comments
Fire Chief Small:

Cumberland Lands & Conservation Commission Review: Not Yet Received.

TOWN PLANNER'S REVIEW: (Applicant responses in blue font below)

1. The cover letter states the parcel size is 59.59 acres with a golf course easement of .72 acres, but the wetland report refers to the "40 acre Godsoe property". Why the discrepancy? Does this affect the wetland calculations? Same acreage statements relating to vernal pools.
2. The 9-12-17 IF&W letter refers to the "Catalpa Lane" project. Provide letter for Phase 2.
3. Right, title or interest is evidenced by submission of a Trustees' Deed of Sale which gives the Grantee (Ocean View) a fifty percent (50%) undivided interes in the real property, building and improvements. Why 50%?
4. Provide draft HOA documents and a copy of the draft deed.
5. What is the total amount of wetlands disturbance?
6. Floodplain map number not provided.
7. Will there be a street sign at the Greely Road entrance?
8. Will there be an entrance sign for the project at either or both entrances?
8. Information on trails needed.
9. Conservation Commission review letter needed.
10. Provide proposed road names for Roads 1, 2, 3, 4. 5 and 6.
11. Will there be a dumpster at the community center? If so, show location and buffering.
12. Photometric plan missing.
13. Note needed regarding status of internal roadways.
14. Note needed for standard conditions of approval.
15. Are any speed tables proposed?
16. Elevation drawings with building color and materials information needed.
12. Waivers?

Waiver Request 1 - Road width for access drive from Greely Road to Community Center. Applicant requests a waiver to maintain the existing road width of 14.5 feet. SME recommends that the Applicant provide detail on the projected use of the entrance.

- What is the projected use of this access road after full build-out?
- Will this drive be the primary access for Phase 1 Residents prior to completion of the Phase 2 roadway (projected in 2024/2025 timeframe).

- Is it possible to make this drive one-way to prevent conflicting traffic?

Waiver Request 2 - Show True North on Subdivision Plan. SME recommends approval of this waiver request.

Waiver Request 3 - Street Signs. Applicant requests waiver from requirement to show street signs until reviewed by Town E911 Administrator. SME recommends approval of this waiver request.

Waiver Request 4 - Trees over 10-inch dbh. SME recommends approval of this waiver request.

TOWN ENGINEER'S REVIEW:

January 13, 2020

Ms. Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Subject: Peer Review of Cumberland Crossing – Phase 2
Preliminary Subdivision and Site Plan Application
Tuttle Road & Greely Road, Cumberland, Maine

Dear Ms. Nixon:

As requested, Sevee & Maher Engineers, Inc. (SME) has conducted a peer review of the preliminary application for a Major Subdivision and Site Plan for the proposed Cumberland Crossing – Phase 2 senior living community located off Tuttle Road. In addition, the project is required to submit a Shoreland Zoning Application for impacts within a Stream Protection District. The application materials received by SME were prepared by LICHT Environmental Design, LLC (LICHT), and consist of the following:

- Application package with cover letter prepared by Frederic Licht, P.E., L.S.E., dated December 2019;
- Project plan set dated December 18, 2019; and
- Stormwater Management Report dated December 18, 2019.

PROJECT DESCRIPTION

The Applicant proposes to develop the 59.6-acre Godsoe farmstead as Phase 2 of the Cumberland Crossing, formerly Oceanview at Cumberland senior living facility. Phase 2 will include an additional 52 senior cottages and associated infrastructure, utilities and stormwater management. This will increase the approved senior cottages to 105 total between Phase 1 and Phase 2.

The parcel is located at 228 Greely Road which will be redeveloped and renovated from the current equestrian farm to a formal community center. The development will be accessed from Phase 1 of the development off Tuttle road by a 3,300-foot extension to Little Acres Drive. Access from Greely Road

will be limited to preserve a 500-foot scenic view area. The subdivision will be served with public utilities, including water, sewer, natural gas, electric, telephone, and cable.

This project is being reviewed as a Major Subdivision as outlined in Chapter 250 - Subdivision of Land of the Town of Cumberland Ordinances, most recently amended and adopted on January 12, 2011, and Chapter 229 - Site Plan Review, most recently amended and adopted on March 26, 2012. The comments below relate to the appropriate Ordinance Sections.

Chapter 250: Subdivision of Land

SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.

Section 250-4(N) – Stormwater

1. Please provide clarification on why the cumulative predevelopment watershed areas do not appear to match the total post development watershed areas in the Stormwater Management Report provided.

Section 250-29 – Review and approval by other agencies.

2. SME understands the following permit applications are underway for the project and applications will be filed with appropriate agencies following submittal of the preliminary subdivision and site plan application:

    - Maine Department of Environmental Protection (ME DEP) Site Location of Development Act (SLODA) permit,
    - ME DEP Natural Resources Protection Act (NRPA) Tier 2 permit for proposed wetland impacts,
    - United States Army Corps of Engineers (USACOE) permit for wetland impacts, proposed stream crossings, and culvert replacements,

2. Please confirm that the site work associated with the Focal Point system at the intersection of Little Acres Drive and Road 1 does not occur within the 25-foot setback of the stream and require an NRPA Individual Permit.

Section 250-33 – Utilities

3. SME understands Central Maine Power (CMP) has been contacted to provide electricity for the development. SME recommends that the location of underground electric lines, transformers, and electrical easements be added to the plan.

Section 250-35 – Sewage disposal.

4. SME recommends the applicant provide more detail on the sewage disposal intended for the new community center. Will the septic system be abandoned? If so, please provide details on proposed connection from the house and pool to the proposed sewer system.
5. If the septic system will remain, please provide evaluation of the condition and capacity of the septic system to handle the proposed use.
6. Please provide engineering design demonstrating that the low-pressure pumps will be able to pump sewage from the Community Center or furthest extents to the Tuttle Road sewer system.

7. Please confirm that the project will include 5-feet of cover over the sewer mains included in the project. Plan sheets C7 through C10 appear to indicate a cover in the 3-foot to 4-foot range.
8. SME recommends that a letter from the Town of Cumberland demonstrating capacity for sewer disposal be required prior to final approval.

Section 250-38 – Design and construction standards.

9. SME understands proposed streets will be constructed to urban standards. Portions of Little Acres Drive do not include an esplanade between the street and sidewalk. SME recommends the applicant request a waiver to address these items.

Section 250-40 – Fire Protection

10. Please provide additional information on the fire protection planned for the proposed Community Center (Godsoe Farm). It does not appear from the plans that a new hydrant is proposed near the existing buildings.

Section 250-41 – Soil Erosion

11. SME recommends erosion control devices proposed for the project be included on the site plan, including silt fence, check dams, catch basin protection, etc.

Section 250-45– Waivers and modifications.

Waiver Request 1 - Road width for access drive from Greely Road to Community Center. Applicant requests a waiver to maintain the existing road width of 14.5 feet. SME recommends that the Applicant provide detail on the projected use of the entrance.

- What is the projected use of this access road after full build-out?
- Will this drive be the primary access for Phase 1 Residents prior to completion of the Phase 2 roadway (projected in 2024/2025 timeframe).
- Is it possible to make this drive one-way to prevent conflicting traffic?

Waiver Request 2 - Show True North on Subdivision Plan. SME recommends approval of this waiver request.

Waiver Request 3 - Street Signs. Applicant requests waiver from requirement to show street signs until reviewed by Town E911 Administrator. SME recommends approval of this waiver request.

Waiver Request 4 - Trees over 10-inch dbh. SME recommends approval of this waiver request.

Chapter 229: Site Plan Review

SME has reviewed the applicable sections of Chapter 229 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 229 requirements.

Section 229-10(B) – Traffic, Circulation and Parking.

12. Please provide more detail on the anticipated use of the existing driveway from Greely Road to the proposed Community Center.
13. SME recommendS that the Applicant provide additional detail on the required parking for the Community Center in accordance with Zoning Section 315-57. If this community center will be private, it appears that parking should be provided at the rate of one space per member.

14. Please provide additional information on pedestrian access within the Community Center site proper.

Section 229-10(H) – Exterior lighting.

15. Please outline locations for exterior lighting on the Community Center, if any will be added.

General Comments

16. Plan Sheet C1 – SME recommends that the label for Phase 1 be revised to indicate 53 cottage units so that the total is 105 on the plan, as proposed.
17. Plan Sheet C2 – Please add and label the stream locations and setbacks on the plan to demonstrate where development is proposed within the Maine IF&W setback, if it is.
18. Plan Sheets C3 through C6A – Please provide contour labels and identify areas where slopes are in excess of 3:1 and require stabilization beyond loam and seed.
19. Plan Sheets C3 through C6A – Please edit storm drain and structure labels so that they are easily identified. Several of them appear to be behind other lines or labels.
20. Plan Sheet C3 – Please provide details on utility sizes on Road 3. It appears the utilities dead end at the end of the road. Will these require a blow-off, cap and plug, or additional measures at the end of the pipes?
21. Plan Sheet C3 – It appears that the 12-inch water line is shown through Culvert 1 near STA 47+75.
22. Plan Sheet C3 – Does Underdrained Soil Filter drain to Buffer 3?
23. Plan Sheet C4 – Please add storm drain pipe and structure labels for review.
24. Plan Sheet C5 through C6A – Please provide additional information on the drainage proposed at the Community Center and how flows will be directed to Buffer 4. Currently, the grading in the area appears to require a culvert at the entrance to the 39-space parking area.
25. Plan Sheet 6A – Please provide more information on the proposed improvements at the Community Center, including:
    a. Labels and dimensions for proposed parking, access-ways, paved areas, and site improvements.
    b. Spot grades and drainage within the existing and proposed paved areas, including at the accessible parking area.
    c. Will the 5 parking spaces east of the leach field will be grassed parking spaces?
    d. It appears that the 39-space parking area will be paved and lit? This does not seem to match the language in the application that refers to this area as overflow parking during gatherings.
    e. The test pit symbols on the plan are large and not labelled.
    f. Please provide additional information on landscaping around the community center.
26. Plan Sheet C7 – Please show cross-pipe SD01 on the profile. It appears it may interfere with 12" water line
27. Plan Sheet C7 – It appears that the water line conflicts with Culvert 1.
28. Plan Sheet C7 – Please confirm that the pipe slope and outlet of SD06 will work with the grading around the stone berm level spreader at Buffer 2.
29. Plan Sheet C7 – Please add sewer manholes to profile sheet.
30. Plan Sheet C8 – Please add vertical grid labels for review of project specifics.
31. Plan Sheet C9 – Please add the sewer main and structures to the profile.
32. Will Plan Sheets C7 through C10 – Please label utility pipes and structures shown on the plans.

33. Plan Sheet C12 – Please clarify if additional snowmobile trail is proposed. It is shown in the legend, but not on the plans.
34. Subdivision Plat S1-3 – Additional information to the drawings prior to final approval, including stream locations and setbacks and stormwater and utility easements, if required.
35. Roadway Sections and Details Sheet C13 – Please add a detail or notes for the section of road that transitions from 22-feet wide to 20-feet wide, including sections for the transition.
36. Civil details C15 – The Town of Cumberland does not usually include ladder rungs in catch basin structures. SME recommends the applicant amend the plans to reflect Town Construction Standards.
37. Plan Sheet C28 – It appears that a specific module detail was missing on this drawing
38. Plan Sheet C28 – Please provide grading details over the R-Tank units and treatment modules.
39. Please confirm that there is no PRE2 Drainage Plan included with the set.
40. Please provide additional information on construction of stone bermed level spreaders in the plan set, including grading, pipe outlet, and berm construction.
41. Please provide information on proposed wetland impacts. There did not appear to be labels for impacts included within the plan set.
42. SME recommends that the areas of boulder or segmental block retaining walls be labeled on the plans with grading design details confirmed.
43. There does not appear to be a profile for Road 1 in the drawing set provided.
44. Please provide any review comments from the Maine DEP on the stormwater general and flooding standards received during the application process.

Please call me with any questions, or if you would like, I could meet with you to discuss our comments.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.



Daniel P. Diffin, P.E.
Vice President/Civil Engineer

Cumberland Crossing – Phase 2

Tuttle Road & Greely Road

Cumberland, Maine



Preliminary Subdivision and Site Plan Application

December, 2019

Prepared for:

OceanView at Cumberland, LLC
20 Blueberry Lane
Falmouth, Maine 04105

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT ENVIRONMENTAL DESIGN, LLC
Civil Engineering Planning Project Management

LICHT
ENVIRONMENTAL DESIGN, LLC

December 31, 2019 (Via Delivery & Email) J16.084.1

Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

OceanView at Cumberland, Tuttle Road, Cumberland
Preliminary Subdivision, Site Plan & Shoreland Zone Permit Submittal
(Map R04 Parcel 34A and portion of Parcel 41)

Dear Carla:

On behalf of OceanView at Cumberland, LLC, we are pleased to present for Planning Board review, the attached Preliminary Subdivision, Site Plan and Shoreland Zoning applications, report and plans for the development of Phase 2 of the "*Cumberland Crossing Senior Community*" located between Tuttle and Greely Roads in Cumberland. (*Note: A separate application is also being submitted to amend the Phase 1 Approved Subdivision plan to substitute a 53rd unit for the originally proposed small community center.)*

Enclosed are 2 hard copies and an electronic PDF copy of the following materials:

Cover Letter Report
Subdivision Application Form- Appendix A
Fee Computation Worksheet
Site Plan Application Form – Appendix C
Shoreland Zone Application Form
Site Plan Appendix C and Subdivision Appendix D Checklists
Application & Escrow Review Fee Check
Exhibit 1 – Waiver Requests
Exhibit 2 - Subdivision Chapter 250-1 Standards Findings
Exhibit 3 – USGS Quad and Aerial Locus Maps
Exhibit 4 – Assessors and Zoning Maps
Exhibit 5 - RT&I and Financial/Technical Capacity
Exhibit 6 - Soils
Exhibit 7 - Agency Letters
Exhibit 8 - Utility Serviceability Letters
Exhibit 9 – Lighting Cuts
Exhibit 10 – Traffic Assessment
Exhibit 11 - Stormwater Management (bound separately)
Exhibit 12 – FEMA Map

Full Size Plans "*Cumberland Crossing – Phase 2, Prepared by Belanger Engineering and Licht Environmental Design, LLC ,* dated 12-18-19.

1. INTRODUCTION

The applicant, OceanView at Cumberland LLC is pleased to present this **Preliminary Subdivision and Site Plan application for Phase 2 of Cumberland Crossing Senior Community** (formerly *OceanView at Cumberland*). Phase 1 of the project, approved in August, 2018 includes 52 senior cottage units and associated infrastructure and open space located on the north side of Tuttle Road in Cumberland.

The Phase 1 senior community is under construction and now has residents living on-site and will have approximately 15 units completed and occupied by the spring/summer of 2020. (See project locus maps, *Exhibits 3.1 and 3.2*).

The Phase 2 project was reviewed at two Pre-Application meetings with the Planning Board in February and April, 2019 respectively.

Cumberland Crossing Phase 2 includes the following:

1. Acquisition and development of the 59.59 acre former Godsoe farmstead and wooded acreage connecting the Phase 1 development off Tuttle Road northerly to Greely Road. A small triangular access and utility easement over the southeast corner of the Town of Cumberland – Val Halla Golf course has been obtained to allow the extension of "Little Acres Drive" from Phase 1 into Phase 2.
2. Development of 52 additional senior cottage units and associated infrastructure, utilities and stormwater facilities. (Additionally Phase 1, approved with a small community center will be amended to change that original community center location to a new cottage unit in Phase 1. That request is being made as a separate Subdivision Amendment application from this submittal)
    a. **Total Unit count as proposed will be 53 Units Phase 1 and 52 Units Phase 2 = 105 Units.**
3. Extension of Little Acres Drive an additional 3300 +/- feet from the end of Phase 1 to the Godsoe Farm drive at 228 Greely Road. Re-pave the 500+/- foot drive in its current location from the community center (former Godsoe residence) to Greely Road.
4. Utilization and renovations to the former Godsoe equestrian farm located at 228 Greely Road, into a formal community center. The main house will serve as the main activity center with meeting rooms, sales office, a new pool facility, outdoor amenity areas and modest parking. The large barns and field/paddock areas will continue to be used as a horse farm for the immediate future. Phase out existing well and septic system and connect services to new water and sewer mains and natural gas main.
5. Creation of additional trails and connections to adjacent Town properties in consultation with the Lands & Conservation Commission – Recreational Trails Subcommittee.
6. Preservation of over 41 acres (68% of property) of open space including a 500 foot significant view preservation area from Greely Road to the farmstead which has been codified into the Town Senior Housing (SHC) Overlay Ordinance.
7. Provide easement for municipal/public utility connections from Little Acres Drive to Greely Road.

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Project Area:
Total Amended project acreage is:

- Phase 1 – 38.56 acres deeded plus 0.53 acres Allen Lot access/utility easement = 37.09 acres.
- Phase 2 - Godsoe Parcel acquisition (deeded) - 59.59 acres
- Phase 2 – Golf Course Easement – 0.72 acres
    - **Amended project total acreage & easements = 97.41 acres**

Project Team:
The project team includes the following seasoned professionals and firms.

- Licht Environmental Design, LLC- Engineering, Planning and Permitting
- Belanger Engineering –Engineering and Stormwater Management
- Titcomb Associates – Survey
- Mark Hampton Associates, Inc. – Natural Resource and Soils Mapping
- The Sewall Company (Diane Morabito PE. PTOE) – Traffic Assessment
- Gawron-Turgeon Architects – Unit Design/Architecture
- David Haynes, RLA – Landscape Architecture

2. EXISTING SITE CONDITIONS:

The former Godsoe equestrian farmstead contains approximately 17 acres of open fields, barns, residence and associated equestrian paddock areas at the northern end of the 60+/- acre parcel towards and abutting Greely Road. The farm and fields represent a significant view shed location which has been identified as an important vista by the Town. The southern 2/3rds of the property is wooded with former tote roads used for horse riding and farm equipment. The Maine Central Railroad abuts the eastern property line and the Town of Cumberland Val Halla Golf course abuts the western property line with additional Town open space to the south providing opportunities for trail connections and access.

The existing farm contains area of existing developed and impervious gravel, pavement, lawns and buildings. Refer to the Existing Conditions plan and *Exhibit 3.2* for additional detail. The farm residence is serviced by a subsurface wastewater disposal system and leach field located in the lawn behind the residence and an onsite well, located on the north side of the house. Existing utilities also include an above ground propane tank, generator and underground electric service.



Horse Barn, paddock and house from field to south

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Stream and Exist wood bridge to remain

Topographically, the southern wooded portion of the site contains two high plateaus bisected by a large un-named stream and riverine floodplain wetland system which flows from the golf course and areas further north and west to Route 9 and discharges through a granite box culvert in the railroad berm to the east joining with Maxfield Brook. The site ultimately drains to the East Branch of the Picataqua further east and south. The site stream has a 12-foot wide wooden bridge located near the eastern property line which connects the northern fields and farm to the southern wooded portions of the site.

A portion of the stream and floodplain have been mapped by FEMA as a Zone A-100 year floodplain (*Exhibit 12*, no elevation provided - maps to be scaled.) However the applicant's engineering team believes the FEMA line to be in error when scaled to the existing topography and a new flood study has been performed to support a Letter of Map Amendment request to FEMA to adjust the flood plain delineation. The main stream is also zoned as Stream Protection (SP) for 75 feet either side of the stream under the Town of Cumberland Shoreland Zoning Ordinance. (Refer to *Exhibit 11* Stormwater calculations and plans for the overall FEMA flood study of the entire offsite watershed.)

A second connected wetland and small DEP stream are located below and south of the farmstead at the edge of the woods and fields which also drains portions of the golf course and properties further west along Greely Road. This drainage connects to the larger stream near the eastern property line via a farm culvert.

Several additional forested wetland pockets are located in the southern wooded portions of the site. Wetlands have been delineated by Hampton Associates. No vernal pools were identified onsite. Refer to *Exhibit 6* for wetlands and vernal pool review letters.

Soils are generally mapped as silt loams to sandy loams, similar to Phase 1. No ledge blasting is anticipated for the Phase 2 development. A Class B High Intensity Soils Map has been prepared by Mark Hampton, CSS and is contained in the plan set. Refer to *Exhibit 6* for additional soils information.

The Phase 1 development properties (Former Doane parcel) and the Godsoe Parcel (*Exhibit 3.2)* do not actually adjoin each other. To provide a physical connection, a small triangular easement was secured from the Town of Cumberland over the current 5th tee of the Val Halla Golf course (Assessor's Map 34 Parcel 41) to provide for Little Acres Drive and associated infrastructure to connect the two properties. This location will also provide for an additional trail connection to the golf course cart paths. Refer to *Exhibit 5* for a copy of the easement. (The Town will re-construct a new tee box adjacent to the current location with funding provided by the applicant.) Refer to the Subdivision Plat for the location of the easement.

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Existing Utilities:

Existing utilities in Greely Road include

- 12-inch water (Portland Water District) on the north shoulder of the road
- Overhead electric/Tele/Internet pole line
- Water, sewer low pressure force main, underground e/t/tv and natural gas mains will be extended from Phase 1 into Phase 2 and connect to the new Godsoe Farm/Community Center.

Existing farmstead utilities include:

- Subsurface wastewater disposal system
- Onsite drilled well
- Above ground propane and generator
- Underground e/t/tv from Greely Road

(Refer to the Existing Conditions Plan for existing utility locations.)

3. ZONING:

The underlying zoning is Rural Residential District 1 (RR1) and the property is located within the Town of Cumberland Growth Area as shown on the Comprehensive Plan "Future Land Use Plan". The adoption of the Senior Housing Community (SHC) Overlay District provides design standards for implementation of the proposed senior cottage community in accordance with Section 315-28.4 of the Zoning Ordinance. The subdivision plans have been prepared consistent with the new SHC Zoning standards. Refer to the Site Data Table found on Subdivision Plan Sheet S-5 for dimensional standards. Several key design standards are summarized below:

- The total Phase 2 site acreage is 59.6+/- acres. At an allowable density of 10.000 s.f. gross land area per unit, 259 units could be permitted. The project Phase-2 proposes 52 cottage units and a community center building.
- The project provides 68% Open Space - well in excess of the 20% Open Space required by the SHC zoning.
- A minimum 50-foot external perimeter buffer is proposed except for two road locations. (Refer to Section 7 for additional detail.)
- Each unit would provide a minimum of 1 garage vehicle space and 1 driveway parking space. Many units would allow for a two car garage to offer more flexibility in the marketplace.

The main stream onsite has been mapped as a Shoreland Zoned –Stream Protection (SP) District. The proposed road crossing and culvert is being proposed within the SP District. A Shoreland Zone Application accompanies this application for approval by the Planning Board.

4. WAIVER REQUESTS:

Refer to *Exhibit 1* for a list of submission waiver requests.

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5. PROPOSED DEVELOPMENT:

5.1 Layout and General Design:



Existing 14.5 foot winding drive to farmstead

Cumberland Crossing Phase 2 has been designed with similar community ideals as Phase 1 –that is by creating internal neighborhoods and clusters with extensive wooded buffers and open space. The main 22 foot wide private road, Little Acres Drive, which commences at Tuttle Road and extends 2900+/- feet through Phase 1 will be extended an additional 3,300+/- feet to connect to the existing Godsoe Farm driveway as discussed at the Pre-Application meeting with the Planning Board.

The Phase 2 layout includes a loop road neighborhood, a culdesac to the high wooded promenade south of the farm fields and several minor side roads. All roads will be private and designed to the SHC Ordinance (Section 315-28.4) standards as with Phase 1. Curbed roads with walks are 22 feet in width and side "driveway roads" are 18 feet with no walks or curbing. The extension of Little Acres Drive beyond the main stream culvert (Station 59+50+/-) transitions to a 20 foot wide paved roadway without curbing (at Station 63+75). The 20 foot roadway extends across the open fields to and in front of the barn connecting to the 14.5 foot wide paved Godsoe Drive which extends approximately 500 feet to Greely Road. The stately drive with entry walls is proposed to be resurfaced. In August 2019, a field test was conducted with the Cumberland Fire Department which confirmed that the existing driveway can accommodate the largest fire vehicle in the Town fleet. A waiver of the Section 315-28.4 SHC and Subdivision Road Standards is being requested to maintain the reduced pavement width of the existing driveway. (Refer to Waivers- *Exhibit 1*).

Little Acres Drive will include a new concrete box culvert – Culvert #3 located at the main stream crossing at Station 59+50+-/- Little Acres Drive. The crossing will be similar to the first two box culverts installed in Phase 1 with a wider culvert and retaining walls to minimize wetland impacts. The existing wooden farm bridge is proposed to remain to be used as a pedestrian/golf cart and nordic skiing access across the brook.

The project will employ several stormwater BMPs's to meet with Chapter 500 stormwater standards, including a Focal Point System®, wooded buffers and small stormwater filter basin. (Refer to *Exhibit 11* – Stormwater Management.)

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The former Godsoe residence will be transformed into a Community Center for the residents of Cumberland Crossing incorporating minor building upgrades as needed. Improvements as shown on the plans include:



Stone walls and landscaping at residence



Town of Cumberland Zoning Ordinance
Chapter 315-28.4 Senior Housing Community (SHC) Overlay District
Appendix B –Viewshed to Map R04-Parcel 34A from Greely Road

- Maintaining the overall character of the main buildings and landscaped grounds.
- Addition of pool, pool deck and patio areas.
- Internal residence modifications and renovations, including new locker rooms for the pool facility, energy upgrades, new efficiency heating systems and solar systems.
- Utilization of existing rooms for meetings and events (approximately 30 seat meeting area.)
- In keeping with a rich history of sustainable development practices, installation of several EV charging stations for electric vehicles.
- Provide 13 parking spaces at the community center building.
- Overflow gravel parking lot located to the south of the main riding barn for events.
- Maintain barn(s) and working farm for the near future for equestrian uses and boarding of horses.

The plans include a proposed gravel parking lot for approximately 38 vehicles located south of the barn. The lot would be expected to be used for special events and access to the community center while continuing to provide access for farm trailers to the existing barn. (Refer to Plan C6A.)

The significant view shed from Greely Road towards the farm property has been protected as a "500 foot Preservation Area" and codified in the SHC Overlay Ordinance (Section 315-28.4). The fields, paddock areas, and character of the farmstead and buildings will be maintained with the opportunity to continue use as an equestrian facility. This protected view shed represents approximately 8.9 acres. The proposed roadway extension and minor

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parking improvements around the proposed community center will not affect the overall view shed due to the topography of the fields and the presence of a stone wall in front of the community center

5.2 Utilities:

The site will be serviced by underground electric/communication utilities, public water, natural gas connections to Tuttle Road from the extension of Little Acres Drive in Phase 1. Refer to *Exhibit 8* for utility serviceability letters and *Exhibit 9* for lighting information.

- **Sewer:** A low pressure sewer system will discharge wastewater to the Phase 1 low pressure sewer which discharges to the existing public sewer main in Tuttle Road. As with Phase 1, typically one or two units are connected to a small sewer pump which is maintained by OceanView at Cumberland, LLC. Additionally a connection and terminal end is proposed at Greely Road as requested by the Town for the potential to service up to 25 dwelling units in the future in the Greely Road area. No extensions of sewer in Greely Road are proposed with this project.
- **Water:** The Phase 1, 12-inch water main will be extended to service the project and connect through an easement to the Greely Road main to provide a looped system. In addition to public hydrants located within the project, all units will contain fire sprinkler systems, similar to Phase 1. The community center will replace the existing well with a separate water service from Greely Road.
- **Natural Gas:** Natural gas will be extended by Summit Natural Gas from Phase 1 through the project and connect to Greely Road through the utility easement located in the fields north of the Godsoe farmstead barn.
- **E/T/TV:** The applicant is working with CMP and communications companies to extend underground electric and communications utilities from Phase 1 into Phase 2. Current plans are to end services at the end of the culdesac road neighborhood. The community center will continue to be serviced from a separate overhead & underground utility line from Greely Road. The community center will also include several auto EV charging stations to promote electric car use.
- **Solar:** As with Phase 1, all units will utilize rooftop solar photovoltaic units.
- **Generators:** All units are provided with generators. The farm property & community center will utilize an existing or refurbished generator located behind the barn.
- **Site Lighting** – The site proposes to install a modest level of sight lighting to maintain night-time ambiance and night sky protection while maintaining a safe evening environment for seniors similar to Phase 1. Light fixture cuts by Beacon® are provided in *Exhibit 9* and will be a decorative LED model as used on the OceanView Falmouth campus. Each unit will contain a single driveway light. The lighting from the units supplemented with modest site lighting provides a secure nighttime environment while protecting the privacy of the residents.

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5.3 Impervious and Developed Areas:

Phases 1 and 2 of the project will create the following impervious and developed areas as defined by the DEP Chapter 500 rules and incorporated into the Stormwater Management systems. (Refer *to Exhibit 11.)*

Phase	Impervious (Ac.)	Landscaped (Ac.)	Total Developed (Ac.)
Phase 1 Approved	7.81	11.95	19.76
Phase 2 Proposed	7.55	11.14	19.40
Totals	15.36	23.09	39.16

5.4 Site Context:

The Phase 2 site is uniquely suited for a senior community. First, It is located near Cumberland Center and is less than 6 miles from the sister community of OceanView. Second, the ability to provide walking, cross country skiing and cycling connections both to the Town Forest on the south side of Tuttle Road, the Phase 1 and new Tuttle Road sidewalks, Twin Brooks and Val Halla golf course and open space trails is an important asset to providing healthy and active lifestyles for residents and the community at large. Third, the property has access to public sewer, water and natural gas. This project will promote smart growth principles through the creation of liveable neighborhoods, preservation of large tracts of open space and attention to design details to present an attractive, walkable community.



Typical OceanView Units & Landscaping

The cottage style units will be the same model “A” and “B” units which have been constructed in Phase 1. (Architectural Plans for these units are on file as submitted to the Town Planner with the Phase 1 Addenda 1 dated March 02, 2018 and are not included herein.) Units are designed in a traditional New England character with a focus on energy efficient design and use of solar options. All units would have one car garages with an option to expand to a two car garage where site conditions allow. The neighborhoods and individual cottages would be complimented with robust landscaping similar to the OceanView campus in Falmouth and Phase 1 units. The ordinance required 50-foot exterior buffer would also be complimented with plantings in the open field south of the Godsoe barn where the forest is limited along the southern property line and the Little Acres Drive extension is located partially within the buffer.

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Phase 1 Existing Unit #11 Walkout



Phase 1 Existing Unit #1 & Landscaping

5.5 Ownership and Maintenance:

Phase 1 and 2 of the project will be owned and operated by OceaView at Cumberland, LLC. All infrastructure will be private, however easements have been proposed over the roadways to provide for acceptance of the water utilities as a form of "public" utility pending final review with the Portland Water District. The applicant has a full maintenance staff and subcontracts some services such as snow plowing, etc. to maintain all properties includeing common areas, open space, unit lawns, driveways, walkways, roadways and sidewalks, stormwater management systems.

The unit cottages are marketed under a returnable entrance fee structure, commonly used in senior communities. Cottages are purchased by the residents with the purchase cost being fully refindable when/if they leave the unit.

5.6 Open Space, Buffers and Trails:

The quality of the project and community is defined to a large part not only by the New England architecture and attention to landscaping but also to the sense of connection to nature and the surrounding community amenities. The project provides significant open space as defined (68% or 41 acres) - well in excess of the 20% required by the SHC Ordinance Section 315-28.4D.5.



View of fields, wetlands and woods behind barns from exist tote road looking northwest

The two streams and wetland systems will have 100 foot buffers as requested by the Maine Department of Inland Fisheries and Wildlife (MDIFW). The applicant has shown conceptually, potential trails along these corridors with several connections to the Town trail system to the south and to the golf course cart paths. (Refer to the Trail and Walkway Masterplan.) The final determination of trail locations and links is expected to be reviewed with the Lands & Conservation Commission – Recreational Trails Subcommittee in the coming weeks which may result in revisions in the trail locations.

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The project will provide the required 50-foot wooded perimeter buffer within the wooded portions of the project, excepting road connections and the Little Acres Drive stream/culvert crossing and for a portion of the road extension through the open fields connecting to the farmstead. The road alignment is within the 50-foot buffer to minimize wetland impacts as required by the DEP and Corps of Engineers. Buffer landscaping will be provided within the buffer area within the field to soften the view from the north. Additionally a portion of the road on the sloping field up to the barn has been shifted to the west and downslope of the crest of the hill in the fields where the current farm road exists to further shield the road from view from the abutter to the north. All units are landscaped professionally to both create personal spaces and to compliment the architecture and site character of the project. The streets will be landscaped with street trees and area planting beds similar to Phase 1.

Refer to Plans C11A and C11B for site and typical unit landscaping plans.

Sidewalks are also provided as noted above along the main roadways within the project. In keeping with sustainable practices and minimizing impervious areas together with "Complete Street" policies, smaller side roads/driveways and the extension of Little Acres Drive to the community center do not propose sidewalks and will encourage use of the low volume streets for shared pedestrian and vehicle use.

5.7 Traffic Impact Assessment:

A Traffic Impact Study has been prepared by Diane Morabito. PE, PTOE of The Sewall Company and is included as *Exhibit 10*. The study evaluated vehicular trips generated by both the Phase 2 development and together with the Phase 1 development through a projected 2025 build out. Phase 2 is expected to generate only 13 peak hour trips in the AM peak hour and 16 trips in the PM peak hour of the adjacent street. The overall completed project is projected to generate 25 AM Peak hour trips and 31 PM hour trips. The study concludes that there are no significant impacts off-site. Refer to *Exhibit 10* for additional detail and analysis.



Greely Road looking north to site drive on left and Mere Wind Drive on right

5.8 Stormwater Management and Erosion & Sedimentation Controls:

Refer to *Exhibit 11* for the project Stormwater Management Report (bound separately) and the Pre and Post Development and Water Quality Treatment Plans for a summary of the stormwater management design and sizing. The project will employ several BMP's to mitigate stormwater flows and provide treatment meeting the DEP Chapter 500 General

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Standards including: wooded and meadow buffers, Focal Point ® system, underdrained soil filter and level spreaders. The report includes the offsite watershed 100 year flood analysis to determine the FEMA flood elevation at the stream located onsite and to the railroad culvert to the east.

The Stormwater Management Report includes inspection and maintenance logs for all proposed stormwater systems.

5.9 Construction Plan:

Construction of the 52 unit project is expected to commence in 2022, pending market conditions and adsorption rates for Phase 1, following issue of Town and DEP permits. The construction of the road and utility infrastructure is expected to continue into 2025 in phases. Construction of units will depend on market conditions but based on the recent success of Phase 1, we would expect the 52 units to be constructed within 3-4 years. However the applicants expect to construct the community center pool and locker room renovations at the former Godsoe residence commencing in 2020 following issue of permits to allow current and new Phase 1 residents the opportunity to use this facility. Construction sequencing will generally include the following on a phased basis:

- Community Center Pool, utilities, renovations
- Main project tree clearing and stump removal.
- Rough grading, earthwork for roadways and units and installation of utilities and stormwater systems.
- Stream Crossing (July to October period).
- Finish gravels and surfaces & paving
- Loam, seed, landscaping and stabilization.

6. DRAWINGS

The plans entitled “Cumberland Crossing – Phase 2”, last revised 12-18-19, prepared by Belanger Engineering include the following drawings - plans are being folded individually and accompany this application).

(NOTE: the Pre and Post Development Stormwater Plans are contained with the Stormwater Management Report as part of Section 12 and bound in a separate Volume II binder.)

C0	Cover Sheet
S1-S4	Subdivision Plat By Titcomb Associates
1 Of 1	Topographic Site Plan By Titcomb Associates
C1	Overall Phasing Plan *1"=100'*
C2	Overall Site Development Plan *Scale: 1" = 60'*
C3-C6a	Site Development Plans *Scale: 1" = 40'*
C7-C10	Plan & Profiles *Scale: 1" = 40'*
C11a-C11b	Landscape Plans 1"=60'
C12	Trail And Walkway Master Plan 1" = 100'
C13	Roadway Sections, Erosion Details, and General Notes

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C14-C15.	Site Development Details
C16-C17	Erosion Control Notes And Details
C18	Low Pressure Sewer Main Details
C19	Civil Details
C20-C21	Pipe And Structure Tables
C22-C23	Vacant
C24	Stone Strong Block Wall Details
C25	Filter Pond Details And Cottage Dripline Details
C26	Box Culvert 3 Details
C27	Focalpoint 10 Scale Plan View
C28-C30	Focalpoint Details
C32	Class B High Intensity Soil Survey By Mark Hampton
C33	Sh 1 Portland Water District Standard Details
C34	Sh 2 Portland Water District Standard Details
ES1	Mancini Electrical Photometric Plan
CMP	CMP 905 Plan - Pending
Pre	Pre Development Drainage Plan - Submitted Separately
Pre2	USGS Map Overlay
Post	Post Development Drainage Plan - Submitted Separately
Post2	Post Development Drainage Plan - Submitted Separately

7. OUTSIDE AGENCY PERMITS REQUIRED:

The project requires the following outside reviews or permits. Applications to the respective agencies are being filed following this submission.

- DEP Site Location of Development (SLODA) permit amendment.
- DEP Natural Resources Protection Act (NRPA) Tier 2 amendment and Permit By Rule permits.
- US Army Corps of Engineers (Corps) permit amendment.
- CCS&WCD stormwater and erosion control review (If required by Planning Board).

8. SUMMARY:

In summary we believe that the project as presented fits well within in the context of the surrounding neighborhoods, maintains significant open space and preserves of one of the most significant viewsheds in Cumberland. The project is consistent with the goals of the Comprehensive Plan in providing senior housing and meets the standards of the Senior Housing Community Overlay District and Subdivision Ordinance.

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We look forward to meeting with the Planning Board at the January, 2020 meeting to present the project in further detail. In the meantime should you have any comments or questions please do not hesitate to contact me.

Sincerely,



Frederic (Rick) Licht, PE, LSE
Principal

Encl: As Noted

Cc: Chris Wasileski; OceanView at Cumberland LLC
Christian Haynes; SeaCoast Management Company
David Haynes, RLA: SeaCoast Management Company
Chris Belanger; Belanger Engineering
Rex Croteau; Titcomb Associates
Mark Hampton; Mark Hampton Associates, Inc.
Scott Anderson; Verrill-Dana

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CUMBERLAND CODE

Appendix A
Planning Board Application

Map: R04
Lot: 34A AND PORTION OF 41

1. ***APPLICANT:***
   Name: OCEANVIEW AT CUMBERLAND, LLC
   Address: 20 BLUEBERRY LANE,
   FALMOUTH, ME 04105
   Telephone: 207.233.4194
   Cell: 207.433.4194
   Fax:
   E-mail: CHRISW@OCEANVIEWRC.COM
   Interest in property: OWN
   Interest in abutting properties, if any: EASEMENT AT TOWN OWNED VAL HALLA GOLF COURSE

2. ***OWNER:***
   Name: SAME AS APPLICANT
   Address:
   Telephone:
   Cell:
   Fax:
   E-mail:

3. ***APPLICANT'S ARCHITECT, LANDSCAPE ARCHITECT, ENGINEER, PLANNER OR SURVEYOR:***
   Name: FREDERIC (RICK) LICHT, PE
   Address: LICHT ENVIRONMENTAL DESIGN, LLC
   35 FRAN CIRCLE, GRAY, ME 04039
   (If more than one, please attach name and contact information for each.)
   Telephone: 207.749.4924
   Cell: 207.749.4924
   Fax:
   E-mail: RLICHT@SECURESPEED.NET
   (SEE APPLICATION REPORT SECTION 1)

4. ***PROJECT:***
   Name of project: CUMBERLAND CROSSING - PHASE 2
   Address of site: 228 GREELY ROAD AND OFF PHASE 1 CUMBERLAND CROSSING, TUTTLE ROAD
   Project data:
   Book: 35426
   Page: 97
   Map: R04
   Lot: 34A
   Zoning district: RR1
   Overlay district: SHC AND SP
   Size of site: 60+/- AC.
   Number of dwellings: 52
   Number of buildings: 52 + EXISTING GODSOE
   Number of lots: 1 RESIDENCE/BARNS
   Minor subdivision
   Major subdivision X
   Minor site plan
   Major site plan X
   Other: SHORELAND ZONE PERMIT - SP DISTRICT STREAM CROSSING

5. ***OTHER INFORMATION:***
   a) Is Board of Adjustment and Appeals approval required? NO
   b) Are any ordinance waivers requested? X Yes ____ No
      (If 'Yes' attach a list of waivers and reasons for their request.) SEE EXHIBIT 1
   c) Application fee per Town ordinance: $7,800 + $6,800 REVIEW ESCROW. SEE ATTACHED FEE CALC. SHEET
   d) This application form and all accompanying materials must be submitted to the Town Planner at least 21 days prior to the meeting at which it is to be considered by the Planning Board.

The undersigned, being the applicant, owner or legally authorized representative, states that all information contained in this application is true and correct to the best of his/her knowledge and hereby does submit the information for review by the Town and in accordance with applicable ordinances, statutes and regulations of the Town, state and federal governments.

Signature of applicant/owner/representative — Date: 12/31/19

CUMBERLAND CROSSING PHASE 2 & PHASE 1 AMENDMENT (53RD UNIT) TOWN APP. FEES:

DEC, 2019

ITEM	FEE			
	APPLICATION AND NOTICE FEE	REVIEW FEE	SUBDIV PER LOT FEE (3.)	CONSULTING ESCROW (3.)
MAJOR SUBDIVISION FEE	$ 100.00	$ 1,500.00	$ 5,300.00	$ 5,300.00
SITE PLAN FEE (COMMUNITY CENTER) PLAN BOARD REVIEW	$ 150.00	$ 500.00		$ 1,500.00
SHORELAND ZONE FEE (PLAN BOARD REVIEW)	$ 250.00			
SUBTOTAL FEE:	$ 500.00	$ 2,000.00	$ 5,300.00	$ 6,800.00
TOTAL FEE TOWN SUBDIV/SZ/SITE PLAN FEES (CHECK #1)	**$**		**7,800.00**	
TOTAL CONSULTING ESCROW FEE (CHECK #2)				**$ 6,800.00**
TOTAL FEES	**$ 14,600.00**			
* PAYABLE TO : TOWN OF CUMBERLAND				
REF: CUMB. CROSSING PH2 FEES AND PHASE 1 AMEND FEE				
1. SUBDIVISION PER LOT FEE $100				
2. SUBDIVISION CONSULTING ECSROW = $100/UNIT				
3. USE 52 NEW UNITS PHASE 2 + 1 ADDITIONAL UNIT PHASE 1				

SITE PLAN REVIEW
Town of Cumberland

Appendix C
Planning Board Site Plan Review Application

Applicant's name OCEANVIEW AT CUMBERLAND LLC

Applicant's address 20 BLUEBERRY LANE, FALMOUTH, ME 04105

Cell phone 207.233.4194 Home phone _____ Office phone 207.233.4194

Email Address CHRISW@OCEANVIEWRC.COM

Project address 228 GREELY ROAD AND EXTENSION OF LITTLE ACRES DRIVEOFF TUTTLE RD.

Project name CUMBERLAND CROSSING - PHASE 2

Describe project PROPOSED PHASE-2 OF SENIOR COMMUNITY -52 UNITS & COMMUNITY CENTER

Number of employees N/A

Days and hours of operation N/A

Project review and notice fee SEE ATTACHED FEE CALCULATION SHEEET WITH SUBDIV. FEES

Name of representative FREDERIC (RICK) LICHT, PE, LSE LICHT ENVIRONMENTAL DESIGN, LLC

Contact information: Cell: 207.749.4924 Office: 207.749.4924

What is the applicant's interest in the property?

Own X Lease _____ Purchase and sale agreement _____ (provide copy of document)
If you are not the owner, list owner's name, address and phone number _____
N/A

If you are not the owner, list owner's name, address and phone number _____

Boundary Survey
Submitted? Yes X No _____

Are there any deed restrictions or easements? Yes X No _____ If yes, provide information and show easement location on site plan. (ACCESS/UTIL. EASEMENT AT TOWN OWNED VAL HALLA GOLF COURSE LOT R04/41.)

Building Information
Are there existing buildings on the site? Yes X No _____ Number: 2 (HOUSE AND BARN)
Will they be removed? Yes _____ No X (Note: A demolition permit is required 10 days prior to demolition.)

Will a new structure(s) be built on the site? Yes X No _____
Describe: 52 SENIOR COTTAGE S
Number of new buildings 52
Square footage 2000-2500 INCLUDIING 1-2 CAR GARAGES (1500-1600 SF LIVING SPACE)
Number of floor levels including basement 1 FLOOR CRAW SPACE OR WALK OUTS SOME WITH LOFTS (1-2 STORIES)

Parking
Number of existing parking spaces ESTIMATED 10+/- AT RESIDENCE AND FARM
Number of new parking spaces 38 GRAVEL + 13 PAVED AT COMMUNITY CENTER
Number of handicapped spaces 2
Will parking area be paved? X Yes ___ No PAVED AT COMMUNITY CENTER. OVERFLOW AT BARN GRAVEL

Entrance LITTLE ACRES DRIVE EXTENSION FROM PHASE 1 & TUTTLE ROAD. SECONDARY ENTRANCE AT 228
Location: GREELY ROAD
Width 14.5-22 ft Length SEE PLANS
Is it paved? X Yes ___ No ___ If not, do you plan to pave it?

Where will snow storage for entrance and parking be located? Show on site plan. (SEE PLANS)

Utilities

Water: Public water X Well ___ (Show location on site plan.) (EXISTING WELL TO BE ABANDONED OR USED FOR IRRIGATION)

Sewer/septic: Public sewer X Private septic ___ Show location on site plan and submit HHE-200 septic design or location of passing test pit locations if new system is proposed. Also show any wells on abutting properties within 200 feet of the site. (EXISTING SEPTIC TO BE PHASED OUT AND REMOVED AT COMMUNITY CENTER

Electric: On site? Yes X No ___
Show location of existing and proposed utilities on the site plan and indicate if they are above or below ground.

Signs
Number: 1
Size: TO BE DETERMINED (SUBTLE SMALL LOCATION SIGN AT GREELY ROAD ENTRANCE
Material: TO BE DETERMINED
Submit sign design and completed sign application. TO BE SUBMITTED
Will the sign be lighted? TBD Submit information on type and wattage of lights.
Show location of sign(s) on the site plan. (TO BE DETERMINED - LOCATION AT GREELY ROAD DRIVE ENTRANCE

Natural Features
Show location of any of the following on the site plan:
River ___ Stream X Wetland X Pond ___ Lake ___ Stone walls ___
Are there any other historic or natural features? NO

Lighting
Will there be any exterior lights? Yes X No ___ Show location on site plan (e.g., pole fixtures, wall packs on building) and provide fixture and lumen information.

Trees
Show location of existing trees on the site plan and indicate if any are to be removed. SEE PLANS

Landscaping
Is there existing landscaping on the site? Yes X No ___ Show type and location on site plan. (SEE LANDSCAPING PLAN TO BE SUBMITTED SEPARATELY FROM SITE /SUBDIVISION SUBMITTAL)

Is new landscaping proposed? (Note: if property has frontage on Route 100, a twenty-five-foot landscape easement to the Town is required.)

Buffering
Show any existing or proposed buffering measures for adjacent properties, e.g., plantings, fences. (SEE PLANS AND 50 FOOT SHC BUFFER AND ADDITIONAL PLANTINGS ON LANDSCAPE PLAN)

Erosion Control
Has an erosion and sedimentation control plan been submitted? Yes X No _____

Stormwater Management Plan
Provide stormwater information for both pre and post development of the site. Show location of any detention areas and/or culverts on the site plan. (SEE SEPARATE VOLUME REPORT AND STORMWATER PLANS)

Fire Protection 140 FT FROM SITE ENTRANCE GREELY ROAD
Location of nearest hydrant _____ Sprinklers? Yes X No _____ (ALLUNITS TO BE SPRINKLERED)
Do you plan to have an alarm system? Yes_____No (TBD) Please contact the Fire/EMS Department at 829-4573 to discuss any Town or state requirements.

Trash
Will trash be stored inside X outside_____. If outside, will a dumpster be used? NOT OUTSIDE Yes_____No_____. Show location on site plan and show type of screening proposed (e.g., fencing, plantings). (NA)

Technical Capacity
List and provide contact information for all consultants who worked on the project, for example: licensed land surveyor, licensed soils evaluator, professional engineer, attorney, etc.
(SEE APPLICATION REPORT SECTION 1)

Financial Capacity
Please indicate how project will be financed. If obtaining a bank loan, provide a letter from the bank BANK FINANCING. SEE BANK LETTER IN EXHIBIT 5 OF APPLICATION REPORT

- Zoning district: RR1/SHC/STREAM PROTECTION (SP)
- Minimum lot size: 5 AC
- Classification of proposed use: SENIOR COMMUNITY
- Parcel size: 59.59 ARES
- Frontage: 750+ FEET (SEE SITE DATA TABLE ON SUBDIVISION PLAT)
- Setbacks: Front _____ Side _____ Rear _____
- Board of Appeals Required? NO
- Tax Map R04 Lot 34A Deed book 35246 Deed page 97
- Floodplain map number 230162-00158 Designation ZONE A (NO ELEVATION)
- Vernal pool identified? NONE
- Is parcel in a subdivision? NO
- Outside agency permits required:
  MDEP Tier 1 _____ MDEP Tier 2 X Army Corps of Engineers X
  MDEP general construction (stormwater) permit (for disturbance of 1 acre or more)
- MDOT entrance permit NO
- MDOT traffic movement permit NO
- Traffic study required YES. SEE EXHIBIT 10
- Hydrogeologic evaluation N/A
- Market study N/A
- Route 1 Design Guidelines? N/A
- Route 100, VMU or TCD Design Standards? N/A

A LETTER OF MAP AMENDMENT IS BEING PROPOSED TO FEMA TO ADJUST ZONE A.

(*DEP SITE LOCATION PERMIT AMENDMENT COVERS GENERAL BEING SUBMITTED. PERMIT COVERS GENERAL CONSTRUCTION PERMIT.

Applicant's signature _____ (agent)

Submission date: 12-21-19

DECD/OCP 1/91 - Revised locally 10/1/02

FOR OFFICE USE ONLY:
PERMIT NO.: _____
ISSUE DATE: _____
FEE AMOUNT: _____

(CUMBERLAND CROSSING PHASE 2)

Town of Cumberland
Shoreland Zoning Permit Application

GENERAL INFORMATION

1. APPLICANT	2. APPLICANT ADDRESS	3. APPLICANT PHONE NUMBER
OCEANVIEW AT CUMBERLAND LLC	20 BLUEBERRY LANE. FALMOUTH ME 04105	207.233.4194
4. PROPERTY OWNER	**5. PROPERTY OWNER ADDRESS**	**6 PROPERTY OWNER PHONE NUMBER**
OCEANVIEW AT CUMBERLAND. LLC	SAME AS ABOVE	207.233.4194
7. CONTRACTOR:	**8. CONTRACTOR'S ADDRESS:**	**9 CONTRACTOR'S PHONE NUMBER:**
STOVEN BROTHERS EXCAVATION	215 MIDDLE ROAD CUMBERLAND. ME 04021	207-829-4282
10. LOCATION / ADDRESS OF PROPERTY	**11. TAX MAP & LOT NUMBER, AND DATE LOT WAS CREATED**	**12. ZONING DISTRICT**
228 GREELY ROAD	MAP R04 PARCEL 34A	RR-1/SHC OVERLAY/ & S.P.

13 DESCRIPTION OF PROPERTY INCLUDING A DESCRIPTION OF ALL PROPOSED CONSTRUCTION, E.G. LAND CLEARING, ROAD BUILDING, SEPTIC SYSTEMS AND WELLS (PLEASE NOTE THAT A SITE PLAN SKETCH IS REQUIRED ON PAGE 3)

SEE ATTACHED FULL
PROJECT DESCRIPTION
IN SUBDIVISION APPLICATION.
REFER TO SECTIONS 2+5
FOR STREAM CROSSING
DESCRIPTION.. @ S.P. ZONE BROOK.
* FEMA 100 YR FLOODPLAIN MAPPING
TO BE SUBMITTED TO FEMA AS LETTER OF
MAP AMENDMENT TO ADJUST CURRENT FIRM MAP

14. PROPOSED USE OF PROJECT	15. ESTIMATED COST OF CONSTRUCTION
52-UNIT AMENDMENT TO PHASE-1 OF CUMBERLAND CROSSING SENIOR COMMUNITY	2022-2025

(CUMBERLAND CROSSING - PHASE 2)

SHORELAND PROPERTY INFORMATION

16. LOT AREA (SQ. FT.)	17. FRONTAGE ON ROAD (FT.)
59.59 Acres	750+'
18. SQ. FT. OF LOT TO BE COVERED BY NON-VEGETATED SURFACES	19. ELEVATION ABOVE 100 YEAR FLOOD
7.55 Acres	Road/Culvert Crossing ~ EL. 71.5±
20. FRONTAGE ON WATERBODY (FT.)	21. HEIGHT OF PROPOSED STRUCTURE
ALONG SP. STREAM = 1100'± EA SIDE = 2200 LF+/-	CULVERT (BOX) = 8.5'±
22. EXISTING USE OF PROPERTY	23. PROPOSED USE OF PROPERTY
HORSE FARM & UNDEVELOPED WOODS	RESIDENTIAL SENIOR COMMUNITY

NOTE: *Questions 24 & 25 apply only to expansions of portions of existing structures which are less than the required setback from the high water mark.*

24. A) TOTAL FLOOR AREA OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK AS OF 1/1/89 (SQ. FT.)	25. A) TOTAL VOLUME OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK AS OF 1/1/89 (CU. FT.)
N/A	N/A
B) FLOOR AREA OF EXPANSIONS OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK FROM 1/1/89 TO PRESENT (SQ. FT.)	B) VOLUME OF EXPANSIONS OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK FROM 1/1/89 TO PRESENT (CU. FT.)
N/A	N/A
C) FLOOR AREA OF PROPOSED EXPANSION OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK (SQ. FT.)	C) VOLUME OF PROPOSED EXPANSION OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK (CU. FT.)
N/A	N/A
D) % INCREASE OF FLOOR AREA OF ACTUAL AND PROPOSED EXPANSIONS OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK SINCE 1/1/89 (% INCREASE = (B+C)/A×100)	D) % INCREASE OF VOLUME OF ACTUAL AND PROPOSED EXPANSIONS OF PORTION OF STRUCTURE WHICH IS LESS THAN REQUIRED SETBACK SINCE 1/1/89 (%) (% INCREASE = (B+C)/A×100)
N/A	N/A

SITE PLAN

PLEASE INCLUDE: LOT LINES; AREA TO BE CLEARED OF TREES AND OTHER VEGETATION; THE EXACT POSITION OF PROPOSED STRUCTURES, INCLUDING DECKS, PORCHES, AND OUT BUILDINGS WITH ACCURATE SETBACK DISTANCES FROM THE SHORELINE, SIDE AND REAR PROPERTY LINES; THE LOCATION OF PROPOSED WELLS, SEPTIC SYSTEMS, AND DRIVEWAYS; AREAS AND AMOUNTS TO BE FILLED OR GRADED. IF THE PROPOSAL IS FOR THE EXPANSION OF AN EXISTING STRUCTURE, PLEASE DISTINGUISH BETWEEN THE EXISTING STRUCTURE AND THE PROPOSED EXPANSION.

NOTE: FOR ALL PROJECTS INVOLVING FILLING, GRADING, OR OTHER SOIL DISTURBANCE, YOU MUST PROVIDE A SOIL EROSION CONTROL PLAN DESCRIBING THE MEASURE TO BE TAKEN TO STABILIZE DISTURBED AREAS BEFORE, DURING, AND AFTER CONSTRUCTION. (See attached guidelines.)



Scale: _____ inches = _____ feet.

EXTERIOR ELEVATIONS

DRAW A SIMPLE SKETCH SHOWING BOTH EXISTING AND PROPOSED STRUCTURES WITH DIMENSIONS:

SEE FULL SIZE
SUBDIVISION PLANS
SHEETS C5, C24-C26
FOR STREAM CROSSING &
ASSOCIATED WORK & STORMWATER
MEASURES IN 75' S.P. DISTRICT

FRONT OR REAR ELEVATION

SEE FULL SIZE
SUBDIVISION PLANS
SHEETS C6-C7 PROFILES

SIDE ELEVATION

Scale: _____ inches = _____ feet.

(CUMBERLAND CROSSING - PHASE 2)

ADDITIONAL PERMITS, APPROVALS, AND/OR REVIEWS REQUIRED

CHECK IF REQUIRED:

- [x] PLANNING BOARD REVIEW APPROVAL (e.g. Subdivision, Site Plan Review)
- [ ] BOARD OF APPEALS REVIEW APPROVAL
- [ ] FLOOD HAZARD DEVELOPMENT PERMIT
- [ ] EXTERIOR PLUMBING PERMIT (Approved HHE-200 Application Form)
- [ ] INTERIOR PLUMBING PERMIT
- [x] D.E.P. PERMIT (Site Location, Natural Resource Protection Act)
- [x] ARMY CORPS OF ENGINEERS PERMIT (e.g. Sec. 404 of Clean Waters Act)
- [ ] ARMY CORPS OF ENGINEERS PERMIT (e.g. Sec. 404 of Clean Waters Act)

OTHERS:

- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____

NOTE: Applicant is advised to consult with the Code Enforcement Officer and appropriate State and Federal agencies to determine whether additional permits, approvals, and reviews are required.

I CERTIFY THAT ALL INFORMATION GIVEN IN THIS APPLICATION IS ACCURATE. ALL PROPOSED USES SHALL BE IN CONFORMANCE WITH THIS APPLICATION AND THE **CUMBERLAND** SHORELAND ZONING ORDINANCE. I AGREE TO FUTURE INSPECTIONS BY THE CODE ENFORCEMENT OFFICER AT REASONABLE HOURS.

APPLICANT'S SIGNATURE	DATE
(agent)	12/31/19
AGENT'S SIGNATURE (if applicable)	DATE

* If the person signing the application is not the owner or lessee of the property, then that person shall submit a letter of authorization from the owner or lessee.

APPROVAL OR DENIAL OF APPLICATION
(For Office Use Only)

THIS APPLICATION IS: MAP _____ LOT _____

☐ APPROVED ☐ DENIED

IF APPROVED, THE FOLOWING CONDITIONS ARE PRESCRIBED:

IF DENIED, REASON FOR DENIAL:

NOTE: IN APPROVING A SHORELAND ZONING PERMIT, THE PROPOSED USE SHALL COMPLY WITH THE PURPOSES AND REQUIREMENTS OF THE SHORELAND ZONING ORDINANCE FOR THE TOWN OF CUMBERLAND.

_____ _____

CODE ENFORCEMENT OFFICER DATE

* This permit will expire one year fom the date of issuance, if no substantial start is made in construction.

INSPECTION CHECKLIST:

☐ Prior to Clearing and Excavation

☐ Prior to Foundation Pour

☐ Prior to Final Landscaping

☐ Prior to Occupancy

Permit # _____

Fee Amount _____

CUMBERLAND CROSSING-2
12/2019

APPENDIX D

MAJOR TRADITIONAL OR CLUSTERED SUBDIVISION SUBMISSION REQUIREMENTS AND CHECKLIST

The subdivision plan for a major traditional or clustered subdivision shall consist of an electronic submission and two (2) paper copies of all required application materials. Major subdivision review is a two-step process: 1) preliminary plan review and approval; 2) final plan review and approval. Occasionally, both preliminary and final approval may be granted by the Planning Board at the same meeting if all required information for both preliminary and final approval have been submitted, reviewed and approved by staff.

PRELIMINARY PLAN

A. Preliminary plan location map. The preliminary plan shall be accompanied by a location map drawn at a scale of not over 1,000 feet to the inch to show the relation of the proposed subdivision to the adjacent properties and to the general surrounding area. The preliminary plan shall show all the area within 1,000 feet of any property line of the proposed subdivision. Within such area the location map shall show:

1. All existing subdivisions and approximate tract lines of adjacent parcels together with the names of the record owners of all adjacent parcels of land, those directly abutting or directly across any street adjoining the proposed subdivision.
2. Locations, widths and names of existing, filed or proposed streets, easements, and building lines pertaining to the proposed subdivision and to the adjacent properties.
3. The boundaries and designations of zoning districts, parks and other public spaces.
4. An outline of the proposed subdivision together with its street system and an indication of the future probable street system of the remaining portion of the tract, if the preliminary plan submitted covers only part of the subdivider's entire holding.

B. Preliminary plan maps and information. The preliminary plan shall be submitted in 2 copies of one or more maps or drawings which may be printed or reproduced on paper with all dimensions shown in feet or decimals of a foot, drawn to a scale of one inch equals not more than 100 feet or, for plans describing construction of required improvements, a scale of one inch equals 40 feet; drawings are not to exceed 24 inches by 36 inches. All materials must also be provided in an electronic format. All plans shall be accompanied by the following information:

1. Proposed subdivision name or identifying title and the name of the municipality.
2. Name and address of record owner, subdivider and designer of preliminary plan.
3. Date of plan submission, true North point and graphic scale.
4. Number of acres within the proposed subdivision, location of property lines, existing easements, buildings, watercourses and other essential existing physical features.
5. The names of all subdivisions immediately adjacent and the names of owners of record of adjacent acreage.

6. The space standard and setback provisions of the Chapter 315, Zoning, applicable to the area to be subdivided and any zoning district boundaries affecting the subdivision.

7. The location and size of any existing or proposed sewers and water mains, culverts, hydrants, and drains on the property to be subdivided. This shall show the connections with existing sewer or water systems. Where public water and/or sewerage is not to be provided, alternative means of water supply and sewage treatment and disposal shall be shown, both horizontally and vertically. If on-site groundwater wells are proposed, the effect of withdrawal of groundwater may be required by the Board as set forth in this chapter.

8. If individual or collective private sewage disposal system(s) is (are) proposed, the location and results of tests to ascertain subsurface soils and groundwater conditions shall be signed and numbered by a licensed site evaluator. If a cluster system or collective private sewage disposal system(s) is (are) proposed, a hydrogeologic investigation shall be submitted meeting the sewage disposal standards as set forth in this chapter. A hydrogeologic investigation may be required by the Board for individual systems as set forth in this chapter.

9. Location, names and present and proposed widths of existing and proposed streets, highways, easements, building lines, alleys, parks and other public open spaces both within and abutting the subdivision. Grades and street profiles of all streets, sidewalks or other public ways proposed by the subdivider shall be shown.

10. Contour lines at intervals of two feet or at such intervals as the Planning Board may require, based on United States Geological Survey datum and referred to mean sea level.

11. A high-intensity soil survey shall be conducted by a certified soil scientist to identify soils within the proposed development in accordance with United States Department of Agriculture Natural Resources Conservation Service National Cooperative Soil Classification. The soil boundaries and names shall be superimposed on a plot plan of the proposed development.

12. Deed reference and map of survey of tract boundary made and certified by a registered land surveyor, tied into established reference points. Deed restrictions, if any, shall be described.

13. A surface drainage plan or stormwater management plan, with profiles and cross sections drawn by a professional engineer registered in the State of Maine, showing preliminary design of all facilities and conveyances necessary to meet the stormwater management standards as set forth in this chapter.

14. The proposed lot lines with dimensions and suggested locations of buildings.

15. The location of temporary markers adequate to enable the Board to locate readily and appraise the basic layout in the field.

16. All parcels of land proposed to be dedicated to public use and the conditions of such dedication.

17. The location of all natural features or site elements to be preserved.

18. A grading and landscaping plan, including natural features to be preserved.

19. Plans shall bear the seals or numbers of the registered professionals responsible for preparing appropriate sections of the plan. Surveys shall be stamped by registered professional engineers, soil surveys shall bear the numbers of a soil scientist, subsurface sewage disposal plans shall bear the number of the professional site evaluator responsible for those evaluations, geological evaluations shall bear a registered geologist's number and architectural work shall bear the architect's seal.

FINAL PLAN

C. The final subdivision plan for a major traditional or clustered subdivision shall consist of an electronic submission and two (2) paper copies of all required application materials. All materials must also be provided in an electronic format.

The final plan shall show:

1. All of the information presented on the preliminary plan and location map and any amendments thereto required by the Board or otherwise added to the plan. Engineering plans submitted shall be final plans on which construction may be based.
2. The name, registration number and seal of the engineer, land surveyor, geologist, soil scientist, architect or planning consultant who prepared the plan.
3. Street names and lines, pedestrian ways, lanes, easements, rights-of-way and areas to be reserved for or dedicated to public use.
4. The length of all straight lines, the deflection angles, radii, length of curves and central angles of all curves, tangent distance and tangent bearings for each street.
5. An actual field survey of the boundary lines of the tract, giving complete descriptive data by bearings and distances, made and certified by a licensed land surveyor. The corners of the tract shall be located on the ground and marked by monuments as herein required and shall be referenced as shown on the plan.
6. Sufficient data acceptable to the municipal officials to determine readily the location, bearing and length of every lot line and boundary line and to reproduce such lines upon the ground. Where practical these should be tied to reference points previously established.
7. The survey of the outside boundaries of the tract and the computation of the lot lines shall be performed to an accuracy of one foot in 5,000 feet. If requested by the Planning Board, the surveyor shall furnish copies of computation sheets for outside boundaries showing.
   a. Sketch of traverse lines.
   b. Closures;
   c. Adjustments;
   d. Coordinates; and
   e. Computation of outside boundaries.

8. By proper designation, all public open space for which offers of cession are made by the subdivider and those spaces to which the title is reserved by him.
9. Lots and blocks within the subdivision numbered in accordance with local practice.
10. Proposed homeowners' covenants and restrictions.
11. Required MDEP stormwater maintenance documents.

D. There shall be submitted to the Board with final plan:

1. Copies of declarations, agreements or other documents showing the manner in which open space or easements are to be held and maintained.
2. Where conveyance of public open space or easements to the Town is contemplated, a written offer to make such conveyance to the Town and written evidence that the municipal officers are willing to accept such conveyances and are satisfied with the terms and conditions of the proposed conveyance and with the legal sufficiency of the proposed transfer documents. Such written evidence shall not constitute an acceptance by the municipality of any such public open space.

COMPLETION CHECKLIST FOR MAJOR TRADITIONAL OR CLUSTERED SUBDIVISION SUBMISSION REQUIREMENTS

Waivers: Please make a check in the *Waiver Request* column for any requested waivers. Attach a separate sheet citing the Subdivision Ordinance section number, description, and reason for the waiver request.

	Check if provided	Location of information in packet, e.g. plan #, page #	Waiver Request?
General Submissions:			
2 ~~15~~ copies of plans and materials. All sheet sized to be 24" x 36" +PDF	✓		
1"=100' scale for general plan	✓		
1"=40' scale for construction of required improvements	✓		
Traffic Info?	✓	Traffic Study - Sewall Co.	
Capacity to Serve letters?	✓		
Financial and Technical Capacity (Sec.14)	✓		
Sewer user permits required? Status?		TO BE OBTAINED	
Deed restrictions, if any, describe on separate sheet		.	
Cover Sheet:			
Proposed subdivision name	✓		

	Check if provided	Location of information in packet, e.g. plan #, page #	Waiver Request
Name & address of record owner, subdivider, and designer of preliminary plan	✓		
Location Map:			
Scale 1"=1000'	✓		
Shows area 1000' from property lines	✓		
All existing subdivisions	✓		
Approximate tract lines of adjacent parcels	✓		
Approximate tract lines of parcels directly across street	✓		
Location of existing & proposed streets, easements, lot lines & bldg. lines of proposed subdivision & adjacent properties.	✓		
Existing Conditions Plan:			
Existing buildings	✓		
Watercourses	✓		
Legend	✓		
Wetlands	✓		
Existing physical features (trees 10" diameter or more. Stone walls ✓		INDIVIDUAL SPECIMEN TREES @ GODSOE FARM LOCATED	* TREES > 10" DBH
Trail System?	✓	PRELIM TRAIL SYSTEM	
Subdivision Plan:			
Date of plan submission, true north & graphic scale	✓		
Net residential acreage calculations	✓		
Legend	✓		
Trail (connecting?)	✓	PRELIM TRAIL SYSTEM	
Widths of existing/proposed streets, easements & bldg. lines	✓		
Names of existing/ proposed streets, easements & bldg. lines			
Boundaries & designations of zoning districts, parks, public spaces	✓		
Outline of proposed subdivision w/ street system	✓		
Future probable street system of remaining portion of tract.	N/A		

	Check if provided	Location of information in packet, e.g. plan #, page #	Waiver Request
Opportunities for Connecting Road(s) (13.2D)	N/A		
Space and Setback of district	✓		
Classification of road	✓		
Width of road(s)	✓	PRIVATE STREETS	
Drainage type (open, closed, mix)	✓		
Type of byway provided (8.4D)			
Names of adjacent subdivisions	✓		
Names of owners of record of adjacent acreage	✓		
Any zoning district boundaries affecting subdivision	✓		
Location & size of existing or proposed sewers, water mains, culverts, hydrants and drains on property	✓		
Connections w/existing sewer or water systems	✓		
Private water supply shown	N/A	EX. GODSOE WELL	
Private septic shown	✓	EX. GODSOE W.W. SYSTEM	
Hydro-geologic study	N/A		
(option for Board)			
Test pit locations	✓	SOILS MAP STAMPED	
Well locations	✓		
Signature & lic. # of site evaluator	N/A		
Existing streets: location, name(s), widths w/in and abutting	✓		
Proposed streets: location, name(s), widths w/in and abutting	✓		
The above for any highways, easements, bldg. lines, alleys, parks, other open spaces w/in and abutting	✓		
Grades & street profiles of all streets, sidewalks or other public ways proposed			
2'contour lines	✓		
High intensity soil survey by cert. soil scientist	✓	SOILS MAP. M. HAMPTON	
Soil boundaries & names superimposed on plot plan	✓	SEE STORMWATER PLANS	
Deed reference & map of survey of tract boundary by reg. land surveyor tied to established reference points	✓		

	Check if provided	Location of information in packet, e.g. plan #, page #	Waiver Request
Surface drainage or stormwater mgmt plan w/profiles & cross sections by a P.E. showing prelim. design and conveyances	✓		
Proposed lot lines w/ dimensions and suggested bldg. locations.	✓		
Location of temp. markers in field	✓		
All parcels proposed to be dedicated to public use and conditions of such.	N/A		
Location of all natural features or site elements to be preserved	✓		
Street lighting details	✓		
Landscaping and grading plan including natural features to be preserved	✓		
Survey stamped by ~~P.E.~~ (PLS)	✓		
Soil surveys w/# of soil scientist	✓		
Septic plan w/ # of prof. site evaluator	N/A		
Geological evals w/ reg. geologists number	N/A		
Architect's seal	N/A		
For Rt. One: 75' undisturbed buffer applicable to all buildings, structures, parking areas, drainage facilities and uses.	N/A		
Open Space?	✓		
Any part of parcel in a shoreland zone?	✓	* SZ PERMIT APP. INCLUDED	
Flood Map Number and rating?	✓		
Stormwater Report?	✓		
Rivers, ponds, wetlands?	✓		
Historic, archeological features?	N/A	MHPC LETTER	
Solid waste disposal?	✓		
Required Notes on Plan:			
Fire Department notes			
Clearing limits note			
Re: approval limit of 90 days before recording or null p. 10	✓		
Actual field survey of boundary lines w/ monumentation shown	✓		
Assessor's approval of street names and assignment of lot numbers.		PENDING	

	Check if provided	Location of information in packet, e.g. plan #, page #	Waiver Request
Designation of all open spaces w/ notes on ownership	✓		
Copies of declarations, agreements or other documents showing the manner in which open space or easements are to	✓		
Written offer for any conveyance to the Town of open space or easements along with written evidence that the Council is willing to accept such offer	N/A		
Evidence of Outside Agency Approvals		PENDING (DEP/CORPS)	

As per Section 7.2 - REVIEW AND APPROVAL BY OTHER AGENCIES:

E. *Where review and approval of any subdivisions or site plan by any other governmental agency is required, such approval shall be submitted to the Planning Board in writing prior to the submission of the Final Plan.*

Please list below all outside agency approvals that are required for this subdivision.

- **Maine Department of Environmental Protection**: *List type of permit(s) required (e.g., SLODA, NRPA (tier type?), Maine Construction General Permit, etc.)*
- ***US Army Corps of Engineers***
- **Maine Department of Transportation**: *List type of permit(s) required.*
- ***Maine Department of Inland Fisheries and Wildlife***
- **Cumberland County Soils and Water Conservation Service:** Required by Town.

Other: (Please List):_____

Exhibit 1

Waiver Requests

EXHIBIT 1
WAIVER REQUESTS

The following waivers are being requested from the Preliminary Subdivision Plan Checklist Appendix D of the Town of Cumberland Chapter 250 - Subdivision of Land Use Ordinance. Please note that the waiver request 1 is for a technical standard. Waiver requests 2-4 are for submittal requirements.

WAIVER REQUEST-1 Senior Housing Community (SHC) Overlay District Ordinance (Section 315-28.4.I. (2) – Road Width

Basis of Waiver – The applicant respectfully requests a waiver of the street width requirement from 20 feet of pavement (roads serving over 10 homes) to 14.5 feet for the portion of Little Acres Drive extension over the existing Godsoe Farmstead drive from Greely Road to the existing residence parking area, a distance of approximately 500 feet. The waiver is requested for several reasons:

1. The SHC ordinance Section E.4 refers to special standards related to the 500 foot preservation area including maintaining the character of the view shed. The aesthetics of the existing driveway as a gateway to the estate blends with the fields and is very much a part of the view to be preserved. Widening this drive to 20 feet would in our opinion, create the feel of a residential subdivision as opposed to a driveway and significantly alter the character of the view shed.
2. Widening of the road would require removing the elegant curved stone walls framing the entrance to the site.
3. The drive is not intended as a primary access to the project and increasing the width would have no practical purpose and would only increase impervious area requiring additional altering of the fields to create storm water management BMPs.
4. A field test was conducted on August 26th, 2019 with the Cumberland Fire Department using the largest turning radius fire apparatus. The test demonstrated that that vehicle can easily maneuver the existing 14-14.5 foot drive.

WAIVER REQUEST -2 Appendix D. B. 3. – Show true north on subdivision plan:

Basis of Waiver – Current survey standards comply with the Maine State Grid coordinate system for a basis of bearings for the project boundary. The basis of bearings for the project prepared by Titcomb Associate, Surveyors is the Maine State Plan Coordinate System, NAD 83 West Zone. The requirement to provide true north conflicts with the Town's requirement to provide the project in a GIS compatible format. Applicant recommends that this requirement be updated to currently used technical standards in the future.

WAIVER REQUEST -3 Appendix D Checklist Item 29 – Street Signs:

Basis of Waiver - Applicant requests waiver of requirement to show street signs until reviewed by the Town E911 administrator to confirm street names and locations. We respectfully request that this be made a Final Plan requirement. (Note the Planning Board referred this requirement to a Condition of Approval for Phase 1.)

WAIVER REQUEST – 4 Existing Features – Trees over 10 inch dbh:
Basis of Waiver – Approximately two thirds of the project site is wooded and the applicant has designed the project to provide buffering and retain wooded open space as an integral component of this active senior community. Location of 10 inch dbh trees would be very costly and serve no real value. As a matter of practice during construction the applicant for all previous projects has taken care to do two tree cuttings to preserve specimen trees in and around units where grading permits. The first cut is conservatively the edge of the woods lines saving potential trees around units. The second cut removes and trims those final trees which would not survive due to final unit or site grading.

Exhibit 2

Subdivision Ch 250-1 Standards Findings

EXHIBIT 2

SUBDIVISION CRITERIA REVIEW

CHAPTER 250-1 LAND USE ORDINANCE

A. Pollution: The proposed subdivision will not result in undue water or air pollution.

The project development includes a comprehensive erosion and sedimentation control (EC) plan and storm water management system to be approved by the DEP and Town Peer Review by the Cumberland County Soil & Water Conservation District (CCSWCD). The EC plan once approved satisfies rigorous requirements to protect the site streams and wetlands from sedimentation or pollution from the construction of the project. Furthermore the project will include a third party inspector to provide oversight during the construction period.

The storm water management system provides water quality protection for adjacent properties, streams and wetlands through the implementation of approved BMP's to satisfy both water quality and peak flow rate storm water standards.

As a residential development, the project proposes no significant sources of air pollution. The potential for construction air-borne dust will be mitigated though regular street sweeping and watering.

The project will not result in the undue water or air pollution.

B. **Sufficient Water: The proposed Subdivision has sufficient water available for the reasonable foreseeable needs of the subdivision.**

The Portland Water District has available public water and has issued a letter of serviceability indicating that a sufficient water supply is available for domestic water usage and fire protection.

C. Municipal Water Supply: The proposed subdivision will not cause an unreasonable burden on an existing water supply, if one is used.

The Portland Water District has available public water and has issued a letter of serviceability indicating that a sufficient water supply is available for domestic water usage and fire protection.

D. **Erosion: The proposed subdivision will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition exists.**

The project development includes a comprehensive erosion and sedimentation control (EC) plan and storm water management system to be approved by the DEP and Town Peer Review by the Cumberland County Soil & Water Conservation District (CCSWCD). The EC plan once approved satisfies rigorous requirements to protect the site streams and wetlands from sedimentation or

pollution from the construction of the project. Furthermore the project will include a third party inspector to provide oversight during the construction period.

E. Traffic: The proposed subdivision will not cause unreasonable highway or pubic road congestion or unsafe conditions with respect to the use of the highways or public roads, existing or proposed.

The applicant has submitted a Traffic Impact Study prepared by Diane Morabito, PE dated December, 2019 which summarizes that the project will generate a modest level of vehicle peak hour trips, will not have any significant impact on off-site traffic operations, has adequate sight distance at Greely Road and there are no attributable vehicular safety concerns from the development of the project.

Based on the traffic analysis the proposed subdivision will not cause unreasonable highway or public road congestion or unsafe conditions.

F. Sewage Disposal: The proposed subdivision will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services.

The applicant has estimated an average water/wastewater load of approximately 10,360 gallons per day. Portland Water District operates the down gradient pump stations in Tuttle Road and has reported the ability to handle the increased flows. The wastewater is ultimately treated at the Falmouth Wastewater Facility (FWWF) under an inter-municipal agreement. A letter from the Cumberland Town Manager has been requested and is expected to be issued indicating sufficient reserve capacity at the FWWF.

G. Solid Waste Disposal: The proposed subdivision will not cause an unreasonable burden on the municipality's ability to dispose of solid waste, if municipal services are to be utilized.

The project proposes to utilize the municipal waste and recycling curbside pick-up services to manage the disposal of residential waste and recycling materials. Cumberland is a member of Eco-Maine which has capacity to handle the additional recycling volume produced by this project.

Construction debris will be collected, recycled and properly disposed of by the site contractor consistent with the Phase 1 project.

The project will not cause an unreasonable burden on the municipal waste disposal services.

H. Aesthetic, Cultural and Natural Values:

The Phase 2 project development cottages will not be visible from Greely Road and the closest units to any abutting properties on Greely Road are 0ver 850 away and set back over 100 feet into a wooded buffer. The roadway extending into the fields behind the barn will be set below the adjacent grades shielding from the view of the abutters to the north and sections at grade and additional parking will be provided with landscaped buffers. The project is buffered and contains significantly more open space that the SHC ordinance requires (68% verses 20% required).

Furthermore the project proposes a robust landscaping and buffering plan to provide the same superior quality community as exists with the applicant's other senior campus projects.

Letters have been provided from the Maine Natural Areas program, Maine Historic Preservation Commission and MDIF&W indicating that no mapped significant wildlife or plant communities have been mapped on the site.

The project should not have an undue adverse impact on scenic, natural or historic values of the property.

I. Conformity with Local Ordinances:

The project has been designed in compliance with the applicable SHC, Site Plan and Subdivision Ordinance Standards. Furthermore the project is located within a mapped Growth Area and Senior Housing Overlay District which are zoned to promote smart growth and more intense development near the community center where there are public utilities. The project also helps to address housing for seniors In Cumberland – a need identified in the Comprehensive Plan.

The project is in conformance with local ordinances and the Comprehensive Plan.

J. Financial and Technical Ability :

The project has submitted evidence of the ability to finance the project through bank financing. The applicant has brought an experienced team to the project and has a 35+ year record of providing and expanding senior communities in Maine demonstrating the technical capacity to undertake the project.

K. Surface Waters; outstanding river segments:

The project does not lie in the watershed of an Outstanding River Segment, pond or within 250 feet or any wetland, great pond or river as defined under Title 38, Chapter 3, Subchapter 1, Article 2-B – Shoreland Zoning.

Therefore the project will have no adverse impacts on any pond, lake or shoreland zoned area or resources as specifically defined in the referenced Statute.

Note – The project does require a Shoreland Zone permit from the Town of Cumberland for the crossing of the Stream Protection District (SP) brook. The stream does not qualify as a specific resource in the referenced Statute under this standard.

L. Groundwater: The proposed subdivision will not, alone or in conjunction with existing activities , adversely affect the quality or quantity of groundwater.

The project does not propose to utilize any groundwater from wells. Infiltration of storm water is limited to the installation of BMP's along the access road which meet all DEP standards for treatment of storm water prior to discharge to groundwater.

The project will not adversely affect the quality or quantity or groundwater.

M. Flood Areas:

The applicant has submitted a FEMA-FIRM Map indicating that the project is located partially within a 100 year Zone A floodplain. No units will be placed within the 100 year floodplain requiring first floors to be placed one foot above the floodplain. Additionally the applicant's team has evaluated the contributing watershed and is proposing to submit a Letter of Map Amendment to correct the existing FEMA flood maps which are not based on elevation but on scaling of the map which we believe to be inconsistent with the actual ground topography.

The project will not have an adverse impact on a FEMA Zone A – 100 year flood plain.

N. Storm water: The proposed subdivision will provide for adequate storm water management.

The project has been designed to meet the standards of the Town of Cumberland Storm water Management Chapter 250-38 and the DEP Chapter 500 Storm water Rules using a combination of underdrained soil filter, buffers, storm drain system, proprietary bio-filters and underground storage systems and level spreaders. The applicant has submitted a storm water management report indicating that the post-development flow rates do not exceed the pre-development flow rates for the required storm events. The project proposed steam crossing will pass the 100 year storm event.

Based on the submitted information the project will provide adequate storm water management.

O. Freshwater Wetlands: All freshwater wetlands as defined in 30-A M.R.S.A. § 4401 Subsection 2-A have been defined onsite.

All wetlands on site have been delineated and mapped by Mark Hampton Associates, Inc. and shown on the project plans. Impacts to wetlands due to the development have been minimized through careful analysis of alternative design options to require a DEP-NRPA Tier 2 permit application be filed.

P. River, Stream or Brook: Any river, stream or brook within or abutting the proposed subdivision has been identified and mapped.

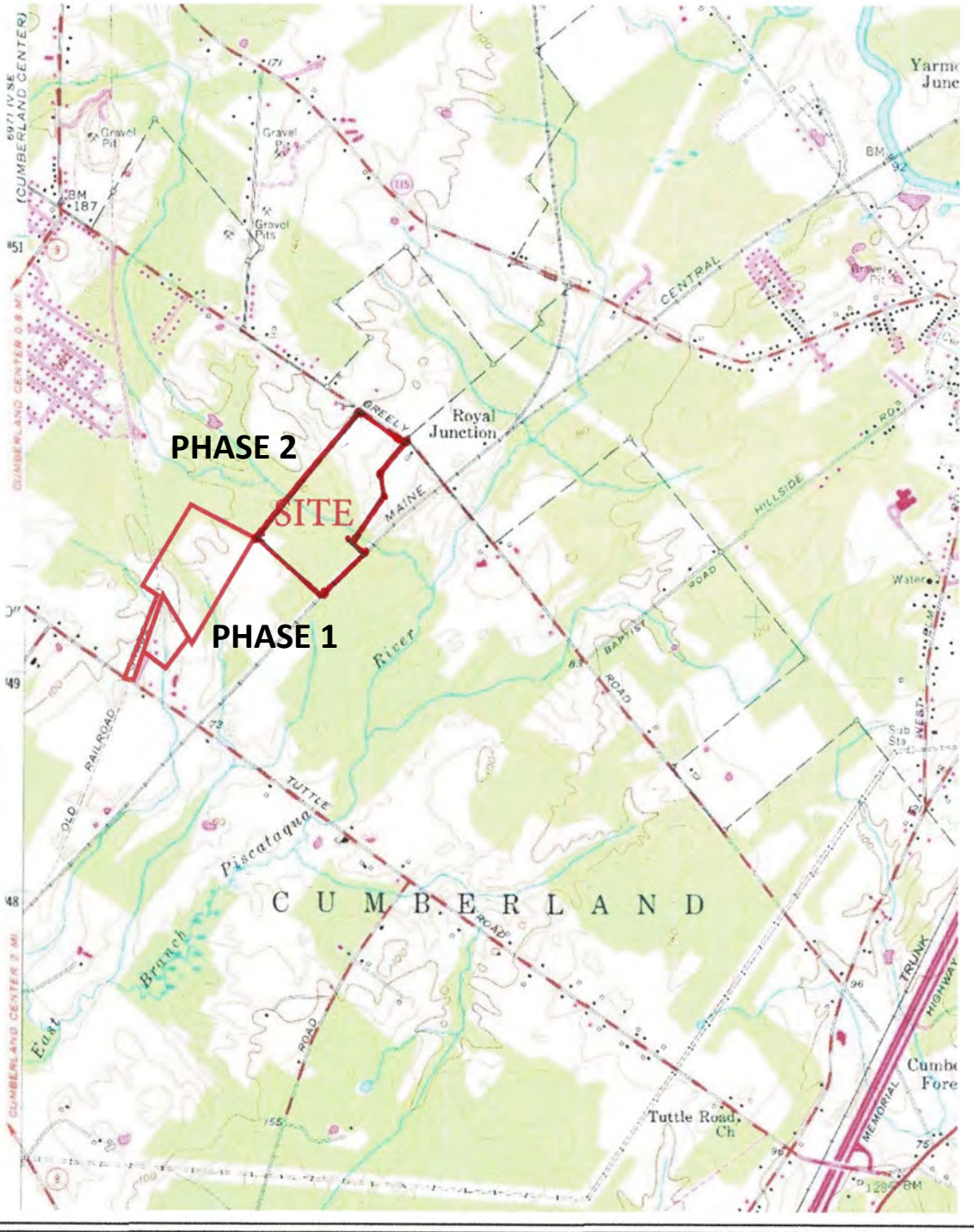
Two streams as defined by the Maine Department of Environmental Protection cross the site. Both streams have been shown on the project plans. The larger of the two streams requires a road crossing using a concrete box culvert similar to Phase 1.

The project has mapped all rivers, streams or brooks on the property.

Exhibit 3

USGS Map and Aerial Locus

REFERENCE : USGS, Yarmouth, 7.5 Minute Series, 1957, 1977 Rev



- PREPARED FOR:

OCEANVIEW AT CUMBERLAND
TUTTLE ROAD
CUMBERLAND

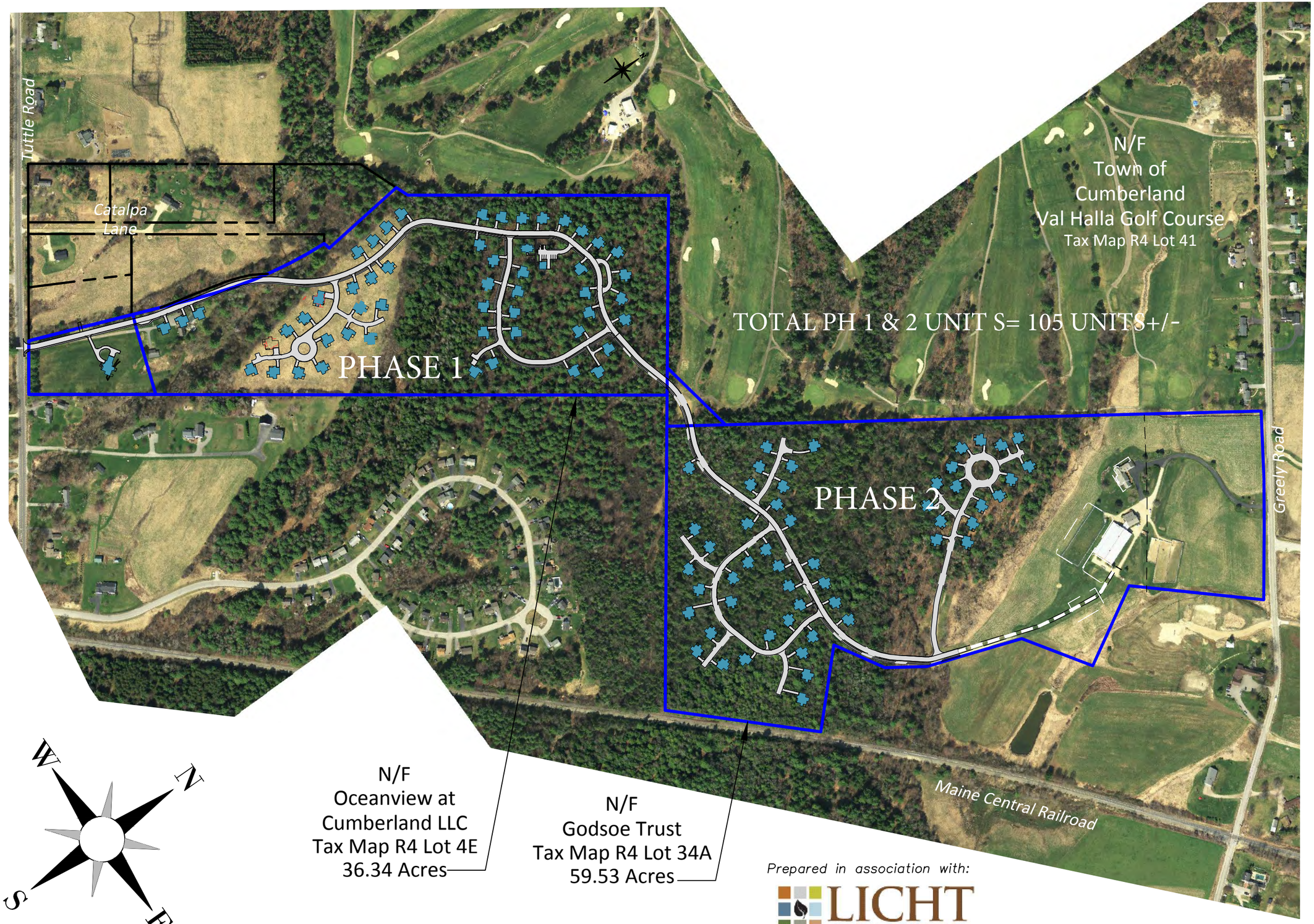
- TITLE:

USGS Locus Map

LICHT
ENVIRONMENTAL DESIGN, LLC

- DATE: **DEC. 2019** SCALE: 1"=1000' JOB NO: 16.084

Exhibit 1.1



Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

SHEET TITLE:

Aerial Plan

Client / Project: Oceanview at Cumberland Crossing

Location: Tuttle and Greely Roads

Town: Cumberland County: Cumberland State: Maine

Project: 109 Drawn by:

Scale: 1"=400'

Date: 1-28-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue , Augusta, Maine 04330

Exhibit 4

Assessors and Zoning Maps

CUMBERLAND CROSSING Ph. 1 & 2
SUBJECT PARCELS
MAP R04- 4E, 5 & 34A

34A

4E

SUBJECT LOT

GREELY ROAD

TUTTLE ROAD

MAINE CENTRAL RAILROAD

CLASSIFIED FARMLAND

CMP TRANSMISSION LINE / RAVEN FARM SUBSTATION

CENTRAL MAINE POWER TRANSMISSION LINE

Maps Prepared by: Spatial Alternatives 207.846.2355 www.spatialalternatives.com

Tax Sheets are intended for assessing purposes only.
Boundary locations are approximate and should not be used for conveyance of property.

Legend
ROW/Easements; Farmland and Tree Growth; ROW; Roads
Tax Parcels; Town Owned or Cemetery; Utility; Water
Parcels; Open Space; Railroad

Town of Cumberland, Maine

1,000 Feet

Index Map

R05 R04 R02 R03 R01

N

Cumberland Tax Map
R04
Map updated to: April 1, 2018

Official Overlay Zoning Map
Cumberland, Maine

I certify this to be a true copy of the Official Zoning Map as amended by vote of the Town Council.

Town Clerk

Adopted: 01/25/1999
Amended: 01/15/2008
Amended: 06/22/2009
Amended: 04/11/2011
Amended: 10/10/2011
Amended: 04/17/2012
Amended: 06/17/2013
Amended: 01/14/2013
Amended: 04/14/2014
Amended: 09/15/2015
Amended: 07/24/2017
Amended: 12/10/2018
Amended: 01/14/2019

0 1,000 2,000 3,000 4,000
Feet

Map Printed: 04/24/2019

Shoreland Overlay Zones
- General Development
- Limited Residential
- Resource Protection
- Stream Protection
- Wetlands

Overlay Zones
- Senior Housing
- West Cumberland Housing
- Medical Caregiver (MC)
- Fairgrounds Overlay
- Val Halla Golf & Rec Center Overlay
- West Cumberland Field Rec Facility Overlay
- Setback Overlay 1
- Setback Overlay 2
- Manufactured Housing (MH)
- Mobile Home Park (MHP)
- Land Use Zones

The depiction of the Shoreland Overlay districts on the Official Zoning Map for the Town of Cumberland is merely illustrative of their general location. The boundaries of these districts shall be determined by measurement of the distance indicated in the ordinance from the normal high water mark of the water body or the upland edge of wetland vegetation, regardless of the location of the boundary on the map.

See Official Zoning Map for detail of Land Use Zones.

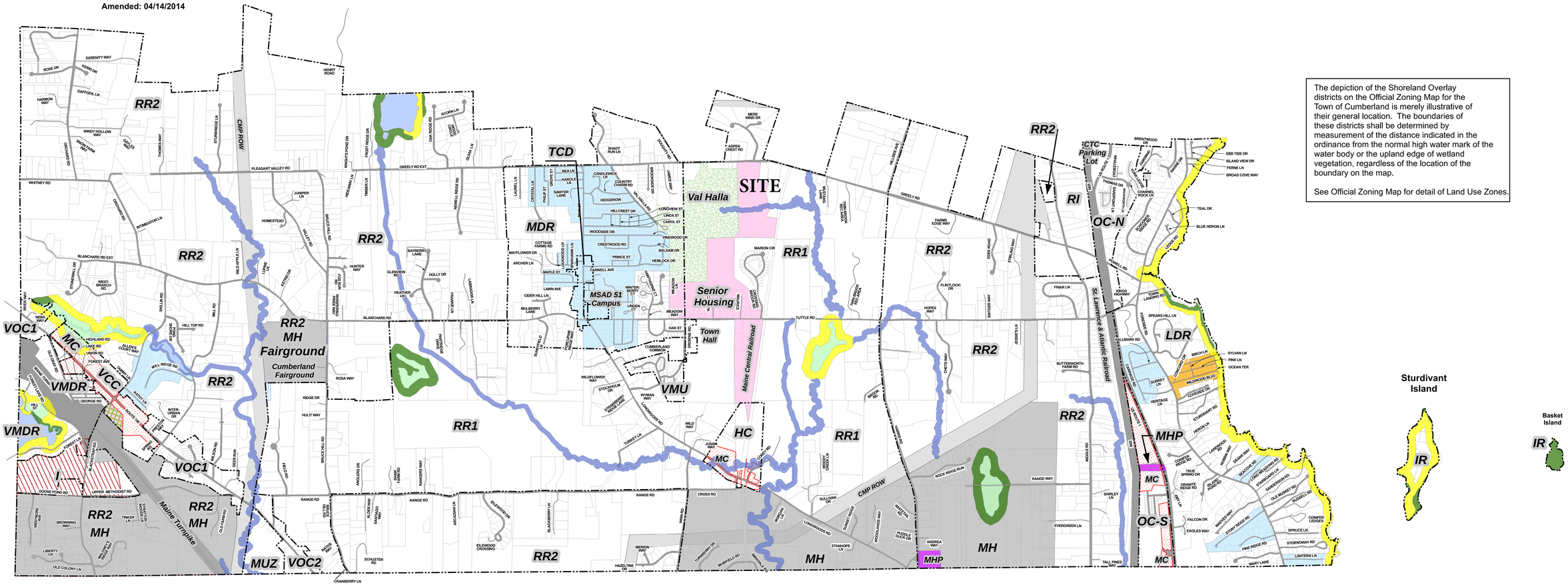


EXHIBIT 4.2 ZONING

Exhibit 5

RT&I and Financial/Technical Capacity

DLN: 1001840042331

MAINE REAL ESTATE TAX PAID

TRUSTEES' DEED OF SALE

PETER H. GODSOE of Yarmouth, Maine and **BETHANY ELLEN GODSOE** of Brooklyn, New York, as Trustees of the **JOHN A. GODSOE MARITAL TRUST DATED JANUARY 11, 2015**, (the "Grantor"), by the power conferred by law, and every other power, for consideration paid, hereby grant to **OCEAN VIEW AT CUMBERLAND, LLC**, a Maine limited liability company, with an address of 20 Blueberry Lane, Falmouth (the "Grantee"), a fifty percent (50%) undivided interest in the real property, together with the buildings and improvements thereon, situated on the westerly side of Greely Road in the Town of Cumberland, Cumberland County, Maine being more particularly described in **Exhibit A** attached hereto and made a part hereof.

Being the same property conveyed by Personal Representative's Deed of Distribution recorded in the Cumberland County Registry of Deeds in Book 32363, Page 207.

This conveyance is subject to all restrictions, easements and encumbrances of record.

[Signature pages follow]

IN WITNESS WHEREOF, the said Peter H. Godsoe, Trustee as aforesaid, has hereunto set his hand and seal as of the dates set forth below.

Witness

Peter H. Godsoe, Trustee of the
John A. Godsoe Marital Trust
dated January 11, 2015

STATE OF MAINE
COUNTY OF CUMBERLAND

October 26, 2018

Personally appeared before me the above named Peter H. Godsoe, in his said capacity as a Trustee and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of said Trust.

Notary Public/Attorney-at-Law

Print name: Ronald N. Ward
My Commission Expires: N/A

IN WITNESS WHEREOF, the said Bethany Ellen Godsoe, Trustee as aforesaid, has hereunto set her hand and seal as of the date set forth below.

Witness

Bethany Ellen Godsoe, Trustee of the
John A. Godsoe Marital Trust
dated January 11, 2015

STATE OF NEW YORK
COUNTY OF _____

October 25, 2018

Personally appeared before me the above named Bethany Ellen Godsoe, in her said capacity as a Trustee and acknowledged the foregoing instrument to be her free act and deed and the free act and deed of said Trust.

Notary Public

Print name: _____
My Commission Expires: _____

EXHIBIT A

A certain lot or parcel of land, with any buildings and improvements thereon, situated on the westerly side of Greely Road in the Town of Cumberland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning at an iron rod on the westerly sideline of said Greely Road, which iron road marks the northeasterly corner of a parcel of land described in a deed from Robert E. Brown to Gerald A. Nelson and Janet K. Nelson dated April 25, 1973 and recorded in Cumberland County Registry of Deeds in Book 3388, Page 312; thence South 58° 01' 30" West along said land of Nelson a distance of five hundred eighty-three and seventy-eight hundredths (583.78) feet, more or less, to another iron rod; thence South 12° 26' 30" East along said land of Nelson a distance of three hundred seventy-six and four hundredths (376.04) feet, more or less, to another iron rod; thence South 73° 54' 30" West a distance of three hundred twenty-two and thirty-five hundredths (322.35) feet, more or less, to another iron rod; thence South 36° 38' 30" West a distance of four hundred twenty-four and seventy-one hundredths (424.71) feet, more or less, to another iron rod; thence South 52° 00' West a distance of one hundred seventy-seven and ninety-three hundredths (177.93) feet, more or less, to another iron rod; thence South 76° 50' 15" West a distance of two hundred thirty-nine and seventy hundredths (239.70) feet, more or less to another iron rod; thence South 28° 39' 40" East a distance of three hundred fifty-nine and forty-one hundredths (359.41) feet, more or less, to an iron rod in the northerly side line of a Maine Central Railroad right of way; thence continuing on the course of South 28° 39' 40" East a distance of sixteen and five tenths (16.5) feet to a point in the northerly sideline of said Maine Central Railroad right of way; thence South 60° 48' 30" West along the northerly side line of said Maine Central Railroad right of way a distance of six hundred seventy and seven tenths (670.7) feet, more or less, to an iron rod; thence North 36° 43' West along land now or formerly of Sweetsir a distance of one thousand two hundred twelve and eight tenths (1212.8) feet, more or less, to an iron pipe and land now or formerly of Val Halla Country Club; thence North 51° 29' 10" East along said land of Val Halla Country Club and a rail fence a distance of two thousand five hundred thirty-seven and one tenth (2537.1) feet, more or less, to a point in the westerly sideline of Greely Road; thence South 38° 28' 30" East along the westerly sideline of Greely Road a distance of seven hundred ninety-seven and five tenths (797.5) feet, to the point of beginning.

Said parcel contains 59.6 acres, and is shown as Parcel "B" on a plan entitled "Property Plan for Robert E. Brown, Greely Road, Cumberland, Maine" dated Nov. 22, 1983, drawn by Howard F. Babbidge, R.L.S.

Received
Recorded Register of Deeds
Oct 26,2018 02:53:48P
Cumberland County
Nancy A. Lane

EASEMENT DEED

The TOWN OF CUMBERLAND, a municipal corporation organized and existing under the laws of the State of Maine and having a place of business at 290 Tuttle Road, Cumberland, Maine (hereinafter "Grantor"), for consideration paid does hereby grant to **Ocean View at Cumberland, LLC** (hereinafter "Grantee"), a Maine limited liability company with a principal place of business at Blueberry Lane, Falmouth, Maine, its successors and assigns, a perpetual non-exclusive easement for the purposes herein set forth, over the following described land:

A certain lot or parcel of land located in the Town of Cumberland, County of Cumberland and State of Maine, depicted on **Exhibit A** attached hereto and described as follows (the "Easement Area"):

The Easement Area is deseribed in Exhibit B hereto.

Subject to any and all easements and/or right-of-ways of record in the Cumberland County Registry of Deeds.

The easement shall be for the following purposes, which shall include the right to enter on the Easement Area at any and all times for the purposes stated herein, except as may be expressly stated otherwise.

1. Pedestrian and vehicular access to and from Grantee's properties abutting the Easement Area. Vehicular access shall not include the right to park or store, on a temporary basis or otherwise, vehicles of any kind.

2. Upon prior written consent of Grantor, which consent shall not be unreasonably withheld, the right to install, maintain, inspect, repair, replace and remove below-ground utilities within the Easement Area, including, without limitation, utilities for water, sewer, electricity, telephone, cable, natural gas, or other energized control lines, together with all necessary fixtures and appurtenances thereto.

3. All roads, sidewalks, trails and utilities installed within the Easement Area shall be located and installed in accordance with plans reviewed and approved by the Town's Planning Board.

4. Upon prior written consent of Grantor, which consent shall not be unreasonably withheld, the right to trim, cut, and/or remove bushes, trees or any other vegetation within the Easement Area, to such extent as is necessary for any of the above-described purposes provided that such cutting, clearing or trimming shall comply with all applicable ordinance provisions of the Town of Cumberland.

5. No buildings or any other permanent structures shall be permitted within the Easement Area.

Grantee shall repair, replace, restore and return any adjoining lands of the Grantor which are disrupted, damaged or destroyed as a result of any work done by or on behalf of Grantee within the Easement Area or in connection with this easement.

Grantee hereby agrees to indemnify, defend, and hold harmless the Grantor from (i) all claims, demands, liabilities and suits of any nature whatsoever arising out of, because of or due to any act, omission, occurrence or use by Grantee, its members, managers, employees, agents, guests or invitees, use of the Easement Area; (ii) the conduct or management of any work, or any act or omission done in, near, or on the Easement Area by or under the direction or at the request of Grantee; or (iii) any act or negligence or willful misconduct of Grantee, its members, managers, employees, agents, guests or invitees.

Grantor for itself, its successors and assigns, reserves the use and enjoyment of the Easement Area for all purposes that are not inconsistent with and do not interfere with the use of the Easement Area by the Grantee for the purposes hereinabove stated.

IN WITNESS WHEREOF, the Town of Cumberland has caused its acknowledgement and seal to be hereto affixed and these presents to be signed by William R. Shane, its Town Manager in its name and on its behalf this 1st day of May, 2018, and delivered on October 26, 2018.

TOWN OF CUMBERLAND

William R. Shane
Town Manager

State of Maine
CUMBERLAND, ss

May 1, 2018

Personally appeared before me William R. Shane, Town Manager of the Town of Cumberland, and acknowledged the foregoing to be his free act and deed in his said capacity and the free act and deed of the Town of Cumberland.

Notary Public/Attorney at Law
Print Name BRENDA L. MOORE
Commission expires/Bar No.: Notary Public, Maine My Commission Expires June 14, 2021

Exhibit B

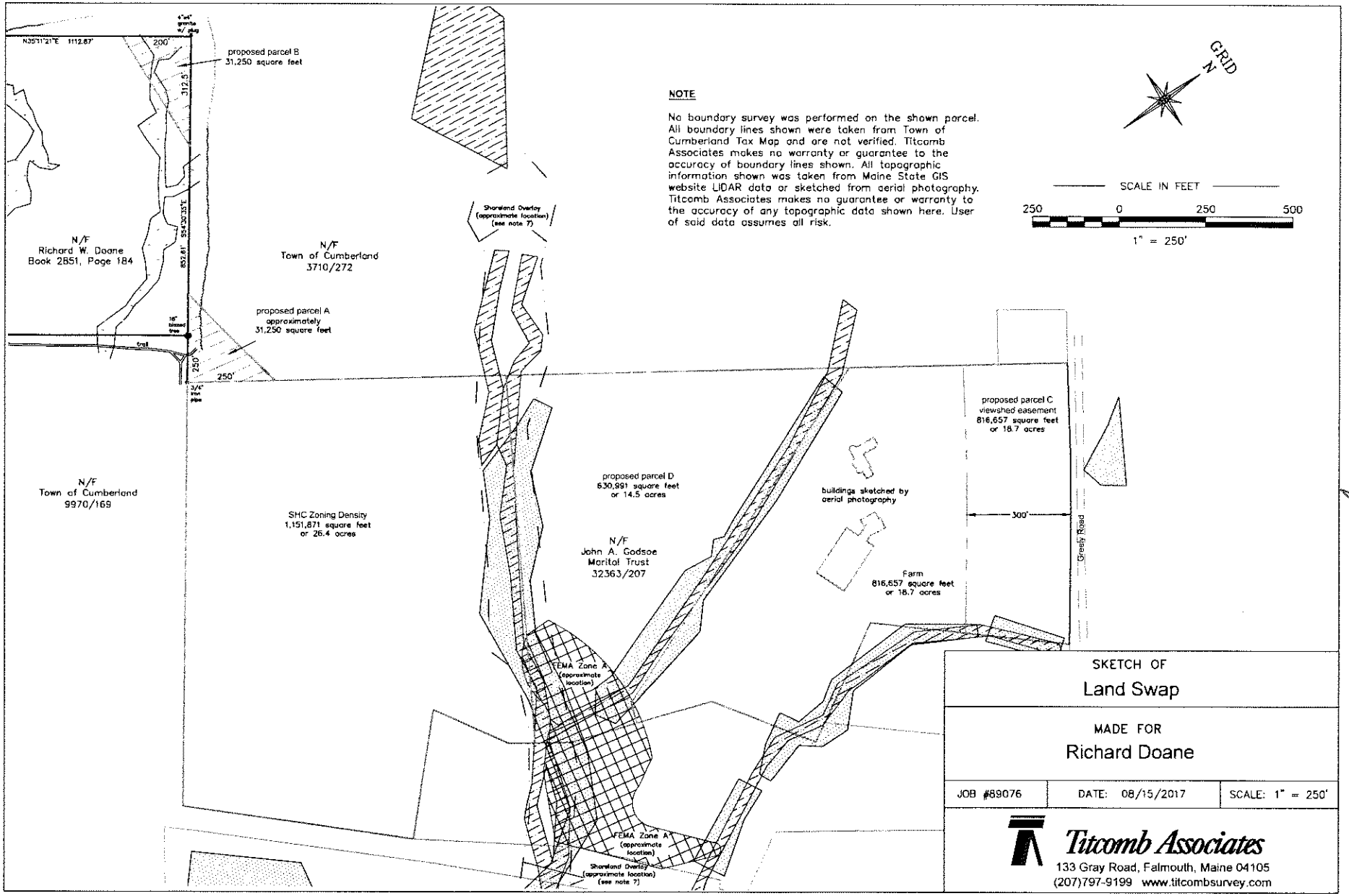

N3511'21"E 1112.87'
200'
proposed parcel B
31,250 square feet
312.5'
852.81'
S54°30'35"E
N/F
Richard W. Doane
Book 2851, Page 184
16" blazed tree
trail
250'
3/4" iron pipe
proposed parcel A
approximately
31,250 square feet
Shoreland Overlay
(approximate location)
(see note 7)
N/F
Town of Cumberland
3710/272
N/F
Town of Cumberland
9970/169
SHC Zoning Density
1,151,871 square feet
or 26.4 acres
proposed parcel D
630,991 square feet
or 14.5 acres
N/F
John A. Godsoe
Marital Trust
32363/207
buildings sketched by
aerial photography
proposed parcel C
viewshed easement
816,657 square feet
or 18.7 acres
300'
Greely Road
Farm
816,657 square feet
or 18.7 acres
FEMA Zone A
(approximate
location)
FEMA Zone A
(approximate
location)
Shoreland Overlay
(approximate location)
(see note 7)
NOTE
No boundary survey was performed on the shown parcel. All boundary lines shown were taken from Town of Cumberland Tax Map and are not verified. Titcomb Associates makes no warranty or guarantee to the accuracy of boundary lines shown. All topographic information shown was taken from Maine State GIS website LIDAR data or sketched from aerial photography. Titcomb Associates makes no guarantee or warranty to the accuracy of any topographic data shown here. User of said data assumes all risk.
GRID N
SCALE IN FEET
250 0 250 500
1" = 250'
SKETCH OF
Land Swap
MADE FOR
Richard Doane
JOB #89076
DATE: 08/15/2017
SCALE: 1" = 250'
Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

Exhibit 4

Exhibit B

(Easement Area)

A certain easement located northeasterly of, but not adjacent to, Tuttle Road in the Town of Cumberland, County of Cumberland, State of Maine, bounded and described as follows:

Beginning at a ¾" iron pipe at the westerly corner of land now or formerly of John A. Godsoe Marital Trust as described in a deed recorded in the Cumberland County Registry of Deeds in Book 32363, Page 207 and the northeasterly line of land now or formerly of the Town of Cumberland as described in a deed recorded in said Registry in Book 9970, Page 169. Thence:

1) N 54°23'34" W by said land of the Town of Cumberland a distance of One Hundred Thirty-Two and 92/100 (132.92) feet to a point at the easterly corner of land now or formerly of Ocean View at Cumberland, LLC as described in a deed recorded in said Registry in Book 34876, Page 194;

2) N 54°30'35" W by said land of Ocean View at Cumberland, LLC a distance of One Hundred Seventeen and 08/100 (117.08) feet to a point;

3) N 79°36'50" E through land of the Grantor a distance of Three Hundred Forty-Seven and 71/100 (347.71) feet to a point on the northeasterly line of said land of John A. Godsoe Marital Trust;

4) S 33°40'31" W by said land of John A. Godsoe Marital Trust a distance of Two Hundred Fifty and 00/100 (250.00) feet to the point of beginning.

Bearings are referenced to grid north, Maine State Plane Coordinate System, West Zone, NAD83.

The above described easement contains 31,217 square feet, more or less, lying over land now or formerly of the Town of Cumberland as described in a deed recorded in the Cumberland county Registry in Book 3710, Page 272.

Kennebunk Savings

December 14, 2019

Maine DEP
17 State House Station
28 Tyson Drive
Augusta ME 04333

RE: Oceanview at Cumberland LLC – Cumberland Crossing Phase II

To Whom It May Concern:

Kennebunk Savings has financed multiple development projects for Oceanview related entities. Currently approved by the bank is financing sufficient to complete the proposed Phase II infrastructure related to the Cumberland Crossing project. Upon my review of the project documents for the above referenced project, it is my opinion that Oceanview at Cumberland LLC has the financial capacity to complete the land development and construction project as proposed for this parcel.

Please do not hesitate to contact me with any additional questions regarding this project.

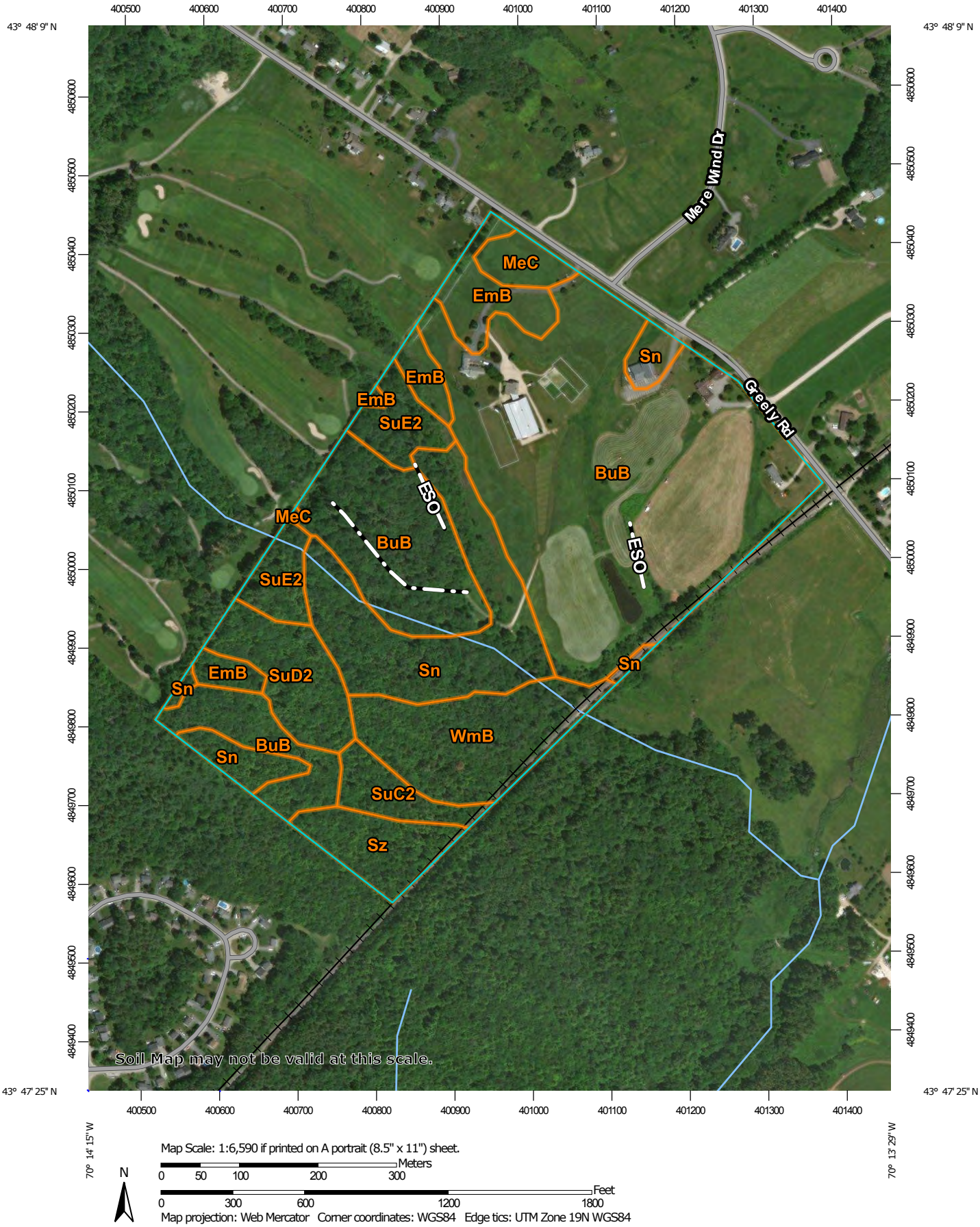
Sincerely,

Christopher Kehl
Senior Vice President
Kennebunk Savings

Exhibit 6

Soils

Soil Map—Cumberland County and Part of Oxford County, Maine
(Cumb Crossing Phase 2)



Map Scale: 1:6,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 15, Sep 6, 2018

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 13, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuB	Lamoine silt loam, 3 to 8 percent slopes	48.1	53.4%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	4.9	5.4%
MeC	Melrose fine sandy loam, 8 to 15 percent slopes	1.5	1.7%
Sn	Scantic silt loam, 0 to 3 percent slopes	13.3	14.8%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	2.3	2.5%
SuD2	Suffield silt loam, 15 to 25 percent slopes, eroded	4.6	5.1%
SuE2	Suffield silt loam, 25 to 45 percent slopes, eroded	4.1	4.5%
Sz	Swanton fine sandy loam	3.4	3.8%
WmB	Windsor loamy sand, 0 to 8 percent slopes	7.9	8.8%
Totals for Area of Interest		**90.1**	**100.0%**

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

October 2, 2017

Mr. Rick Licht
Licht Environmental Design, LLC
35 Fran Circle
Gray, ME 04039

Re: Wetland Delineation, 40 acre Godsoe parcel Greely Road Cumberland, ME

Dear Rick,

I have completed a wetland delineation on the 40 acre Godsoe parcel located on Greely Road Cumberland for SeaCoast Management. The wetland delineation was completed in accordance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Northcentral and Northeast Regions dated January 2012. These manuals require the presence of three parameters for a wetland to be present, wetland hydrology, hydrophytic vegetation, and hydric soils.

The wetlands I found on the parcel were flagged with yellow flagging. The flagging was labeled in an alphanumeric sequence. The wetland flags were located by gps equipment capable of locating a point to within three feet. The wetland data has been forwarded to your office. The wetlands found onsite are forested wetlands. The wetlands on the parcel are related to drainage moving across the site from west to the east. The wetlands on the parcel located adjacent to the stream will meet the definition of wetlands of special significance as defined by Maine Department of Environmental Protection.

If you have any questions or require additional information, please contact me.

Sincerely,

Mark J. Hampton C.S.S., L.S.E.
Certified Soil Scientist #216
Licensed Site Evaluator #263

P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland, LLC
Cumberland, ME

Soil Narrative Report

DATE:	Soil Profiles observed on November 27 and December 16, 2018
BASE MAP:	Base plan provided by Titcomb Associates scale 1 inch equals 100 feet and two foot contours.
GROUND CONTROL:	Soil survey boundaries located by Mark Hampton Associates, Inc. for Class B Soil Survey

Class B-High Intensity Soil Survey (Minimum Standards)

Mapping units of 1 acre or larger.
Scale of 1"= 100 feet or larger.
Up to 25% inclusions in mapping units of which no more than 15% may be dissimilar soils.
Ground Control – test pits located accurately under direction of registered land surveyor
Base Map –2 foot contour intervals

Provided:

Mapping units of 1/2 acre or larger
Base map scale of 1"= 100 feet.
Up to 25 percent inclusions in mapping units of which no more than 15 percent is dissimilar soils.
Baseline information and test pits located by Mark Hampton Associates, Inc.
Ground topographic survey with one foot contours and ground control provided.

The accompanying soil profile descriptions, soil map, and this soil narrative report were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.

C.S.S. #216, L.S.E. #263 3/6/19

Mark J. Hampton Date



MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Elmwood
(Dystric Eutrochrepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Moderately well drained with a perched watertable from 1.5 to 3.0 feet below the surface at some time from November to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine loamy sand 0-9"
Subsurface Layer:	Olive brown loamy sand, 8-22"
Subsoil Layer:	Olive silty clay loam, 22-65"

HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None



INCLUSIONS

(Within Mapping Unit)

CONTRASTING: Lamoine, Buxton, Scantic

USE AND MANAGEMENT

DEVELOPMENT: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Man Made Land

SETTING

PARENT MATERIAL:	Derived from various materials found onsite and offsite.
LANDFORM:	N/A
POSITION IN LANDSCAPE:	N/A
SLOPE GRADIENT RANGES:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS:	Generally moderately well to somewhat poorly drained but varies.
TYPICAL PROFILE:	Varies in profile and onsite from fine loamy sand to silty clay loam
HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Usually very slow due to compaction
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Buxton, Lamoine

USE AND MANAGEMENT

Development: There may be limiting factors for building site development.



P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

Quality services that meet your deadline

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Buxton
(Aquic Dystric Eutrochrepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3 %, (B) 3-8%, (C) 8-15%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Moderately well drained with a perched watertable from 1.5 to 3.0 feet below the surface at some time from November to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine sandy loam 0-7"
Subsurface Layer:	Olive brown, silt loam, 8-15"
Subsoil Layer:	Olive gray silty clay loam, 15-32"
Substratum:	Gray silty clay loam +32"

HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 60 inches
HAZARD TO FLOODING:	None



INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Scantic, Lamoine, Elmwood

USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Lamoine
(Aeric Haplaquepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3%, (B) 3-8%, (D) 15-25%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Somewhat poorly drained with a perched watertable from 0.5 to 2.0 feet below the surface at some time from November to June or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine sandy loam 0-7"
Subsurface Layer:	Lt. Olive brown silt loam, 7-14"
Subsoil Layer:	Olive silty clay loam, 14-21"
Substratum:	Olive, silty clay loam, 21-65"

HYDROLOGIC GROUP:	Group D
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Buxton, Elmwood, Scantic



USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Scantic
(Aquic Haplorthod)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Lower positions on landform
SLOPE GRADIENT RANGES:	(A) 3-8%, (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Poorly drained with a perched watertable from 0.0 to 1.0 feet below the surface at some time from October to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark grayish brown, silt loam 0-9"
Subsurface Layer:	Olive gray silt loam, 9-16"
Substratum:	Gray silty clay loam, 16"+

HYDROLOGIC GROUP:	Group D
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Lamoine, Buxton, Elmwood



USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✕ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
	SS1	☐	Lamoine SPD	12	N/A	12	32	2	
	SS2	☐	Lamoine SPD	14	N/A	14	34	2	
	SS3	☐	Scantic PD	4	N/A	4	34	2	
	SS4	☐	Lamoine SPD	14	N/A	14	36	2	
	SS5	☐	Lamoine SPD	12	N/A	12	34	4	
	SS6	☐	Scantic PD	6	N/A	6	20	2	
	SS7	☐	Elmwood MWD	17	N/A	17	36	2	
	SS8	☐	Lamoine SPD	14	N/A	14	32	6	
	SS9	☐	Scantic PD	6	N/A	6	22	2	
	SS10	☐	Scantic PD	6	N/A	6	24	2	
	SS11	☐	Elmwood MWD	17	N/A	17	38	2	
	SS12	☐	Elmwood MWD	18	N/A	18	38	2	
	SS13	☐	Lamoine SPD	10	N/A	10	30	20	
	SS14	☐	Buxton MWD	16	N/A	16	36	2	
	SS15	☐	Lamoine SPD	10	N/A	10	32	18	
	SS16	☐	Scantic PD	6	N/A	6	30	2	
	SS17	☐	Lamoine SPD	12	N/A	12	34	20	
	SS18	☐	Scantic PD	6	N/A	6	30	2	
	SS19	☐	Lamoine SPD	10	N/A	10	34	24	
	SS20	☐	Elmwood MWD	17	N/A	17	32	2	
	SS21	☐	Lamoine SPD	12	N/A	12	32	26	
	SS22	☐	Elmwood MWD	16	N/A	16	36	2	
	SS24	☐	Lamoine SPD	10	N/A	10	34	20	
	SS25	☐	Buxton MWD	15	N/A	15	38	2	
	SS26	☐	Scantic PD	4	N/A	4	36	2	
	SS27	☐	Lamoine SPD	12	N/A	12	38	18	
	SS28	☐	Lamoine SPD	13	N/A	13	36	20	
	SS29	☐	Scantic PD	4	N/A	4	34	2	
	SS30	☐	Buxton MWD	15	N/A	15	38	2	
	SS31	☐	Lamoine SPD	12	N/A	12	36	12	
	SS32	☐	Lamoine SPD	14	N/A	14	34	14	
	SS33	☐	Buxton MWD	17	N/A	17	40		

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	263/216

Qualification

- ☑ Licensed Site Evaluator
- ☐ Certified Geologist
- ☑ Certified Soil Scientist
- ☐ Other:

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST

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FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✖ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
	SS34	☐	Buxton MWD	16	N/A	16	40	10	
	SS35	☐	Buxton MWD	16	N/A	16	38	4	
	SS36	☐	Made Land	Varies	N/A	Varies	36		
	SS23	☐	Lamoine SPD	10	N/A	10	36	22	
		☐							
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Marc J. Hampton

Date: 3/6/19

Name Printed: Marc J. Hampton

Cert/Lic/Reg. #: 263/216

Qualification: ☒ Licensed Site Evaluator ☐ Certified Geologist ☒ Certified Soil Scientist ☐ Other:

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS 1

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth: 12	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 2

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth: 14	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 3

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	silt loam	Friable	Black	
10	silty clay loam	Firm	gray	common distinct
20				
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: C	Condition: E	Percent: 2	Depth: 4	"	

Soil Series/Phase Name: Scantic PD

■ Hydric ☐ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 4

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ■ Licensed Site Evaluator ■ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # 555 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	4	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 556 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	Common + Distinct
20–60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 557 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	loamy sand	Friable	Dark Brown	
10–20	loamy sand	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
1	C	2	17"	☒	☒	☐

Soil Series/Phase Name: Elmwood mucky

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 558 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	6		☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☒ Non-hydric ☐ Hydrologic Soil Group:

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 5/6/19

Name Printed: MARK J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS9

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	Gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS10

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD — Hydric ☒ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS11

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–30	Silty Clay loam	Firm	gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	17"	☐	☒	☐

Soil Series/Phase Name: Elmwood MWD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS12

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–30	Silty Clay loam	Firm	gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2		☐	☒	☐

Soil Series/Phase Name: Elmwood MWD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton	Date: 3/6/19
Name Printed: Mark J. Hampton	Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS13

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	20	10 "	☐	☒	☐

Soil Series/Phase Name: Lamoine SPD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS14

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	C	2	16 "	☐	☒	☐

Soil Series/Phase Name: Buxton MWD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS15

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	18	10 "	☐	☒	☐

Soil Series/Phase Name: Lamoine SPD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS16

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt loam	Friable	Black	
10	Silty Clay loam	Firm	gray	common distinct
20				
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	E	2	"	☐	☒	☐

Soil Series/Phase Name: Scantic PD

Hydrologic: ☒ Hydric ☐ Non-hydric Soil Group: _____

STATE OF MAINE MARK J. HAMPTON #215 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 215

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS17

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	D	20	12"	Restrictive Layer	Lamoine SPD	Non-hydric	

Exploration Symbol # SS18

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	common & distinct
20–60				

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	E	2	6"	Restrictive Layer	Scantic PD	Hydric	

Exploration Symbol # SS19

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	D	24	10"	Restrictive Layer	Lamoine SPD	Non-hydric	

Exploration Symbol # SS20

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
7	C	2	17"	Restrictive Layer	Elmwood MUD	Non-hydric	

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	263/216

Title ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST
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PAGE ___ OF ___

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # 5521

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	D	26	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5522

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Loamy sand	Friable	Dark Brown	
10–20	Loamy sand	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	16"	☐	☐	☐

Soil Series/Phase Name: Elmwood MWD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5523

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	22	10"	■	■	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5524

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	20	10"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

STATE OF MAINE

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 5/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ■ Licensed Site Evaluator ■ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS25 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: C	Percent: 2	Depth: 15	"	

Soil Series/Phase Name: Buxton MUD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS26 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty clay loam	Firm	gray	Common & Distinct
20–60				

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: E	Percent: 2	Depth: 4	"	

Soil Series/Phase Name: Scantic PD — ☒ Hydric ☐ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS27 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: D	Percent: 18	Depth: 12	"	

Soil Series/Phase Name: Lamoine SPD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS28 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: D	Percent: 20	Depth: 13	"	

Soil Series/Phase Name: Lamoine SPD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	2603/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE — MARK HAMPTON #216 — CERTIFIED SOIL SCIENTIST — affix professional seal

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS29

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt Loam	Friable	Black	
10	Silty Clay Loam	Firm	Gray	Common + Distinct
20				
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	E	2	4"	☐	☐	☐

Soil Series/Phase Name: Scantic SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS30

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	C	2	15"	☐	☑	☐

Soil Series/Phase Name: Buxton MWD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS31

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	D	12	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS32

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	D	14	14"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS33

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	6	17 "	☑ Groundwater ☑ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS34

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	10	16 "	☑ Groundwater ☑ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS35

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	4	16 "	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS36

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Varies	Friable	Mixed	
10	Mixed	Friable	Mixed	Varies
20				
30	Mixed	Firm	Gray	
40	Silty Clay loam			
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
				☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Made Land

☐ Hydric ☐ Non-hydric

Hydrologic Soil Group: _____

STATE OF MAINE

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/16/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263216

Title: ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

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May 27, 2019

Mr. Rick Licht
Licht Environmental Design, LLC
35 Fran Circle
Gray, ME 04039

Re: Vernal Pool Assessment, 40 acre Godsoe Parcel Cumberland, ME

Dear Rick,

I have completed a vernal pool assessment during this breeding season, on the 40+/- acre Godsoe parcel of land located off Greely Road Cumberland, ME for Seacoast Management. The vernal pool assessment was conducted in accordance with Chapter 335 Significant Wildlife Habitat, Section 9 Significant Vernal Pools for the Maine Department of Environmental Protection. This section outlines the definition of a vernal pool as well as the requirements of a vernal pool to meet the definition of significance as related to the number of amphibian egg masses counted during the breeding season.

I made 2 site visits to the property over the course of six weeks beginning the third week in April. There are no vernal pools on the property. The wetlands on the property did not provide the necessary conditions to support vernal habitat.

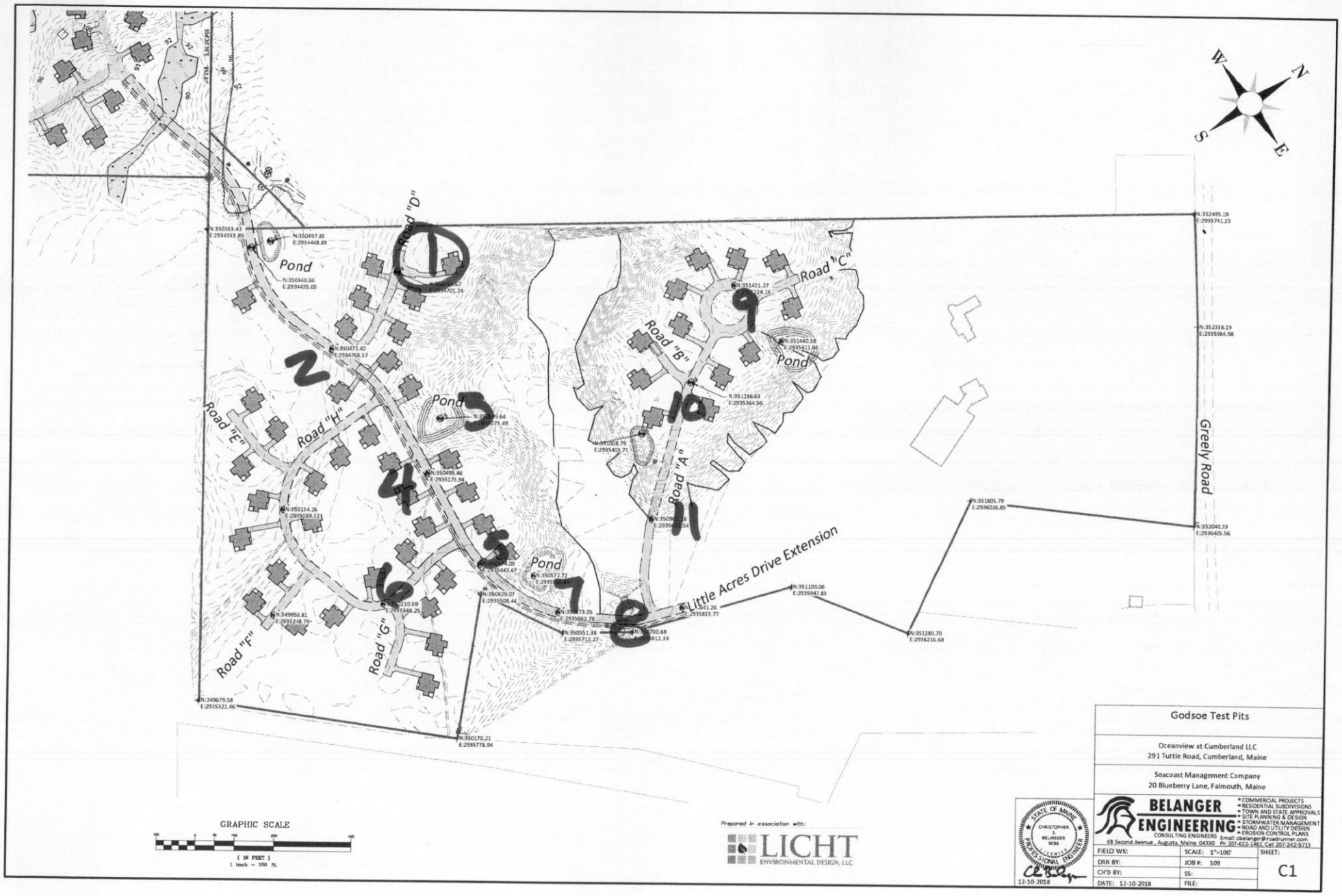
Sincerely,

Mark J. Hampton L.S.E., C.S.S.
Licensed Site Evaluator #263
Certified Soil Scientist #216

Enc.

P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

Quality services that meet your deadline



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

Prepared in association with:
LICHT
ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER L. BELANGER
9098
REGISTERED PROFESSIONAL ENGINEER
12-10-2018

Godsoe Test Pits

Oceanview at Cumberland LLC
291 Tuttle Road, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
68 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5711
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
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- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET:
DRN BY:	JOB #: 109	C1
CH'D BY:	SS:	
DATE: 12-10-2018	FILE:	

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # STP 1

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	dark brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	Olive Gray	Common Distinct
30				
40				
50				
84 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	C	2	16"	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 2

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
88 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	C	2	17"	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 3

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
96 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	D	15	9"	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 4

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	sand	Friable	Brown	
20				
30	loamy sand	Friable	Olive	Common Distinct
40				
50			Water @ 54"	
84 / 60	sand	Friable	Olive	

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
5	C	2	24"	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mary J. Hampton Date: 12/16/18

Name Printed: MARY J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # STW 5

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	sand	Friable	Brown	
20				
30	loamy sand	Friable	gray	Common Distinct
40				
50		Water @ 46"		
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
5	C	2	22 "	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 6

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	loamy sand	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	18 "	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 7

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
8	C	12	16 "	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 8

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
8	D	2	12 "	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Marc J. Hampton Date: 12/16/15

Name Printed: MARC J. Hampton Cert/Lic/Reg. #: 263 1216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

affix professional seal

PAGE ___ OF ___

4674

FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # SPW9

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Loamy Sand	Friable	Dark Brown	
10	Sand	Friable	Brown	
20				
30	Sand	Friable	Gray	Common Distinct
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
5 (Profile)	C (Condition)	2 (Percent)	24	" (Depth)	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # SPW10

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Loamy Sand	Friable	Dark Brown	
10				
20	Loamy Sand	Friable	Brown	
30				
40	Silty Clay Loam	Firm	Gray	Common Distinct
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
7 (Profile)	C (Condition)	2 (Percent)	40	" (Depth)	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # STW11

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt Loam	Friable	Dark Brown	
10	Silt Loam	Friable	Brown	
20	Silty Clay Loam	Firm	Gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
9 (Profile)	C (Condition)	2 (Percent)	15	" (Depth)	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # _____

☐ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
_____ (Profile)	_____ (Condition)	_____ (Percent)	_____	" (Depth)	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 12/16/18

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

affix professional seal

Exhibit 7

Agency Letters

LICHT
ENVIRONMENTAL DESIGN, LLC

February 04, 2019 VIA USPS 16.084.A

Kirk F. Mohney
Director, Maine Historic Preservation Commission
65 State House Station
Augusta, Maine 04333-0065

RECEIVED
FEB 11 2019
By 0186-19
CR 0692-17

Property Assessment
Cumberland Crossing Phase 2
277 Tuttle Road and 228 Greely Road, Cumberland
(Tax Map R04, Lot 34A)

Dear Mr. Mohney:

Our client, OceanView at Cumberland, LLC is proposing to develop a second phase of the approved Cumberland Crossing Senior Housing Community (formerly known as OceanView at Cumberland) on a 60-acre parcel known as the former Godsoe Estate property, 228 Greely Road in Cumberland. You may recall that your office completed a review for historic or archeological significance in 2017 for Phase 1 of the project under MHPC File # 0692-17 (See attached approval for convenience.)

Phase 1 of the project has been approved and is under construction. That property connects to Tuttle Road and will extend northerly to and adjacent to the Val Halla Golf Course. The abutting Godsoe parcel (Map R04 Parcel 34A) became available and was purchased by the applicant to expand the new Cumberland Crossing into a second phase of approximately 52 senior cottages and to re-purpose the former Godsoe horse farm/estate into a community center for residents. (Refer to attached Exhibits for reference.). There will be no formal "through road" connecting Tuttle Road to Greely Road – only a gated emergency road connection.

The current 60-acre parcel contains the circa 1994 Godsoe Farmstead on the northern 1/3 of the parcel towards Greely Road and the southern 2/3rds of the site is wooded. The farm buildings will be utilized as a community center with internal renovations but maintaining the significant view shed from Greely Road under a zoning preservation area which includes the general character of the structures. Proposed pool area, parking or building additions would take place in the rear of the current facilities.

The project is seeking local Planning Board and DEP Site Location of Development Amendments to the current permits. As part of the planning process we would like to request MHPC review the property for any historic or archaeological areas of significance which might be identified on your database. Again there are no other structures on the property other than the recent period farm buildings which will be preserved and re-purposed.

35 Fran Circle, Gray, Maine 04039 • rlicht@securespeed.net • V 207.749.4924 F 207.428.4167

LICHT
ENVIRONMENTAL DESIGN, LLC

Thank you for your assistance. Please do not hesitate to contact me should you require any additional information for your review.

Sincerely,

Frederic (Rick) Licht, PE, LSE
Principal

Encl: Phase 1 MHPC Approval Ltr
Exhibit 1 - Assessors Map
Exhibit 2 - Aerial Phase 1-2 Context Plan
Exhibit 3 - USGS Quad Locus
Exhibit 4 - Photograph Exhibit

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney — 2/19/19
Kirk F. Mohney, Date
State Historic Preservation Officer
Maine Historic Preservation Commission
MHPC # 0186-19

35 Fran Circle, Gray, Maine 04039 • rlicht@securespeed.net • V 207.749.4924 F 207.428.4167

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

February 8, 2019

Rick Licht
Licht Environmental Design, LLC
35 Fran Circle
Gray, ME 04039

Via email: rlicht@securespeed.net

Re: Rare and exemplary botanical features in proximity to: #16.084.A, Cumberland Crossing Phase 2, Cumberland, Maine

Dear Mr. Licht:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received February 7, 2019 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Cumberland, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
FAX: (207) 287-8040
WWW.MAINE.GOV/DACF/MNAP

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov

Rare and Exemplary Botanical Features within 4 miles of
Project: #16.084.A, Cumberland Crossing Phase 2, Cumberland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Adder's Tongue Fern						
	SC	S1	G5	1905-08-10	7	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
American Chestnut						
	SC	S4	G4	2001-02-13	2	Hardwood to mixed forest (forest, upland)
Engelmann's Spikerush						
	PE	SH	G4G5	1916-08-31	2	Open wetland, not coastal nor rivershore (non-forested, wetland)
Fern-leaved False Foxglove						
	SC	S3	G5	1902-09-02	13	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Great Blue Lobelia						
	PE	SX	G5	1905-09	3	Forested wetland,Non-tidal rivershore (non-forested, seasonally wet)
Horned Pondweed						
	SC	S2	G5	1913-09-13	9	Tidal wetland (non-forested, wetland)
Marsh Milkwort						
	PE	SH	G5T4	1903-08-18	1	Dry barrens (partly forested, upland),Open wetland, not coastal nor rivershore (non-forested, wetland)
Mountain-laurel						
	SC	S2	G5	1985-08-01	13	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Oak - Hickory Forest						
	<null>	S1	G4G5	2014-08-21	5	Hardwood to mixed forest (forest, upland)
Rattlesnake Hawkweed						
	E	S1	G5T4Q	1909-07	1	Dry barrens (partly forested, upland)
Salt-hay Saltmarsh						
	<null>	S3	G5	2009	24	Tidal wetland (non-forested, wetland)

Rare and Exemplary Botanical Features within 4 miles of
Project: #16.084.A, Cumberland Crossing Phase 2, Cumberland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	<null>	S3	G5	2011-09-09	62	Tidal wetland (non-forested, wetland)
Slender Knotweed						
	PE	SH	G5	1902-09-07	1	Dry barrens (partly forested, upland)
Spotted Wintergreen						
	E	S2	G5	2009-07-26	30	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Upper Floodplain Hardwood Forest						
	<null>	S3	GNR	2010-06-23	20	Forested wetland
Variable Sedge						
	E	S1	G3	2012-08-09	1	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Water-plantain Spearwort						
	PE	SH	G4	1903-07-29	2	Open water (non-forested, wetland)
Wild Leek						
	SC	S3	G5	2013-04-29	28	Hardwood to mixed forest (forest, upland),Forested wetland

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
S3 Rare in Maine (20-100 occurrences).
S4 Apparently secure in Maine.
S5 Demonstrably secure in Maine.
SU Under consideration for assigning rarity status; more information needed on threats or distribution.
SNR Not yet ranked.
SNA Rank not applicable.
S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
G3 Globally rare (20-100 occurrences).
G4 Apparently secure globally.
G5 Demonstrably secure globally.
GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
http://www.maine.gov/dacf/mnap

PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

September 12, 2017

Frederic Licht
Licht Environmental Design, LLC
35 Fran Circle
Gray, ME 04039

RE: Information Request - Catalpa Lane Senior Housing, Cumberland

Dear Rick:

Per your request received August 16, 2017, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Catalpa Lane Senior Housing Project* in Cumberland.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (*M. lucifugus*, State Endangered); northern long-eared bat (*M. septentrionalis*, State Endangered); and eastern small-footed bat (*M. leibii*, State Threatened). The five remaining bat species are listed as Special Concern: big brown bat (*Eptesicus fuscus*); red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*).

While a comprehensive statewide inventory for bats has not been completed, it is likely that several of these species occur within the project area during migration and/or the breeding season. We recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. Otherwise, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools

At this time, MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Deer Wintering Areas,

Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we strongly recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

Without details, it is difficult to know what impacts your project may have on the mapped streams within the search area. That being said, MDIFW makes the following general recommendations as they pertain to streams.

We recommend that a 100-foot undisturbed vegetated buffer be maintained along these streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work or work within 100 feet of streams occur between July 15 and October 1.

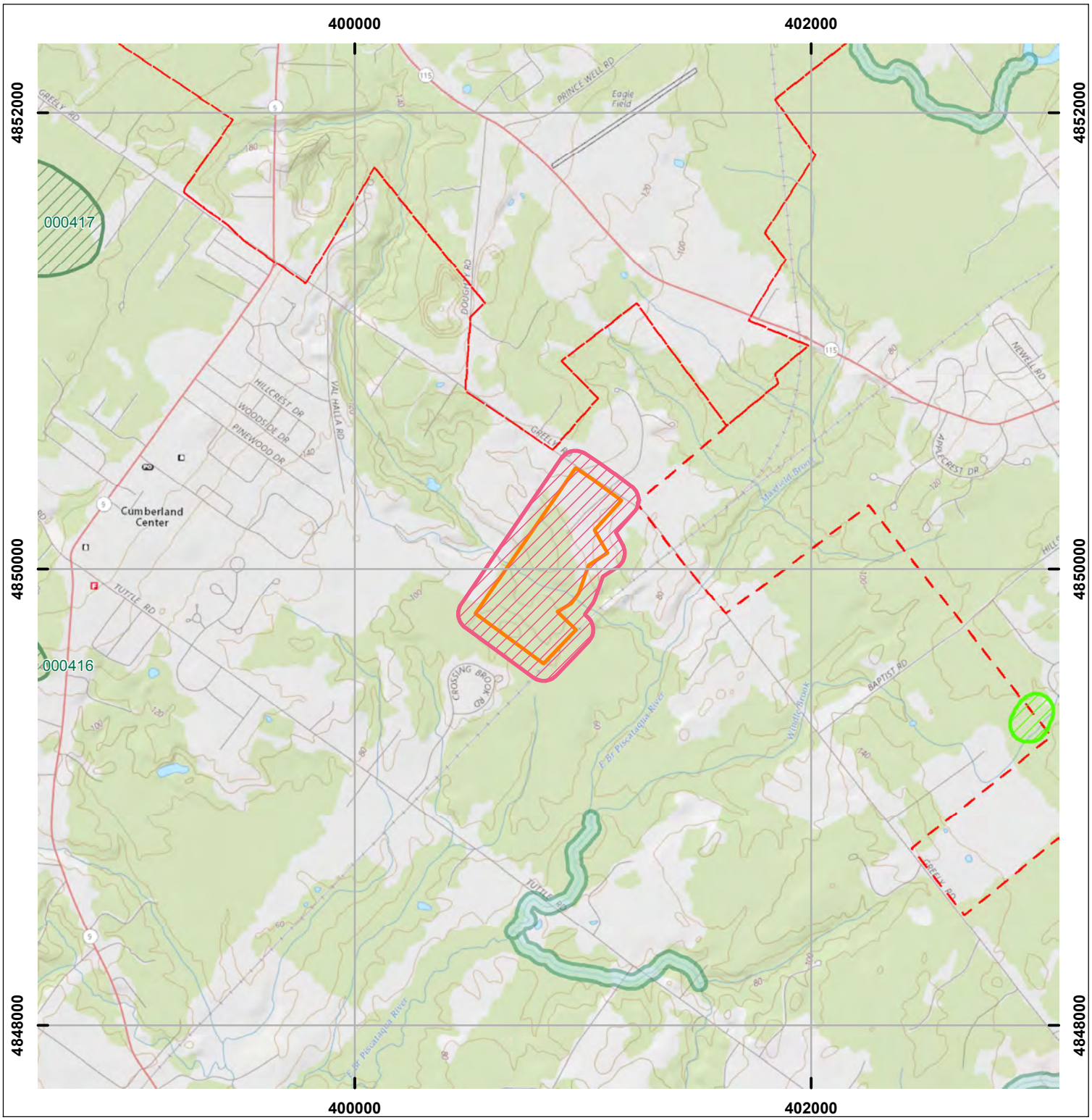
This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Cumberland, Catalpa Lane Senior Housing (Version 2)

Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 8/18/2017

- ProjectPolys
- ProjectSearchAreas
- Deer Winter Area
- Significant Vernal Pools
- Special Concern-occupied habitats(100ft buffer)



Exhibit 8

Utility Serviceability Letters

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

December 2, 2019

Frederic (Rick) Licht, PE, LSE
Licht Environmental Design, LLC
35 Fran Circle
Gray, Maine 04039

Re: Oceanview at Cumberland Phase 2, CU
Ability to Serve with PWD Water

Dear Mr. Licht:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on September 10, 2019. Based on the information provided per plans dated November 27, 2019, we can confirm that the District will be able to serve the proposed project as further described in this letter. **Please note that this letter constitutes approval of the water system as currently designed. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- The District can confirm that the existing water and sewer systems in Tuttle Road and Little Acres Drive have the capacity to serve the additional single family house lots proposed within Phase 2 of the Oceanview at Cumberland Subdivision in Cumberland. A 12-inch ductile iron water main extension will be required within Little Acres Drive from the end of the Phase 1 water main extension to at least the center of the last lot to be served within Phase 2; a 4-inch ductile iron water main extension will be required within Mallard Way, from Little Acres Drive to the lost lot to be served within Phase 2.
- New 1.5-inch domestic water services may be installed from the 12-inch and 4-inch water main extensions within Phase 2 of the proposed subdivision.
- It is the District's understanding that all single family homes within the subdivision will require an NFPA 13D life safety sprinkler system. A single service line may be used to serve both domestic and fire protection needs. The split for the sprinkler service must be located after the water meter and must include a non-testable backflow prevention device.

Prior to construction, the owner or contractor will need to complete the Main Extension Initiation form and pay all necessary fees. PWD will guide the applicant through the new development process.

Existing Site Service

According to District records, the project site does currently have existing water service. A 12-inch diameter ductile iron water main installed in Little Acres Drive provides water service to the site.

Water System Characteristics

According to District records, there is an 12-inch diameter ductile iron water main in Little Acres Drive and a public fire hydrant located approximately 600 feet from the site. Recent flow data is not available in this area.

Public Fire Protection

The installation of new public hydrants to be accepted into the District water system will most likely be required. It is your responsibility to contact the Town of Cumberland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project. Based on the high water pressure in this area, we recommend that you consider the installation of pressure reducing devices that comply with state plumbing codes.

Private Fire Protection Water Needs

You have indicated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact MEANS to request a hydrant flow test and we will work with you to get more complete data.

Should you disagree with this determination, you may request a review by the District's Internal Review Team. Your request for review must be in writing and state the reason for your disagreement with the determination. The request must be sent to MEANS@PWD.org or mailed to 225 Douglass Street, Portland Maine, 04104 c/o MEANS. The Internal Review Team will undertake review as requested within 2 weeks of receipt of a request for review.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District



Robert A. Bartels, P.E.
Senior Project Engineer

TOWN OF CUMBERLAND, MAINE
290 TUTTLE ROAD
CUMBERLAND, MAINE 04021
TEL: 207-829-2205 FAX: 829-2224

January 14, 2020

Mr. Rick Licht, PE, LSE
Licht Environmental Design, LLC
35 Fran Circle
Gray, Maine 04039

Re: Ocean View Phase II
Cumberland, Maine

Dear Rick:

The Town of Cumberland agrees to accept the sewer design flow from Phase II of your project off Tuttle Road. The Town has the capacity to handle the requested flow amounts. Each of the units will be required to have its own account and each permit will be $500 plus a $50 inspection fee. Monthly bills will be assessed upon occupancy through the Portland Water District. All inspections and permits are coordinated through the Codes office at Cumberland Town Hall.

Cumberland is a relatively new sewer system (less than 30 years in age) and we have been fortunate to have limited inflow and infiltration in our system. We presently own 30% of the Falmouth Treatment Plant. This new flow would be pumped via our Tuttle Road / Rt 88 distribution system.

Please let me know if you have any additional questions regarding this request.

Sincerely,

William R. Shane, P.E.
Town Manager

cc: Carla Nixon, Director of Planning
Bill Longley, Code Enforcement Officer

TABLE 1: Cumberland Crossing Sr. Housing, Tuttle & Greely Roads, Cumberland

Estimated Peak Hour Wastewater (& Water Usage) Flows -Phases 1 & 2

Licht Environmental Design, LLC — *REV3 DEC. 2019 -ADD PHASE 2 FLOWS*

(Note -Total Phase 1 and Phase 2 project = 105+/- Cottage Units)

Phase	Type of Use	# Units		Bedrooms/unit (1)	Total Bedrooms	Flow/Unit (GPD)	Total Daily Flows (GPD)	Peak Flows (GPM) (4.)
Phase 1	Proposed Active Sr. Cottages	52	units	2	104	90	9360	19.50
Phase 1	Community Center -REMOVED. REPLACE WTH 1 UNIT	1	unit	2	2	90	90	0.19
Phase 2	Proposed Active Sr. Cottages	52	units	2	104	90	9360	19.50
Phase 2	Community Center/Pool Facility	100	pp	NA	NA	10	1000	2.08
	TOTAL PROJECT WASTEWATER PROJECTED FLOWS						**19,810**	**41.27**
	FUTURE TOWN GREELY ROAD LP FM EXTENSION - NOT PART OF CUMB. CROSSING DEVELOPMENT FLOWS (SEE NOTE 7.)							
Future	Greely Road Allowance for 25 Homes (3 Br/unit)	25	units	3	75	90	6750	14.06
	TOTALS -PROJECT AND FUTURE TOWN EXPANSION						**26,560**	**55.33**
	ADDITIONAL WATER USAGE (NON WASTEWATER FLOWS)							
Phase 1&2	Cottage Unit Irrigation Estimated Flows (3.)	105	units	NA	NA	300	31500	
Phase 2	Equestrian Lease Use of Barns and Paddock (6.)	1	ea.	NA	NA	200	200	
	TOTAL WATER PROJECTED FLOWS (PROJECT ONLY)**						**51,510**	

Notes:

1. Cottage Peak daily flow @90 gpd/br based on the State of Maine Subsurface Wastewater Code, 10-144 CMR 241, Jan. 18, 2011 ed., Table 4. Cottages are occupied by 1-2 seniors and a two (2) bedroom design flow has been used. Typical senior water usage is well below Table 4 estimated flows -so figures are conservative.

2. Community Center: Assume Peak 100 pp/day use center facilities. UseWW Code Table 4 "Swimming Pool/Bathhhouse" at 10 gpd/pp = 1000 gal/d

3. Irrigation Flows estimated based on typical units Ocean View and Cumberland Crossing at 600 gpd over 6 mos. Average annual daily flow = 300 gpd (Not WW Flow)

4. Peak hourly flows - (ave daily flow/24 hour per day) x (peaking factor of 3.0 residential use.)

5. Allowance for I&I not provided.

6. Equestrian Lease - flows currently from well and estimated at 15 Gallons/day/horse @ 12 horses + washing. Water does not contribute to wastewater flows.

7. Provide allowance for Town potential future low pressure FM Extension to 25+/- homes on Greely Road. Not part of Cumb. Crossing Project. Use for planning Only.

Exhibit 9

Lighting Cuts

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Type:	SA
Project Name:	OV AT CUMBERLAND LIGHTING
Notes:	

rev. 03.14.2014

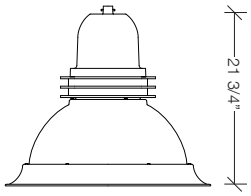
URBAN (LED)

Urban LED Luminaires

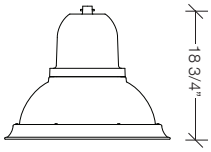
Sample	*CAP-21*	*36NB-80*	*4K*	*T2*	*UNV*	*PEC*	*3RNW*	*BBT*
Ordering	CAP-26 /	36NB-80 /	4K /	T3 /	UNV /	PEC /	NRNW /	BBT
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**

DETAILS

CAP - Round Shade

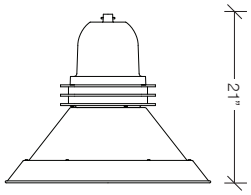


26" - CAP
Shown with optional 3RNW rings
EPA: 1.39 ft²
40 lbs

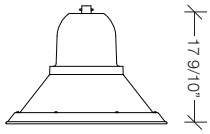


21" - CAP
EPA: 1.04 ft²
35 lbs

MRDS - Deep Shade

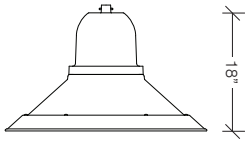


26" - MRDS
Shown with optional 3RNW rings
EPA: 1.25 ft²
40 lbs



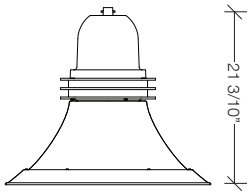
21" - MRDS
EPA: 1.00 ft²
35 lbs

MRSS - Shallow Shade

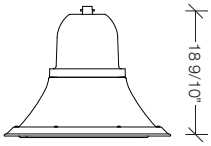


26" - MRSS
EPA: 1.17 ft²
40 lbs

MAR - Curved Shade



26" - MAR
Shown with optional 3RNW rings
EPA: 1.25 ft²
40 lbs



21" - MAR
EPA: 1.00 ft²
35 lbs

A. MODEL

CAP-21	21" Capitol
MRDS-21	21" Miramar deep shade
MAR-21	21" Maritas
CAP-26	26" Capitol
MRSS-26	26" Miramar shallow shade
MRDS-26	26" Miramar deep shade
MAR-26	26" Maritas

B. ENGINE-WATTS

24NB-27	27 Watts - LED array
24NB-55	55 Watts - LED array
36NB-80	80 Watts - LED array
48NB-110	110 Watts - LED array[3]
60NB-136	136 Watts - LED array[3]

3 = 26" Urban only

C. CCT - COLOR TEMP

3K	3000K
4K	4000K
5K	5000K (std.)

D. OPTICS

T2	type II
T3	type III
T4	type IV
T5R	type V, rectangular
T5QM	type V, square medium
T5W	type V, round wide

E. VOLTAGE

UNV	120-277V
347	347V
480	480V

F. ELECTRICAL OPTIONS

PEC	photocell, button
2PF	dual power feed [1,2]

[1] not available on 24NB-27

G. STYLE OPTIONS

NRNW	no rings
3RNW	three cast rings

H. COLOR

BBT	basic black textured
BMT	black matte textured
WHT	white textured
MBT	metallic bronze textured
BZT	bronze textured
DBT	dark bronze textured
GYS	gray smooth
DPS	dark platinum smooth
GNT	green textured
MST	metallic silver textured
MTT	metallic titanium textured
OWI	old world iron
RAL	_____

Housing & LED Thermal Management: The drivers shall be located in the top cast housing and shall be accessible without tools by hinging the lower shade assembly. The driver and all electrical components shall be on a tray. The lower shade shall be made from a one-piece aluminum spinning. The LED bezel assembly shall be attached to a one piece aluminum heat sink to provide direct-heat exchange between the LED light engine and the cool outdoor air. The Housing is designed for LED thermal management without the use of metallic screens, cages, or fans. The top casting shall be able to be pendent mounted in place with a stainless steel safety pin and then permanently held in place with four stainless steel bolts.

Bezel optical system: Each Beacon luminaire is supplied with an Optical one piece cartridge system consisting of an LED engine, LED lamps, optics, gasket and stainless steel bezel. The cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one piece optical system. A two-piece die cut silicone and polycarbonate foam gasket ensures a weather-proof seal around each individual LED and allows the luminaire to be rated for high-pressure hose down applications.

The optical cartridge is secured to the aluminum heat sink with fasteners to ensure thermal conductivity. The optics are held in place without the use of adhesives and the complete assembly is gasketed for high pressure hose down cleaning. The cartridge assembly is available in various lighting distributions using TIR designed Acrylic optical lenses over each LED.

Printed Circuit Board (PCB): Aluminum thermal clad board with 0.062" thick aluminum base layer "high temperature" HT-06503 or equivalent (subject to change) dielectric (0.003" thick, thermal conductivity of 2.2 W/MK, UL RTI of 140°C) 0.0014" thick copper circuit layer Circuit layer designed with copper pours to minimize thermal impedance across dielectric. Board shall be supplied with QPAD-3 fiberglass reinforced thermal pad 0.005" thick thermal conductivity of 2.0 W/Mk. Continuous use temperature of 180°C UL94 V-0. Board will be mounted to the heat sink using 12 #4-40 screws to ensure contact with thermal pad and heat sink. Use of thermal grease will not be allowed.

LifeShield™ Circuit: Thermal circuit shall protect the luminaire from excessive temperature by interfacing with its 0-10V dimmable drivers to reduce drive current as necessary. The factory-preset temperature limits shall be designed to ensure maximum hours of operation to assure L70 rated lumen maintenance. The device shall activate at a specific, factory-preset temperature, and progressively reduce power over a finite temperature range in recognition of the effect of reduced current on the internal temperature and longevity of the LEDs and other components.
A luminaire equipped with the device may be reliably operated in any ambient temperature up to 55ºC (131ºF).

The thermal circuit will allow higher maximum Wattages than would be permissible on an unregulated luminaire (if some variation in light output is permissible), without risk of premature LED failure.

Operation shall be smooth and undetectable to the eye. Thermal circuit shall directly measure the temperature at the LED solder point.

Thermal circuit shall consist of surface mounted components mounted on the LED engine (printed circuit board). For maximum simplicity and reliability, the device shall have no dedicated enclosure, circuit board, wiring harness, gaskets, or hardware. Device shall have no moving parts, and shall operate entirely at low voltage (NEC Class 2). The device shall be located in an area of the luminaire that is protected from the elements.

Thermal circuit shall be designed to "fail on", allowing the luminaire to revert to full power in the event of an interruption of its power supply, or faulty wiring connection to the drivers.

Device shall be able to co-exist with other 0-10V control devices (occupancy sensors, external dimmers, etc.). The device will effectively control the solder point temperature as needed; otherwise it will allow the other control device(s) to function unimpeded.

Electrical: Luminaires are equipped with an LED driver that accepts 100V through 277V, 50 Hz to 60 Hz (UNIV), or a driver that accepts 347V or 480V input. Power factor is .92 at full load. All electrical components are rated at 50,000 hours at full load and 40°C ambient conditions per MIL-217F Notice 2. Optional 0 to 10 volt dimming drivers are available upon request. All driver components supplied are Component-to -component wiring within the luminaire will carry no more than 80% of rated current and is listed by UL for use at 600VAC at 50°C or higher. Plug disconnects are listed by UL for use at 600 VAC, 15A or higher.

Surge Protector: The on-board surge protector shall be a UL recognized component for the United States and Canada and have a surge current rating of 20,000 Amps using the industry standard 8/20 pSec wave. The LSP shall have a clamping voltage of 825V and surge rating of 540J. The case shall be a high-temperature, flame resistant plastic enclosure.

Fasteners: All fasteners shall be stainless steel. When tamper resistant fasteners are required, spanner HD (snake eye) style shall be provided (special tool required, consult factory).

Color Rendering Index (CRI): Luminaire shall have a minimum CRI of 67 at 5000K.

Operating Environment: Shall be able to operate normally in ambient temperatures from -40°C to 40°C

Finish: Finish shall be a Beacote V polyester powder-coat electro-statically applied and thermocured. Beacote V finish shall consist of a five stage iron phosphate chemical pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pound.

Agency Certification: The luminaire shall bear a CSA label and be marked suitable for wet locations.

Warranty: Beacon luminaires feature a 5 year limited warranty. Beacon LED luminaires with LED arrays feature a 5 year limited warranty covering the LED arrays. LED drivers are covered by a 5 year limited warranty. PIR sensors carry a 5 year limited warranty from the sensor manufacturer. See Warranty Information on www.beaconproducts.com complete details and exclusions.

Power/Lumens & Distrubutions

Engine	Wattage	Delivered Lumens (varies by optic)	Delivered LPW	TM21 Calculated % Lumen Maint. at 100,000 hrs
24NB	27	2752-3014	105-115	96.19%
24NB	55	5138-5500	93-100	96.19%
36NB	80	6935-8215	93-103	94.87%
48NB	110	10240-10950	93-103	92.73%
60NB	136	12800-13700	93-103	85.79%

TM21 is the framework for taking LM-80 data and making useful LED lifetime projections. Reported and Calculated Lifetimes shown are based on hours at the time of this printing. For current Reported and Calculated hours please contact factory or Beacon's web-site.

CCT (COLOR TEMP) Lumen Output Multipliers	**CRI (Color Rendering)**
5000K = 1.0	min 67 CRI
4000K = .92	min 70 CRI
3000K = .75	min 80 CRI

Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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Type:	SA ARM
Project Name:	
Notes:	

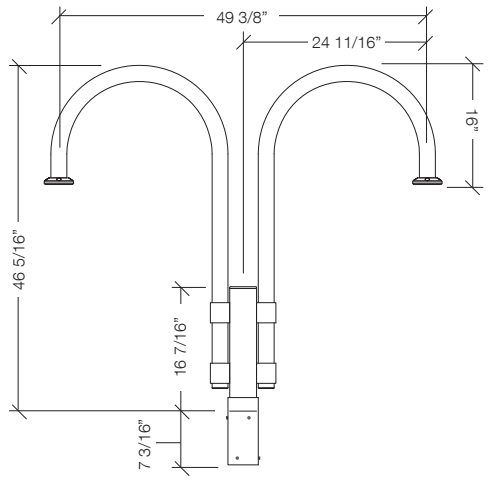
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AA-41 RAILROAD STRAP

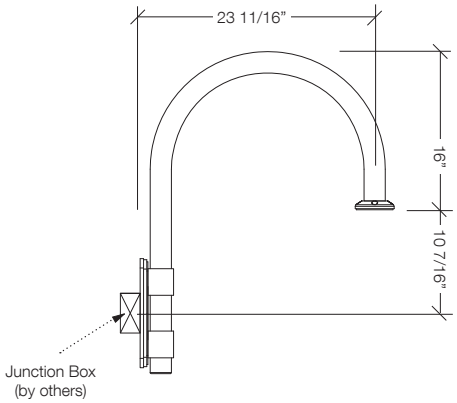
Arms

Sample	AA-40		S		4		B		P		BBT
Ordering		/		/		/		/		/	
	A		B		C		D		E		F

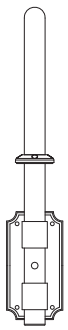
DETAILS



WALL BRACKET DETAILS



WALL PLATE DETAILS



Due to our continued efforts to improve our products, product specifications are subject to change without notice.

A. MODEL

AA-41	Railroad Strap

B. POST SHAFT PROFILE

W	wall mount
S	smooth
F	fluted

C. POST SHAFT DIAMETER

4	4"
5	5"
6	6"
OTHER	_____

D. ARRANGEMENT

B — *see arrangement table below*

E. LUMINAIRE MOUNTING

P	pendant

F. COLOR

BBT	basic black textured
BMT	black matte textured
WHT	white textured
MBT	metallic bronze textured
BZT	bronze textured
GYS	gray smooth
DPS	dark platinum smooth
GNT	green textured
MST	metallic silver textured
MTT	metallic titanium textured
OWI	old world iron
RAL	_____

Construction: All cast aluminum parts shall be low copper alloy A356. All extruded aluminum parts shall be alloy 6061-T6, 6063-T5 or equal.

EPA (effective projected area): EPA is de¬fined as (projected surface area X drag factor) and measured in ft2. Allowable post, luminaire arm, luminaire and accessory EPAs are derived from the most current published AASHTO (American Association of State Highway and Transportation Officials) standard, currently AASHTO 2001 (50yr design life). Customer assumes all responsibility for selecting the ap¬propri-ate post for installation (consult factory for assistance). Luminaire arm, luminaire and accessory EPA must be equal to or less than allowable EPA of post. Consult a professional engineer for compliance with local codes and standards.

Fasteners: All fasteners shall be Corrosion Resistant. When tamper resistant fasteners are required, spanner HD (snake eye) style shall be provided (special tool required, available at additional cost).

Finish: Finish shall be a Beacote V polyester pow-der-coat electro-statically applied and thermocured. Beacote V finish shall consist of a five stage iron phosphate chemical pretreatment regimen with a poly-mer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester pow¬der coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists sur-face impacts of up to 160 inch-pound.

Limited Warranty: Beacon Products warrants its products, to the original purchaser, against defects in materials and workmanship for proper usage for a pe-riod of 5 years after date of production, when properly installed, maintained and appropriately specified. See Warranty Information on www.beaconproducts.com for complete details and exclusions.

		arrangement (EPA index ft² / weight (lbs))									
shaft Ø		A	B	C	D	E	F	G	H	I	J
wall	weight	12	-	-	-	-	-	-	-	-	-
Ø4"	EPA	-	1.50	2.41	-	1.93	2.17	-	2.41	2.41	-
	weight	-	15	23	-	23	32	-	32	41	-
Ø5"	EPA	-	1.52	2.49	-	2.00	2.24	-	2.49	2.49	-
	weight	-	16	25	-	25	34	-	34	43	-
Ø6"	EPA	-	1.71	2.62	-	2.10	2.36	-	2.62	2.62	-
	weight	-	19	27	-	27	36	-	36	45	-

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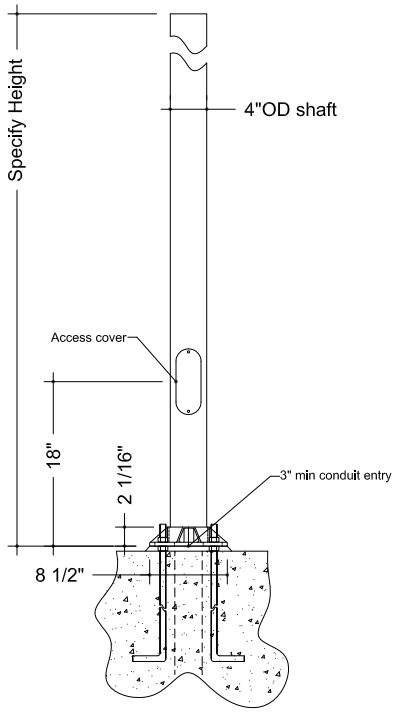
Type:	SA - POLE
Project Name:	
Notes:	

rev. 02.20.2014

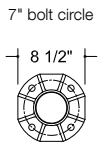
4" STRUCTURAL
Poles & Bases

	A		B		C		D		E		F		G
Sample	SHO4		S		8		4G		OT		GFI-IU		BBT
Ordering		/		/		/		/		/		/	

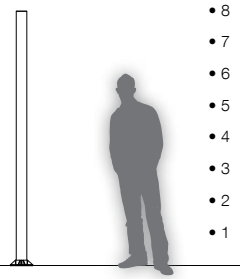
DETAILS



Bolt Circle



Perspective



available EPA index

catalog #	wall thickness	nominal height	AASHTO 2001 wind zones (mph) 90	100	110	120	130	140	150
SHO4/S/10/4G	.125"	10'	7.3	5.5	4.3	3.3	2.8	2.3	1.9
SHO4/S/12/4G	.125"	12'	5.5	4.0	3.0	2.2	1.8	1.4	1.2
SHO4/S/14/4M	.188"	14'	6.6	5.0	3.7	2.9	2.3	1.9	1.6
SHO4/S/14/4P	.226"	14'	7.4	5.6	4.3	3.3	2.7	2.3	1.9
SHO4/S/16/4M	.188"	16'	5.1	3.6	2.6	1.8	1.5	1.1	0.9
SHO4/S/16/4P	.226"	16'	5.8	4.2	3.1	1.2	0.0	0.0	0.0
SHO4/S/18/4P	.226"	18'	4.3	3.0	2.0	1.3	1.0	0.7	0.5
SHO4/F/10/4G	.125"	10'	6.3	4.8	3.6	2.7	2.0	1.5	1.0
SHO4/F/12/4M	.188"	12'	6.5	4.9	3.7	2.8	2.0	1.6	1.1
SHO4/F/14/4M	.188"	14'	4.9	3.5	2.5	1.7	1.1	0.7	0.3
SHO4/F/16/4M	.188"	16'	3.5	2.3	1.5	0.8	0.3	0.0	0.0

CAUTION: Consult factory for structural approval prior to ordering poles. Warranty void if pole is cut, welded, drilled or otherwise modified outside Beacon factory.

A. MODEL

SHO4	Ø4" Structural Post

B. PROFILE

S	smooth
F	fluted

C. HEIGHT

6	6'
8	8'
10	10'
12	12'
OTHER	16'

D. SHAFT

4G	Ø4", .125" wall thickness (S) (F)
4M	Ø4", .188" wall thickness (S) (F)
4P	Ø4", .226" wall thickness (S)

E. POLE TOP

OT	open top
ARC	acorn finial
BAL	ball finial
TN	tenon
OTHER	

F. OPTIONS

GFI-IU	20AMP GFCI receptacle
OTHER	

G. COLOR

BBT	basic black textured
BMT	black matte textured
WHT	white textured
MBT	metallic bronze textured
BZT	bronze textured
DBT	dark bronze textured
GYS	gray smooth
DPS	dark platinum smooth
GNT	green textured
MST	metallic silver textured
MTT	metallic titanium textured
OWI	old world iron
RAL	

Construction: All cast aluminum parts shall be low copper alloy A356. All extruded aluminum parts shall be alloy 6061-T6, 6063-T5 or equal. Standard fluted shaft profile shall be 16-flat flutes for 3"OD and 12-flat flutes for 4", 5", & 6"OD.

Base Covers: require specification of smooth or fluted shafts of the size required to meet wind load requirements

Vibration Dampeners: Vibration dampener pads shall be provided when required by customer or deemed necessary by Beacon Products. Please consult factory for bridge mounted applications.

EPA (effective projected area): EPA is defined as (projected surface area X drag factor) and measured in ft2. Allowable post, luminaire arm, luminaire and accessory EPAs are derived from the most current published AASHTO (American Association of State Highway and Transportation Officials) standard, currently AASHTO 2001 (50yr design life). Customer assumes all responsibility for selecting the appropriate post for installation (consult factory for assistance). Luminaire arm, luminaire and accessory EPA must be equal to or less than allowable EPA of post. Consult a professional engineer for compliance with local codes and standards.

Anchor Bolt: Anchor bolts, sized as required, double hex nuts and flat washers shall be hot dipped galvanized steel. A bolt circle template shall be provided for installation.

Fasteners: All fasteners shall be Corrosion Resistant. When tamper resistant fasteners are required, spanner HD (snake eye) style shall be provided (special tool required, available at additional cost).

Finish: Finish shall be a Beacote V polyester powdercoat electrostatically applied and thermocured. Beacote V finish shall consist of a five stage iron phosphate chemical pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pound.

Limited Warranty: Beacon Products warrants its products, to the original purchaser, against defects in materials and workmanship for proper usage for a period of 5 years after date of production, when properly installed, maintained and appropriately specified. See Warranty Information on www.beaconproducts.com for complete details and exclusions.

Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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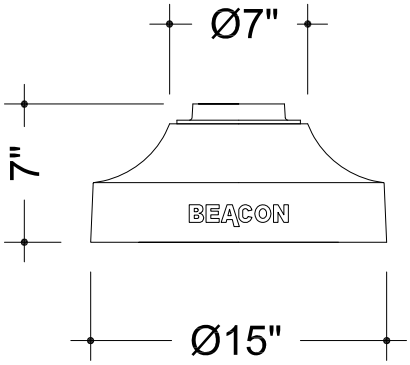
Type:	SA BASE COVER
Project Name:	
Notes:	

rev. 02.20.2014

DOMUS
Poles & Bases

Sample	*DOMU*		*5*		*BBT*	
Ordering		/		/		
	A		**B**		**C**	

DETAILS



A. MODEL

DOMU	Domus

B. POST SHAFT DIAMETER

3	3”
4	4”
5	5”
6	6”

C. COLOR

BBT	basic black textured
BMT	black matte textured
WHT	white textured
MBT	metallic bronze textured
BZT	bronze textured
DBT	dark bronze textured
GYS	gray smooth
DPS	dark platinum smooth
GNT	green textured
MST	metallic silver textured
MTT	metallic titanium textured
OWI	old world iron
RAL	_____

Construction: All cast aluminum parts shall be low copper alloy A356. All extruded aluminum parts shall be alloy 6061-T6, 6063-T5 or equal. Standard fluted shaft profile shall be 16-flat flutes for 3”OD and 12-flat flutes for 4”, 5”, & 6”OD.

Base Covers: require specification of smooth or fluted shafts of the size required to meet wind load requirements

Vibration Dampeners: Vibration dampener pads shall be provided when required by customer or deemed necessary by Beacon Products. Please consult factory for bridge mounted applications.

EPA (effective projected area): EPA is defined as (projected surface area X drag factor) and measured in ft2. Allowable post, luminaire arm, luminaire and accessory EPAs are derived from the most current published AASHTO (American Association of State Highway and Transportation Officials) standard, currently AASHTO 2001 (50yr design life). Customer assumes all responsibility for selecting the appropriate post for installation (consult factory for assistance). Luminaire arm, luminaire and accessory EPA must be equal to or less than allowable EPA of post. Consult a professional engineer for compliance with local codes and standards.

Anchor Bolt: Anchor bolts, sized as required, double hex nuts and flat washers shall be hot dipped galvanized steel. A bolt circle template shall be provided for installation.

Fasteners: All fasteners shall be Corrosion Resistant. When tamper resistant fasteners are required, spanner HD (snake eye) style shall be provided (special tool required, available at additional cost).

Finish: Finish shall be a Beacote V polyester powdercoat electrostatically applied and thermocured. Beacote V finish shall consist of a five stage iron phosphate chemical pretreatment regimen with a polymer primer sealer, oven dry off, and top coated with a thermoset super TGIC polyester powder coat finish. The finish shall meet the AAMA 605.2 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pound.

Limited Warranty: Beacon Products warrants its products, to the original purchaser, against defects in materials and workmanship for proper usage for a period of 5 years after date of production, when properly installed, maintained and appropriately specified. See Warranty Information on www.beaconproducts.com for complete details and exclusions.

Due to our continued efforts to improve our products, product specifications are subject to change without notice.

Cottage Building & Post lights

Norwell Lighting

Product Name **Cottage Onion**

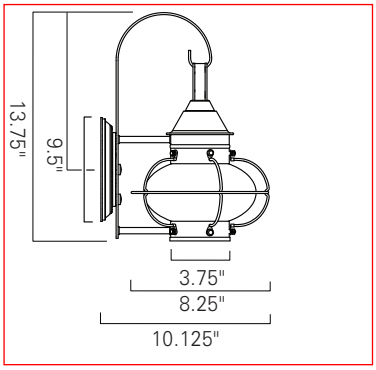
Model Number **1323 1324 1321**

Project Name OceanView at Cumberland

Fixture Type _____ Quantity _____

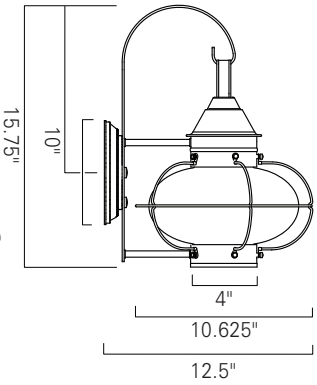


Cottage Onion Small - **1323**
Bronze (**BR**) Seedy Glass (**SE**)





Cottage Onion Small - **1323**
Bronze (**BR**) Clear Glass (**CL**)



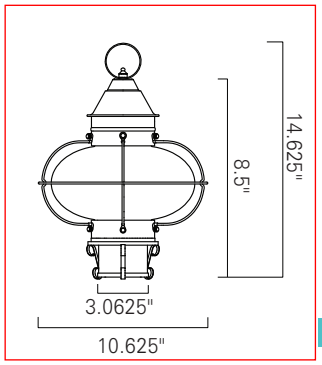
Cottage Onion Medium - **1324**
Black (**BL**) Clear Glass (**CL**)



Cottage Post - **1321**
Black (**BL**) Seedy Glass (**SE**)



Cottage Post - **1321**
Black (**BL**) Clear Glass (**CL**)



INC

Product Name / Model / Dimensions	Finish Options	Glass	Lamping Options
Cottage Onion Small - 1323 Cottage Onion Medium - 1324 Cottage Onion Post - 1321	**Standard** Black (BL) Bronze (BR)	**Standard** Clear (CL) Seedy (SE)	**Standard** Incandescent (1) 100 Watt Edison

	Height	Width	Projection	TTO
1323	13.75"	8.25"	10.125"	9.5"
1324	15.75"	10.625"	12.5"	10"
1321	14.625"	10.625"		

Backplate Sconce 6.25" Diameter

Norwell norwellinc.com | 800 822 2831 | 508 823 1751 | f: 508 823 9431

ILEX
ilexlight.com
HOSPITALITY
COMMERCIAL

Exhibit 10

Traffic Impact Assessment

Exhibit 11

Stormwater Management

(See Separate Volume Binder)

TRAFFIC IMPACT STUDY
PHASE 2 – CUMBERLAND CROSSING
CUMBERLAND, MAINE

January 2, 2020

Prepared for:

Oceanview at Cumberland, LLC.
20 Blueberry Lane
Falmouth, ME 04105



Prepared by:

Sewall
The evolution of expertise

A TFIC Company
40 Forest Falls Drive, Suite 2 • Yarmouth, Maine 04096 • +1.207.817.5440 • sewall.com • info@sewall.com

Introduction

Sewall was engaged to assess the traffic impacts of the proposed second phase of the Cumberland Crossing development in Cumberland, Maine. Phase 1 consisted of 52 age restricted (senior) cottage units, with one retained existing residence, for a total of 53 dwelling units. A small community center was provided as part of Phase 1.

The currently proposed Phase 2 will consist of an additional 52 senior cottage dwelling units plus an expanded community center to be located in the Godsoe farmhouse. Phase 2 will also modify Phase 1 by converting the former community center into a residential dwelling unit, resulting in 53 Phase 1 units.

The overall site location is shown in Figure 1. Primary access will be provided by the existing full movement drive to Tuttle Road. A secondary minor access will be provided to Greely Road for Phase 2, through the Godsoe farm property, to provide a second means of egress for emergency purposes as well as for those residents desiring to travel to/from Greely Road destinations.

Construction of Phase 1 is ongoing with completion and full occupancy expected by 2022. Phase 2 construction and occupancy is expected to occur from 2022 through 2025. As a result, to allow for construction and full occupancy of Cumberland Crossing, 2025 was used as the study year for traffic analysis purposes.

Trip Generation

The number of trips to be generated by the residential development was estimated using Institute of Transportation Engineers (ITE) Trip Generation manuals. Both the 7th edition, currently being utilized by MaineDOT for traffic permitting purposes, and the newest 10th edition report were utilized. Additionally, both land use codes (LUCs) 251– Senior Adult Housing - Detached and 252 – Senior Adult Housing – Attached were used for the analysis. The highest rate for each time period was selected to be conservative, which was generally the detached rates, as would be expected. A comparison of the 7th and 10th edition rates follows:

Time Period	7th	10th
Weekday	3.71	4.27
AM Peak Hour – Adjacent Street	0.20	0.24
AM Peak Hour – Generator	0.31	0.34
PM Peak Hour – Adjacent Street	0.26	0.30
PM Peak Hour – Generator	0.35	0.39

As seen in the preceding table, the newer 10th Edition rates are consistently higher so they will be used as the basis of this study and the traffic analysis. The 10th Edition rates are also considered better information since they are newer and developed from a larger data base. Based upon these rates, the senior dwelling units will generate from 0.24 to 0.39 trips per unit during peak hours. These are significantly less than non-age restricted single-family homes which generate from 0.74 to 1.00 trip per dwelling units during these peak hour trips.

The results for Phase 2, as well as the overall completed development, on the basis of 52 and 105 dwelling units respectively, are summarized in the following tables:

ITE Projected Trip Generation
Phase 2 Cumberland Crossing

Time Period	One-way Trip-ends
Weekday	222
AM Peak Hour – Adjacent Street	13
Entering	4
Exiting	9
AM Peak Hour – Generator	18
Entering	8
Exiting	10
PM Peak Hour – Adjacent Street	16
Entering	10
Exiting	6
PM Peak Hour – Generator	20
Entering	12
Exiting	8

Overall Phase 1 & 2 Combined

Time Period	One-way Trip-ends
Weekday	448
AM Peak Hour – Adjacent Street	25
Entering	8
Exiting	17
AM Peak Hour – Generator	36
Entering	15
Exiting	21

Time Period	One-way Trip-ends
PM Peak Hour – Adjacent Street	32
Entering	20
Exiting	12
PM Peak Hour – Generator	41
Entering	23
Exiting	18

As can be seen in the preceding tables, based upon the more recent 10th edition data with higher results, Phase 2 of the senior residential development is expected to generate from 13 to 20 one-way trips during peak hours. Since peak hour trip generation for the entire development will be well under 100 trips, based upon the 7th edition report (as well as the newer and more current 10th edition) a Traffic Movement Permit (TMP) is not required from the Maine Department of Transportation (MaineDOT).

Traffic Volumes

Turning movement/classification counts were conducted by Sewall/Maine Traffic Resources at nearby intersections on Tuttle Road and Greely Road during the weekday AM (7:00 – 9:00) and PM (3:00 – 6:00 PM) peak hour periods to determine existing volumes. The counts were conducted as outlined below:

Intersection Description	Count Period/Count Date	Peak Hour
Tuttle Road and Crossing Brook Road	AM - 12/6/2018	7:30 – 8:30
Tuttle Road and Crossing Brook Road	PM - 11/29/2018	4:00 – 5:00
Greely Road, Mere Wind and farm drive	AM - 10/24/2019	7:30 – 8:30
Greely Road, Mere Wind and farm drive	PM - 10/24/2019	4:30 – 5:30

The count records are included in the appendix. The counts were factored to peak summer conditions using MaineDOT group mean factors to obtain 30th highest hour conditions. Peak summer volumes or 30th highest hour volumes are used for design and traffic analysis purposes and generally occur in Maine in late July or early August.

Existing average annual daily traffic (AADT) data for the vicinity of the site was obtained from "Traffic Volume Counts, 2017, 2014 and 2009 Annual Reports", published by MaineDOT. This data is summarized as follows:

	Average Annual Daily Traffic				
Location Description	2005	2007	2010	2013	2016
Greely Road, northwest of Middle Road	1,810	1,960	1,810	2,040	2,010
Tuttle Road, northwest of Middle Road	---	---	---	3,380	3,330
Tuttle Road, northwest of Harris Road	---	---	---	---	3,900
Tuttle Road, southeast of Main Street	5,480	5,040	---	4,360	5,090

As seen above, during the most recent short-term period (2013 to 2016), traffic volumes generally remained steady near Middle Road but rose in the vicinity of Main Street on Tuttle Road. Over the longer term, 2005 to 2016 period, volumes declined at this location. Given this historical data, a 1/2 % annual growth rate was used to project the existing 2018 volumes to base 2019 conditions, as shown in Figure 2. This same ½ % growth rate was also used to project 2019 volumes to base 2025 conditions.

In addition, other development projects, which have been approved but not yet constructed, or are pending approval, need to be considered in the traffic analysis. The Town of Cumberland Planner was contacted and she identified the nearby Christmas Creek subdivision. This is a twenty-lot subdivision that will be located east of Cumberland Crossing on Tuttle Road. The number of trips to be generated by Christmas Creek were also estimated using the ITE report and were assigned based upon the travel patterns recorded during the traffic counts. Similarly, the remainder of residences to be constructed as part of Phase 1 of Cumberland Crossing need to be considered in the analysis. The trip assignments for these remaining Phase 1 homes (assumed to be 50 of the 52 approved and all of the trips) are shown in Figure 3. The resulting projected 2025 no-build volumes, allowing for 1/2 % annual traffic growth and Christmas Creek and Phase 1 of Cumberland Crossing to be fully occupied, are shown in Figure 4.

The trip assignments for the proposed additional Phase 2 senior residences, were also based upon the recorded residential traffic patterns, shown by the traffic counts and area AADT data. The peak hour trip assignments for Phase 2 are shown in Figure 5. All of the trips were assumed to be primary, or new trips (no pass-by trips), since they are residential in nature. The projected 2025 build volumes, allowing for background traffic growth, and both Christmas Creek and Cumberland Crossing to be fully occupied, are shown in Figure 6.

Traffic Analysis

Traffic operations are evaluated in terms of level of service (LOS). Level of service is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. The level of service for unsignalized intersections is based upon average control delay per vehicle for each minor, opposed movement, as defined in the following table excerpted from the 2010 "Highway Capacity Manual":

Unsignalized Intersection Level of Service

LOS	Delay Range
A	< = 10.0 seconds
B	> 10.0 and <= 15.0
C	> 15.0 and <= 25.0
D	> 25.0 and <= 35.0
E	> 35.0 and <= 50.0
F	> 50.0

Unsignalized Intersection Analysis

The level of service was calculated using Synchro 10 for the unsignalized site drive intersections on Tuttle Road (primary) and Greely Road (secondary) for projected 2025 No Build (with Phase 1) and Build (with Cumberland Crossing fully occupied) volumes. The results for the AM and PM peak hours are provided in the appendix and are summarized in the following tables with the level of service followed by the delay, in seconds, in parentheses:

TUTTLE ROAD & SITE DRIVE

AM Peak Hour Levels of Service

Approach/Movement	2025 Phase1	2025 Full-Build
Eastbound Tuttle Road Left into Cumberland Crossing	A (7.9)	A (7.9)
Southbound Cumberland Crossing Drive	B (12.4)	B (12.7)

PM Peak Hour Levels of Service

Approach/Movement	2025 Phase1	2025 Full-Build
Eastbound Tuttle Road Left into Cumberland Crossing	A (7.8)	A (7.8)
Southbound Cumberland Crossing Drive	B (10.3)	B (10.5)

GREELY ROAD & SITE DRIVE

AM Peak Hour Levels of Service

Approach/Movement	2025 Phase1	2025 Full-Build
Westbound Greely Road Left into Site	A (0.0)	A (0.0)
Northbound Cumberland Crossing Drive	B (10.9)	B (10.6)

PM Peak Hour Levels of Service

Approach/Movement	2025 Phase1	2025 Full-Build
Westbound Greely Road Left into Site	A (7.5)	A (7.5)
Northbound Cumberland Crossing Drive	A (9.0)	A (9.0)

As shown in preceding tables, the stop-controlled site drive approaches, to Tuttle Road, will operate at a good LOS "B" overall during both the AM and PM peak hours, under peak summer conditions, under projected 2025 No Build conditions, with Phase 1 fully occupied. The same high levels of service are projected for 2025 full build conditions with both Phases 1 & 2 of Cumberland Crossing fully occupied. For the Greely Road site drive, the levels of service will be "B" during the AM peak hour and "A" during the PM peak hour. Hence, there are absolutely no capacity concerns and both Tuttle Road and Greely Road have the capacity to accommodate the additional Phase 2 trips.

Safety Analysis

Accident Review

The Maine Department of Transportation uses two criteria to determine high crash locations (HCLs). The first is the critical rate factor (CRF), which is a measure of the accident rate. A CRF greater than one indicates a location which has a higher than expected accident rate. The expected rate is calculated as a statewide average of similar facilities.

The second criterion, which must also be met, is based upon the number of accidents that occur at a particular location. Eight or more accidents must also occur over the three-year study period for the location to be considered a high crash location. Data for the vicinity of the site drives on both Tuttle Road and Greely Road was obtained from MaineDOT and is included in the appendix. The CRF and number of accidents are summarized by location for the most recent three-year period, 2016 to 2018, in the following tables:

Tuttle Road Location Description	# of Acc.	CRF
Intersection of Blanchard Road and Main Street	5	0.29
Between Willow Way/Campus Dr. and Red Mill Way/Cumberland Common	2	0.70
Intersection of Red Mill Way and Cumberland Common	2	0.80
Between Drowne Road and Crossing Brook Road	2	0.20
Between Crossing Brook Road and Harris Road	1	0.07
Between Harris Road and Chet's Way	4	0.51
Between Flintrock Drive and Friar Lane	6	0.46
Intersection of Middle Road	6	1.75

Greely Road Location Description	# of Acc.	CRF
Intersection of Greely Road Extension and Town Line	1	0.33
Between Val Halla Road and Brookside Drive	1	0.25
Between Doughty Road and Mere Wind Dr	3	0.45
Between town lines	1	0.17
Between town line and Hillside Avenue	1	0.18
Between Hillside Avenue and town line	2	0.35
Between town line and town line	1	0.28
Between Edes Road and Middle Road	1	0.16

As seen above, there are no high crash locations within the vicinity of the site on either Greely Road or Tuttle Road. As a result, no further accident review or evaluation is necessary. It is important to note that the intersection of Tuttle Road and Middle Road was previously classified as a high crash location, with a CRF of 3.24 and 10 reported crashes, when the Phase 1 traffic study was performed in 2017. Intersection improvements have recently been implemented at the intersection, which appear to have addressed the safety problem since it no longer meets high crash criteria.

Driveway Sight Distance

One of the most important safety factors to consider for a project is sight distance from the access drives. This sight distance is measured ten feet back from the edge of travel way at a driver's eye height of 3.5 feet to an object height of 4.25 feet. Sewall recommends 10 feet of sight distance for every posted mile per hour of speed limit.

The speed limit is posted at 35 mph on both Tuttle Road and Greely Road in the vicinity of Cumberland Crossing. Sewall recommends a minimum of 350' of sight distances for this speed. The Cumberland ordinance references the MaineDOT sight distance standards, which require a lesser 305'. Sight distances were measured in the field and are summarized as follows:

	Driveway Sight Distance			
Driveway Description	To Right	Adequate	To Left	Adequate
Tuttle Road	500'+	Yes	500'+	Yes
Greely Road	500'+	Yes	450'+	Yes

As seen above, sight distances from both existing drives far exceed the recommended minimum standards of Sewall and the Town. There is an elaborate mailbox to the west of the drive on Tuttle Road. While this mailbox does not block sight distance to the right it has the potential to partially restrict it, dependent upon where an exiting vehicle positions itself. It is recommended that either this mailbox be replaced with a simpler/smaller one or relocated further west out of the sight line to assure no sight restrictions, particularly with the expected concentration of senior drivers. Additionally, it is important that no signage or landscaping be located in the driveway sight triangles that could obstruct the driveway sight distances in the future.

SUMMARY

To summarize, Phase 2 of Cumberland Crossing is expected to generate just 13 one-way trips during the weekday AM peak hour and 16 during the PM peak hour of the adjacent streets. The overall competed project will generate 25 AM trips and 32 PM trips during the peak hours of the adjacent roadways. This level of traffic typically does not have any significant impact off-site. Since peak hour trip generation will be well under 100 trips, a Traffic Movement Permit (TMP) is not required from the Maine Department of Transportation (MaineDOT).

Level of service was calculated for the proposed Cumberland Crossing site drive intersections to assure acceptable operations. Both unsignalized site drive intersections will operate at LOS "B" or better during both peak hour periods under 2025 full build volumes. As a result, there are no capacity concerns and both Tuttle Road and Greely Road have the capacity to accept the additional Cumberland Crossing Phase 2 trips.

In terms of safety, there are no high crash locations within the study area. Sight distance was measured in the field from the proposed site drives and found to be more than adequate to meet standards. It is important to note that no signage or landscaping should be located in the sight triangle which could obscure or limit driveway sight distances in the future. Additionally, it is recommended that an existing mailbox on Tuttle Road be replaced or relocated to address a potential partial sight line restriction.

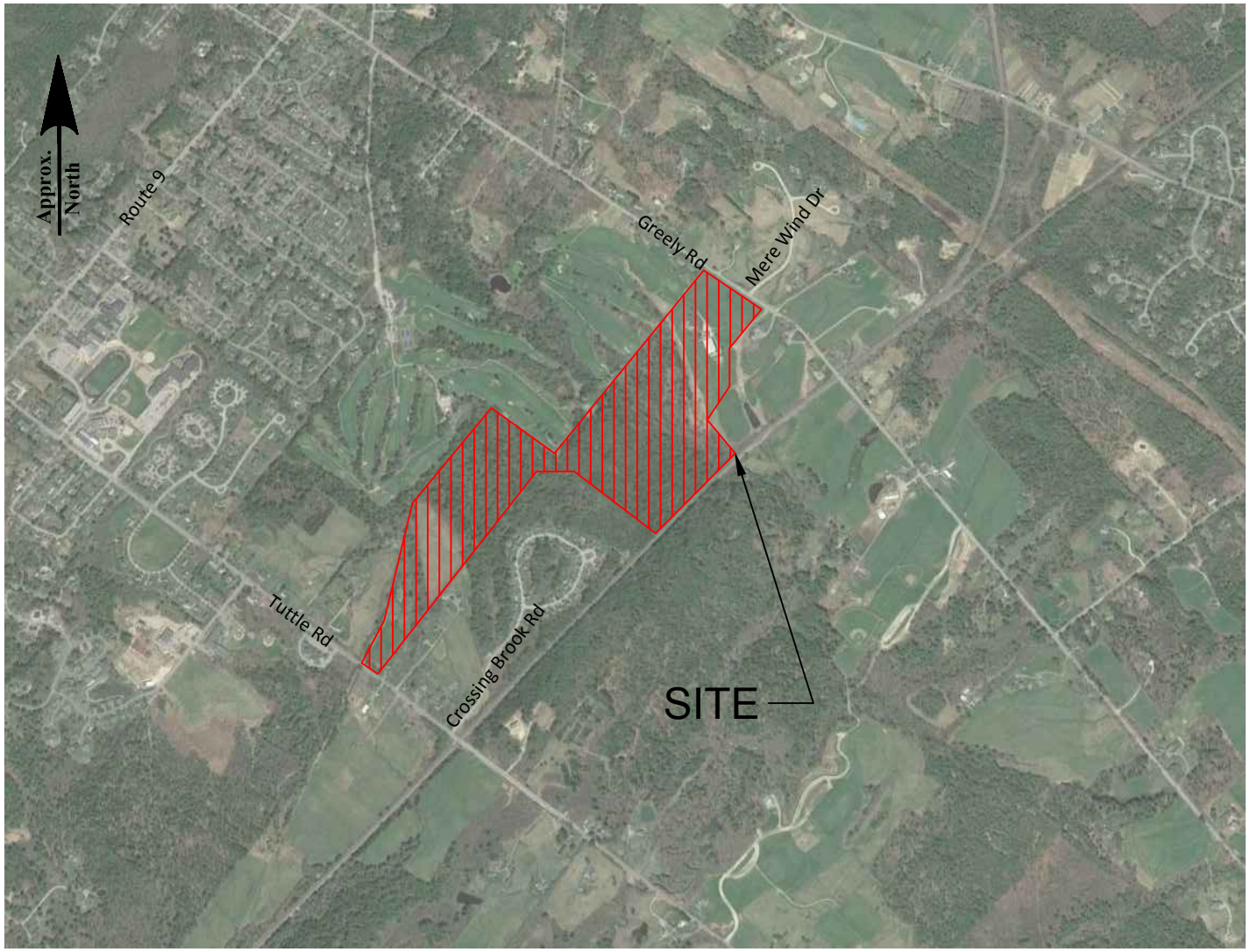


Figure 1

Site Location Map
Cumberland Crossing
Cumberland, Maine

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A TFC Company

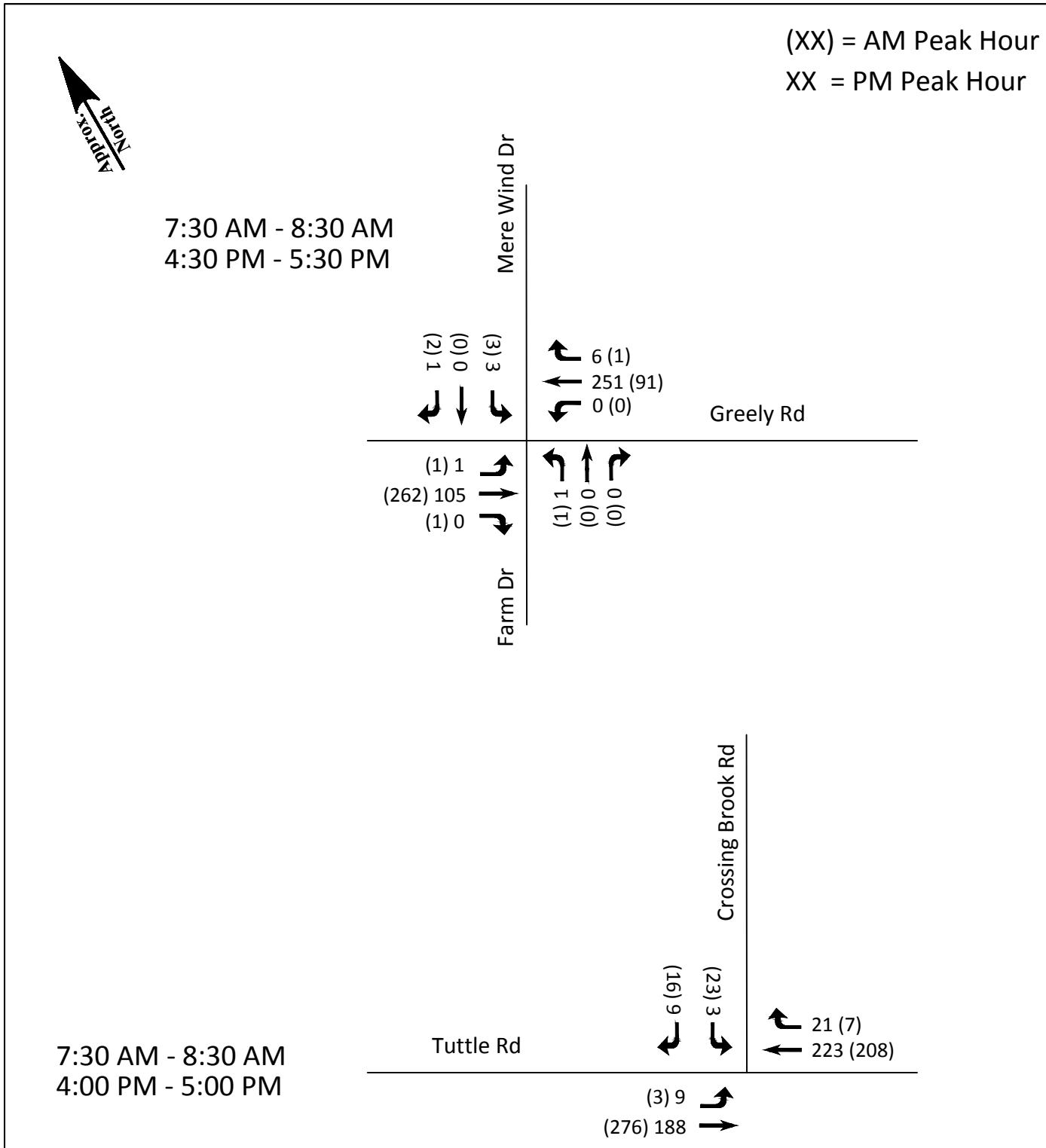


Figure 2

Existing 2019 30th H.H. Volumes	Sewall The evolution of expertise
Cumberland Crossing	
Cumberland, Maine	

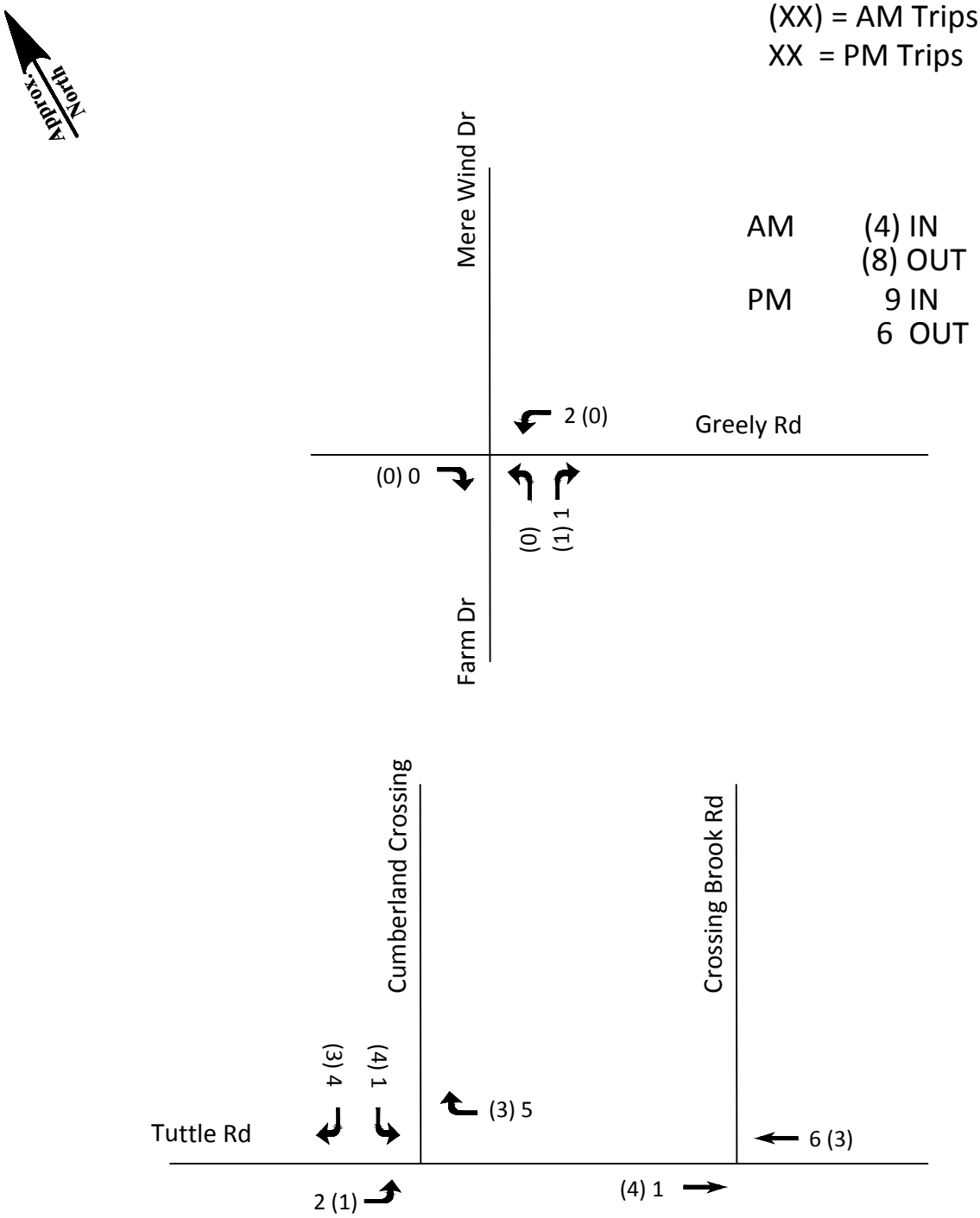


Figure 3

Trip Assignments
Cumberland Crossing, Phase 1
Cumberland, Maine

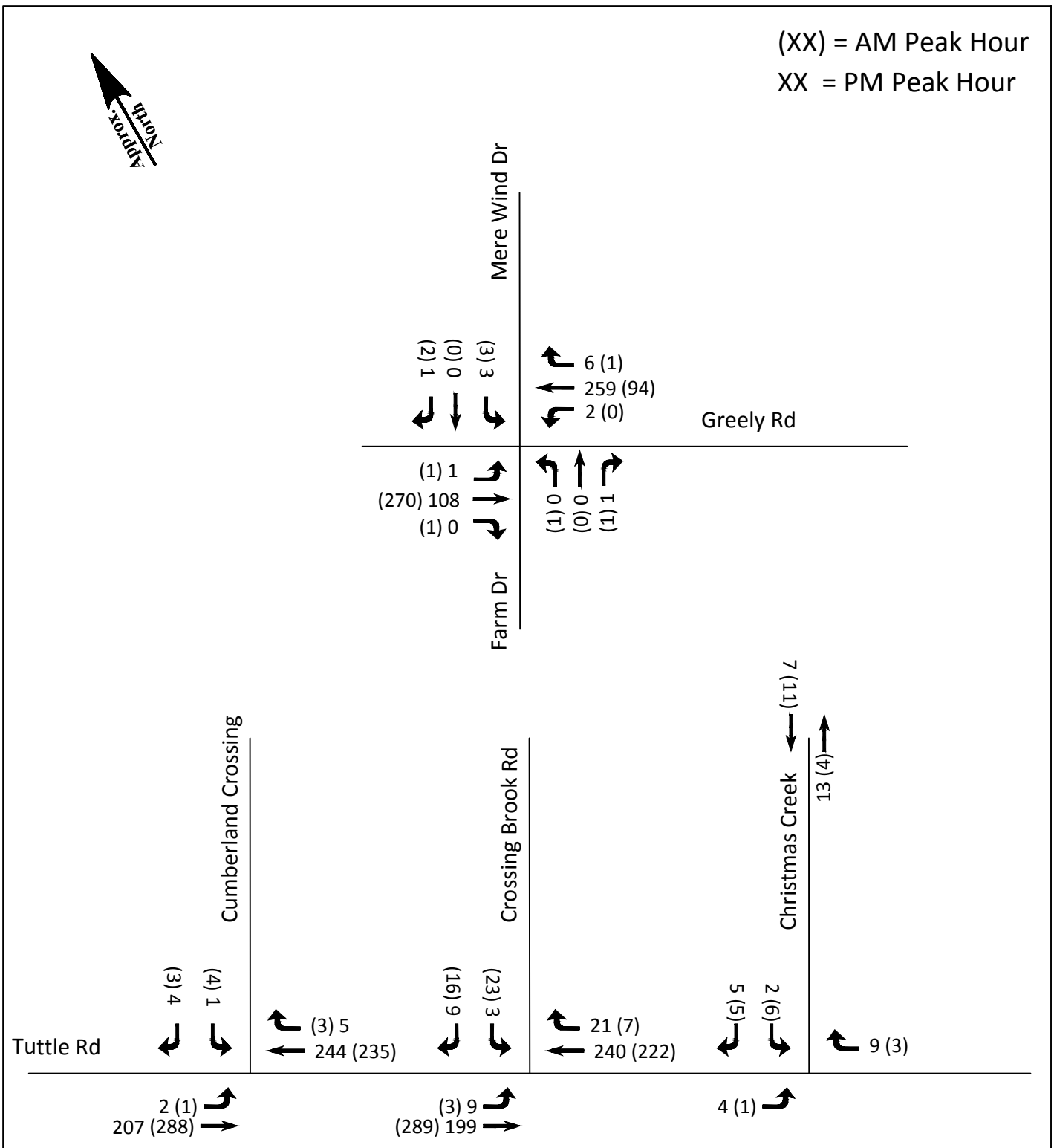


Figure 4

Projected 2025 No Build Volumes
Cumberland Crossing
Cumberland, Maine

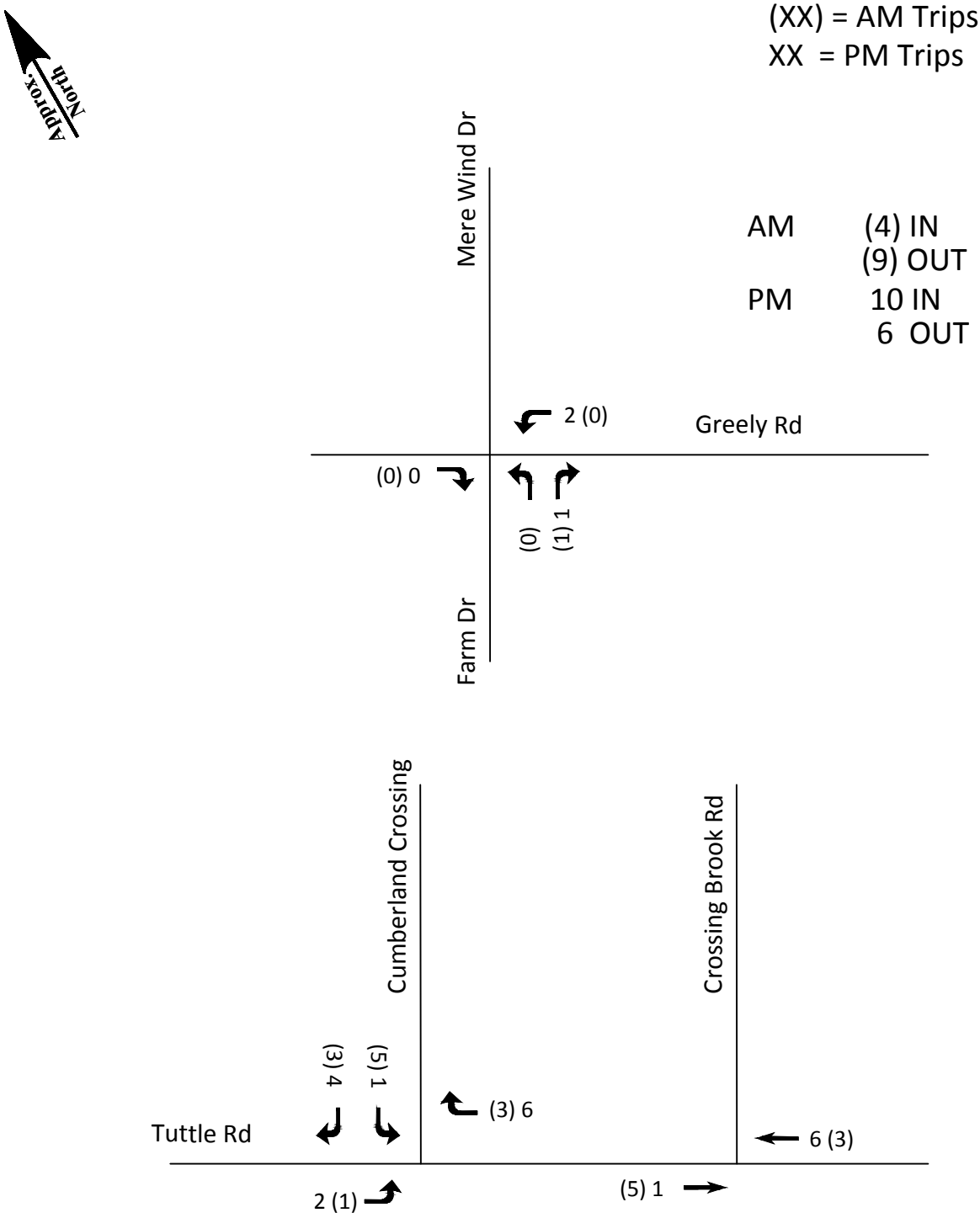


Figure 5

Trip Assignments
Cumberland Crossing, Phase 2
Cumberland, Maine

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(XX) = AM Peak Hour

XX = PM Peak Hour

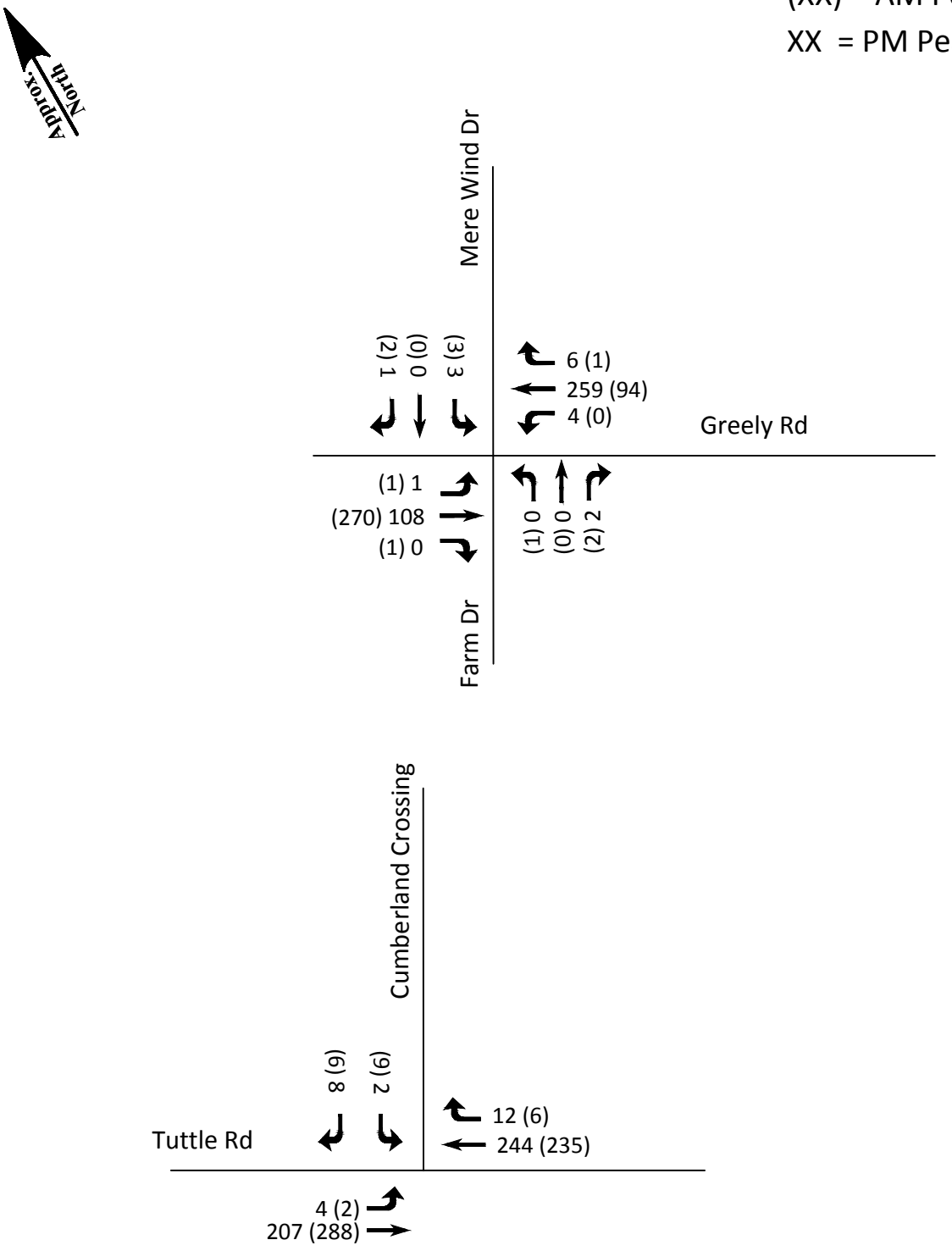


Figure 6

Projected 2025 Build Volumes
Cumberland Crossing, Phase 2
Cumberland, Maine

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APPENDIX

Turning Movement Counts

Capacity Analysis

Accident Data

Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

Title: Tuttle Road & Crossing Brook Rd
Town: Cumberland
Counter: JAM
Weather: Sun & Clouds

File Name : CumberTuttleCB2018AM
Site Code : 12342112
Start Date : 12/6/2018
Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Crossing Brook Rd From North					Tuttle Road From East					From South					Tuttle Road From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int Total
07:00 AM	0	0	1	0	1	0	20	0	0	20	0	0	0	0	0	0	30	0	0	30	51
07:15 AM	3	0	7	0	10	0	29	0	0	29	0	0	0	0	0	0	49	0	0	49	88
07:30 AM	4	0	8	0	12	2	65	0	0	67	0	0	0	0	0	0	61	0	0	61	140
07:45 AM	2	0	3	0	5	1	72	0	0	73	0	0	0	0	0	0	68	1	0	69	147
Total	9	0	19	0	28	3	186	0	0	189	0	0	0	0	0	0	208	1	0	209	426
08:00 AM	4	0	9	0	13	2	32	0	0	34	0	0	0	0	0	0	45	0	0	45	92
08:15 AM	4	0	1	0	5	1	29	0	0	30	0	0	0	1	1	0	72	2	0	74	110
08:30 AM	2	0	6	0	8	0	27	0	0	27	0	0	0	0	0	0	59	2	0	61	96
08:45 AM	2	0	3	0	5	2	24	0	0	26	0	0	0	0	0	0	50	2	0	52	83
Total	12	0	19	0	31	5	112	0	0	117	0	0	0	1	1	0	226	6	0	232	381
Grand Total	21	0	38	0	59	8	298	0	0	306	0	0	0	1	1	0	434	7	0	441	807
Apprch %	35.6	0	64.4	0		2.6	97.4	0	0		0	0	0	100		0	98.4	1.6	0		
Total %	2.6	0	4.7	0	7.3	1	36.9	0	0	37.9	0	0	0	0.1	0.1	0	53.8	0.9	0	54.6	
Passenger Vehicles	19	0	38	0	57	7	278	0	0	285	0	0	0	0	0	0	415	7	0	422	764
% Passenger Vehicles	90.5	0	100	0	96.6	87.5	93.3	0	0	93.1	0	0	0	0	0	0	95.6	100	0	95.7	94.7
Light Trucks	2	0	0	0	2	1	19	0	0	20	0	0	0	1	1	0	19	0	0	19	42
% Light Trucks	9.5	0	0	0	3.4	12.5	6.4	0	0	6.5	0	0	0	100	100	0	4.4	0	0	4.3	5.2
Heavy Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Heavy Trucks	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0.1

Gr. I .95 / .85 = 1.118

Maine Traffic Resources

25 Vine Street
Gardiner, Maine 04345
www.mainetrafficresources.com

Title: Tuttle & Crossing Brook Roads
Town: Cumberland
Counter: JAM
Weather: Cloudy

File Name : CumberTuttleCBR2018PM
Site Code : 12342111
Start Date : 11/29/2018
Page No : 1

Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Crossing Brook Rd From North					Tuttle Road From East					From South					Tuttle Road From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int Total
03:00 PM	1	0	2	0	3	4	50	0	0	54	0	0	0	1	1	0	27	1	0	28	86
03:15 PM	0	0	1	0	1	1	43	0	1	45	0	0	0	0	0	0	46	1	0	47	93
03:30 PM	1	0	5	0	6	2	30	0	0	32	0	0	0	0	0	0	60	3	0	63	101
03:45 PM	0	0	2	0	2	1	36	0	0	37	0	0	0	0	0	0	42	0	1	43	82
Total	2	0	10	0	12	8	159	0	1	168	0	0	0	1	1	0	175	5	1	181	362
04:00 PM	2	0	0	0	2	5	53	0	0	58	0	0	0	0	0	0	35	1	0	36	96
04:15 PM	3	0	2	0	5	6	44	0	0	50	0	0	0	0	0	0	61	2	0	63	118
04:30 PM	0	0	1	1	2	4	57	0	0	61	0	0	0	0	0	0	38	1	0	39	102
04:45 PM	3	0	0	0	3	4	47	0	0	51	0	0	0	0	0	0	42	4	0	46	100
Total	8	0	3	1	12	19	201	0	0	220	0	0	0	0	0	0	176	8	0	184	416
05:00 PM	2	0	3	0	5	8	49	0	0	57	0	0	0	0	0	0	28	1	0	29	91
05:15 PM	1	0	1	0	2	7	57	0	0	64	0	0	0	0	0	0	31	2	0	33	99
05:30 PM	1	0	1	0	2	3	41	0	0	44	0	0	0	0	0	0	27	4	1	32	78
05:45 PM	1	0	2	0	3	5	33	0	0	38	0	0	0	0	0	0	29	3	0	32	73
Total	5	0	7	0	12	23	180	0	0	203	0	0	0	0	0	0	115	10	1	126	341
Grand Total	15	0	20	1	36	50	540	0	1	591	0	0	0	1	1	0	466	23	2	491	1119
Apprch %	41.7	0	55.6	2.8		8.5	91.4	0	0.2		0	0	0	100		0	94.9	4.7	0.4		
Total %	1.3	0	1.8	0.1	3.2	4.5	48.3	0	0.1	52.8	0	0	0	0.1	0.1	0	41.6	2.1	0.2	43.9	
Passenger Vehicles	15	0	18	0	33	50	514	0	1	565	0	0	0	0	0	0	444	23	2	469	1067
% Passenger Vehicles	100	0	90	0	91.7	100	95.2	0	100	95.6	0	0	0	0	0	0	95.3	100	100	95.5	95.4
Light Trucks	0	0	2	1	3	0	26	0	0	26	0	0	0	1	1	0	22	0	0	22	52
% Light Trucks	0	0	10	100	8.3	0	4.8	0	0	4.4	0	0	0	100	100	0	4.7	0	0	4.5	4.6
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Gr. I = .92/.85 = 1.082

Growth rate 8.2% ↑

Maine Traffic Resources

40 Forest Falls Drive, Suite 2
Yarmouth, Maine 04096
www.mainetrafficresources.com

Title: Greely Road, Mere Wind & farm dr
Town: Cumberland
Counter: HH
Weather: Sunny

File Name : CumberlandGreelyMereWindFarm2019AM
Site Code : 11111111
Start Date : 10/24/2019
Page No : 1

Groups Printed- Passenger Cars - Light Trucks - Heavy Trucks

	Mere Wind Dr From North					Greely Road From East					farm dr From South					Greely Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	0	30	0	0	30	40
07:15 AM	1	0	0	1	2	0	19	0	0	19	0	0	0	0	0	0	43	0	0	43	64
07:30 AM	1	0	1	1	3	1	29	0	0	30	0	0	0	0	0	0	77	0	0	77	110
07:45 AM	1	0	1	0	2	0	15	0	0	15	0	0	0	1	1	0	71	1	0	72	90
Total	3	0	3	2	8	1	72	0	0	73	0	0	0	1	1	0	221	1	0	222	304
08:00 AM	0	0	1	0	1	0	22	0	0	22	0	0	0	0	0	0	45	0	0	45	68
08:15 AM	0	0	0	0	0	0	18	0	0	18	0	0	1	0	1	1	49	0	0	50	69
08:30 AM	0	0	2	0	2	3	27	0	0	30	0	0	0	0	0	0	36	0	0	36	68
08:45 AM	0	0	0	0	0	1	18	0	0	19	0	0	0	0	0	0	32	1	0	33	52
Total	0	0	3	0	3	4	85	0	0	89	0	0	1	0	1	1	162	1	0	164	257

Gr I = .92 / .85 = 1.082

Maine Traffic Resources

40 Forest Falls Drive, Suite 2
Yarmouth, Maine 04096
www.mainetrafficresources.com

Title: Greely Road, Mere Wind farm dr File Name : CumberlandGreelyMereWindFarmPM2019
Town: Cumberland Site Code : 12345678
Counter: HH Start Date : 10/24/2019
Weather: Sunnny Page No : 1

Groups Printed- Passenger Cars - Light Trucks - Heavy Trucks

	Mere Wind Dr From North					Greely Road From East					farm drive From South					Greely Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
03:00 PM	1	0	0	0	1	1	29	0	0	30	0	0	0	1	1	0	16	3	0	19	51
03:15 PM	0	0	2	0	2	1	27	0	0	28	0	0	0	0	0	0	30	0	0	30	60
03:30 PM	1	0	0	1	2	0	28	0	0	28	0	0	0	1	1	0	28	1	0	29	60
03:45 PM	0	0	0	0	0	1	32	0	0	33	0	0	0	0	0	0	27	0	0	27	60
Total	2	0	2	1	5	3	116	0	0	119	0	0	0	2	2	0	101	4	0	105	231
04:00 PM	2	0	2	1	5	1	40	0	0	41	0	0	1	1	2	0	19	0	0	19	67
04:15 PM	1	0	1	0	2	1	49	0	0	50	0	0	0	0	0	0	28	1	0	29	81
04:30 PM	0	0	0	0	0	2	45	0	0	47	0	0	0	0	0	0	20	1	0	21	68
04:45 PM	0	0	1	0	1	0	64	0	0	64	0	0	1	0	1	0	30	0	0	30	96
Total	3	0	4	1	8	4	198	0	0	202	0	0	2	1	3	0	97	2	0	99	312
05:00 PM	1	0	2	0	3	1	77	0	0	78	0	0	0	0	0	0	14	0	0	14	95
05:15 PM	0	0	0	0	0	3	46	0	0	49	0	0	0	0	0	0	33	0	0	33	82
05:30 PM	0	0	0	0	0	1	47	0	0	48	0	0	0	0	0	0	20	0	0	20	68
05:45 PM	1	0	1	0	2	2	56	0	0	58	0	0	0	0	0	0	21	0	0	21	81
Total	2	0	3	0	5	7	226	0	0	233	0	0	0	0	0	0	88	0	0	88	326
		0	3			S 234	0				0	0	1			0	97	0			
Survival	1	0	3			E 253	0				0	0	1			0	105	0			

Gr. $\frac{I}{}$ = .92/.85 = 1.082

4:45-5:45 P.M.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	288	235	3	4	3
Future Vol, veh/h	1	288	235	3	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	70	70
Heavy Vehicles, %	0	4	7	17	0	8
Mvmt Flow	1	384	313	4	6	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	317	0	-	0	701	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	4.1	-	-	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.372
Pot Cap-1 Maneuver	1255	-	-	-	408	712
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1255	-	-	-	408	712
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	691	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1255	-	-	-	499
HCM Lane V/C Ratio	0.001	-	-	-	0.02
HCM Control Delay (s)	7.9	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	207	244	6	1	4
Future Vol, veh/h	2	207	244	6	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	90	90	60	60
Heavy Vehicles, %	0	3	4	0	0	0
Mvmt Flow	3	276	271	7	2	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	278	0	-	0	557	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	282	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1296	-	-	-	495	769
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1296	-	-	-	494	769
Mov Cap-2 Maneuver	-	-	-	-	494	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1296	-	-	-	692
HCM Lane V/C Ratio	0.002	-	-	-	0.012
HCM Control Delay (s)	7.8	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	288	235	6	9	6
Future Vol, veh/h	2	288	235	6	9	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	70	70
Heavy Vehicles, %	0	4	7	17	0	8
Mvmt Flow	3	384	313	8	13	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	321	0	-	0	707	317
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.1	-	-	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.372
Pot Cap-1 Maneuver	1250	-	-	-	405	710
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1250	-	-	-	404	710
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1250	-	-	-	488
HCM Lane V/C Ratio	0.002	-	-	-	0.044
HCM Control Delay (s)	7.9	0	-	-	12.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	207	244	12	2	8
Future Vol, veh/h	4	207	244	12	2	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	90	90	60	60
Heavy Vehicles, %	0	4	7	17	0	8
Mvmt Flow	5	276	271	13	3	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	284	0	-	0	564	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	4.1	-	-	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.372
Pot Cap-1 Maneuver	1290	-	-	-	490	747
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1290	-	-	-	488	747
Mov Cap-2 Maneuver	-	-	-	-	488	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1290	-	-	-	675
HCM Lane V/C Ratio	0.004	-	-	-	0.025
HCM Control Delay (s)	7.8	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	270	0	0	94	1	1
Future Vol, veh/h	270	0	0	94	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	70	70	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	338	0	0	134	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	338	0	472	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1221	-	551	704
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1221	-	551	704
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	892	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	618	-	-	1221	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s)	10.9	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	108	1	2	259	0	1
Future Vol, veh/h	108	1	2	259	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	1	3	324	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	136	0	466	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	330	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1448	-	555	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1448	-	553	913
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1448	-
HCM Lane V/C Ratio	0.002	-	-	0.002	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	270	0	0	94	1	2
Future Vol, veh/h	270	0	0	94	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	70	70	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	338	0	0	134	2	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	338	0	472	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1221	-	551	704
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1221	-	551	704
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	892	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	644	-	-	1221	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	10.6	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	108	1	4	259	0	2
Future Vol, veh/h	108	1	4	259	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	1	5	324	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	136	0	470	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1448	-	552	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1448	-	550	913
Mov Cap-2 Maneuver	-	-	-	-	550	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1448	-
HCM Lane V/C Ratio	0.004	-	-	0.003	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☐ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Cumberland: Tuttle Rd between Main St (node 15581) and Middle Rd (node 12388), and Greely Rd between Main St (node 14685) to Middle Rd (node 11926)

REPORT PARAMETERS

Year 2016, Start Month 1 through Year 2018 End Month: 12

Route: **0500392**	Start Node: **15581**	Start Offset: **0**	☐ Exclude First Node
	End Node: **12388**	End Offset: **0**	☐ Exclude Last Node
Route: **0500314**	Start Node: **14685**	Start Offset: **0**	☐ Exclude First Node
	End Node: **11926**	End Offset: **0**	☐ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF	
13974	0500392 - 4.47	Int of CROSSING BROOK RD TUTTLE RD	1	0	0	0	0	0	0	0.0	1.552	0.00	0.58	0.00	
												Statewide Crash Rate:	0.18		
11864	0500392 - 5.24	Int of HARRIS RD TUTTLE RD	1	0	0	0	0	0	0	0.0	1.526	0.00	0.58	0.00	
												Statewide Crash Rate:	0.18		
9926	0500392 - 3.75	Int of CUMBERLAND COM RED MILL WY TUTTLE RD	1	2	0	0	0	2	0	100.0	1.411	0.47	0.59	0.00	0.80
												Statewide Crash Rate:	0.18		
11843	0500392 - 3.58	Int of BROADMOOR DR TUTTLE RD	1	0	0	0	0	0	0	0.0	1.872	0.00	0.55	0.00	
												Statewide Crash Rate:	0.18		
11867	0500392 - 3.98	Int of DROWNE RD, TUTTLE RD	1	0	0	0	0	0	0	0.0	1.399	0.00	0.59	0.00	
												Statewide Crash Rate:	0.18		
12388	0500392 - 6.57	Int of MIDDLE RD, TUTTLE RD	1	6	0	0	1	3	2	66.7	2.143	0.93	0.53	1.75	-
												Statewide Crash Rate:	0.18		
18401	0500392 - 6.49	Int of FRIAR LN TUTTLE RD	1	0	0	0	0	0	0	0.0	1.271	0.00	0.61	0.00	
												Statewide Crash Rate:	0.18		
11868	0500392 - 3.52	Int of MEADOWVIEW RD TUTTLE RD	1	0	0	0	0	0	0	0.0	1.908	0.00	0.55	0.00	
												Statewide Crash Rate:	0.18		
15581	0500392 - 3.33	Int of BLANCHARD RD MAIN ST TUTTLE RD	9	5	0	0	0	1	4	20.0	4.557	0.37	1.29	0.00	0.29
												Statewide Crash Rate:	0.73		
11841	0500392 - 3.65	Int of CAMPUS DR TUTTLE RD WILLOW LN	1	0	0	0	0	0	0	0.0	1.611	0.00	0.57	0.00	
												Statewide Crash Rate:	0.18		
18279	0500392 - 3.85	Int of CUMBERLAND COM TUTTLE RD	1	0	0	0	0	0	0	0.0	1.290	0.00	0.61	0.00	
												Statewide Crash Rate:	0.18		
64679	0500392 - 5.66	Int of FLINTLOCK DR TUTTLE RD	1	0	0	0	0	0	0	0.0	1.299	0.00	0.61	0.00	
												Statewide Crash Rate:	0.18		
64666	0500392 - 5.59	Int of CHETS WY TUTTLE RD	1	0	0	0	0	0	0	0.0	1.417	0.00	0.59	0.00	
												Statewide Crash Rate:	0.18		
73668	0500392 - 3.50	Int of MSAD51 BLVD TUTTLE RD	1	0	0	0	0	0	0	0.0	0.951	0.00	0.65	0.00	
												Statewide Crash Rate:	0.18		
11873	0500314 - 3.06	Non-Int GREELY RD	1	0	0	0	0	0	0	0.0	0.415	0.00	0.56	0.00	
												Statewide Crash Rate:	0.13		
11877	0500314 - 2.64	Non-Int GREELY RD	1	0	0	0	0	0	0	0.0	0.415	0.00	0.56	0.00	
												Statewide Crash Rate:	0.13		
11930	0500314 - 3.86	Non-Int GREELY RD	1	0	0	0	0	0	0	0.0	0.378	0.00	0.56	0.00	
												Statewide Crash Rate:	0.13		
11878	0500314 - 2.06	TL Cumberland North Yarmouth	1	0	0	0	0	0	0	0.0	0.940	0.00	0.51	0.00	
												Statewide Crash Rate:	0.13		
14685	0500314 - 1.44	TL Cumberland North Yarmouth Int of CUMBERLAND RD	1	1	0	0	0	0	1	0.0	2.492	0.13	0.40	0.00	0.33
												Statewide Crash Rate:	0.13		
11879	0500314 - 1.87	Int of BROOKSIDE DR, GREELY RD	1	0	0	0	0	0	0	0.0	0.867	0.00	0.51	0.00	
												Statewide Crash Rate:	0.13		
11926	0500314 - 4.64	Int of GREELY RD, MIDDLE RD	1	0	0	0	0	0	0	0.0	1.445	0.00	0.46	0.00	
												Statewide Crash Rate:	0.13		
11927	0500314 - 4.09	Non-Int GREELY RD	1	0	0	0	0	0	0	0.0	0.378	0.00	0.56	0.00	
												Statewide Crash Rate:	0.13		

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
14878	0500314 - 1.54	Non Int GREELY RD	1	0	0	0	0	0	0	0.0	0.449	0.00 Statewide Crash Rate: 0.13	0.56	0.00
12588	0500314 - 1.60	Int of GREELY RD, SHADY RUN LN	1	0	0	0	0	0	0	0.0	0.927	0.00 Statewide Crash Rate: 0.13	0.51	0.00
9924	0500314 - 4.16	Int of EDES RD, GREELY RD	1	0	0	0	0	0	0	0.0	0.770	0.00 Statewide Crash Rate: 0.13	0.52	0.00
18005	0500314 - 1.63	Int of GREELY RD VAL HALLA RD	1	0	0	0	0	0	0	0.0	0.992	0.00 Statewide Crash Rate: 0.13	0.50	0.00
11933	0500314 - 3.43	Int of GREELY RD HILLSIDE AV	1	0	0	0	0	0	0	0.0	0.922	0.00 Statewide Crash Rate: 0.13	0.51	0.00
59701	0500314 - 1.46	TL Cumberland North Yarmouth	1	0	0	0	0	0	0	0.0	1.031	0.00 Statewide Crash Rate: 0.13	0.50	0.00
63676	0500314 - 2.07	Non-Int GREELY RD	1	0	0	0	0	0	0	0.0	0.419	0.00 Statewide Crash Rate: 0.13	0.56	0.00
59309	0500314 - 2.54	Int of GREELY RD, MERE WIND DR	1	0	0	0	0	0	0	0.0	0.851	0.00 Statewide Crash Rate: 0.13	0.52	0.00
Study Years: 3.00		**NODE TOTALS:**		14	0	0	1	6	7	50.0	37.898	0.12	0.34	0.36

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF	
73668	15581	4767100	0 - 0.17	0500392 - 3.33	0.17	1	0	0	0	0	0	0	0.0	0.00323	0.00	564.53	0.00	
Int of MSAD51 BLVD TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11868	73668	4768010	0 - 0.02	0500392 - 3.50	0.02	1	0	0	0	0	0	0	0.0	0.00038	0.00	928.36	0.00	
Int of MEADOWVIEW RD TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11843	11868	3120299	0 - 0.06	0500392 - 3.52	0.06	1	0	0	0	0	0	0	0.0	0.00112	0.00	740.67	0.00	
Int of BROADMOOR DR TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11841	11843	3106112	0 - 0.07	0500392 - 3.58	0.07	1	0	0	0	0	0	0	0.0	0.00129	0.00	715.55	0.00	
Int of CAMPUS DR TUTTLE RD WILLOW LN				RD INV 05 00392											Statewide Crash Rate: 224.36			
9926	11841	3099468	0 - 0.10	0500392 - 3.65	0.10	1	2	0	0	0	0	2	0.0	0.00134	498.22	708.80	0.00	0.70
Int of CUMBERLAND COM RED MILL WY TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
9926	18279	183233	0 - 0.10	0500392 - 3.75	0.10	1	0	0	0	0	0	0	0.0	0.00129	0.00	715.21	0.00	
Int of CUMBERLAND COM RED MILL WY TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11867	18279	3123912	0 - 0.13	0500392 - 3.85	0.13	1	0	0	0	0	0	0	0.0	0.00164	0.00	672.99	0.00	
Int of DROWNE RD, TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11867	13974	3106113	0 - 0.49	0500392 - 3.98	0.49	1	2	0	0	0	0	2	0.0	0.00723	92.15	463.23	0.00	0.20
Int of DROWNE RD, TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11864	13974	3117654	0 - 0.77	0500392 - 4.47	0.77	1	1	0	0	0	0	1	0.0	0.01123	29.70	419.78	0.00	0.07
Int of HARRIS RD TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
11864	64666	3139698	0 - 0.35	0500392 - 5.24	0.35	1	4	0	0	0	0	4	0.0	0.00517	258.02	502.00	0.00	0.51
Int of HARRIS RD TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
64666	64679	3116350	0 - 0.07	0500392 - 5.59	0.07	1	0	0	0	0	0	0	0.0	0.00094	0.00	772.80	0.00	
Int of CHETS WY TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
64679	18401	3116351	0 - 0.83	0500392 - 5.66	0.83	1	6	0	0	0	0	6	0.0	0.01014	197.30	429.18	0.00	0.46
Int of FLINTLOCK DR TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
12388	18401	3099790	0 - 0.08	0500392 - 6.49	0.08	1	0	0	0	0	0	0	0.0	0.00100	0.00	762.95	0.00	
Int of MIDDLE RD, TUTTLE RD				RD INV 05 00392											Statewide Crash Rate: 224.36			
14685	59701	3506465	0 - 0.02	0500314 - 1.44	0.02	1	0	0	0	0	0	0	0.0	0.00013	0.00	961.47	0.00	
TL Cumberland North Yarmouth Int of CUMBERLAND RD GREELEY ROAD EXT GREELY				RD INV 05 00314											Statewide Crash Rate: 238.48			
59701	14878	3506491	0 - 0.08	0500314 - 1.46	0.08	1	0	0	0	0	0	0	0.0	0.00072	0.00	863.56	0.00	
TL Cumberland North Yarmouth				RD INV 05 00314											Statewide Crash Rate: 238.48			
12588	14878	186958	0 - 0.06	0500314 - 1.54	0.06	1	0	0	0	0	0	0	0.0	0.00054	0.00	918.78	0.00	
Int of GREELY RD, SHADY RUN LN				RD INV 05 00314											Statewide Crash Rate: 238.48			
12588	18005	186959	0 - 0.03	0500314 - 1.60	0.03	1	0	0	0	0	0	0	0.0	0.00027	0.00	1018.13	0.00	
Int of GREELY RD, SHADY RUN LN				RD INV 05 00314											Statewide Crash Rate: 238.48			
11879	18005	186032	0 - 0.24	0500314 - 1.63	0.24	1	1	0	0	0	1	0	100.0	0.00202	165.01	666.98	0.00	0.25
Int of BROOKSIDE DR, GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF	
11878	11879	186030	0 - 0.19	0500314 - 1.87	0.19	1	0	0	0	0	0	0	0.0	0.00163	0.00	705.45	0.00	
TL Cumberland North Yarmouth				RD INV 05 00314											Statewide Crash Rate: 238.48			
63676	11878	2670752	0 - 0.01	0500314 - 2.06	0.01	1	0	0	0	0	0	0	0.0	0.00008	0.00	758.91	0.00	
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
59309	63676	2750946	0 - 0.47	0500314 - 2.07	0.47	1	3	0	0	0	0	3	0.0	0.00394	253.77	562.06	0.00	0.45
Int of GREELY RD, MERE WIND DR				RD INV 05 00314											Statewide Crash Rate: 238.48			
11877	59309	2027723	0 - 0.10	0500314 - 2.54	0.10	1	0	0	0	0	0	0	0.0	0.00083	0.00	834.80	0.00	
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
11873	11877	2027764	0 - 0.42	0500314 - 2.64	0.42	1	1	0	0	0	0	1	0.0	0.00349	95.58	579.60	0.00	0.17
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
11873	11933	186021	0 - 0.37	0500314 - 3.06	0.37	1	1	0	0	0	0	1	0.0	0.00307	108.49	598.59	0.00	0.18
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
11930	11933	186114	0 - 0.43	0500314 - 3.43	0.43	1	2	0	0	0	0	2	0.0	0.00325	205.20	590.12	0.00	0.35
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
11927	11930	2027773	0 - 0.23	0500314 - 3.86	0.23	1	1	0	0	1	0	0	100.0	0.00174	191.82	693.53	0.00	0.28
Non-Int GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
9924	11927	183229	0 - 0.07	0500314 - 4.09	0.07	1	0	0	0	0	0	0	0.0	0.00053	0.00	922.04	0.00	
Int of EDES RD, GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
9924	11926	183228	0 - 0.48	0500314 - 4.16	0.48	1	1	0	0	1	0	0	100.0	0.00361	92.45	574.75	0.00	0.16
Int of EDES RD, GREELY RD				RD INV 05 00314											Statewide Crash Rate: 238.48			
Study Years: 3.00				**Section Totals:**	6.44		25	0	0	2	1	22	12.0	0.07184	116.00	311.17	0.37	
				Grand Totals:	6.44		39	0	0	3	7	29	25.6	0.07184	180.97	345.72	0.52	

Exhibit 12

FEMA Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LiMWA)**. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 19. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography. Basemap files were provided in digital form by State of Maine, Maine Office of GIS (MeGIS). Ortho imagery was produced at a scale of 1:600 and is dated August 2012. The projection used in the preparation of this map is Maine State Plane West (FIPSZONE 1802). The horizontal datum is NAD 83, GRS1980 spheroid.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

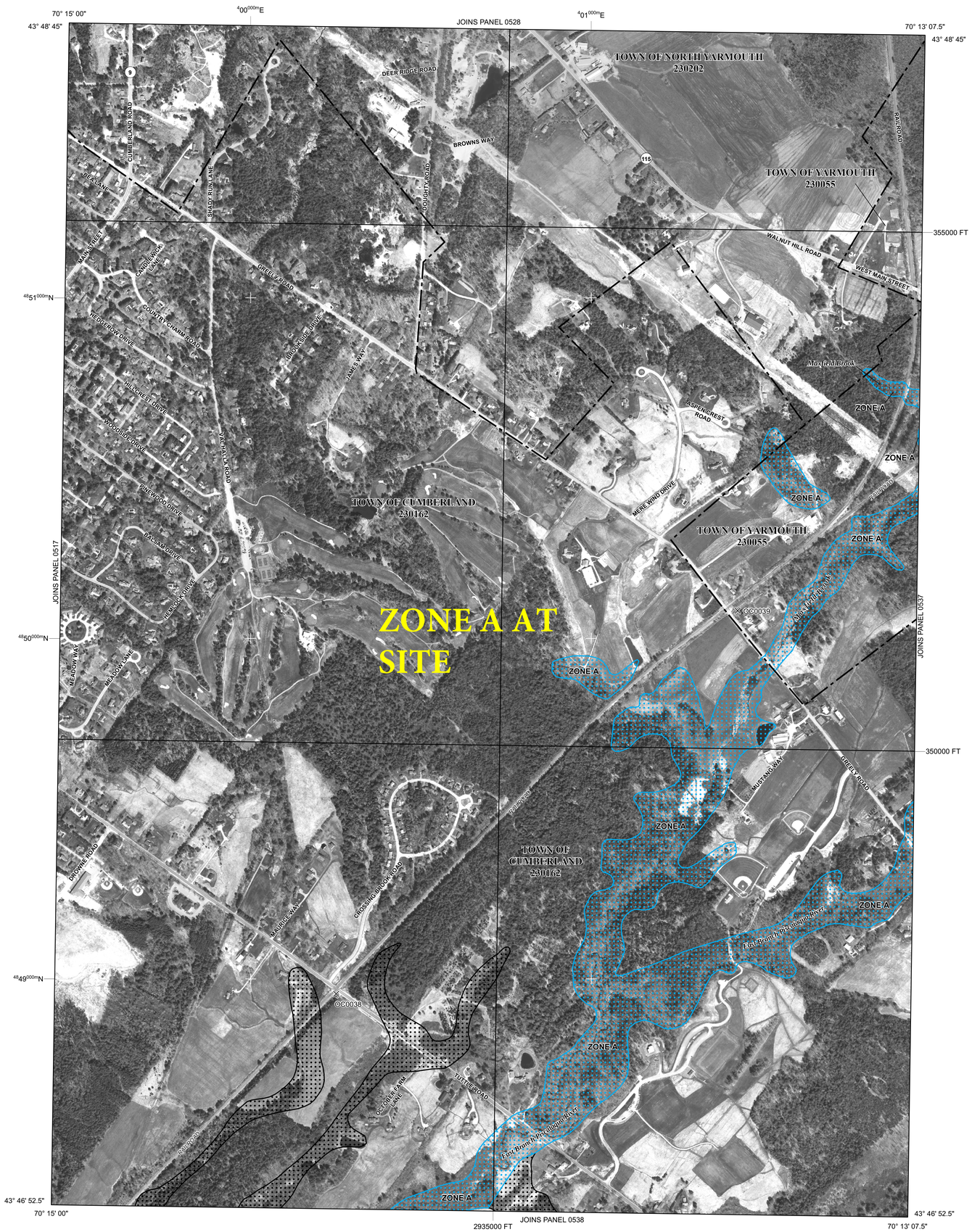
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

State of Maine Floodway Note: Under the Maine Revised Statutes Annotated (M.R.S.A.) Title 38 § 439-A, 7C where the floodway is not designated on the Flood Insurance Rate Map, the floodway is considered to be the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain, unless a technical evaluation certified by a registered professional engineer is provided demonstrating the actual floodway based upon approved FEMA modeling methods.

Only coastal structures that are certified to provide protection from the 1-percent-annual chance flood are shown on this panel. However, all structures taken into consideration for the purpose of coastal flood hazard analysis and mapping are present in the DFIRM database in S_Gen_Struct.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- Limit of Moderate Wave Action
- Limit of Moderate Wave Action coincident with Zone Break
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 3100000 FT — 5000-foot ticks: Maine State Plane West Zone (FIPS Zone 1802), Transverse Mercator projection
- 4889000mN — 1000-meter Universal Transverse Mercator grid values, zone 19
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0536F

FIRM

FLOOD INSURANCE RATE MAP

CUMBERLAND COUNTY, MAINE
(ALL JURISDICTIONS)

PANEL 536 OF 862
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CUMBERLAND, TOWN OF	230162	0536	F
NORTH YARMOUTH, TOWN OF	230202	0536	F
YARMOUTH, TOWN OF	230055	0536	F

PRELIMINARY
NOVEMBER 5, 2013

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
23005C0536F
EFFECTIVE DATE

Federal Emergency Management Agency

EXHIBIT 12.1

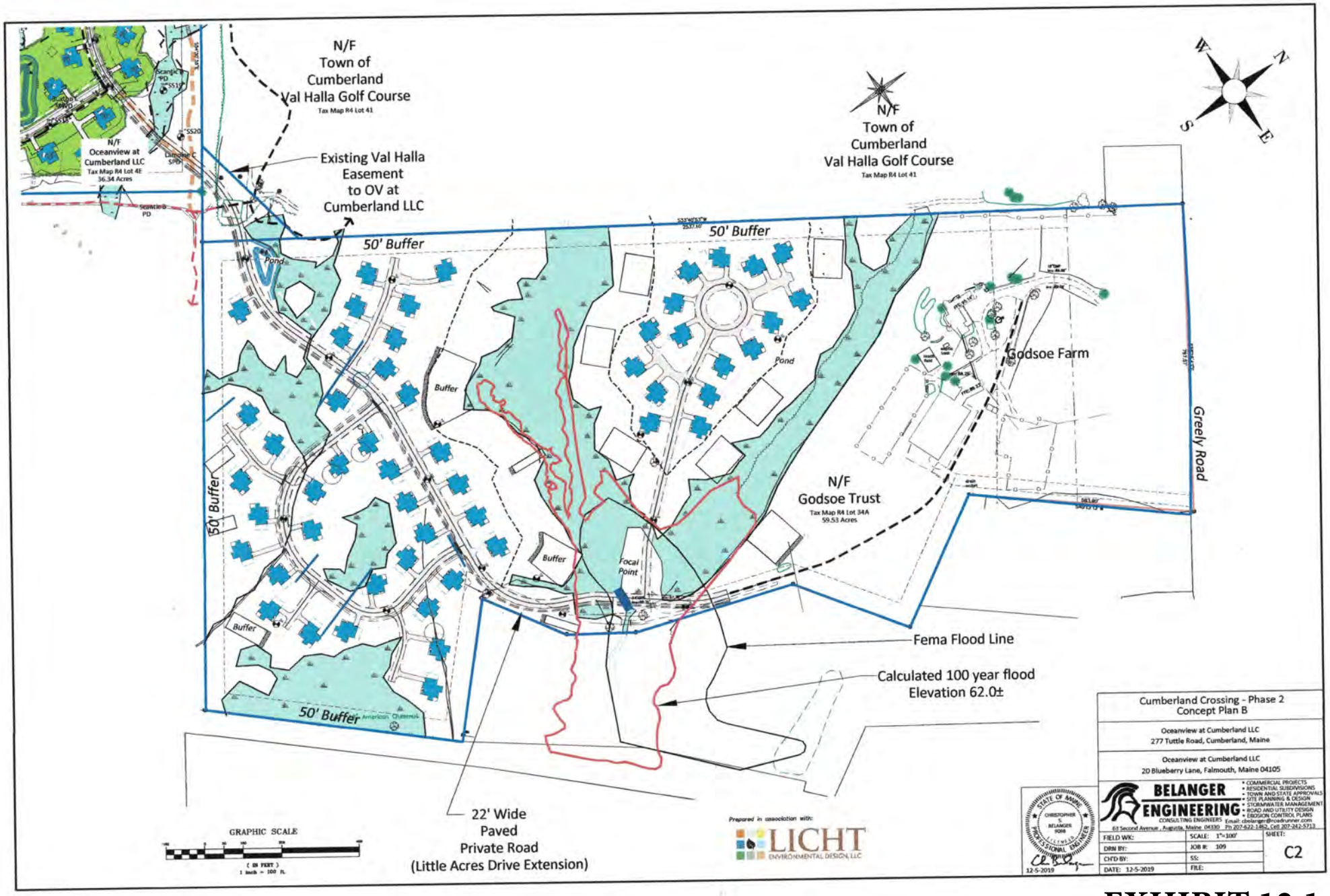


EXHIBIT 12.1
PROPOSED FEMA 100 YEAR ZONE A



PRELIMINARY

N/F
Town of Cumberland
3970/169

State of Maine, Cumberland, ss
Registry of Deeds
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at ____m____M and recorded in
Plan Book _____ Page ____
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Register

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Rex J. Croteau, P.L.S. #2273

Approved by the Town of Cumberland Planning Board dated _____

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- Iron marker – found
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- Property line (abutter)
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- Guy wire
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RR1 and Senior Housing Community Overlay District
Shoreland-Stream Protection Overlay

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4) Subdivision Plan Oceanview at Cumberland made for Ocean View at Cumberland LLC dated December 26, 2017 and revised through July 31, 2018 as recorded in Plan Book 218, Page 411.

AREA

Phase 1 (approved) = 37.09 acres
Phase 2 = 59.59 acres + 0.72 acre Town/Val Halla Easement = 60.31 acres
Total Phase 1 + 2 = 97.40 acres

OWNERS OF RECORD

Ocean View at Cumberland, LLC
Book 35246, Page 97

SCALE IN FEET
50 0 50 100
1" = 50'

PLAN OF

Subdivision Plat Cumberland Crossing Phase II

228 Greely Road — Cumberland, Maine

MADE FOR

Ocean View at Cumberland, LLC

20 Blueberry Lane — Falmouth, Maine

JOB #89076.1	DATE: December 18, 2019	SCALE: 1" = 50'
BOOK #898,904		
89076_Subdivision Plat.dwg		

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

SITE DATA TABLE

ZONING	RR1 AND SENIOR HOUSING COMMUNITY (SHC) OVERLAY DISTRICT AND S.Z. STREAM PROTECTION DISTRICT	
STANDARD	REQUIRED SHC	PROVIDED
MIN. LOT AREA (AC)	5 AC	59.59 (1)
MIN. FRONTAGE (FT)	0	797.5
SETBACKS:		
A. EDGE PAVED ROAD	25	25+
B. BETWEEN STRUCTURES	20	20+
C. DEVELOPMENT PROPERTY LINE	30	50 MIN.(2)
MAXIMUM DENSITY (LAND AREA/UNIT)	10,000	49,893
MAX. ALLOWABLE UNITS	259	52
OPEN SPACE	20% (11.9 AC.)	68% (41 AC.)
MAX. STRUCTURE HEIGHT (FT.)	40	40 (3.)
PERIMETER BUFFER (FT.)	50	50 (2.)

NOTES:

1. TOWN/GOLF COURSE ACCESS/UTIL. EASEMENT = 0.72 ACRES.
   TOTAL PHASE 2 AREA = 60.31 ACRES.
   PHASE 1 (37.09 AC.) + PHASE 2 = 97.40 ACRES.
2. BUFFER < 50 FEET AT STREAM CROSSING AREA BELOW FARM PER SHC ORDINANCE WITH PLANNING BOARD APPROVAL.
3. TYPICAL COTTAGE HEIGHTS ARE 23 FEET+/-. NO BUILDING SHALL EXCEED 40 FT.

PRELIMINARY

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Register

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PHASE II SUBDIVISION PLAT NOTES

1) This project is being proposed as Phase 2 of the 2018 approved Cumberland Crossing (f.k.a. Oceanview at Cumberland) Phase 1 Senior Housing Community permitted under the town of Cumberland Land Use Ordinance Section 315–28.4.– Senior Housing Community (SHC) Overlay District. This Phase 2 project includes 52 cottage units, a community center and associated infrastructure. the project propos

2) Project lies within the RR1 Zoning District, Senior Housing Community (SHC) Overlay District and Shoreland Zoning Stream Protection District.

3) Wetlands mapping by Hampton Associates, spring, 2017 and located by GPS survey (Hampton Assoc. and Titcomb Assoc, Surveyors.)

4) Site topography and existing conditions from a field survey by Titcomb Associates, Surveyors with information supplemented from the State of Maine GIS digital ortho and lidar mapping as noted.

5) Project to be serviced by public water, private on–site low pressure sewer system discharging to the Portland Water District public sewerage system in Tuttle Road, natural gas and underground cable utilities.

6) All internal roadways shall remain private.

7) Cottage units and footprint styles and driveway locations are shown in the general locations intended to be constructed. however approval. Final locations and building types may vary slightly to fit field conditions.

8) There shall be no less than one parking space per unit per Ordinance Section 315–28.4.f.

9) Refer to site data table for setbacks and dimensional requirements.

10) This plat shall be recorded within 90 days of final subdivision approval and signing of the plat by the Town of Cumberland Planning Board, subject to the establishment of any performance guarantee.

11) Access & utility widths proposed over main roads:
   a. Little Acres Drive (LAD) extension – 50 feet.
   b. cross country extension from LAD to Greely Road –50 feet.
   c. Road 1 (loop road) – 50 feet
   d. Road 2 (culdesac) – 50 feet

12) DEP Meadow and Forested Buffers as shown shall be monumented or marked in the field using iron rods and plastic "Buffer Caps"or similar markings. Locations of forested buffer monuments shall be field determined at reasonable locations due to the irregular and large size of these buffers.

13) 100– foot Maine Department of Inland Fisheries & Wildlife (MDIFW) buffers are shown along stream associated wetlands excepting permitted areas of encroachment for roads and infrastructure as shown on this plan and the accompanying engineering plans. Some buffer areas are existing farmland and meadows and shall continue to be managed as meadows subject to any overlapping DEP Stormwater Meadow Easements as shown on the plans.

14) Street names to be submitted to and approved by the town assessor prior to final plan approval. Street signs to be provided by the developer in accordance with Town of Cumberland street standards for private streets.

15) Clearing limits shall be as shown on the plans as proposed treelines or as otherwise noted. All clearing limits shall be flagged in the field for review prior to cutting operations.

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Rex J. Croteau, P.L.S. #2273

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AREA

2,595,768 square feet / 59.59 acres

OWNERS OF RECORD

Ocean view at Cumberland, LLC
Book 35246, Page 97

PLAN OF

Subdivision Plat Cumberland Crossing Phase II

228 Greely Road — Cumberland, Maine

MADE FOR

Ocean View at Cumberland, LLC

20 Blueberry Lane — Falmouth, Maine

JOB #89076.1	DATE: December 18, 2019	SCALE: 1" = 50'
BOOK #898,904		
89076_Subdivision Plat.dwg		

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com



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Approved by the Town of Cumberland Planning Board

dated _____

_____ _____

_____ _____

_____ _____

_____ _____

LEGEND

- Monument – found
- Iron marker – found
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- Property line (abutter)
- Fence
- Edge of pavement
- Edge of gravel
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SCALE IN FEET

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1" = 50'

PLAN OF

Subdivision Plat Cumberland Crossing Phase II

228 Greely Road Cumberland, Maine

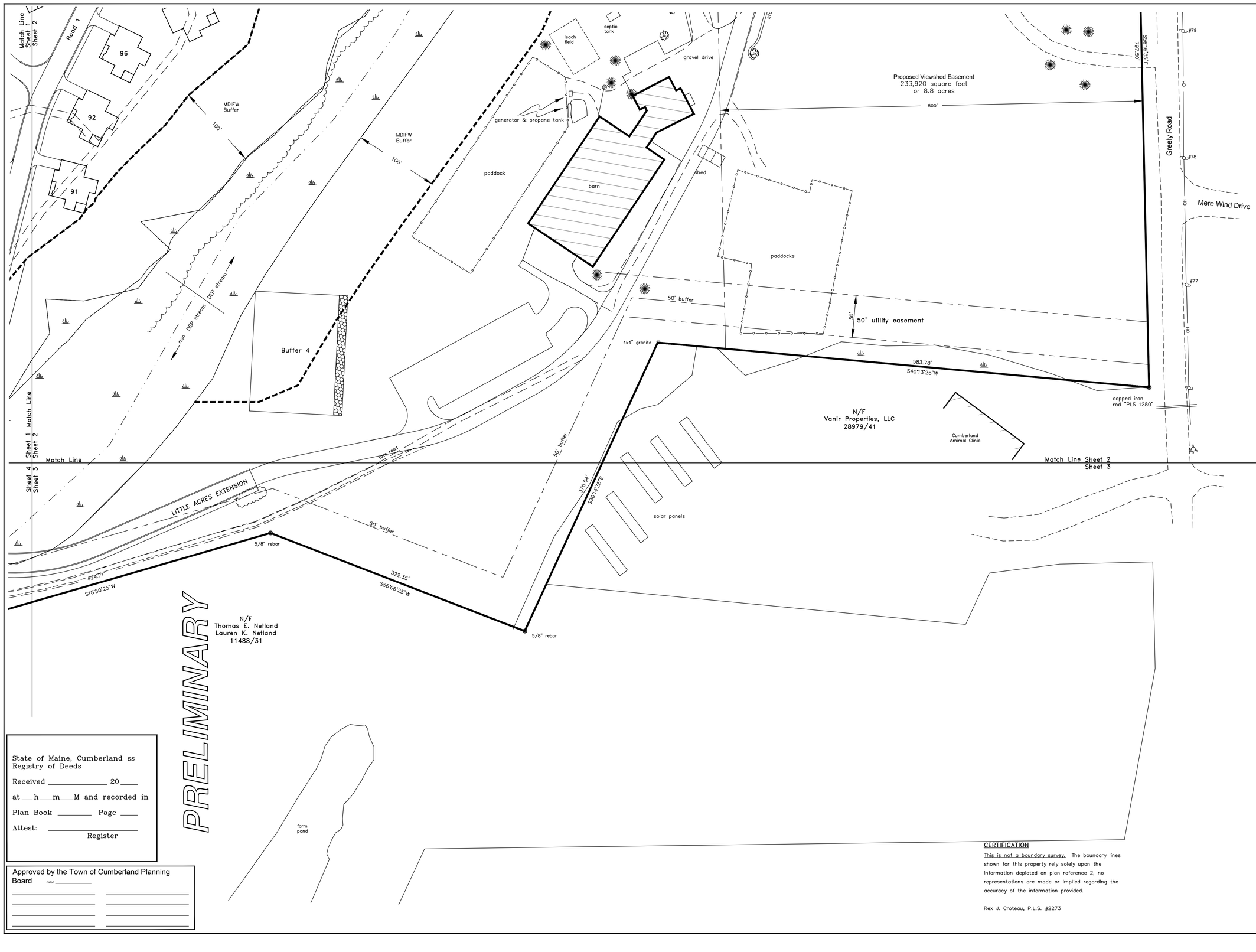
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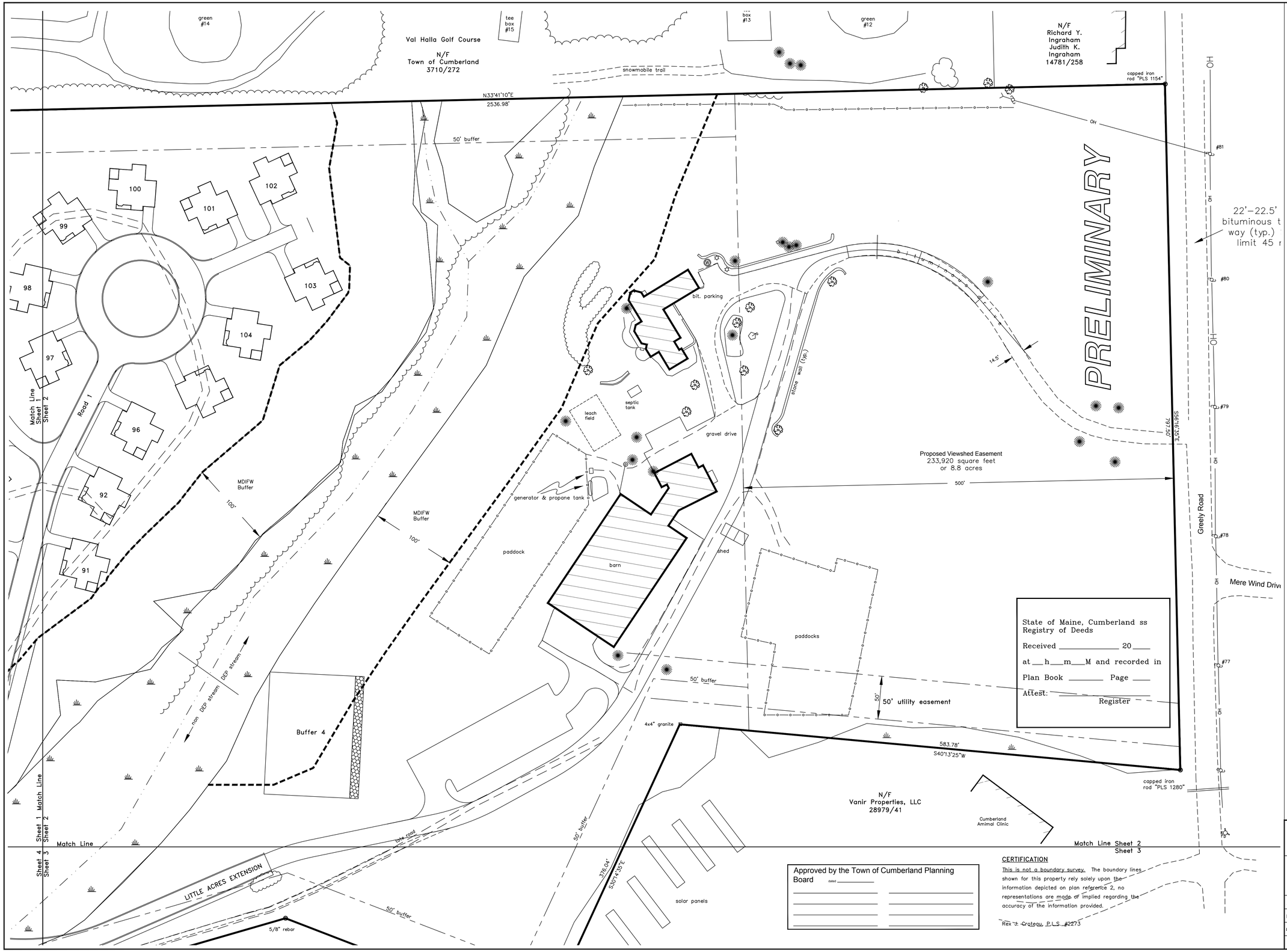
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BELANGER ENGINEERING
CONSULTING ENGINEERS

Maine DEP SLODA
Permit Application

STORMWATER MANAGEMENT REPORT

Project: Cumberland Crossing Phase 2
Greely Road, Cumberland, Maine

Prepared By:
Belanger Engineering
63 Second Avenue
Augusta, ME 04330
207-622-1462

Prepared For:
Seacoast Management Company
20 Blueberry Lane
Falmouth, Maine
207-233-4194 – Chris Wasileski



Date: December 18, 2019

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Stormwater Narrative – December 18, 2019
Cumberland Crossing – Phase 2 Godsoe Farm Expansion
Greely Road, Cumberland, Maine

Belanger Engineering has evaluated the proposed stormwater impacts resulting from the creation of a new residential Senior Housing Community located off Tuttle and Greely Roads in Cumberland. The property is shown on Town Tax Map R4 Lot 34A and is approximately 59.53 acres in size.

This approval will focus on the proposed development expansions located on Lot 34A (a.k.a. Godsoe parcel). In particular, the project creates 7.66 acres of new impervious area and 18.93 acres of new developed area. Approximately 3.91 acres of road, 0.88 acres of driveway, and 2.87 acres of building roof will be created. We expect to construct 52 residential cottages and community facilities to support them. An expansion of the Godsoe farm is also planned to support the project. We have modeled 0.71 acres of new impervious area to include parking around the barn and expansion of the access road to 20' wide per Town standards.

Project Location: The project is located off Tuttle and Greely Roads in Cumberland, Maine. The site is located across the street from the Cumberland Town Hall building.

DEP Jurisdiction: The proposed project includes the development of 18.93 acres of developed area and 7.66 acres of impervious area. The project does trigger the Site Law. The project is not within an urban impaired stream or a severely blooming lake. As a result, the Basic Standards, General Standards, and the Flooding Standard apply to this project. See Section 4A and 4B of the Chapter 500 Rules, pages 4&5.

Basic Standards
1. Erosion and sedimentation control plan – See Appendix A of Chapter 500 Rules
2. Inspection and Maintenance Plan – See Appendix A and B of Chapter 500 Rules
3. Housekeeping – See Appendix C of the Chapter 500 Rules

General Standards
1. Narrative
2. Drainage Plans
3. Calculations
4. Details, designs, and specifications for Underdrained vegetated filters, & Buffers.

Flooding Standards
1. Stormwater Management System must detain, retain, or result in infiltration of stormwater for the 2,10,25 storms such that the peak flows do not exceed "pre-development" conditions.

Surface water on or abutting the site: Runoff from the site drains southerly toward an existing 5'X6' Box Culvert under the railroad. Part of the farm area drains to an off site pond. The pond outlets and crosses the railroad. We have assumed a 24" outlet in this case. Runoff continues to drain toward Mill Brook and the Piscataquis River.

Alterations to Land Cover: The drainage study is conducted on the sites 59.53 acres. The existing ground cover is 100% woods and meadow in the cottage area. The Godsoe farm is open and has existing for many years. The proposed ground cover will result in approximately: 18% impervious, 17% lawn, and 65% woods and meadow.

Downstream ponds and Lakes: Runoff from the site drains to Mill Brook and the Piscataquis River. Enclosed is a U.S.G.S. Map showing the site location.

Historic Flooding: The property is fairly uniform with mildly irregular topography and typical slopes between 2 % and 18 %. The stream area may have localized flooding but is located within ravine areas and outside development areas. A portion of the site in the vicinity of the railroad and culvert crossings are shown as flood areas on the FEMA maps. We have calculated the 100 year flood elevations for the box culvert. We found the 100 year flood is at approximately elevation 62.0. See enclosed Firm Maps.

Alterations to natural drainage ways: Natural drainage ways will not be altered as a result of the proposed development. Pipe Arch's and Culverts will be installed to maintain current drainage flow patterns.

Proposed BMP's: Steep slopes will be rip rapped. Silt fence is shown at the bottom of all fill slopes, hay bale barriers and stone check dams will be used in ditches and/or around catch basins. BMP's proposed for this project are shown and described on the enclosed plans.

Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 12-18-2019						
					Existing	Existing
	Total	Total	Existing	Existing	Woods/Field	Developed
Subarea	Area	Area	Impervious	Lawn	Undeveloped	Area
	sf	acres	acres	acres	acres	acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

Proposed Conditions – Cumberland Crossing

The project will be accessed from Little Acres Drive and will extend a new road to the project area. The main access road is approximately 2257' long, 22' wide, curbed, and a 5' sidewalk will be installed on the right side. Several other spurs are located off this road. The spur roads will be 18' and 22' wide. The roads create 3.09 acres of impervious area.

The developer is proposing to construct 52 residential homes. We have assumed each house will have approximately 2400 s.f. (.055 ac.) of building footprint area including an optional garage. We have also assumed each driveway will be 24' by 32' (.017 acres) in area. This will accommodate a 2 bay garage option. Impervious area per cottage is .072 acres each based on the above assumptions. The driveways create 0.88 acres of impervious area. The cottages create 2.87 acres of impervious area. We have assumed the farm area will expand the road and parking and add 0.71 acres of impervious area.

The project creates 7.66 acres of impervious area and 18.93 acres of developed area. This is the basis of the general standards calculations below.

OV Cumberland Phase 2 Impervious Area Summary 12-18-2019								
Description	Road Length	New Impervious Area		New Lawn Area		New Developed Area		Comments
	feet	s.f.	acres	s.f.	acres	s.f.	acres	
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Road 1 - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Road 2 - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Road 3 - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Road 4 - Sta 90+00-Sta92+30	230	4140	0.10					18', no curb
Road 5 - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Road 6 - Sta 96+00-Sta98+00	200	3600	0.08					18' no curb
Road 1 Spurs (2)	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5566	333733	7.66	459874	10.56	824534	18.93	

General Standard Narrative and Selected BMP's:

The developer will utilize the following BMP's for stormwater treatment and storage.

1. Grassed Underdrained Soil Filter Pond (1) – Maine BMP's Chapter 7.
2. Roof Dripline BMP – Maine BMP's Chapter 7.5.
3. FocalPoint Proprietary Subsurface Treatment and Storage Systems.
4. Forested Buffers adjacent to development
5. Forested Buffers with Stone Bermed Level Lip Spreader

Filter Pond

One Pond will be developed to support the project. The pond has been sized to store 1" X the watershed impervious area and 0.4" X the watershed disturbed area. An outlet control structure and spillway has been implemented in the pond to provide emergency overflow as required. The outlet control structure will also be the gravel drain outlet. Runoff will discharge to the adjacent wetland.

Roof Dripline

Roof driplines with capture roof areas and drain them through foundation backfill and discharge to footing drains. The roof dripline will be 3' wide and 1.5' deep and will be installed in roof drainage areas. Once treated, 4" drain pipes will outlet into the street catch basins or can daylight in forested areas behind the buildings as conditions allow. The roof driplines will store 1" X roof areas utilizing 40% voids.

Focal Point Proprietary System

Along the main access road, **we will utilize focalpoint which is an approved proprietary stormwater treatment system at one location along Little Acres Drive Extension.** We have followed the sizing guidelines from the manufacturer and the Departments approval letter dated February 2, 2017. Utilizing the Chapter 500 Design Worksheet / Checklist enclosed, we have sized the focal point system based on the drainage area being captured and treated. The following design elements are included with each location.

1. FocalPoint Bed Area (min. 174 square feet per acre of impervious area (e.g. 0.2 acres=35 s.f.)).
2. Verify a 0.95 inch Type III rainfall event is treated prior to activation of the overflow (typically 6-12"). We have provided 12" of storage in each treatment area.

3. Maintain a ratio of filter media (s.f.) to the temporary ponding volume (c.f.) at 1:5.
4. Subsurface Chamber Treatment row must be sized to treat the peak flow from a 1 year-24 hr storm event. The cultic 150XLHD requires (1 chamber per 0.185 cfs).
5. The subsurface storage basin will provide storage of 1" X Impervious Area and will control release over 24-48 hrs.
6. The design has been reviewed by the Manufacturer. The letter is attached.

Stormwater from 1.71 acres of impervious area and 2.41 acres of lawn area will drain to the focal point system. Runoff passes through a grassed filter strip or sediment forebay prior to entering the focalpoint filter system. This forebay captures the majority of the coarse sediment and provides pre-treatment prior to draining into the focalpoint media. Runoff then drains from the focalpoint system to the subsurface treatment row sized for the 1 year peak flow. In this case the system treats 1.71 acres of impervious area and 2.41 acres of lawn area. The minimum focalpoint bed area is calculated to be 466 s.f.. We have provided a 18'X26' bed area (466' s.f.). The system was modeled with a 0.95 inch storm and stores the volume without breaching the overflow outlet as required. The ratio of surface area to temporary volume is approximately 1:5. The subsurface treatment row requires 36 units of cultic 150XLHD chambers by ACF environment. In addition, approximately 931 R-tank units are needed to provide storage of the Water quality volume.

Forested Buffer

Portions of the back yard lawn areas that cannot be practically captured will drain toward the buffers located along the stream protection corridor. The back yards are largely pervious and will be graded to sheet flow into the undeveloped forested area below the back yard area. Note that buildings and pavement are being routed to other BMP devices and will not drain to the buffers. We have provided 100' buffers below the back yard lawn areas along the stream corridor as required by site law projects. We will utilize BMP 5.1 – Buffer Adjacent to Residential, Largely Pervious or Small Impervious Area. The buffer slopes are 9-15% generally and they are HSG C soils. Maine DEP BMP 5.1 - Table 5.2 suggests a forested buffer of 90 feet for a C soil. Table 5.3 requires a 70' buffer width from single family residential areas. We have provided a minimum 100' buffers adjacent to the back yard lawn areas which exceeds the minimum lengths. The added buffer width compensates for portions of the buffer that exceed 15%.

Forested Buffer with Stone Berm Level Spreader

Three forest buffers will be used to treat the project. Forested Buffer #1 treats 1.07 acres of impervious area and 1.59 acres of lawns. Buffer #2 treats 0.58 acres of impervious area and 0.26 acres of lawn area. Buffer #3 treats 0.16 acres of impervious area and 0.23 acres of lawn area. Table 5.5 requires 180' of berm per acre of impervious area and 54' of berm per acre of lawn area for slopes 9-15%. Soils are listed as Lamoine which is a C soil.

Forested Buffer #1	Stone Berm Length = 279'
Forested Buffer #2	Stone Berm Length = 119'
Forested Buffer #3	Stone Berm Length = 41'
Forested Buffer #4	Stone Berm Length = 97'

General Standard Calculations

Calculations: BMP's will be utilized to treat impervious and developed areas as far as practical. The project is required to effectively treat 95% of the impervious area and 80% disturbed area as described in the rules as far as practical. Certain areas cannot practically receive treatment. Where treatment of 95% of the impervious area is not practical, the department may allow treatment as low as 90% of the impervious area if the applicant is able to demonstrate that treatment of a greater depth of runoff than specified in the standards will result in at least an equivalent amount of overall treatment for the impervious area. As described in the calculation, the project captures 98% of the "new" projects impervious area and 80% of the projects overall developed areas. At 90-95%, DEP recommends 05" & 0.02" additional storage per % below 95%. The BMP's captures proposed areas to the extent practical. The treatment area summary and general standard calculations are attached.

The project as developed meets the General Standards as outlined in the Chapter 500 stormwater rules. The General Standard calculation is shown on the post development drainage plan and is included in this report.

Post Area Summary and General Standard Calculation

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 12-18-2019											
			Existing	New	New	Existing	New	New	New	Existing	Treatment
	Total	Total	Impervious	Impervious	Impervious	Lawn	Lawn	Developed	Developed	Woods/Field	BMP
Subarea	Area	Area		Area	Area			Area	Area	Undeveloped	
					Treated				Treated		
	sf	acres	acres	acres	acres	acres	acres	acres	acres	acres	
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.16	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	368.16	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	121.75	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	9.03	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.46	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.41	4.12	4.12	0.82	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.26	0.84	0.84	0.24	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.05	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	5.82	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.05	721	
				>95%	98%	✓		>80%	80%	✓	

Flooding Standard

This drainage study will focus on the proposed impacts created by the Oceanview Cumberland Crossing residential project. The model compares flooding standard results as they cross the project boundary. The intent is to meet the pre-development peak flows.

The watershed has been estimated to be 1163 acres and is adjacent to Greely Road and Main Street. The top end of the watershed is above Main Street and is routed to several large road culverts installed under Greely Road and upper Main Street (Route 9). Runoff travels through the residential neighborhood and crosses through the Golf Course. Runoff travels overland through woods and field until it drains to a stream above the Cumberland Crossing Phase 2 site. Soils in the vicinity of the project site show the natural wooded areas to Lamoine soils which is a "C" soil. This stream drains through the development site and crosses the railroad by one 5'X6' box culvert.

These drainage areas are defined in our Stormwater Model as shown on the HydroCAD diagrams. Full-size drainage plans and stormwater calculations for the existing and developed site conditions are included with this report. Refer to the HydroCAD diagrams, calculations, report and drainage plans for modeling assumptions, subcatchments, flowpaths, drainage reaches, etc. Runoff calculations were performed for the 2-year, 10 year, and 25 year storm events in accordance with Cumberland Ordinances and DEP requirements. Results of the calculations are shown in the Summary Table for ease of comparison. In order to significantly reduce the volume of paper required to reproduce complete data and calculation reports for all design storms, partial HydroCAD reports were generated for the 2-10-25-year storm events (pre- & post-) for selected subcatchments.

Modeling assumptions: The flooding standard is required with this development because this is a Site Law Project. We have modeled the pond areas to demonstrate that the outlets have the required storage volume capacity and that they will pass the 25 year storm event without flooding the pond embankments. The "HydroCad" computer program was used to determine the peak storm water runoff for the pre- and post-development conditions. HydroCad is a storm water modeling system, which utilizes the TR-20 method developed by the Soil Conservation Service (SCS).

The design assumptions used for this project are:

Design storm: 24 hour, Type III rainfall distribution.

Rainfall: 24 hour precipitation values from U.S. Weather Bureau Technical Release No. 40:

2 year storm = 3.1 inches
10 year storm = 4.6 inches
25 year storm = 5.80 inches
50 year storm = 6.90 inches
100 year storm = 8.10 inches
500 year storm = 12.10 inches

Site specific parameters for the project are listed below:

Soils: Soils information to determine the hydrologic soil group for the site, are derived from the Soil Survey of Cumberland County by the United States Department of Agriculture Soil Conservation Service. The soils and hydrologic group are listed below:

Soil Classification	Hydrologic Group
BgB – Belgrade very fine Sandy Loam	HSG B
BuB – Lamoine silt loam	HSG C
BuC2 – Buxton Silt Loam	HSG D
DeB - Deerfield Loam Sand	HSG B
EmB – Elmwood Fine Sandy Loam	HSG C
Ls – Limerick – Saco silt loams	HSG C
Sn – Scantic Silt Loam	HSG D
SuC2 – Suffield Silt Loam	HSG C
SuD2 – Suffield Silt Loam	HSG C
SuE2 – Suffield Silt Loam	HSG C
WmB – Windsor Loamy Sand	HSG A
MeC – Melrose fine sandy loam	HSG C
Sz – Swanton fine sandy loam	HSG C/D

Ground Cover:

Pre-& Post Development: The watershed ground cover is modeled as woods, grass, meadow and impervious.

Cover Description	Curve Number:
Impervious	98
Woods	70
Lawn	74

PRE- & POST-DEVELOPMENT HYDROLOGIC RESULTS

Pond 38P – 5'X6' Box Culvert at Railroad

FLOODING STANDARD RESULTS POND 38P			
Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

Pre Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

Post Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.43
10 YEAR	58.07
25 YEAR	59.17
100 YEAR	61.54

Pond 81P – Pond and outlet at Railroad

FLOODING STANDARD RESULTS POND 81P			
Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

Pre Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

Post Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

Pond 3P – outlet at Railroad

FLOODING STANDARD RESULTS POND 3P			
Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	12.04	9.29	-30%
10 YEAR	25.22	20.6	-22%
25 YEAR	42.47	28.17	-51%
50 YEAR	64.8	41.49	-56%
100 YEAR	85.78	55.83	-54%

Pre Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.64
10 YEAR	57.78
25 YEAR	59.3
100 YEAR	59.86

Post Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.38
10 YEAR	56.85
25 YEAR	58.47
100 YEAR	59.5

Conclusion:

The above analysis points are located where the project crosses the property line and points of interest along the railroad. (See Ponds 3P, 34P, and 81P above). Peak flows are being maintained for the 2, 10 and 25 year storms at the existing 5'X6' Box Culvert at the Railroad Croosing (pond 34P). Peak flows are less than pre development flows. Pond 3P is located toward the back and drains toward a culvert at the RR crossings. Peak flows are being maintained in all three locations below the site. The project will maintain the pre-development peak flow as required for the existing project. Reach 43R, 55R and Pond 81P model the stream, wetland, and off site pond as it crosses the property line. These locations also maintain the pre-development flows as required.

One Filter Pond, 4 Buffers, stream buffer, and a focal point drainage system provide water quality and quantity treatment. The proposed pond has the capacity to control flow from the 100 year storm which exceeds the DEP Flooding Standards. Adjacent properties will not be flooded as a result of this project. The project does not significantly impact downstream structures or properties. We submit that the Flooding Standard has been met or exceeded with this development.

The proposed project captures 98% of the newly developed impervious area and 80% of the developed area as required to meet the General Standards. One Pond will be constructed to provide impervious treatment and storage. Each cottage will provide roof driplines (BMP 7.6) to provide building roof treatment and storage. The access road will install focal point devices to provide treatment and storage along the road. Finally, back yard lawn areas, that cannot be practically captured, adjacent to the stream will be sent to the forested buffer for treatment. The General Standard will be met with the above BMP's installed.

The Basic Standards will be met with the proposed erosion control plans and stabilization details provided. No additional water quality or quantity measures are warranted for the Cumberland Crossing Phase 2 Expansion Project. We submit that the project meets the Basic, General, and the Flooding standard as outlined in the Maine DEP Chapter 500 Stormwater Rules. The proposal maintains these standards as required.

Cumberland Crossing Property Maintenance:

PART 1: RESPONSIBILITY FOR MAINTENANCE

Cumberland Crossing Retirement Community will be responsible for maintenance of the stormwater systems. Contact Chris Wasileski at Seacoast Management Company.

PART 2: INSPECTIONS – During Construction and Post Construction

- Detention Facilities: One (1) Grassed Under drained Filter Pond
  Two (2) wet ponds
  Embankment inspection and maintenance
  Spillway maintenance
  Outlet Structure sump cleaning and maintenance
  Sediment removal and disposal
  Stone Bermed Level Spreader Maintenance at outlet

- Detention Facilities: Focalpoint Devices and Detention Ponds
  Debris removal from stone storage area (leaves, branches, trash, etc.)
  Sediment removal and disposal

- Ditches, Swales, or other open stormwater channels
  Embankment inspection and maintenance
  Channel inspection
  Sediment removal and disposal

- Culverts, catch basins, stormwater control structures
  Embankment inspection and maintenance
  Inlet and Outlet inspection
  Debris removal and disposal
  Stone Bermed Level Spreader Maintenance

- Buffers with Stone Bermed Level Spreaders
  Buffer inspection and maintenance
  Outlet inspection
  Debris removal and disposal
  Stone Bermed Level Spreader Maintenance

- Roof Dripline Filter BMP Maintenance
  Sediment removal and disposal
  Filter and Underdrain replacement
  Debris removal and disposal
  Stone Dripline Replacement
  Foundation Sealant
  Foundation Backfill

- Focalpoint filter media and underground pipe storage
    Embankment inspection and maintenance
    Channel inspection
    Sediment removal and disposal
    Pipe flushing and cleaning
    Filter media replacement
    Coarse sediment removal at focalpoint media inlet

The owners representative will inspect the detention ponds, roof driplines, swales, channels, stormwater structures, focalpoint devices to determine if the soil blockage or impaired capacity to pass flow exists. Inspections will be performed on a monthly basis from March to November, and quarterly during the remainder of the year. A record of inspections and maintenance or corrective measures shall be kept by the owner (see part 4).

PART 3: MAINTENANCE AND CLEANING

The owner will regularly inspect for sediment accumulation, obstructions, debris, and other potential causes for operational difficulty in the conveyance and detention system as described in Part 2. Immediate action shall be taken to remedy detrimental obstructions. This may include replacing the filter pond and roof driplines filter beds as necessary to allow infiltration and treatment to occur.

Cleaning out of catch basins, culvert cleaning, and other means necessary to ensure the stormwater system is maintained. Some additional measures (but not limited to) are shown below:

- Under drained filter Maintenance (One Filter Pond – Pond 47):
    Soil Filter Inspection
    Soil Filter replacement
    Sediment removal and disposal
    Mowing
    Harvesting and Weeding

The owner will regularly inspect the soil filter after every major storm event in the first few months to ensure proper function. There after the filter should be inspected bi-annually to ensure that it is draining within 24 hours. The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. Sediment shall be removed from the filter bed annually. The bed shall be hand raked and re-seeded as necessary. The removed sediment shall be hauled off site and disposed of in a stabilized area. Mowing of the filter area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the filter zone will be completed as necessary.

- Stormwater Facilities: Stormwater Buffers with Stone Berm Level Lip Spreaders

Inspect the culvert outlets to ensure it is working and in proper function. Inspect the stone berm level spreader to ensure the level lip is working and that runoff is evenly distributed along the entire stone berm. Inspect the buffer below the stone berm to ensure it is stable. Repair erosion areas immediately. Install erosion blanket if needed to prevent additional erosion.

- Wet Pond maintenance – (2 Total) Periwinkle Wet Pond and Mallard Way Wet Pond
  - Gravel Drain Inspection
  - Gravel Drain replacement
  - Outlet Structure sump cleaning and maintenance
  - Sediment removal and disposal
  - Mowing
  - Harvesting and Weeding

The owner will regularly inspect the wet pond after every major storm event in the first few months to ensure proper function. There after the pond should be inspected bi-annually to ensure that it is draining within 24 hours. Sediment shall be removed from the pond when sediment reduces the pond volume by 25%. The removed sediment shall be hauled off site and disposed of. Mowing of the pond area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the pond and pond back slopes will be completed as necessary. The pond outlet shall be inspected for erosion and make repairs as needed annually.

- Focalpoint filter Maintenance – one (1) locations Sta 19+50 right side along Little Acres Drive:
  - Soil Filter Inspection
  - Soil Filter replacement
  - Outlet Structure sump cleaning and maintenance
  - Sediment removal and disposal
  - Mowing
  - Harvesting and Weeding

The owner will regularly inspect the soil filter after every major storm event in the first few months to ensure proper function. There after the filter should be inspected bi-annually to ensure that it is draining within 24 hours. The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. Sediment shall be removed from the filter bed annually. The bed shall be hand raked and re-seeded as necessary. The removed sediment shall be hauled off site and disposed of in a stabilized area. Mowing of the filter area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the filter zone will be completed as necessary. Replacement of the Treatment Row and sediment removal will be completed when 40% full or when the system is bypassed and no longer treating stormwater. The R-Tanks storage units shall be maintained as suggested by the manufacturer.

- Stormwater Facilities: Catch basins, Wet Ponds, Culverts,

A mandatory scheduled maintenance will be performed every four weeks for a period of one hundred and twenty (120) days and will begin after satisfactory completion and acceptance of landscape construction. Ongoing maintenance will be required as necessary.

- Parking/Display Areas:

All sand, salt, etc. accumulated when sweeping the parking and display areas, shall be trucked off-site for disposal. The parking lot shall be swept annually in the spring.

PART 4: RECORD KEEPING

The owner will maintain inspection records, with recordings of condition of basins, and pipes and annotation of substantial precipitation events or mitigating circumstances in the intervening time for trending to develop the anticipated preventive maintenance schedule.

PART 5: MAINTENANCE CONTRACT

Should proprietary devices be utilized, a maintenance contract will be established with the manufacturer for regular maintenance and cleaning of the device. Focalpoint manufactures will be on site through the installation process. A maintenance contract will be maintained as necessary to ensure proper system performance of the focal point system. Other facilities included catch basins, culverts, wet ponds will also be maintained annually or as required by inspection. The intent being to maintain a working system.

PART 6: RE-CERTIFICATION

The owner shall submit a certification to Maine DEP within three months of the expiration of each five year interval from the date of issuance of the permit. The owner shall submit the maintenance log which identifies inspections completed, erosion problems found, when corrective action was taken, and who completed the work. The certification will include a statement indicating that the stormwater system is working and is being maintained in working condition in accordance with the permit requirements.

Maintenance Log Sheet

OceanView @ Cumberland Retirement Community

Name	Maintenance Task Completed	Date

Maine DEP Chapter 500 Appendix C. Housekeeping – Updated 2017

These performance standards apply to all projects.

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 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at http://www.maine.gov/dep/spills/emergspillresp/

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. 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 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 swept 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 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. 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 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.
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 exist, they 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 washdown, 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.

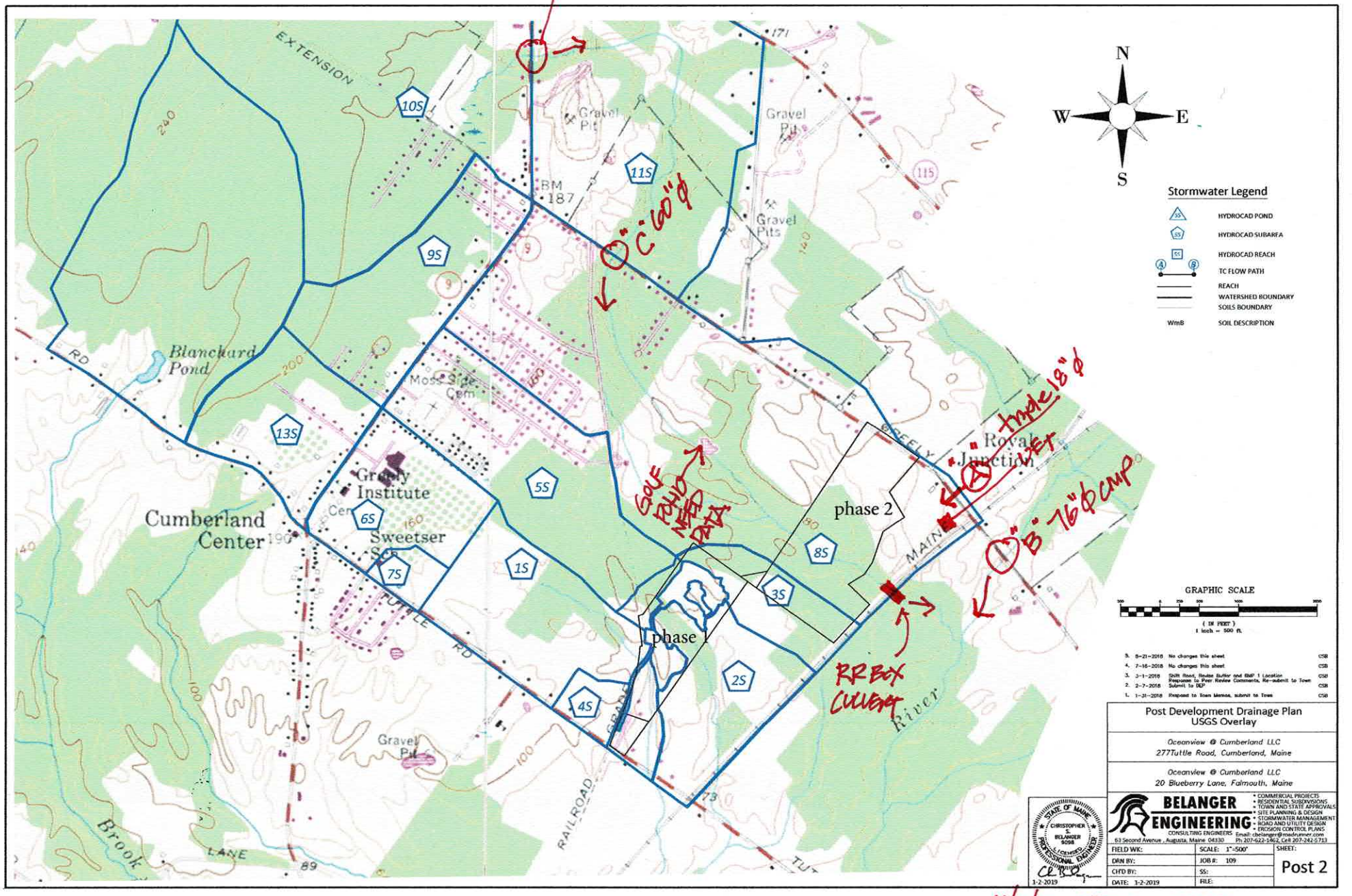
7. Unauthorized non-stormwater discharges. The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non_stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of 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.

Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 12-18-2019						
Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

OV Cumberland Phase 2 Impervious Area Summary 12-18-2019								
Description	Road Length feet	New Impervious Area s.f.	acres	New Lawn Area s.f.	acres	New Developed Area s.f.	acres	Comments
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Road 1 - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Road 2 - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Road 3 - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Road 4 - Sta 90+00-Sta92+30	230	4140	0.10					18', no curb
Road 5 - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Road 6 - Sta 96+00-Sta98+00	200	3600	0.08					18' no curb
Road 1 Spurs (2)	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5566	333733	7.66	459874	10.56	824534	18.93	

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 12-18-2019

Subarea	Total Area	Total Area	Existing Impervious	New Impervious Area	New Impervious Area Treated	Existing Lawn	New Lawn	New Developed Area	New Developed Area Treated	Existing Woods/Field Undeveloped	Treatment BMP
	sf	acres	acres	acres	acres	acres	acres	acres	acres	acres	
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.16	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	368.16	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	121.75	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	9.03	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.46	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.41	4.12	4.12	0.82	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.26	0.84	0.84	0.24	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.05	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	5.82	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.05	721	
				>95%	98%	✓		>80%	80%	✓	


"D" ROUTE 9. 48"ϕ
"C" 60"ϕ
"A" triple 18"ϕ
"B" 76"ϕ CMP
GOLF POND NEED DATA
RR BOX CULVERT
phase 1
phase 2
Cumberland Center
Blanchard Pond
Moss Side Cem
Greely Institute
Sweetser Cem
Royal Junction
Gravel Pit
Gravel Pits
BM 187
Tuttle Rd
Railroad
Brook
Lane
Extension
Greely
Main
10S
11S
9S
13S
5S
6S
7S
1S
8S
3S
2S
4S
N
W
E
S
Stormwater Legend
HYDROCAD POND
HYDROCAD SUBAREA
HYDROCAD REACH
TC FLOW PATH
REACH
WATERSHED BOUNDARY
SOILS BOUNDARY
WmB SOIL DESCRIPTION
GRAPHIC SCALE
(IN FEET)
1 inch = 500 ft.
Post Development Drainage Plan
USGS Overlay
Oceanview @ Cumberland LLC
277Tuttle Road, Cumberland, Maine
Oceanview @ Cumberland LLC
20 Blueberry Lane, Falmouth, Maine
BELANGER ENGINEERING
CONSULTING ENGINEERS
53 Second Avenue , Augusta, Maine 04330
Ph 207-622-1462, Cell 207-242-5713
FIELD WK:
SCALE: 1"=500'
DRN BY:
JOB #: 109
CHD BY:
SS:
DATE: 1-2-2019
FILE:
SHEET:
Post 2
4/3/19 FIELD DATA STREAM/CULVERTS.

- REFERENCE : March 2019 LED Photos



Culvert C outlet Greely Road at main brook



Culvert D - 48 inch HDPE inlet and embankment
At Route 9 at main brook

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



Golf Course Pond above Outlet



Golf Course Pond outlet structure from Bridge Above

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CONSULTING ENGINEERS

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ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



Main brook along Hole 17 at eddy/widening



Main Brook at Golf Course Hole 17 above Cartpath Crossing

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CONSULTING ENGINEERS

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ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



Inlet 60 inch dia. Greely Road Culvert C –Main Brook to Golf Course and Site



Upstream Floodplain Watershed and Main Brook at Greely Road Culvert C

BELANGER ENGINEERING
CONSULTING ENGINEERS

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ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



76 inch dia. Greely Road Culvert B- at Maxfield Brook – East of Site & RR Tracks



Culvert A - Three partially buried 18 inch dla HDPE culverts (inlet) across from Cumberland Animal Hospital wetland drainage

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



Maine Central RR Culvert Inlet



Existing Wood Farm Bridge and Stream looking north

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

OCEANVIEW AT CUMBERLAND SENIOR COMMUNITY

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 01-30-18
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos



Upstream 100 ft from Proposed Road Crossing looking South (Downstream)



Proposed Road/Box Culvert Crossing location north of existing farm bridge

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

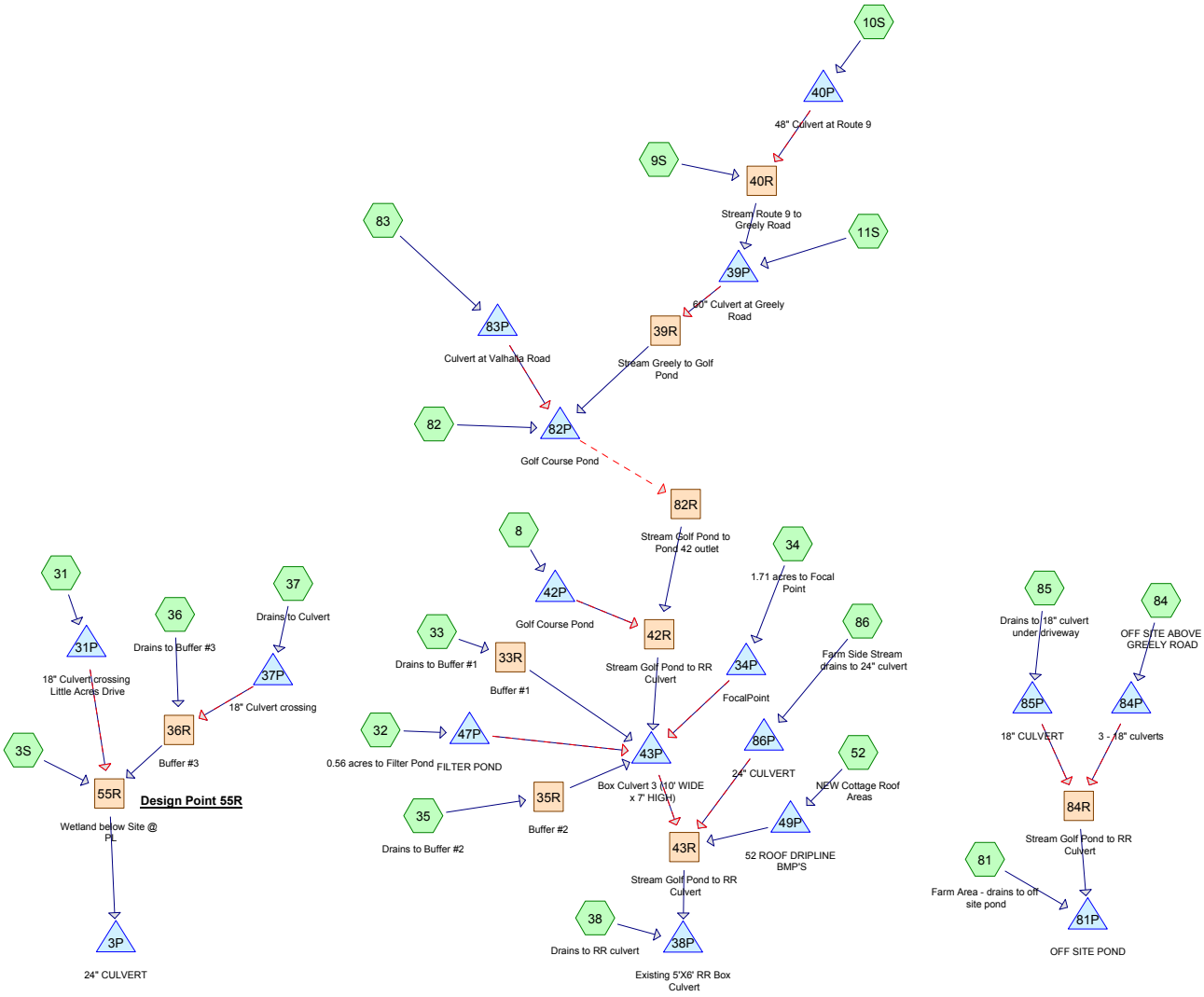
CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.



Subcat Reach Pond Link

Routing Diagram for POST12-23-2019
Prepared by Belanger Engineering, Printed 12/30/2019
HydroCAD® 10.00-21 s/n 02780 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.000	75	1/4 acre lots, 38% imp, HSG B (10S)
2.860	98	52 Cottage Roofs (52)
0.620	74	Approved LAWN C phase 1 (3S)
0.100	98	Approved Trails-phase 1 (3S)
0.520	98	EXISTING BARN AND HOUSE (81, 84)
0.130	98	EXISTING GRAVEL/PAVED FARM (86)
0.260	98	EXISTING HOUSE AND BARN (86)
1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE (86)
13.000	98	EXISTING IMPERVIOUS AREA (9S)
103.300	61	EXISTING LAWN B (11S)
111.520	74	EXISTING LAWN C (3S, 9S, 10S, 81, 82, 83, 84, 85)
129.300	61	EXISTING LAWNS B (8, 86)
20.000	70	EXISTING LOTS B (11S)
1.640	98	EXISTING PAVED/GRAVEL FARM (81, 84)
26.910	98	EXISTING ROADS (8, 10S, 11S, 81, 82, 83, 84, 85)
0.870	98	EXISTING ROADS-OFF SITE (86)
0.170	98	NEW IMPERVIOUS (81)
4.080	98	NEW IMPERVIOUS PAVED AREA (32, 33, 34, 35, 36)
10.060	74	NEW LAWN C (3S, 8, 32, 33, 34, 35, 36, 37, 38)
0.430	70	NEW LAWN C (31)
0.860	74	NEW LAWNS C (86)
0.540	98	NEW PAVED - FARM (86)
0.540	98	NEW PAVEMENT - FARM (8)
23.770	70	WOODS / FIELD HSG C (3S, 31)
18.050	74	WOODS / FIELD HSG C/D (81)
205.000	30	Woods, Good, HSG A (8, 9S, 10S, 11S)
178.000	55	Woods, Good, HSG B (8, 9S, 10S, 11S, 82, 83)
230.850	70	Woods, Good, HSG C (8, 9S, 10S, 11S, 37, 38)
64.000	77	Woods, Good, HSG D (10S, 11S)
1,163.480	**61**	**TOTAL AREA**

Summary for Subcatchment 3S:

Runoff = 7.08 cfs @ 12.91 hrs, Volume= 1.266 af, Depth> 0.72"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	14.740	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.61 AC))
	21.130	71	Weighted Average
	21.030		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 9.66 cfs @ 13.94 hrs, Volume= 3.346 af, Depth> 0.24"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 16.96 cfs @ 13.28 hrs, Volume= 3.916 af, Depth> 0.54"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af, Depth> 0.22"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 19.38 cfs @ 13.45 hrs, Volume= 5.703 af, Depth> 0.27"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 2.93 cfs @ 12.92 hrs, Volume= 0.532 af, Depth> 0.67"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 2.45 cfs @ 12.03 hrs, Volume= 0.150 af, Depth> 1.71"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 5.45 cfs @ 12.03 hrs, Volume= 0.330 af, Depth> 1.49"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.800	74	NEW LAWN C
	2.660	84	Weighted Average
	1.590		59.77% Pervious Area
	1.070		40.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 8.55 cfs @ 12.03 hrs, Volume= 0.517 af, Depth> 1.42"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 2.28 cfs @ 12.03 hrs, Volume= 0.143 af, Depth> 2.04"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.260	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.840	91	Weighted Average
	0.260		30.95% Pervious Area
	0.580		69.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 0.78 cfs @ 12.03 hrs, Volume= 0.047 af, Depth> 1.49"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af, Depth> 0.79"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 8.28 cfs @ 12.04 hrs, Volume= 0.539 af, Depth> 0.70"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	8.410	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.17 ac (1/2) of 2 Roofs + 2 fulll
	9.300	70	Weighted Average
	9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 6.43 cfs @ 12.21 hrs, Volume= 0.639 af, Depth> 2.68"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
2.5	25	0.0400	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.10"
13.1	75	0.1600	0.10		**Sheet Flow, CD** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.7	120	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 14.71 cfs @ 12.77 hrs, Volume= 2.328 af, Depth> 0.92"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 4.29 cfs @ 13.37 hrs, Volume= 1.228 af, Depth> 0.27"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af, Depth> 0.80"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af, Depth> 0.97"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af, Depth> 0.92"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 6.08 cfs @ 13.75 hrs, Volume= 1.783 af, Depth> 0.39"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.660 ac, 40.23% Impervious, Inflow Depth > 1.49" for 2 YEAR event
Inflow = 5.45 cfs @ 12.03 hrs, Volume= 0.330 af
Outflow = 3.59 cfs @ 12.31 hrs, Volume= 0.322 af, Atten= 34%, Lag= 16.6 min

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= 11.8 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 34.8 min

Peak Storage= 2,543 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 35R: Buffer #2

Inflow Area = 0.840 ac, 69.05% Impervious, Inflow Depth > 2.04" for 2 YEAR event
Inflow = 2.28 cfs @ 12.03 hrs, Volume= 0.143 af
Outflow = 1.43 cfs @ 12.34 hrs, Volume= 0.139 af, Atten= 37%, Lag= 18.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.12 fps, Min. Travel Time= 13.4 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 41.5 min

Peak Storage= 1,183 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 0.71" for 2 YEAR event
Inflow = 0.78 cfs @ 12.03 hrs, Volume= 0.124 af
Outflow = 0.42 cfs @ 12.46 hrs, Volume= 0.119 af, Atten= 46%, Lag= 25.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.09 fps, Min. Travel Time= 18.3 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 33.4 min

Peak Storage= 464 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'



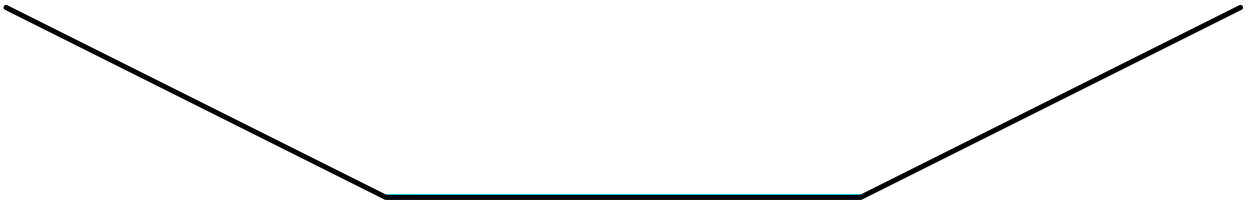
Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.00" for 2 YEAR event
Inflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Outflow = 0.20 cfs @ 20.00 hrs, Volume= 0.008 af, Atten= 76%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 53.6 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 71.8 min

Peak Storage= 1,886 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 17.23 cfs @ 15.31 hrs, Volume= 8.944 af
Outflow = 17.12 cfs @ 16.23 hrs, Volume= 7.939 af, Atten= 1%, Lag= 55.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 32.8 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 38.8 min

Peak Storage= 33,658 cf @ 15.68 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.43" for 2 YEAR event
Inflow = 18.36 cfs @ 14.43 hrs, Volume= 6.045 af
Outflow = 18.22 cfs @ 14.74 hrs, Volume= 5.848 af, Atten= 1%, Lag= 18.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 10.5 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 14.9 min

Peak Storage= 11,518 cf @ 14.57 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 234.390 ac, 8.63% Impervious, Inflow Depth > 0.45" for 2 YEAR event
Inflow = 24.14 cfs @ 14.63 hrs, Volume= 8.742 af
Outflow = 24.11 cfs @ 14.77 hrs, Volume= 8.622 af, Atten= 0%, Lag= 8.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.71 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 9.4 min

Peak Storage= 7,050 cf @ 14.69 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 4.00' Flow Area= 80.0 sf, Capacity= 292.83 cfs

12.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 28.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site @ PL

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 0.70" for 2 YEAR event
Inflow = 9.71 cfs @ 12.96 hrs, Volume= 1.911 af
Outflow = 9.68 cfs @ 13.05 hrs, Volume= 1.898 af, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 6.5 min

Peak Storage= 1,855 cf @ 12.99 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af
Outflow = 10.64 cfs @ 14.30 hrs, Volume= 2.986 af, Atten= 3%, Lag= 29.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 24.4 min

Peak Storage= 10,164 cf @ 14.03 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 0.93" for 2 YEAR event
Inflow = 13.43 cfs @ 12.88 hrs, Volume= 2.227 af
Outflow = 13.11 cfs @ 13.12 hrs, Volume= 2.190 af, Atten= 2%, Lag= 14.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 16.2 min

Peak Storage= 6,419 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 0.70" for 2 YEAR event
Inflow = 9.68 cfs @ 13.05 hrs, Volume= 1.898 af
Outflow = 9.29 cfs @ 13.19 hrs, Volume= 1.874 af, Atten= 4%, Lag= 8.9 min
Primary = 9.29 cfs @ 13.19 hrs, Volume= 1.874 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.38' @ 13.19 hrs Surf.Area= 5,565 sf Storage= 5,487 cf

Plug-Flow detention time= 12.5 min calculated for 1.868 af (98% of inflow)
Center-of-Mass det. time= 8.5 min (887.1 - 878.6)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.29 cfs @ 13.19 hrs HW=55.38' (Free Discharge)
1=Culvert (Inlet Controls 9.29 cfs @ 4.01 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 0.67" for 2 YEAR event
Inflow = 2.93 cfs @ 12.92 hrs, Volume= 0.532 af
Outflow = 2.50 cfs @ 13.19 hrs, Volume= 0.526 af, Atten= 15%, Lag= 16.6 min
Primary = 2.50 cfs @ 13.19 hrs, Volume= 0.526 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.25' @ 13.19 hrs Surf.Area= 7,324 sf Storage= 2,505 cf

Plug-Flow detention time= 15.7 min calculated for 0.524 af (99% of inflow)
Center-of-Mass det. time= 12.3 min (882.4 - 870.1)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.50 cfs @ 13.19 hrs HW=80.25' (Free Discharge)
1=Culvert (Barrel Controls 2.50 cfs @ 4.15 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 1.42" for 2 YEAR event
Inflow = 8.55 cfs @ 12.03 hrs, Volume= 0.517 af
Outflow = 8.67 cfs @ 12.04 hrs, Volume= 0.517 af, Atten= 0%, Lag= 0.7 min
Primary = 0.69 cfs @ 11.55 hrs, Volume= 0.330 af
Secondary = 7.97 cfs @ 12.04 hrs, Volume= 0.187 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 65.83' @ 12.04 hrs Surf.Area= 300 sf Storage= 1,500 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.5 min (802.2 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.55 hrs HW=61.12' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=7.75 cfs @ 12.04 hrs HW=65.83' (Free Discharge)
2=Orifice/Grate (Weir Controls 7.75 cfs @ 1.88 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2 YEAR event
Inflow = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af
Outflow = 0.26 cfs @ 12.67 hrs, Volume= 0.077 af, Atten= 85%, Lag= 37.9 min
Primary = 0.26 cfs @ 12.67 hrs, Volume= 0.077 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.52' @ 12.67 hrs Surf.Area= 4,011 sf Storage= 2,089 cf

Plug-Flow detention time= 152.4 min calculated for 0.077 af (68% of inflow)
Center-of-Mass det. time= 77.1 min (898.7 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.26 cfs @ 12.67 hrs HW=80.52' (Free Discharge)
1=Culvert (Inlet Controls 0.26 cfs @ 1.60 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.690 ac, 8.30% Impervious, Inflow Depth > 0.45" for 2 YEAR event
Inflow = 24.69 cfs @ 14.77 hrs, Volume= 9.162 af
Outflow = 24.65 cfs @ 14.83 hrs, Volume= 9.134 af, Atten= 0%, Lag= 3.9 min
Primary = 24.65 cfs @ 14.83 hrs, Volume= 9.134 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.43' @ 14.83 hrs Surf.Area= 6,078 sf Storage= 3,811 cf

Plug-Flow detention time= 2.5 min calculated for 9.134 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (948.8 - 947.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=24.62 cfs @ 14.83 hrs HW=56.43' (Free Discharge)
1=Box Culvert (Inlet Controls 24.62 cfs @ 3.70 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 29.22 cfs @ 14.17 hrs, Volume= 13.642 af
Outflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af, Atten= 97%, Lag= 349.7 min
Primary = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 120.64' @ 20.00 hrs Surf.Area= 953,534 sf Storage= 588,117 cf

Plug-Flow detention time= 403.8 min calculated for 0.082 af (1% of inflow)
Center-of-Mass det. time= 188.3 min (1,155.6 - 967.3)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.55 cfs @ 20.00 hrs HW=120.64' (Free Discharge)
└**1=60" Culvert** (Inlet Controls 0.55 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af
Outflow = 11.94 cfs @ 16.18 hrs, Volume= 5.028 af, Atten= 48%, Lag= 159.6 min
Primary = 11.94 cfs @ 16.18 hrs, Volume= 5.028 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 161.48' @ 16.18 hrs Surf.Area= 108,987 sf Storage= 131,360 cf

Plug-Flow detention time= 152.2 min calculated for 5.028 af (68% of inflow)
Center-of-Mass det. time= 82.6 min (1,012.5 - 929.9)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.69 cfs @ 16.18 hrs HW=161.48' (Free Discharge)
└**1=48" Culvert** (Inlet Controls 11.69 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.24" for 2 YEAR event
Inflow = 9.66 cfs @ 13.94 hrs, Volume= 3.346 af
Outflow = 8.09 cfs @ 14.77 hrs, Volume= 3.060 af, Atten= 16%, Lag= 49.9 min
Primary = 8.09 cfs @ 14.77 hrs, Volume= 3.060 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 71.24' @ 14.77 hrs Surf.Area= 24,278 sf Storage= 24,528 cf

Plug-Flow detention time= 53.6 min calculated for 3.049 af (91% of inflow)
Center-of-Mass det. time= 33.0 min (975.0 - 942.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.08 cfs @ 14.77 hrs HW=71.24' (Free Discharge)
1=Culvert (Barrel Controls 8.08 cfs @ 4.87 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (10' WIDE x 7' HIGH)

Inflow Area = 176.470 ac, 8.19% Impervious, Inflow Depth > 0.47" for 2 YEAR event
Inflow = 19.48 cfs @ 14.73 hrs, Volume= 6.970 af
Outflow = 19.48 cfs @ 14.73 hrs, Volume= 6.969 af, Atten= 0%, Lag= 0.1 min
Primary = 19.48 cfs @ 14.73 hrs, Volume= 6.969 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 56.05' @ 14.73 hrs Surf.Area= 1,788 sf Storage= 78 cf

Plug-Flow detention time= 0.1 min calculated for 6.946 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (951.7 - 951.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	4,413,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
57.00	10,714	6,017	6,017
60.00	57,000	101,571	107,588
62.00	234,474	291,474	399,062
66.00	504,090	1,477,128	1,876,190
70.00	764,501	2,537,182	4,413,372

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**120.0" W x 84.0" H Box Box Culvert** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 70.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=49.92 cfs @ 14.73 hrs HW=56.05' (Free Discharge)
└**1=Box Culvert** (Barrel Controls 49.92 cfs @ 4.93 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 1.71" for 2 YEAR event
Inflow = 2.45 cfs @ 12.03 hrs, Volume= 0.150 af
Outflow = 0.74 cfs @ 12.33 hrs, Volume= 0.144 af, Atten= 70%, Lag= 18.3 min
Primary = 0.74 cfs @ 12.33 hrs, Volume= 0.144 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 80.50' Surf.Area= 2,167 sf Storage= 2,618 cf
Peak Elev= 81.37' @ 12.33 hrs Surf.Area= 2,695 sf Storage= 4,715 cf (2,098 cf above start)

Plug-Flow detention time= 184.6 min calculated for 0.084 af (56% of inflow)
Center-of-Mass det. time= 38.7 min (820.9 - 782.2)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.50'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.50' / 75.00' S= 0.0161 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.74 cfs @ 12.33 hrs HW=81.36' (Free Discharge)
└**1=Culvert** (Passes 0.74 cfs of 19.24 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.74 cfs @ 3.77 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 2.68" for 2 YEAR event
Inflow = 6.43 cfs @ 12.21 hrs, Volume= 0.639 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.08' @ 20.00 hrs Surf.Area= 867,510 sf Storage= 27,810 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	13,187 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 54 34,020 cf Overall - 1,051 cf Embedded = 32,969 cf x 40.0% Voids
#2	100.00'	1,051 cf	**6.0" Round Pipe Storage** x 51 Inside #1 L= 105.0' S= 0.0050 '/'
		14,239 cf	x 51.00 = 726,182 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 51.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 25.47 cfs @ 12.95 hrs, Volume= 4.518 af
Outflow = 15.11 cfs @ 13.61 hrs, Volume= 4.198 af, Atten= 41%, Lag= 39.2 min
Primary = 15.11 cfs @ 13.61 hrs, Volume= 4.198 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 64.12' @ 13.61 hrs Surf.Area= 31,625 sf Storage= 194,083 cf (54,573 cf above start)

Plug-Flow detention time= 320.2 min calculated for 0.992 af (22% of inflow)
Center-of-Mass det. time= 45.6 min (909.7 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.12 cfs @ 13.61 hrs HW=64.11' (Free Discharge)
1=Culvert (Barrel Controls 15.12 cfs @ 5.66 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=62.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 0.05" for 2 YEAR event
Inflow = 14.17 cfs @ 13.31 hrs, Volume= 3.329 af
Outflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af, Atten= 23%, Lag= 30.1 min
Secondary = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.64' @ 13.81 hrs Surf.Area= 46,588 sf Storage= 27,999 cf

Plug-Flow detention time= 50.8 min calculated for 3.107 af (93% of inflow)
Center-of-Mass det. time= 32.9 min (928.0 - 895.1)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=10.96 cfs @ 13.81 hrs HW=76.64' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 10.96 cfs @ 2.15 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 0.80" for 2 YEAR event
Inflow = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af
Outflow = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af, Atten= 1%, Lag= 5.8 min
Primary = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 122.11' @ 13.27 hrs Surf.Area= 1,142 sf Storage= 1,593 cf

Plug-Flow detention time= 2.5 min calculated for 2.093 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (880.7 - 878.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.93 cfs @ 13.27 hrs HW=122.11' (Free Discharge)
1=Culvert (Inlet Controls 9.93 cfs @ 5.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 0.97" for 2 YEAR event
Inflow = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af
Outflow = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af, Atten= 2%, Lag= 5.0 min
Primary = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.38' @ 12.85 hrs Surf.Area= 5,564 sf Storage= 5,483 cf

Plug-Flow detention time= 19.5 min calculated for 1.602 af (97% of inflow)
Center-of-Mass det. time= 9.5 min (859.6 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00**
			L= 50.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.30 cfs @ 12.85 hrs HW=81.38' (Free Discharge)
1=Culvert (Barrel Controls 10.30 cfs @ 4.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af
Outflow = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af, Atten= 17%, Lag= 15.9 min
Primary = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.93' @ 13.03 hrs Surf.Area= 6,258 sf Storage= 3,475 cf

Plug-Flow detention time= 16.2 min calculated for 0.625 af (99% of inflow)
Center-of-Mass det. time= 13.7 min (866.2 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.31 cfs @ 13.03 hrs HW=90.93' (Free Discharge)
↑└**1=Culvert** (Barrel Controls 3.31 cfs @ 3.43 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
↑└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 55.060 ac, 5.27% Impervious, Inflow Depth > 0.39" for 2 YEAR event
Inflow = 6.08 cfs @ 13.75 hrs, Volume= 1.783 af
Outflow = 5.97 cfs @ 13.91 hrs, Volume= 1.773 af, Atten= 2%, Lag= 9.7 min
Primary = 5.97 cfs @ 13.91 hrs, Volume= 1.773 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.84' @ 13.91 hrs Surf.Area= 5,547 sf Storage= 2,975 cf

Plug-Flow detention time= 7.7 min calculated for 1.773 af (99% of inflow)
Center-of-Mass det. time= 6.1 min (928.9 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.97 cfs @ 13.91 hrs HW=58.84' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 5.97 cfs @ 3.51 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 17.15 cfs @ 12.85 hrs, Volume= 2.878 af, Depth> 1.63"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	14.740	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.61 AC))
	21.130	71	Weighted Average
	21.030		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 41.06 cfs @ 13.68 hrs, Volume= 11.178 af, Depth> 0.80"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 47.02 cfs @ 13.17 hrs, Volume= 9.735 af, Depth> 1.35"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af, Depth> 0.76"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 80.13 cfs @ 13.27 hrs, Volume= 18.133 af, Depth> 0.87"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 7.32 cfs @ 12.85 hrs, Volume= 1.233 af, Depth> 1.56"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 4.22 cfs @ 12.03 hrs, Volume= 0.263 af, Depth> 3.01"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 9.84 cfs @ 12.03 hrs, Volume= 0.605 af, Depth> 2.73"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.800	74	NEW LAWN C
	2.660	84	Weighted Average
	1.590		59.77% Pervious Area
	1.070		40.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 15.69 cfs @ 12.03 hrs, Volume= 0.961 af, Depth> 2.64"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 3.70 cfs @ 12.03 hrs, Volume= 0.238 af, Depth> 3.40"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.260	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.840	91	Weighted Average
	0.260		30.95% Pervious Area
	0.580		69.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 1.41 cfs @ 12.03 hrs, Volume= 0.086 af, Depth> 2.73"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 4.11 cfs @ 12.03 hrs, Volume= 0.249 af, Depth> 1.75"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 20.40 cfs @ 12.04 hrs, Volume= 1.244 af, Depth> 1.60"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	8.410	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.17 ac (1/2) of 2 Roofs + 2 fulll
	9.300	70	Weighted Average
	9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 9.61 cfs @ 12.21 hrs, Volume= 0.966 af, Depth> 4.05"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
2.5	25	0.0400	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.10"
13.1	75	0.1600	0.10		**Sheet Flow, CD** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.7	120	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 31.95 cfs @ 12.74 hrs, Volume= 4.911 af, Depth> 1.94"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 17.74 cfs @ 13.18 hrs, Volume= 3.899 af, Depth> 0.87"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af, Depth> 1.76"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af, Depth> 2.01"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af, Depth> 1.94"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 19.65 cfs @ 13.55 hrs, Volume= 4.958 af, Depth> 1.08"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.660 ac, 40.23% Impervious, Inflow Depth > 2.73" for 10 YEAR event
Inflow = 9.84 cfs @ 12.03 hrs, Volume= 0.605 af
Outflow = 7.22 cfs @ 12.24 hrs, Volume= 0.595 af, Atten= 27%, Lag= 12.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 8.9 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 29.9 min

Peak Storage= 3,864 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 35R: Buffer #2

Inflow Area = 0.840 ac, 69.05% Impervious, Inflow Depth > 3.40" for 10 YEAR event
Inflow = 3.70 cfs @ 12.03 hrs, Volume= 0.238 af
Outflow = 2.53 cfs @ 12.28 hrs, Volume= 0.234 af, Atten= 32%, Lag= 15.1 min

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= 10.7 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 35.4 min

Peak Storage= 1,667 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 1.70" for 10 YEAR event
Inflow = 2.28 cfs @ 12.07 hrs, Volume= 0.297 af
Outflow = 2.02 cfs @ 12.48 hrs, Volume= 0.291 af, Atten= 11%, Lag= 24.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.17 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 27.3 min

Peak Storage= 1,193 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'



Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.10" for 10 YEAR event
Inflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Outflow = 19.97 cfs @ 20.00 hrs, Volume= 5.325 af, Atten= 2%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 19.4 min

Peak Storage= 17,477 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 85.67 cfs @ 13.80 hrs, Volume= 31.827 af
Outflow = 83.71 cfs @ 14.48 hrs, Volume= 30.222 af, Atten= 2%, Lag= 40.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 28.4 min

Peak Storage= 100,395 cf @ 14.15 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



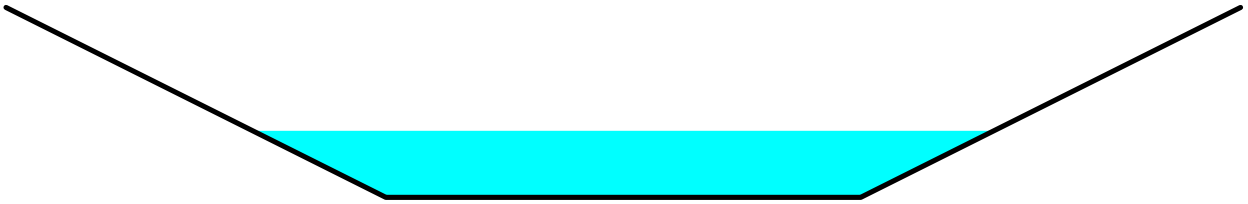
Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 1.62" for 10 YEAR event
Inflow = 63.53 cfs @ 14.11 hrs, Volume= 22.665 af
Outflow = 63.29 cfs @ 14.32 hrs, Volume= 22.017 af, Atten= 0%, Lag= 12.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 10.6 min

Peak Storage= 26,548 cf @ 14.20 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 234.390 ac, 8.63% Impervious, Inflow Depth > 1.48" for 10 YEAR event
Inflow = 82.23 cfs @ 14.26 hrs, Volume= 28.991 af
Outflow = 82.15 cfs @ 14.35 hrs, Volume= 28.647 af, Atten= 0%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 6.6 min

Peak Storage= 16,214 cf @ 14.30 hrs
Average Depth at Peak Storage= 2.02'
Bank-Full Depth= 4.00' Flow Area= 80.0 sf, Capacity= 292.83 cfs

12.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 28.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site @ PL

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 1.61" for 10 YEAR event
Inflow = 23.28 cfs @ 12.89 hrs, Volume= 4.393 af
Outflow = 23.24 cfs @ 12.95 hrs, Volume= 4.374 af, Atten= 0%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 5.4 min

Peak Storage= 3,263 cf @ 12.91 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af
Outflow = 32.47 cfs @ 14.03 hrs, Volume= 11.989 af, Atten= 1%, Lag= 19.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 16.4 min

Peak Storage= 21,227 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 1.96" for 10 YEAR event
Inflow = 28.07 cfs @ 12.87 hrs, Volume= 4.690 af
Outflow = 27.76 cfs @ 13.04 hrs, Volume= 4.638 af, Atten= 1%, Lag= 10.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 13.5 min

Peak Storage= 10,452 cf @ 12.94 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 1.61" for 10 YEAR event
Inflow = 23.24 cfs @ 12.95 hrs, Volume= 4.374 af
Outflow = 20.60 cfs @ 13.23 hrs, Volume= 4.338 af, Atten= 11%, Lag= 16.6 min
Primary = 20.60 cfs @ 13.23 hrs, Volume= 4.338 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.85' @ 13.23 hrs Surf.Area= 8,276 sf Storage= 15,874 cf

Plug-Flow detention time= 11.7 min calculated for 4.324 af (99% of inflow)
Center-of-Mass det. time= 9.0 min (868.4 - 859.4)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.59 cfs @ 13.23 hrs HW=56.85' (Free Discharge)
1=Culvert (Inlet Controls 20.59 cfs @ 6.55 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 1.56" for 10 YEAR event
Inflow = 7.32 cfs @ 12.85 hrs, Volume= 1.233 af
Outflow = 5.66 cfs @ 13.22 hrs, Volume= 1.224 af, Atten= 23%, Lag= 22.0 min
Primary = 5.66 cfs @ 13.22 hrs, Volume= 1.224 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.75' @ 13.22 hrs Surf.Area= 13,973 sf Storage= 7,829 cf

Plug-Flow detention time= 18.6 min calculated for 1.224 af (99% of inflow)
Center-of-Mass det. time= 15.9 min (868.3 - 852.4)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.66 cfs @ 13.22 hrs HW=80.75' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.66 cfs @ 4.89 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 2.64" for 10 YEAR event
Inflow = 15.69 cfs @ 12.03 hrs, Volume= 0.961 af
Outflow = 15.77 cfs @ 12.04 hrs, Volume= 0.961 af, Atten= 0%, Lag= 0.6 min
Primary = 0.69 cfs @ 11.05 hrs, Volume= 0.478 af
Secondary = 15.08 cfs @ 12.04 hrs, Volume= 0.483 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 66.01' @ 12.04 hrs Surf.Area= 300 sf Storage= 1,691 cf

Plug-Flow detention time= 8.1 min calculated for 0.961 af (100% of inflow)
Center-of-Mass det. time= 8.1 min (787.5 - 779.5)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.05 hrs HW=61.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=14.53 cfs @ 12.04 hrs HW=66.00' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 14.53 cfs @ 2.31 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 1.75" for 10 YEAR event
Inflow = 4.11 cfs @ 12.03 hrs, Volume= 0.249 af
Outflow = 1.61 cfs @ 12.27 hrs, Volume= 0.210 af, Atten= 61%, Lag= 14.1 min
Primary = 1.61 cfs @ 12.27 hrs, Volume= 0.210 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.89' @ 12.27 hrs Surf.Area= 4,018 sf Storage= 3,568 cf

Plug-Flow detention time= 86.6 min calculated for 0.210 af (84% of inflow)
Center-of-Mass det. time= 41.1 min (844.5 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.60 cfs @ 12.27 hrs HW=80.89' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.60 cfs @ 3.68 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.690 ac, 8.30% Impervious, Inflow Depth > 1.47" for 10 YEAR event
Inflow = 83.42 cfs @ 14.35 hrs, Volume= 29.890 af
Outflow = 82.04 cfs @ 14.54 hrs, Volume= 29.755 af, Atten= 2%, Lag= 11.5 min
Primary = 82.04 cfs @ 14.54 hrs, Volume= 29.755 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.07' @ 14.54 hrs Surf.Area= 27,219 sf Storage= 28,879 cf

Plug-Flow detention time= 4.1 min calculated for 29.755 af (100% of inflow)
Center-of-Mass det. time= 2.9 min (950.2 - 947.3)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=82.11 cfs @ 14.54 hrs HW=58.07' (Free Discharge)
1=Box Culvert (Inlet Controls 82.11 cfs @ 5.53 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 129.01 cfs @ 14.01 hrs, Volume= 48.355 af
Outflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af, Atten= 84%, Lag= 359.5 min
Primary = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 121.86' @ 20.00 hrs Surf.Area= 1,096,574 sf Storage= 1,836,157 cf

Plug-Flow detention time= 291.0 min calculated for 6.105 af (13% of inflow)
Center-of-Mass det. time= 138.6 min (1,073.5 - 934.9)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.21 cfs @ 20.00 hrs HW=121.86' (Free Discharge)
↑—**1=60" Culvert** (Inlet Controls 20.21 cfs @ 3.59 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.76" for 10 YEAR event
Inflow = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af
Outflow = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af, Atten= 46%, Lag= 65.4 min
Primary = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 163.13' @ 14.38 hrs Surf.Area= 153,871 sf Storage= 348,586 cf

Plug-Flow detention time= 98.1 min calculated for 22.091 af (86% of inflow)
Center-of-Mass det. time= 61.2 min (957.0 - 895.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.93 cfs @ 14.38 hrs HW=163.13' (Free Discharge)
↑—**1=48" Culvert** (Inlet Controls 59.93 cfs @ 5.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.80" for 10 YEAR event
Inflow = 41.06 cfs @ 13.68 hrs, Volume= 11.178 af
Outflow = 31.62 cfs @ 14.37 hrs, Volume= 10.677 af, Atten= 23%, Lag= 41.1 min
Primary = 31.62 cfs @ 14.37 hrs, Volume= 10.677 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 73.18' @ 14.37 hrs Surf.Area= 37,485 sf Storage= 84,903 cf

Plug-Flow detention time= 43.0 min calculated for 10.641 af (95% of inflow)
Center-of-Mass det. time= 30.8 min (942.6 - 911.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=31.63 cfs @ 14.37 hrs HW=73.18' (Free Discharge)
1=Culvert (Barrel Controls 31.63 cfs @ 6.55 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (10' WIDE x 7' HIGH)

Inflow Area = 176.470 ac, 8.19% Impervious, Inflow Depth > 1.64" for 10 YEAR event
Inflow = 65.25 cfs @ 14.30 hrs, Volume= 24.062 af
Outflow = 65.24 cfs @ 14.33 hrs, Volume= 24.059 af, Atten= 0%, Lag= 1.4 min
Primary = 65.24 cfs @ 14.33 hrs, Volume= 24.059 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 56.33' @ 14.33 hrs Surf.Area= 4,439 sf Storage= 956 cf

Plug-Flow detention time= 0.1 min calculated for 24.059 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (957.1 - 957.0)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	4,413,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
57.00	10,714	6,017	6,017
60.00	57,000	101,571	107,588
62.00	234,474	291,474	399,062
66.00	504,090	1,477,128	1,876,190
70.00	764,501	2,537,182	4,413,372

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**120.0" W x 84.0" H Box Box Culvert** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 70.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=65.19 cfs @ 14.33 hrs HW=56.33' (Free Discharge)
└**1=Box Culvert** (Barrel Controls 65.19 cfs @ 5.33 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 3.01" for 10 YEAR event
Inflow = 4.22 cfs @ 12.03 hrs, Volume= 0.263 af
Outflow = 1.05 cfs @ 12.38 hrs, Volume= 0.256 af, Atten= 75%, Lag= 21.3 min
Primary = 1.05 cfs @ 12.38 hrs, Volume= 0.256 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 80.50' Surf.Area= 2,167 sf Storage= 2,618 cf
Peak Elev= 81.98' @ 12.38 hrs Surf.Area= 3,088 sf Storage= 6,482 cf (3,864 cf above start)

Plug-Flow detention time= 143.7 min calculated for 0.196 af (74% of inflow)
Center-of-Mass det. time= 42.9 min (811.7 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.50'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.50' / 75.00' S= 0.0161 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.05 cfs @ 12.38 hrs HW=81.97' (Free Discharge)
└**1=Culvert** (Passes 1.05 cfs of 20.36 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.05 cfs @ 5.33 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 4.05" for 10 YEAR event
Inflow = 9.61 cfs @ 12.21 hrs, Volume= 0.966 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.12' @ 20.00 hrs Surf.Area= 867,510 sf Storage= 42,053 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	13,187 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 54 34,020 cf Overall - 1,051 cf Embedded = 32,969 cf x 40.0% Voids
#2	100.00'	1,051 cf	**6.0" Round Pipe Storage** x 51 Inside #1 L= 105.0' S= 0.0050 '/'
		14,239 cf	x 51.00 = 726,182 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 51.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 56.13 cfs @ 12.88 hrs, Volume= 9.550 af
Outflow = 27.57 cfs @ 13.66 hrs, Volume= 9.103 af, Atten= 51%, Lag= 47.3 min
Primary = 26.70 cfs @ 13.66 hrs, Volume= 9.075 af
Secondary = 0.87 cfs @ 13.66 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.12' @ 13.66 hrs Surf.Area= 48,200 sf Storage= 272,968 cf (133,458 cf above start)

Plug-Flow detention time= 185.6 min calculated for 5.900 af (62% of inflow)
Center-of-Mass det. time= 56.0 min (902.7 - 846.7)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.70 cfs @ 13.66 hrs HW=66.11' (Free Discharge)
1=Culvert (Inlet Controls 26.70 cfs @ 8.50 fps)

Secondary OutFlow Max=0.77 cfs @ 13.66 hrs HW=66.11' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.77 cfs @ 0.84 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 0.20" for 10 YEAR event
Inflow = 38.10 cfs @ 13.28 hrs, Volume= 13.816 af
Outflow = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af, Atten= 14%, Lag= 25.9 min
Secondary = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.33' @ 13.71 hrs Surf.Area= 52,279 sf Storage= 62,339 cf

Plug-Flow detention time= 34.4 min calculated for 12.674 af (92% of inflow)
Center-of-Mass det. time= 14.8 min (972.6 - 957.8)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=32.88 cfs @ 13.71 hrs HW=77.33' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 32.88 cfs @ 3.09 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 1.76" for 10 YEAR event
Inflow = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af
Outflow = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af, Atten= 10%, Lag= 16.3 min
Primary = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.73' @ 13.41 hrs Surf.Area= 2,841 sf Storage= 10,797 cf

Plug-Flow detention time= 4.6 min calculated for 4.576 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (867.2 - 863.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.81 cfs @ 13.41 hrs HW=126.73' (Free Discharge)
1=Culvert (Inlet Controls 20.81 cfs @ 11.77 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.01" for 10 YEAR event
Inflow = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af
Outflow = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af, Atten= 3%, Lag= 6.1 min
Primary = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.96' @ 12.83 hrs Surf.Area= 6,905 sf Storage= 9,098 cf

Plug-Flow detention time= 13.4 min calculated for 3.372 af (98% of inflow)
Center-of-Mass det. time= 7.7 min (842.5 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00**
			L= 50.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.67 cfs @ 12.83 hrs HW=81.96' (Free Discharge)
1=Culvert (Inlet Controls 21.67 cfs @ 4.12 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af
Outflow = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af, Atten= 22%, Lag= 18.6 min
Primary = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.56' @ 13.05 hrs Surf.Area= 9,665 sf Storage= 8,470 cf

Plug-Flow detention time= 17.9 min calculated for 1.314 af (99% of inflow)
Center-of-Mass det. time= 15.4 min (852.2 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.77 cfs @ 13.05 hrs HW=91.56' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.77 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 55.060 ac, 5.27% Impervious, Inflow Depth > 1.08" for 10 YEAR event
Inflow = 19.65 cfs @ 13.55 hrs, Volume= 4.958 af
Outflow = 17.95 cfs @ 13.94 hrs, Volume= 4.933 af, Atten= 9%, Lag= 23.1 min
Primary = 17.95 cfs @ 13.94 hrs, Volume= 4.933 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 60.19' @ 13.94 hrs Surf.Area= 12,025 sf Storage= 14,757 cf

Plug-Flow detention time= 10.2 min calculated for 4.933 af (100% of inflow)
Center-of-Mass det. time= 8.7 min (909.4 - 900.7)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=17.95 cfs @ 13.94 hrs HW=60.19' (Free Discharge)
1=Culvert (Inlet Controls 17.95 cfs @ 5.71 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 26.38 cfs @ 12.82 hrs, Volume= 4.374 af, Depth> 2.48"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	14.740	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.61 AC))
	21.130	71	Weighted Average
	21.030		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 76.77 cfs @ 13.58 hrs, Volume= 19.547 af, Depth> 1.40"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 75.94 cfs @ 13.13 hrs, Volume= 15.334 af, Depth> 2.12"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af, Depth> 1.35"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 147.70 cfs @ 13.19 hrs, Volume= 31.202 af, Depth> 1.50"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 11.37 cfs @ 12.83 hrs, Volume= 1.890 af, Depth> 2.40"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 5.63 cfs @ 12.03 hrs, Volume= 0.358 af, Depth> 4.09"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 13.42 cfs @ 12.03 hrs, Volume= 0.837 af, Depth> 3.78"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.800	74	NEW LAWN C
	2.660	84	Weighted Average
	1.590		59.77% Pervious Area
	1.070		40.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 21.56 cfs @ 12.03 hrs, Volume= 1.339 af, Depth> 3.68"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 4.82 cfs @ 12.03 hrs, Volume= 0.315 af, Depth> 4.50"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.260	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.840	91	Weighted Average
	0.260		30.95% Pervious Area
	0.580		69.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 1.92 cfs @ 12.03 hrs, Volume= 0.120 af, Depth> 3.78"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 6.20 cfs @ 12.03 hrs, Volume= 0.375 af, Depth> 2.63"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 31.45 cfs @ 12.03 hrs, Volume= 1.901 af, Depth> 2.45"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	8.410	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.17 ac (1/2) of 2 Roofs + 2 fulll
	9.300	70	Weighted Average
	9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 12.15 cfs @ 12.21 hrs, Volume= 1.226 af, Depth> 5.15"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
2.5	25	0.0400	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.10"
13.1	75	0.1600	0.10		**Sheet Flow, CD** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.7	120	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 47.10 cfs @ 12.72 hrs, Volume= 7.233 af, Depth> 2.85"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 32.74 cfs @ 13.14 hrs, Volume= 6.707 af, Depth> 1.50"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af, Depth> 2.64"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af, Depth> 2.94"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af, Depth> 2.85"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 33.70 cfs @ 13.51 hrs, Volume= 8.144 af, Depth> 1.77"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.660 ac, 40.23% Impervious, Inflow Depth > 3.78" for 25 YEAR event
Inflow = 13.42 cfs @ 12.03 hrs, Volume= 0.837 af
Outflow = 10.10 cfs @ 12.22 hrs, Volume= 0.825 af, Atten= 25%, Lag= 11.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 7.7 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 27.5 min

Peak Storage= 4,780 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 35R: Buffer #2

Inflow Area = 0.840 ac, 69.05% Impervious, Inflow Depth > 4.50" for 25 YEAR event
Inflow = 4.82 cfs @ 12.03 hrs, Volume= 0.315 af
Outflow = 3.49 cfs @ 12.25 hrs, Volume= 0.310 af, Atten= 28%, Lag= 13.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.18 fps, Min. Travel Time= 9.5 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 32.0 min

Peak Storage= 2,003 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 2.61" for 25 YEAR event
Inflow = 4.42 cfs @ 12.07 hrs, Volume= 0.454 af
Outflow = 3.82 cfs @ 12.34 hrs, Volume= 0.447 af, Atten= 14%, Lag= 16.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 24.8 min

Peak Storage= 1,753 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'



Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.29" for 25 YEAR event
Inflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Outflow = 48.68 cfs @ 20.00 hrs, Volume= 16.519 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 10.7 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 13.5 min

Peak Storage= 31,184 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



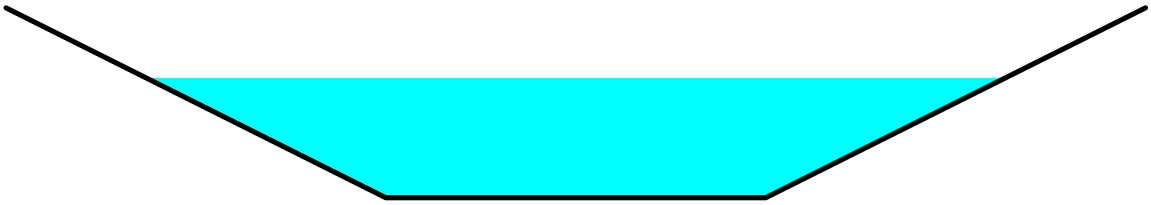
Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 1.37" for 25 YEAR event
Inflow = 161.60 cfs @ 13.61 hrs, Volume= 56.283 af
Outflow = 157.75 cfs @ 14.18 hrs, Volume= 54.212 af, Atten= 2%, Lag= 34.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 16.7 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 25.5 min

Peak Storage= 157,984 cf @ 13.90 hrs
Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 3.26" for 25 YEAR event
Inflow = 98.34 cfs @ 14.08 hrs, Volume= 45.498 af
Outflow = 98.19 cfs @ 14.27 hrs, Volume= 44.342 af, Atten= 0%, Lag= 10.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 2.73 fps, Avg. Travel Time= 9.1 min

Peak Storage= 35,977 cf @ 14.16 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



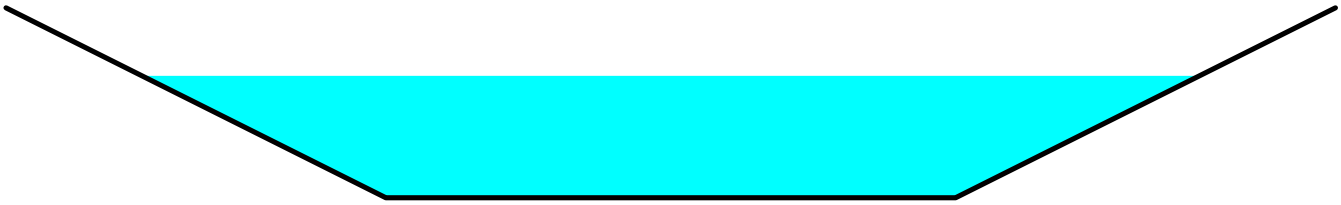
Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 234.390 ac, 8.63% Impervious, Inflow Depth > 2.83" for 25 YEAR event
Inflow = 127.14 cfs @ 14.07 hrs, Volume= 55.249 af
Outflow = 127.07 cfs @ 14.15 hrs, Volume= 54.647 af, Atten= 0%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 5.4 min

Peak Storage= 22,012 cf @ 14.10 hrs
Average Depth at Peak Storage= 2.57'
Bank-Full Depth= 4.00' Flow Area= 80.0 sf, Capacity= 292.83 cfs

12.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 28.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site @ PL

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 2.46" for 25 YEAR event
Inflow = 34.97 cfs @ 12.86 hrs, Volume= 6.697 af
Outflow = 34.92 cfs @ 12.91 hrs, Volume= 6.674 af, Atten= 0%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.68 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 4.9 min

Peak Storage= 4,268 cf @ 12.88 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



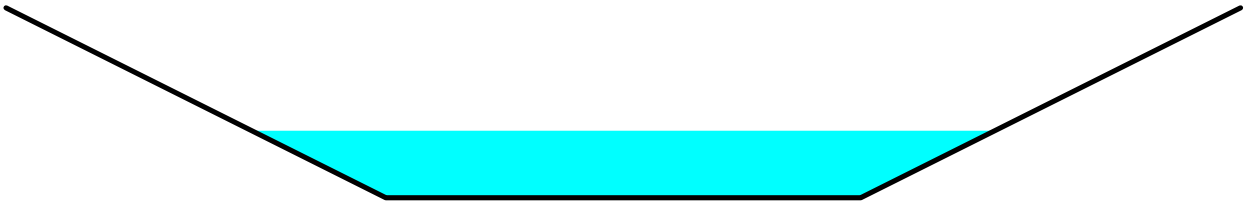
Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af
Outflow = 53.54 cfs @ 20.00 hrs, Volume= 26.636 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 13.4 min

Peak Storage= 29,848 cf @ 20.00 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 2.89" for 25 YEAR event
Inflow = 38.03 cfs @ 13.01 hrs, Volume= 6.894 af
Outflow = 37.70 cfs @ 13.16 hrs, Volume= 6.832 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 12.3 min

Peak Storage= 12,802 cf @ 13.07 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 2.45" for 25 YEAR event
Inflow = 34.92 cfs @ 12.91 hrs, Volume= 6.674 af
Outflow = 28.17 cfs @ 13.30 hrs, Volume= 6.630 af, Atten= 19%, Lag= 23.3 min
Primary = 28.17 cfs @ 13.30 hrs, Volume= 6.630 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.47' @ 13.30 hrs Surf.Area= 12,336 sf Storage= 31,559 cf

Plug-Flow detention time= 13.8 min calculated for 6.630 af (99% of inflow)
Center-of-Mass det. time= 11.6 min (862.2 - 850.7)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=28.16 cfs @ 13.30 hrs HW=58.47' (Free Discharge)
1=Culvert (Inlet Controls 28.16 cfs @ 8.97 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 2.40" for 25 YEAR event
Inflow = 11.37 cfs @ 12.83 hrs, Volume= 1.890 af
Outflow = 7.99 cfs @ 13.28 hrs, Volume= 1.877 af, Atten= 30%, Lag= 26.8 min
Primary = 7.99 cfs @ 13.28 hrs, Volume= 1.877 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.13' @ 13.28 hrs Surf.Area= 19,087 sf Storage= 14,185 cf

Plug-Flow detention time= 21.8 min calculated for 1.877 af (99% of inflow)
Center-of-Mass det. time= 19.3 min (862.9 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.99 cfs @ 13.28 hrs HW=81.13' (Free Discharge)
└**1=Culvert** (Inlet Controls 7.99 cfs @ 4.52 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 3.68" for 25 YEAR event
Inflow = 21.56 cfs @ 12.03 hrs, Volume= 1.339 af
Outflow = 21.67 cfs @ 12.04 hrs, Volume= 1.339 af, Atten= 0%, Lag= 0.6 min
Primary = 0.69 cfs @ 10.40 hrs, Volume= 0.568 af
Secondary = 20.98 cfs @ 12.04 hrs, Volume= 0.771 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 66.14' @ 12.04 hrs Surf.Area= 300 sf Storage= 1,834 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.6 min (779.2 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 10.40 hrs HW=61.16' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=20.16 cfs @ 12.04 hrs HW=66.12' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 20.16 cfs @ 2.58 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 2.63" for 25 YEAR event
Inflow = 6.20 cfs @ 12.03 hrs, Volume= 0.375 af
Outflow = 3.16 cfs @ 12.15 hrs, Volume= 0.334 af, Atten= 49%, Lag= 7.3 min
Primary = 3.16 cfs @ 12.15 hrs, Volume= 0.334 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.18' @ 12.15 hrs Surf.Area= 4,024 sf Storage= 4,754 cf

Plug-Flow detention time= 67.6 min calculated for 0.333 af (89% of inflow)
Center-of-Mass det. time= 33.5 min (827.8 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.16 cfs @ 12.15 hrs HW=81.18' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.16 cfs @ 4.19 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.690 ac, 8.30% Impervious, Inflow Depth > 2.78" for 25 YEAR event
Inflow = 128.94 cfs @ 14.15 hrs, Volume= 56.548 af
Outflow = 124.83 cfs @ 14.51 hrs, Volume= 56.058 af, Atten= 3%, Lag= 21.8 min
Primary = 124.83 cfs @ 14.51 hrs, Volume= 56.058 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.17' @ 14.51 hrs Surf.Area= 44,275 sf Storage= 68,385 cf

Plug-Flow detention time= 6.7 min calculated for 56.058 af (99% of inflow)
Center-of-Mass det. time= 4.6 min (963.9 - 959.3)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=124.81 cfs @ 14.51 hrs HW=59.17' (Free Discharge)
1=Box Culvert (Barrel Controls 124.81 cfs @ 8.17 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 1.38" for 25 YEAR event
Inflow = 250.10 cfs @ 13.75 hrs, Volume= 85.414 af
Outflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af, Atten= 80%, Lag= 375.0 min
Primary = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 122.82' @ 20.00 hrs Surf.Area= 1,208,890 sf Storage= 2,938,188 cf

Plug-Flow detention time= 265.8 min calculated for 17.951 af (21% of inflow)
Center-of-Mass det. time= 131.9 min (1,054.7 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.75 cfs @ 20.00 hrs HW=122.82' (Free Discharge)
└**1=60" Culvert** (Inlet Controls 48.75 cfs @ 4.70 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 1.35" for 25 YEAR event
Inflow = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af
Outflow = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af, Atten= 46%, Lag= 58.9 min
Primary = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.65' @ 14.19 hrs Surf.Area= 195,136 sf Storage= 613,755 cf

Plug-Flow detention time= 87.6 min calculated for 40.813 af (89% of inflow)
Center-of-Mass det. time= 59.5 min (942.8 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=114.72 cfs @ 14.19 hrs HW=164.65' (Free Discharge)
└**1=48" Culvert** (Barrel Controls 114.72 cfs @ 8.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 1.40" for 25 YEAR event
Inflow = 76.77 cfs @ 13.58 hrs, Volume= 19.547 af
Outflow = 48.97 cfs @ 14.57 hrs, Volume= 18.863 af, Atten= 36%, Lag= 59.8 min
Primary = 48.97 cfs @ 14.57 hrs, Volume= 18.863 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.54' @ 14.57 hrs Surf.Area= 55,585 sf Storage= 193,591 cf

Plug-Flow detention time= 52.9 min calculated for 18.800 af (96% of inflow)
Center-of-Mass det. time= 43.0 min (943.5 - 900.5)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.97 cfs @ 14.57 hrs HW=75.54' (Free Discharge)
1=Culvert (Inlet Controls 48.97 cfs @ 9.98 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (10' WIDE x 7' HIGH)

Inflow Area = 176.470 ac, 8.19% Impervious, Inflow Depth > 3.21" for 25 YEAR event
Inflow = 100.78 cfs @ 14.25 hrs, Volume= 47.165 af
Outflow = 100.72 cfs @ 14.30 hrs, Volume= 47.143 af, Atten= 0%, Lag= 2.8 min
Primary = 100.72 cfs @ 14.30 hrs, Volume= 47.143 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 56.93' @ 14.30 hrs Surf.Area= 10,057 sf Storage= 5,290 cf

Plug-Flow detention time= 0.5 min calculated for 46.986 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (971.3 - 970.9)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	4,413,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
57.00	10,714	6,017	6,017
60.00	57,000	101,571	107,588
62.00	234,474	291,474	399,062
66.00	504,090	1,477,128	1,876,190
70.00	764,501	2,537,182	4,413,372

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**120.0" W x 84.0" H Box Box Culvert** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 70.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=100.69 cfs @ 14.30 hrs HW=56.93' (Free Discharge)
1=Box Culvert (Barrel Controls 100.69 cfs @ 6.02 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 4.09" for 25 YEAR event
Inflow = 5.63 cfs @ 12.03 hrs, Volume= 0.358 af
Outflow = 3.03 cfs @ 12.14 hrs, Volume= 0.349 af, Atten= 46%, Lag= 6.6 min
Primary = 3.03 cfs @ 12.14 hrs, Volume= 0.349 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 80.50' Surf.Area= 2,167 sf Storage= 2,618 cf
Peak Elev= 82.13' @ 12.14 hrs Surf.Area= 3,194 sf Storage= 6,964 cf (4,346 cf above start)

Plug-Flow detention time= 122.7 min calculated for 0.289 af (81% of inflow)
Center-of-Mass det. time= 38.6 min (800.1 - 761.5)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.50'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.50' / 75.00' S= 0.0161 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.96 cfs @ 12.14 hrs HW=82.13' (Free Discharge)
└**1=Culvert** (Passes 2.96 cfs of 20.63 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.11 cfs @ 5.65 fps)
└**3=Orifice/Grate** (Weir Controls 1.85 cfs @ 1.16 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 5.15" for 25 YEAR event
Inflow = 12.15 cfs @ 12.21 hrs, Volume= 1.226 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.15' @ 20.00 hrs Surf.Area= 867,510 sf Storage= 53,394 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	13,187 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 54 34,020 cf Overall - 1,051 cf Embedded = 32,969 cf x 40.0% Voids
#2	100.00'	1,051 cf	**6.0" Round Pipe Storage** x 51 Inside #1 L= 105.0' S= 0.0050 '/'
		14,239 cf	x 51.00 = 726,182 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 51.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 78.72 cfs @ 12.82 hrs, Volume= 14.065 af
Outflow = 51.54 cfs @ 13.49 hrs, Volume= 13.523 af, Atten= 35%, Lag= 40.0 min
Primary = 30.23 cfs @ 13.49 hrs, Volume= 11.738 af
Secondary = 21.31 cfs @ 13.49 hrs, Volume= 1.785 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.99' @ 13.49 hrs Surf.Area= 62,678 sf Storage= 321,669 cf (182,159 cf above start)

Plug-Flow detention time= 150.8 min calculated for 10.321 af (73% of inflow)
Center-of-Mass det. time= 54.6 min (892.9 - 838.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=30.23 cfs @ 13.49 hrs HW=66.99' (Free Discharge)
1=Culvert (Inlet Controls 30.23 cfs @ 9.62 fps)

Secondary OutFlow Max=21.21 cfs @ 13.49 hrs HW=66.99' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 21.21 cfs @ 2.67 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 0.44" for 25 YEAR event
Inflow = 58.82 cfs @ 13.22 hrs, Volume= 30.100 af
Outflow = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af, Atten= 9%, Lag= 407.0 min
Secondary = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.86' @ 20.00 hrs Surf.Area= 56,623 sf Storage= 91,213 cf

Plug-Flow detention time= 28.7 min calculated for 27.913 af (93% of inflow)
Center-of-Mass det. time= 13.0 min (990.0 - 977.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=53.64 cfs @ 20.00 hrs HW=77.86' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 53.64 cfs @ 3.60 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 2.64" for 25 YEAR event
Inflow = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af
Outflow = 27.51 cfs @ 13.55 hrs, Volume= 6.874 af, Atten= 21%, Lag= 25.4 min
Primary = 27.51 cfs @ 13.55 hrs, Volume= 6.874 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 131.20' @ 13.55 hrs Surf.Area= 7,245 sf Storage= 28,832 cf

Plug-Flow detention time= 8.6 min calculated for 6.874 af (100% of inflow)
Center-of-Mass det. time= 8.2 min (863.0 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=27.51 cfs @ 13.55 hrs HW=131.20' (Free Discharge)
1=Culvert (Inlet Controls 27.51 cfs @ 15.57 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.94" for 25 YEAR event
Inflow = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af
Outflow = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af, Atten= 14%, Lag= 14.0 min
Primary = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.46' @ 12.95 hrs Surf.Area= 26,457 sf Storage= 17,122 cf

Plug-Flow detention time= 12.3 min calculated for 4.952 af (99% of inflow)
Center-of-Mass det. time= 8.0 min (834.6 - 826.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00**
			L= 50.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=28.13 cfs @ 12.95 hrs HW=82.46' (Free Discharge)
1=Culvert (Inlet Controls 28.13 cfs @ 5.31 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af
Outflow = 10.00 cfs @ 13.03 hrs, Volume= 1.942 af, Atten= 21%, Lag= 18.6 min
Primary = 9.08 cfs @ 13.03 hrs, Volume= 1.927 af
Secondary = 0.91 cfs @ 13.03 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.06' @ 13.03 hrs Surf.Area= 12,502 sf Storage= 13,941 cf

Plug-Flow detention time= 19.9 min calculated for 1.936 af (99% of inflow)
Center-of-Mass det. time= 17.5 min (846.0 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.08 cfs @ 13.03 hrs HW=92.06' (Free Discharge)
↑**1=Culvert** (Barrel Controls 9.08 cfs @ 5.14 fps)

Secondary OutFlow Max=0.87 cfs @ 13.03 hrs HW=92.06' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.87 cfs @ 0.63 fps)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 55.060 ac, 5.27% Impervious, Inflow Depth > 1.77" for 25 YEAR event
Inflow = 33.70 cfs @ 13.51 hrs, Volume= 8.144 af
Outflow = 33.58 cfs @ 13.57 hrs, Volume= 8.106 af, Atten= 0%, Lag= 3.8 min
Primary = 23.11 cfs @ 13.57 hrs, Volume= 7.570 af
Secondary = 10.47 cfs @ 13.57 hrs, Volume= 0.537 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.11' @ 13.57 hrs Surf.Area= 16,663 sf Storage= 28,049 cf

Plug-Flow detention time= 13.2 min calculated for 8.079 af (99% of inflow)
Center-of-Mass det. time= 11.8 min (903.0 - 891.2)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.11 cfs @ 13.57 hrs HW=61.11' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 23.11 cfs @ 7.36 fps)

Secondary OutFlow Max=10.34 cfs @ 13.57 hrs HW=61.11' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 10.34 cfs @ 0.91 fps)

Summary for Subcatchment 3S:

Runoff = 45.42 cfs @ 12.81 hrs, Volume= 7.530 af, Depth> 4.28"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	14.740	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.61 AC))
	21.130	71	Weighted Average
	21.030		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 160.95 cfs @ 13.47 hrs, Volume= 38.986 af, Depth> 2.79"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 137.65 cfs @ 13.11 hrs, Volume= 27.456 af, Depth> 3.80"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af, Depth> 2.73"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 303.09 cfs @ 13.13 hrs, Volume= 61.245 af, Depth> 2.94"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 19.82 cfs @ 12.81 hrs, Volume= 3.283 af, Depth> 4.17"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 8.33 cfs @ 12.03 hrs, Volume= 0.542 af, Depth> 6.19"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 20.30 cfs @ 12.03 hrs, Volume= 1.298 af, Depth> 5.85"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.800	74	NEW LAWN C
	2.660	84	Weighted Average
	1.590		59.77% Pervious Area
	1.070		40.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 32.88 cfs @ 12.03 hrs, Volume= 2.090 af, Depth> 5.74"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 6.96 cfs @ 12.02 hrs, Volume= 0.464 af, Depth> 6.63"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.260	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.840	91	Weighted Average
	0.260		30.95% Pervious Area
	0.580		69.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 2.90 cfs @ 12.03 hrs, Volume= 0.185 af, Depth> 5.85"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 10.46 cfs @ 12.03 hrs, Volume= 0.638 af, Depth> 4.48"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 54.21 cfs @ 12.03 hrs, Volume= 3.295 af, Depth> 4.25"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	8.410	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.17 ac (1/2) of 2 Roofs + 2 fulll
	9.300	70	Weighted Average
	9.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 17.01 cfs @ 12.21 hrs, Volume= 1.724 af, Depth> 7.23"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
2.5	25	0.0400	0.17		**Sheet Flow, BC** Grass: Short n= 0.150 P2= 3.10"
13.1	75	0.1600	0.10		**Sheet Flow, CD** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.7	120	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 77.65 cfs @ 12.71 hrs, Volume= 12.027 af, Depth> 4.74"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 66.86 cfs @ 13.10 hrs, Volume= 13.161 af, Depth> 2.94"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af, Depth> 4.47"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af, Depth> 4.85"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af, Depth> 4.74"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 64.50 cfs @ 13.49 hrs, Volume= 15.247 af, Depth> 3.32"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.660 ac, 40.23% Impervious, Inflow Depth > 5.85" for 100 YEAR event
Inflow = 20.30 cfs @ 12.03 hrs, Volume= 1.298 af
Outflow = 16.15 cfs @ 12.19 hrs, Volume= 1.283 af, Atten= 20%, Lag= 9.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.26 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 23.6 min

Peak Storage= 6,308 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



Summary for Reach 35R: Buffer #2

Inflow Area = 0.840 ac, 69.05% Impervious, Inflow Depth > 6.63" for 100 YEAR event
Inflow = 6.96 cfs @ 12.02 hrs, Volume= 0.464 af
Outflow = 5.25 cfs @ 12.22 hrs, Volume= 0.458 af, Atten= 25%, Lag= 11.7 min

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= 8.0 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 27.6 min

Peak Storage= 2,568 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'



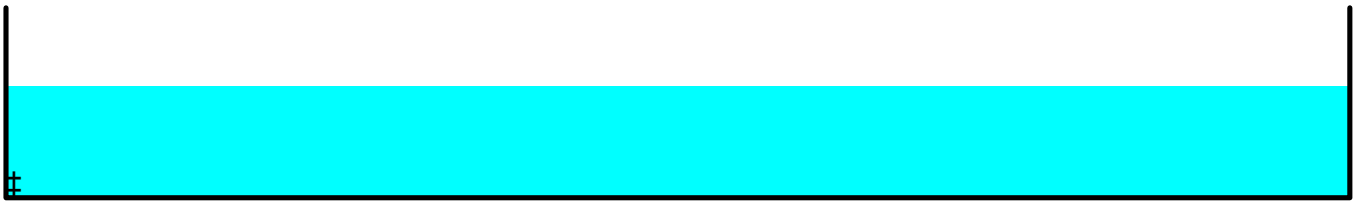
Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 4.48" for 100 YEAR event
Inflow = 8.38 cfs @ 12.07 hrs, Volume= 0.780 af
Outflow = 7.52 cfs @ 12.25 hrs, Volume= 0.771 af, Atten= 10%, Lag= 10.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.29 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 20.8 min

Peak Storage= 2,636 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'



Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.80" for 100 YEAR event
Inflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Outflow = 118.34 cfs @ 19.44 hrs, Volume= 46.702 af, Atten= 0%, Lag= 13.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.49 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 4.54 fps, Avg. Travel Time= 9.7 min

Peak Storage= 57,110 cf @ 19.30 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 2.74" for 100 YEAR event
Inflow = 290.98 cfs @ 13.29 hrs, Volume= 112.352 af
Outflow = 284.54 cfs @ 13.86 hrs, Volume= 109.040 af, Atten= 2%, Lag= 33.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 22.3 min

Peak Storage= 242,556 cf @ 13.62 hrs
Average Depth at Peak Storage= 3.41'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 7.34" for 100 YEAR event
Inflow = 230.92 cfs @ 13.93 hrs, Volume= 102.455 af
Outflow = 228.72 cfs @ 14.09 hrs, Volume= 100.331 af, Atten= 1%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.17 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 3.20 fps, Avg. Travel Time= 7.7 min

Peak Storage= 65,551 cf @ 14.01 hrs
Average Depth at Peak Storage= 2.83'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 234.390 ac, 8.63% Impervious, Inflow Depth > 6.12" for 100 YEAR event
Inflow = 272.33 cfs @ 14.18 hrs, Volume= 119.454 af
Outflow = 271.96 cfs @ 14.25 hrs, Volume= 118.338 af, Atten= 0%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 4.3 min

Peak Storage= 37,932 cf @ 14.21 hrs
Average Depth at Peak Storage= 3.85'
Bank-Full Depth= 4.00' Flow Area= 80.0 sf, Capacity= 292.83 cfs

12.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 28.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site @ PL

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 4.25" for 100 YEAR event
Inflow = 57.38 cfs @ 12.81 hrs, Volume= 11.565 af
Outflow = 57.21 cfs @ 12.86 hrs, Volume= 11.535 af, Atten= 0%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 4.1 min

Peak Storage= 5,947 cf @ 12.83 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af
Outflow = 127.24 cfs @ 19.52 hrs, Volume= 64.849 af, Atten= 0%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 11.2 min

Peak Storage= 54,587 cf @ 19.40 hrs
Average Depth at Peak Storage= 2.27'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 4.78" for 100 YEAR event
Inflow = 55.03 cfs @ 12.87 hrs, Volume= 11.430 af
Outflow = 54.68 cfs @ 13.02 hrs, Volume= 11.350 af, Atten= 1%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 10.8 min

Peak Storage= 16,434 cf @ 12.94 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.680 ac, 0.80% Impervious, Inflow Depth > 4.24" for 100 YEAR event
Inflow = 57.21 cfs @ 12.86 hrs, Volume= 11.535 af
Outflow = 55.83 cfs @ 12.99 hrs, Volume= 11.476 af, Atten= 2%, Lag= 7.4 min
Primary = 32.08 cfs @ 12.99 hrs, Volume= 10.285 af
Secondary = 23.75 cfs @ 12.99 hrs, Volume= 1.191 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.50' @ 12.99 hrs Surf.Area= 17,490 sf Storage= 46,932 cf

Plug-Flow detention time= 14.8 min calculated for 11.476 af (99% of inflow)
Center-of-Mass det. time= 13.0 min (854.2 - 841.2)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.08 cfs @ 12.99 hrs HW=59.50' (Free Discharge)
1=Culvert (Inlet Controls 32.08 cfs @ 10.21 fps)

Secondary OutFlow Max=23.65 cfs @ 12.99 hrs HW=59.50' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 23.65 cfs @ 1.90 fps)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 4.17" for 100 YEAR event
Inflow = 19.82 cfs @ 12.81 hrs, Volume= 3.283 af
Outflow = 10.97 cfs @ 13.43 hrs, Volume= 3.263 af, Atten= 45%, Lag= 37.2 min
Primary = 10.97 cfs @ 13.43 hrs, Volume= 3.263 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.91' @ 13.43 hrs Surf.Area= 29,458 sf Storage= 33,117 cf

Plug-Flow detention time= 32.2 min calculated for 3.263 af (99% of inflow)
Center-of-Mass det. time= 30.0 min (861.8 - 831.7)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.97 cfs @ 13.43 hrs HW=81.91' (Free Discharge)
1=Culvert (Inlet Controls 10.97 cfs @ 6.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 5.74" for 100 YEAR event
Inflow = 32.88 cfs @ 12.03 hrs, Volume= 2.090 af
Outflow = 33.04 cfs @ 12.04 hrs, Volume= 2.090 af, Atten= 0%, Lag= 0.6 min
Primary = 0.69 cfs @ 9.25 hrs, Volume= 0.695 af
Secondary = 32.35 cfs @ 12.04 hrs, Volume= 1.395 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 66.35' @ 12.04 hrs Surf.Area= 300 sf Storage= 2,090 cf

Plug-Flow detention time= 7.1 min calculated for 2.090 af (100% of inflow)
Center-of-Mass det. time= 7.1 min (768.0 - 761.0)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 9.25 hrs HW=61.15' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=31.04 cfs @ 12.04 hrs HW=66.33' (Free Discharge)
2=Orifice/Grate (Weir Controls 31.04 cfs @ 2.98 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 4.48" for 100 YEAR event
Inflow = 10.46 cfs @ 12.03 hrs, Volume= 0.638 af
Outflow = 6.28 cfs @ 12.12 hrs, Volume= 0.594 af, Atten= 40%, Lag= 5.4 min
Primary = 6.28 cfs @ 12.12 hrs, Volume= 0.594 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.68' @ 12.12 hrs Surf.Area= 4,035 sf Storage= 6,764 cf

Plug-Flow detention time= 51.8 min calculated for 0.594 af (93% of inflow)
Center-of-Mass det. time= 27.8 min (809.9 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.18 cfs @ 12.12 hrs HW=81.67' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.18 cfs @ 4.80 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.690 ac, 8.30% Impervious, Inflow Depth > 5.99" for 100 YEAR event
Inflow = 274.85 cfs @ 14.25 hrs, Volume= 121.633 af
Outflow = 228.96 cfs @ 14.91 hrs, Volume= 118.721 af, Atten= 17%, Lag= 39.4 min
Primary = 228.96 cfs @ 14.91 hrs, Volume= 118.721 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.54' @ 14.91 hrs Surf.Area= 193,530 sf Storage= 302,923 cf

Plug-Flow detention time= 15.6 min calculated for 118.721 af (98% of inflow)
Center-of-Mass det. time= 10.0 min (975.2 - 965.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=228.94 cfs @ 14.91 hrs HW=61.54' (Free Discharge)
1=Box Culvert (Barrel Controls 228.94 cfs @ 9.48 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 2.75" for 100 YEAR event
Inflow = 523.45 cfs @ 13.47 hrs, Volume= 170.286 af
Outflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af, Atten= 77%, Lag= 344.6 min
Primary = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 124.62' @ 19.21 hrs Surf.Area= 1,420,388 sf Storage= 5,304,855 cf

Plug-Flow detention time= 250.0 min calculated for 49.310 af (29% of inflow)
Center-of-Mass det. time= 121.4 min (1,039.2 - 917.7)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=118.47 cfs @ 19.21 hrs HW=124.62' (Free Discharge)
↑**1=60" Culvert** (Inlet Controls 118.47 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 2.73" for 100 YEAR event
Inflow = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af
Outflow = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af, Atten= 56%, Lag= 72.2 min
Primary = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.07' @ 14.34 hrs Surf.Area= 288,151 sf Storage= 1,441,429 cf

Plug-Flow detention time= 100.7 min calculated for 84.614 af (92% of inflow)
Center-of-Mass det. time= 78.0 min (947.2 - 869.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=197.65 cfs @ 14.34 hrs HW=168.07' (Free Discharge)
↑**1=48" Culvert** (Barrel Controls 197.65 cfs @ 10.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 2.79" for 100 YEAR event
Inflow = 160.95 cfs @ 13.47 hrs, Volume= 38.986 af
Outflow = 142.68 cfs @ 13.93 hrs, Volume= 37.606 af, Atten= 11%, Lag= 27.5 min
Primary = 63.69 cfs @ 13.93 hrs, Volume= 31.749 af
Secondary = 78.99 cfs @ 13.93 hrs, Volume= 5.857 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.51' @ 13.93 hrs Surf.Area= 77,195 sf Storage= 391,523 cf

Plug-Flow detention time= 66.6 min calculated for 37.481 af (96% of inflow)
Center-of-Mass det. time= 56.2 min (943.5 - 887.3)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=63.68 cfs @ 13.93 hrs HW=78.51' (Free Discharge)
1=Culvert (Inlet Controls 63.68 cfs @ 12.97 fps)

Secondary OutFlow Max=78.66 cfs @ 13.93 hrs HW=78.51' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 78.66 cfs @ 1.93 fps)

Summary for Pond 43P: Box Culvert 3 (10' WIDE x 7' HIGH)

Inflow Area = 176.470 ac, 8.19% Impervious, Inflow Depth > 7.12" for 100 YEAR event
Inflow = 232.58 cfs @ 14.09 hrs, Volume= 104.693 af
Outflow = 226.01 cfs @ 14.24 hrs, Volume= 104.272 af, Atten= 3%, Lag= 9.4 min
Primary = 226.01 cfs @ 14.24 hrs, Volume= 104.272 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 58.70' @ 14.24 hrs Surf.Area= 36,941 sf Storage= 46,522 cf

Plug-Flow detention time= 2.3 min calculated for 103.926 af (99% of inflow)
Center-of-Mass det. time= 1.4 min (978.8 - 977.5)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	4,413,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
57.00	10,714	6,017	6,017
60.00	57,000	101,571	107,588
62.00	234,474	291,474	399,062
66.00	504,090	1,477,128	1,876,190
70.00	764,501	2,537,182	4,413,372

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**120.0" W x 84.0" H Box Box Culvert** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 70.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=225.92 cfs @ 14.24 hrs HW=58.70' (Free Discharge)
1=Box Culvert (Barrel Controls 225.92 cfs @ 7.53 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 6.19" for 100 YEAR event
Inflow = 8.33 cfs @ 12.03 hrs, Volume= 0.542 af
Outflow = 7.82 cfs @ 12.06 hrs, Volume= 0.532 af, Atten= 6%, Lag= 2.3 min
Primary = 7.82 cfs @ 12.06 hrs, Volume= 0.532 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 80.50' Surf.Area= 2,167 sf Storage= 2,618 cf
Peak Elev= 82.30' @ 12.06 hrs Surf.Area= 3,311 sf Storage= 7,510 cf (4,892 cf above start)

Plug-Flow detention time= 99.0 min calculated for 0.470 af (87% of inflow)
Center-of-Mass det. time= 32.7 min (785.3 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.50'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.50' / 75.00' S= 0.0161 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.37 cfs @ 12.06 hrs HW=82.28' (Free Discharge)
└**1=Culvert** (Passes 7.37 cfs of 20.90 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 1.17 cfs @ 5.96 fps)
└**3=Orifice/Grate** (Weir Controls 6.20 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.50' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 7.23" for 100 YEAR event
Inflow = 17.01 cfs @ 12.21 hrs, Volume= 1.724 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.21' @ 20.00 hrs Surf.Area= 867,510 sf Storage= 75,072 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	13,187 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 54 34,020 cf Overall - 1,051 cf Embedded = 32,969 cf x 40.0% Voids
#2	100.00'	1,051 cf	**6.0" Round Pipe Storage** x 51 Inside #1 L= 105.0' S= 0.0050 '/'
		14,239 cf	x 51.00 = 726,182 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 51.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 124.91 cfs @ 12.83 hrs, Volume= 23.377 af
Outflow = 90.88 cfs @ 13.30 hrs, Volume= 22.653 af, Atten= 27%, Lag= 28.1 min
Primary = 33.63 cfs @ 13.30 hrs, Volume= 15.604 af
Secondary = 57.25 cfs @ 13.30 hrs, Volume= 7.050 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 67.94' @ 13.30 hrs Surf.Area= 78,326 sf Storage= 388,610 cf (249,100 cf above start)

Plug-Flow detention time= 115.3 min calculated for 19.386 af (83% of inflow)
Center-of-Mass det. time= 48.3 min (876.2 - 827.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=33.63 cfs @ 13.30 hrs HW=67.94' (Free Discharge)
1=Culvert (Inlet Controls 33.63 cfs @ 10.71 fps)

Secondary OutFlow Max=57.21 cfs @ 13.30 hrs HW=67.94' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 57.21 cfs @ 3.68 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 1.04" for 100 YEAR event
Inflow = 127.45 cfs @ 18.93 hrs, Volume= 71.503 af
Outflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af, Atten= 0%, Lag= 22.9 min
Secondary = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 79.31' @ 19.31 hrs Surf.Area= 68,498 sf Storage= 181,901 cf

Plug-Flow detention time= 24.1 min calculated for 67.123 af (94% of inflow)
Center-of-Mass det. time= 11.5 min (995.5 - 984.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=127.25 cfs @ 19.31 hrs HW=79.31' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 127.25 cfs @ 4.80 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 4.47" for 100 YEAR event
Inflow = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af
Outflow = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af, Atten= 43%, Lag= 45.3 min
Primary = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 136.14' @ 13.86 hrs Surf.Area= 20,365 sf Storage= 96,933 cf

Plug-Flow detention time= 24.1 min calculated for 11.602 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (867.4 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.38 cfs @ 13.86 hrs HW=136.14' (Free Discharge)
1=Culvert (Inlet Controls 33.38 cfs @ 18.89 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 4.85" for 100 YEAR event
Inflow = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af
Outflow = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af, Atten= 32%, Lag= 24.7 min
Primary = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 83.23' @ 13.12 hrs Surf.Area= 58,674 sf Storage= 49,853 cf

Plug-Flow detention time= 15.4 min calculated for 8.172 af (99% of inflow)
Center-of-Mass det. time= 12.5 min (827.9 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00**
			L= 50.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.94 cfs @ 13.12 hrs HW=83.23' (Free Discharge)
1=Culvert (Inlet Controls 35.94 cfs @ 6.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af
Outflow = 20.43 cfs @ 12.81 hrs, Volume= 3.231 af, Atten= 3%, Lag= 6.2 min
Primary = 10.34 cfs @ 12.81 hrs, Volume= 2.768 af
Secondary = 10.09 cfs @ 12.81 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.28' @ 12.81 hrs Surf.Area= 14,299 sf Storage= 16,973 cf

Plug-Flow detention time= 18.1 min calculated for 3.220 af (99% of inflow)
Center-of-Mass det. time= 15.8 min (833.0 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.34 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↑**1=Culvert** (Barrel Controls 10.34 cfs @ 5.85 fps)

Secondary OutFlow Max=10.05 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 10.05 cfs @ 1.43 fps)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 55.060 ac, 5.27% Impervious, Inflow Depth > 3.32" for 100 YEAR event
Inflow = 64.50 cfs @ 13.49 hrs, Volume= 15.247 af
Outflow = 64.41 cfs @ 13.50 hrs, Volume= 15.182 af, Atten= 0%, Lag= 0.9 min
Primary = 23.93 cfs @ 13.50 hrs, Volume= 10.689 af
Secondary = 40.48 cfs @ 13.50 hrs, Volume= 4.493 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.28' @ 13.50 hrs Surf.Area= 17,505 sf Storage= 30,923 cf

Plug-Flow detention time= 11.4 min calculated for 15.182 af (100% of inflow)
Center-of-Mass det. time= 10.0 min (889.1 - 879.1)

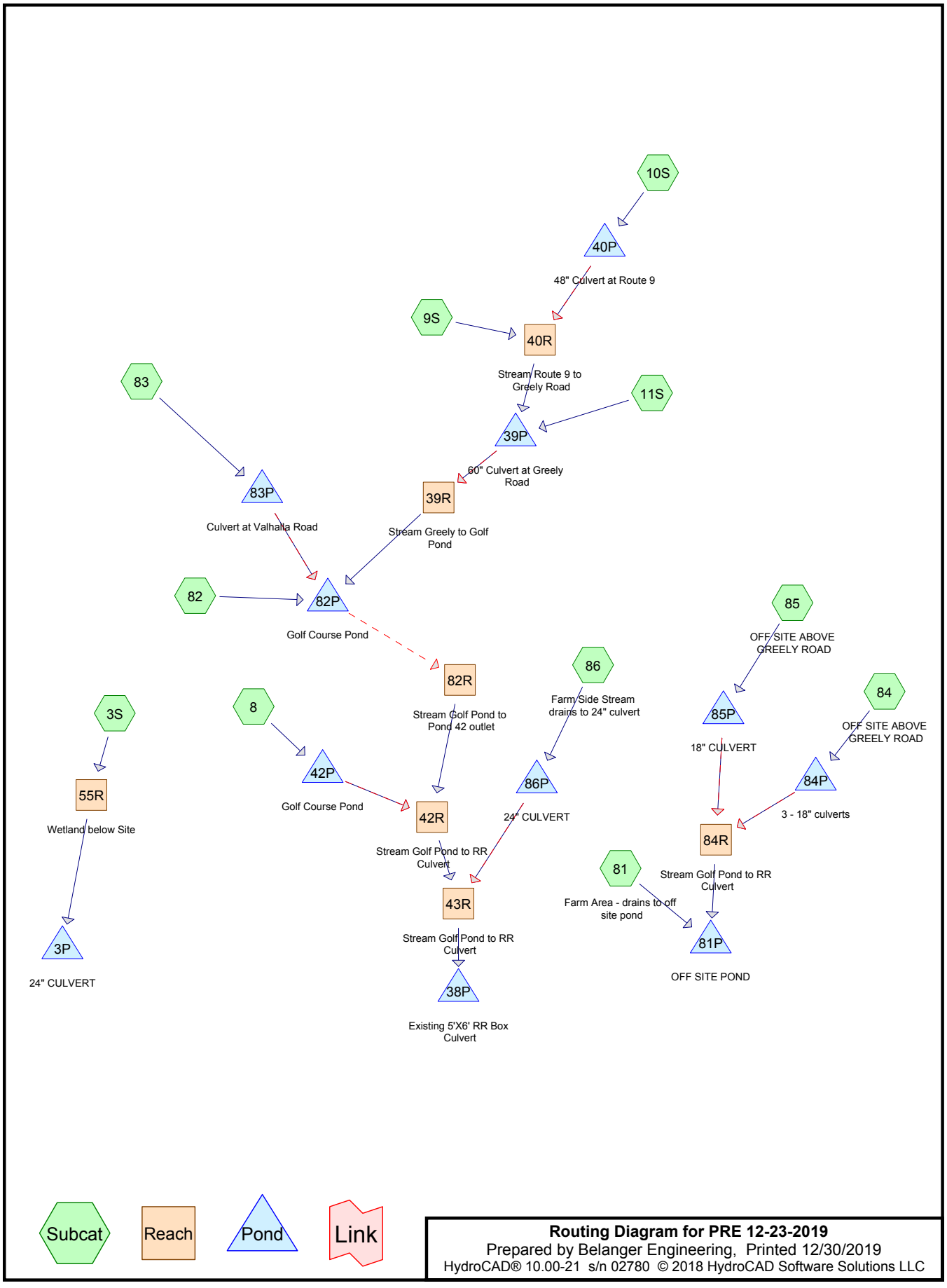
Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.93 cfs @ 13.50 hrs HW=61.28' (Free Discharge)
1=Culvert (Inlet Controls 23.93 cfs @ 7.62 fps)

Secondary OutFlow Max=40.44 cfs @ 13.50 hrs HW=61.28' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 40.44 cfs @ 1.43 fps)



Routing Diagram for PRE 12-23-2019
Prepared by Belanger Engineering, Printed 12/30/2019
HydroCAD® 10.00-21 s/n 02780 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
20.000	70	1/2 acre lots, 25% imp, HSG B (11S)
15.000	75	1/4 acre lots, 38% imp, HSG B (10S)
103.300	61	>75% Grass cover, Good, HSG B (11S)
0.520	98	EXISTING BARN AND HOUSE (81, 84)
0.130	98	EXISTING GRAVEL/PAVED FARM (86)
0.260	98	EXISTING HOUSE AND BARN (86)
1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE (86)
13.000	98	EXISTING IMPERVIOUS AREA (9S)
112.060	74	EXISTING LAWN C (3S, 9S, 10S, 81, 82, 83, 84, 85)
74.270	61	EXISTING LAWNS B (8)
54.530	61	EXISTING LAWNS B - OFF SITE (86)
1.640	98	EXISTING PAVED/GRAVEL FARM (81, 84)
21.910	98	EXISTING ROADS (8, 10S, 81, 82, 83, 84, 85)
0.870	98	EXISTING ROADS-OFF SITE (86)
5.000	98	ROADS (11S)
31.060	70	WOODS / FIELD HSG C (3S)
18.320	74	WOODS / FIELD HSG C/D (81)
205.000	30	Woods, Good, HSG A (8, 9S, 10S, 11S)
178.000	55	Woods, Good, HSG B (8, 9S, 10S, 11S, 82, 83)
244.000	70	Woods, Good, HSG C (8, 9S, 10S, 11S)
64.000	77	Woods, Good, HSG D (10S, 11S)
1,163.970	**61**	**TOTAL AREA**

Summary for Subcatchment 3S:

Runoff = 13.13 cfs @ 12.68 hrs, Volume= 1.989 af, Depth> 0.68"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 12.23 cfs @ 13.91 hrs, Volume= 4.095 af, Depth> 0.27"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 16.96 cfs @ 13.28 hrs, Volume= 3.916 af, Depth> 0.54"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af, Depth> 0.22"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 19.38 cfs @ 13.45 hrs, Volume= 5.703 af, Depth> 0.27"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 15.02 cfs @ 12.77 hrs, Volume= 2.377 af, Depth> 0.92"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 4.29 cfs @ 13.37 hrs, Volume= 1.228 af, Depth> 0.27"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af, Depth> 0.80"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af, Depth> 0.97"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af, Depth> 0.92"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 6.29 cfs @ 13.75 hrs, Volume= 1.842 af, Depth> 0.39"

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 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

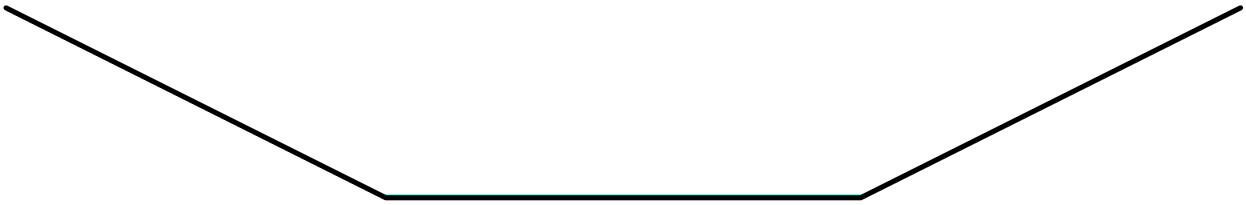
Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.00" for 2 YEAR event
Inflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Outflow = 0.20 cfs @ 20.00 hrs, Volume= 0.008 af, Atten= 76%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 53.6 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 71.8 min

Peak Storage= 1,886 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 17.23 cfs @ 15.31 hrs, Volume= 8.944 af
Outflow = 17.12 cfs @ 16.23 hrs, Volume= 7.939 af, Atten= 1%, Lag= 55.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 32.8 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 38.8 min

Peak Storage= 33,658 cf @ 15.68 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 0.44" for 2 YEAR event
Inflow = 20.63 cfs @ 14.42 hrs, Volume= 6.765 af
Outflow = 20.49 cfs @ 14.72 hrs, Volume= 6.556 af, Atten= 1%, Lag= 17.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 10.1 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 14.3 min

Peak Storage= 12,440 cf @ 14.55 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 0.42" for 2 YEAR event
Inflow = 25.34 cfs @ 14.62 hrs, Volume= 8.388 af
Outflow = 25.30 cfs @ 14.75 hrs, Volume= 8.271 af, Atten= 0%, Lag= 8.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 6.4 min

Peak Storage= 7,006 cf @ 14.67 hrs
Average Depth at Peak Storage= 1.14'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 0.68" for 2 YEAR event
Inflow = 13.13 cfs @ 12.68 hrs, Volume= 1.989 af
Outflow = 13.07 cfs @ 12.76 hrs, Volume= 1.976 af, Atten= 0%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 5.6 min

Peak Storage= 2,247 cf @ 12.71 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af
Outflow = 10.64 cfs @ 14.30 hrs, Volume= 2.986 af, Atten= 3%, Lag= 29.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 24.4 min

Peak Storage= 10,164 cf @ 14.03 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 0.93" for 2 YEAR event
Inflow = 13.43 cfs @ 12.88 hrs, Volume= 2.227 af
Outflow = 13.11 cfs @ 13.12 hrs, Volume= 2.190 af, Atten= 2%, Lag= 14.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 16.2 min

Peak Storage= 6,419 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 0.68" for 2 YEAR event
Inflow = 13.07 cfs @ 12.76 hrs, Volume= 1.976 af
Outflow = 12.04 cfs @ 12.91 hrs, Volume= 1.952 af, Atten= 8%, Lag= 9.0 min
Primary = 12.04 cfs @ 12.91 hrs, Volume= 1.952 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.64' @ 12.91 hrs Surf.Area= 6,162 sf Storage= 6,999 cf

Plug-Flow detention time= 12.4 min calculated for 1.952 af (99% of inflow)
Center-of-Mass det. time= 8.3 min (871.7 - 863.3)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=12.03 cfs @ 12.91 hrs HW=55.64' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 12.03 cfs @ 4.36 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 0.41" for 2 YEAR event
Inflow = 25.30 cfs @ 14.75 hrs, Volume= 8.271 af
Outflow = 25.26 cfs @ 14.82 hrs, Volume= 8.243 af, Atten= 0%, Lag= 3.9 min
Primary = 25.26 cfs @ 14.82 hrs, Volume= 8.243 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.45' @ 14.82 hrs Surf.Area= 6,257 sf Storage= 3,946 cf

Plug-Flow detention time= 2.5 min calculated for 8.243 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (974.8 - 973.1)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.23 cfs @ 14.82 hrs HW=56.45' (Free Discharge)
└**1=Box Culvert** (Inlet Controls 25.23 cfs @ 3.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 29.22 cfs @ 14.17 hrs, Volume= 13.642 af
Outflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af, Atten= 97%, Lag= 349.7 min
Primary = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 120.64' @ 20.00 hrs Surf.Area= 953,534 sf Storage= 588,117 cf

Plug-Flow detention time= 403.8 min calculated for 0.082 af (1% of inflow)
Center-of-Mass det. time= 188.3 min (1,155.6 - 967.3)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.55 cfs @ 20.00 hrs HW=120.64' (Free Discharge)
└**1=60" Culvert** (Inlet Controls 0.55 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af
Outflow = 11.94 cfs @ 16.18 hrs, Volume= 5.028 af, Atten= 48%, Lag= 159.6 min
Primary = 11.94 cfs @ 16.18 hrs, Volume= 5.028 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 161.48' @ 16.18 hrs Surf.Area= 108,987 sf Storage= 131,360 cf

Plug-Flow detention time= 152.2 min calculated for 5.028 af (68% of inflow)
Center-of-Mass det. time= 82.6 min (1,012.5 - 929.9)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.69 cfs @ 16.18 hrs HW=161.48' (Free Discharge)
└**1=48" Culvert** (Inlet Controls 11.69 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 0.27" for 2 YEAR event
Inflow = 12.23 cfs @ 13.91 hrs, Volume= 4.095 af
Outflow = 10.24 cfs @ 14.65 hrs, Volume= 3.779 af, Atten= 16%, Lag= 44.4 min
Primary = 10.24 cfs @ 14.65 hrs, Volume= 3.779 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 71.43' @ 14.65 hrs Surf.Area= 25,628 sf Storage= 29,187 cf

Plug-Flow detention time= 50.6 min calculated for 3.766 af (92% of inflow)
Center-of-Mass det. time= 31.7 min (969.4 - 937.7)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.24 cfs @ 14.65 hrs HW=71.43' (Free Discharge)
└**1=Culvert** (Barrel Controls 10.24 cfs @ 5.11 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 25.75 cfs @ 12.95 hrs, Volume= 4.567 af
Outflow = 15.27 cfs @ 13.60 hrs, Volume= 4.245 af, Atten= 41%, Lag= 39.2 min
Primary = 15.27 cfs @ 13.60 hrs, Volume= 4.245 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 64.13' @ 13.60 hrs Surf.Area= 31,763 sf Storage= 194,644 cf (55,134 cf above start)

Plug-Flow detention time= 316.2 min calculated for 1.039 af (23% of inflow)
Center-of-Mass det. time= 45.6 min (909.5 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.28 cfs @ 13.60 hrs HW=64.13' (Free Discharge)
└**1=Culvert** (Barrel Controls 15.28 cfs @ 5.67 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=62.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.73% Impervious, Inflow Depth > 0.05" for 2 YEAR event
Inflow = 14.17 cfs @ 13.31 hrs, Volume= 3.329 af
Outflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af, Atten= 23%, Lag= 30.1 min
Secondary = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.64' @ 13.81 hrs Surf.Area= 46,588 sf Storage= 27,999 cf

Plug-Flow detention time= 50.8 min calculated for 3.107 af (93% of inflow)
Center-of-Mass det. time= 32.9 min (928.0 - 895.1)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=10.96 cfs @ 13.81 hrs HW=76.64' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 10.96 cfs @ 2.15 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 0.80" for 2 YEAR event
Inflow = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af
Outflow = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af, Atten= 1%, Lag= 5.8 min
Primary = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 122.11' @ 13.27 hrs Surf.Area= 1,142 sf Storage= 1,593 cf

Plug-Flow detention time= 2.5 min calculated for 2.093 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (880.7 - 878.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.93 cfs @ 13.27 hrs HW=122.11' (Free Discharge)
└**1=Culvert** (Inlet Controls 9.93 cfs @ 5.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 0.97" for 2 YEAR event
Inflow = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af
Outflow = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af, Atten= 2%, Lag= 5.0 min
Primary = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.38' @ 12.85 hrs Surf.Area= 5,564 sf Storage= 5,483 cf

Plug-Flow detention time= 19.5 min calculated for 1.602 af (97% of inflow)
Center-of-Mass det. time= 9.5 min (859.6 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.30 cfs @ 12.85 hrs HW=81.38' (Free Discharge)
1=Culvert (Barrel Controls 10.30 cfs @ 4.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af
Outflow = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af, Atten= 17%, Lag= 15.9 min
Primary = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.93' @ 13.03 hrs Surf.Area= 6,258 sf Storage= 3,475 cf

Plug-Flow detention time= 16.2 min calculated for 0.625 af (99% of inflow)
Center-of-Mass det. time= 13.7 min (866.2 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.31 cfs @ 13.03 hrs HW=90.93' (Free Discharge)
1=Culvert (Barrel Controls 3.31 cfs @ 3.43 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 0.39" for 2 YEAR event
Inflow = 6.29 cfs @ 13.75 hrs, Volume= 1.842 af
Outflow = 6.17 cfs @ 13.91 hrs, Volume= 1.832 af, Atten= 2%, Lag= 9.8 min
Primary = 6.17 cfs @ 13.91 hrs, Volume= 1.832 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.86' @ 13.91 hrs Surf.Area= 5,642 sf Storage= 3,087 cf

Plug-Flow detention time= 7.7 min calculated for 1.832 af (99% of inflow)
Center-of-Mass det. time= 6.1 min (928.9 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.17 cfs @ 13.91 hrs HW=58.86' (Free Discharge)
1=Culvert (Inlet Controls 6.17 cfs @ 3.55 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 32.62 cfs @ 12.63 hrs, Volume= 4.606 af, Depth> 1.58"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 48.84 cfs @ 13.67 hrs, Volume= 13.109 af, Depth> 0.85"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 47.02 cfs @ 13.17 hrs, Volume= 9.735 af, Depth> 1.35"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af, Depth> 0.76"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 80.13 cfs @ 13.27 hrs, Volume= 18.133 af, Depth> 0.87"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 32.62 cfs @ 12.74 hrs, Volume= 5.015 af, Depth> 1.94"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 17.74 cfs @ 13.18 hrs, Volume= 3.899 af, Depth> 0.87"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af, Depth> 1.76"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af, Depth> 2.01"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af, Depth> 1.94"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 20.31 cfs @ 13.55 hrs, Volume= 5.122 af, Depth> 1.08"

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 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.10" for 10 YEAR event
Inflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Outflow = 19.97 cfs @ 20.00 hrs, Volume= 5.325 af, Atten= 2%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 19.4 min

Peak Storage= 17,477 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 85.67 cfs @ 13.80 hrs, Volume= 31.827 af
Outflow = 83.71 cfs @ 14.48 hrs, Volume= 30.222 af, Atten= 2%, Lag= 40.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 28.4 min

Peak Storage= 100,395 cf @ 14.15 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



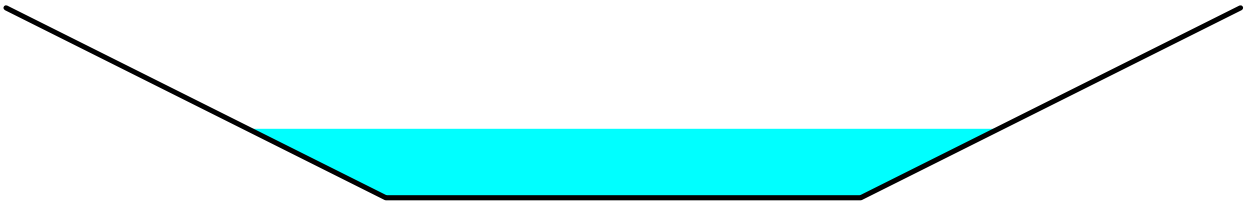
Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 1.60" for 10 YEAR event
Inflow = 67.66 cfs @ 14.16 hrs, Volume= 24.547 af
Outflow = 67.44 cfs @ 14.36 hrs, Volume= 23.887 af, Atten= 0%, Lag= 11.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 10.4 min

Peak Storage= 27,730 cf @ 14.25 hrs
Average Depth at Peak Storage= 1.45'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 1.44" for 10 YEAR event
Inflow = 84.81 cfs @ 14.29 hrs, Volume= 28.983 af
Outflow = 84.74 cfs @ 14.38 hrs, Volume= 28.645 af, Atten= 0%, Lag= 5.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 4.7 min

Peak Storage= 16,189 cf @ 14.33 hrs
Average Depth at Peak Storage= 2.24'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 1.58" for 10 YEAR event
Inflow = 32.62 cfs @ 12.63 hrs, Volume= 4.606 af
Outflow = 32.50 cfs @ 12.70 hrs, Volume= 4.587 af, Atten= 0%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 4.5 min

Peak Storage= 4,074 cf @ 12.66 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af
Outflow = 32.47 cfs @ 14.03 hrs, Volume= 11.989 af, Atten= 1%, Lag= 19.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 16.4 min

Peak Storage= 21,227 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 1.96" for 10 YEAR event
Inflow = 28.07 cfs @ 12.87 hrs, Volume= 4.690 af
Outflow = 27.76 cfs @ 13.04 hrs, Volume= 4.638 af, Atten= 1%, Lag= 10.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 13.5 min

Peak Storage= 10,452 cf @ 12.94 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 1.57" for 10 YEAR event
Inflow = 32.50 cfs @ 12.70 hrs, Volume= 4.587 af
Outflow = 25.22 cfs @ 12.98 hrs, Volume= 4.551 af, Atten= 22%, Lag= 17.0 min
Primary = 25.22 cfs @ 12.98 hrs, Volume= 4.551 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 57.78' @ 12.98 hrs Surf.Area= 9,668 sf Storage= 24,175 cf

Plug-Flow detention time= 12.8 min calculated for 4.536 af (99% of inflow)
Center-of-Mass det. time= 10.1 min (854.0 - 843.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.20 cfs @ 12.98 hrs HW=57.78' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 25.20 cfs @ 8.02 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 1.43" for 10 YEAR event
Inflow = 84.74 cfs @ 14.38 hrs, Volume= 28.645 af
Outflow = 83.43 cfs @ 14.57 hrs, Volume= 28.508 af, Atten= 2%, Lag= 11.3 min
Primary = 83.43 cfs @ 14.57 hrs, Volume= 28.508 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.10' @ 14.57 hrs Surf.Area= 27,754 sf Storage= 29,832 cf

Plug-Flow detention time= 4.2 min calculated for 28.508 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (967.1 - 963.9)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.55 cfs @ 14.57 hrs HW=58.10' (Free Discharge)
1=Box Culvert (Inlet Controls 83.55 cfs @ 5.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 129.01 cfs @ 14.01 hrs, Volume= 48.355 af
Outflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af, Atten= 84%, Lag= 359.5 min
Primary = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 121.86' @ 20.00 hrs Surf.Area= 1,096,574 sf Storage= 1,836,157 cf

Plug-Flow detention time= 291.0 min calculated for 6.105 af (13% of inflow)
Center-of-Mass det. time= 138.6 min (1,073.5 - 934.9)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.21 cfs @ 20.00 hrs HW=121.86' (Free Discharge)
1=60" Culvert (Inlet Controls 20.21 cfs @ 3.59 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.76" for 10 YEAR event
Inflow = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af
Outflow = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af, Atten= 46%, Lag= 65.4 min
Primary = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 163.13' @ 14.38 hrs Surf.Area= 153,871 sf Storage= 348,586 cf

Plug-Flow detention time= 98.1 min calculated for 22.091 af (86% of inflow)
Center-of-Mass det. time= 61.2 min (957.0 - 895.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.93 cfs @ 14.38 hrs HW=163.13' (Free Discharge)
└**1=48" Culvert** (Inlet Controls 59.93 cfs @ 5.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 0.85" for 10 YEAR event
Inflow = 48.84 cfs @ 13.67 hrs, Volume= 13.109 af
Outflow = 36.22 cfs @ 14.41 hrs, Volume= 12.558 af, Atten= 26%, Lag= 44.5 min
Primary = 36.22 cfs @ 14.41 hrs, Volume= 12.558 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 73.72' @ 14.41 hrs Surf.Area= 40,958 sf Storage= 105,820 cf

Plug-Flow detention time= 44.4 min calculated for 12.517 af (95% of inflow)
Center-of-Mass det. time= 32.9 min (942.5 - 909.6)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=36.22 cfs @ 14.41 hrs HW=73.72' (Free Discharge)
└**1=Culvert** (Barrel Controls 36.22 cfs @ 7.38 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 56.76 cfs @ 12.87 hrs, Volume= 9.653 af
Outflow = 28.06 cfs @ 13.66 hrs, Volume= 9.204 af, Atten= 51%, Lag= 46.9 min
Primary = 26.83 cfs @ 13.66 hrs, Volume= 9.160 af
Secondary = 1.23 cfs @ 13.66 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.15' @ 13.66 hrs Surf.Area= 48,771 sf Storage= 274,436 cf (134,926 cf above start)

Plug-Flow detention time= 184.2 min calculated for 5.981 af (62% of inflow)
Center-of-Mass det. time= 56.1 min (902.7 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.83 cfs @ 13.66 hrs HW=66.15' (Free Discharge)
└**1=Culvert** (Inlet Controls 26.83 cfs @ 8.54 fps)

Secondary OutFlow Max=1.10 cfs @ 13.66 hrs HW=66.15' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 0.95 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.73% Impervious, Inflow Depth > 0.20" for 10 YEAR event
Inflow = 38.10 cfs @ 13.28 hrs, Volume= 13.816 af
Outflow = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af, Atten= 14%, Lag= 25.9 min
Secondary = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.33' @ 13.71 hrs Surf.Area= 52,279 sf Storage= 62,339 cf

Plug-Flow detention time= 34.4 min calculated for 12.674 af (92% of inflow)
Center-of-Mass det. time= 14.8 min (972.6 - 957.8)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=32.88 cfs @ 13.71 hrs HW=77.33' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 32.88 cfs @ 3.09 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 1.76" for 10 YEAR event
Inflow = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af
Outflow = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af, Atten= 10%, Lag= 16.3 min
Primary = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.73' @ 13.41 hrs Surf.Area= 2,841 sf Storage= 10,797 cf

Plug-Flow detention time= 4.6 min calculated for 4.576 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (867.2 - 863.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.81 cfs @ 13.41 hrs HW=126.73' (Free Discharge)
1=Culvert (Inlet Controls 20.81 cfs @ 11.77 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.01" for 10 YEAR event
Inflow = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af
Outflow = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af, Atten= 3%, Lag= 6.1 min
Primary = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.96' @ 12.83 hrs Surf.Area= 6,905 sf Storage= 9,098 cf

Plug-Flow detention time= 13.4 min calculated for 3.372 af (98% of inflow)
Center-of-Mass det. time= 7.7 min (842.5 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.67 cfs @ 12.83 hrs HW=81.96' (Free Discharge)
1=Culvert (Inlet Controls 21.67 cfs @ 4.12 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af
Outflow = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af, Atten= 22%, Lag= 18.6 min
Primary = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.56' @ 13.05 hrs Surf.Area= 9,665 sf Storage= 8,470 cf

Plug-Flow detention time= 17.9 min calculated for 1.314 af (99% of inflow)
Center-of-Mass det. time= 15.4 min (852.2 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.77 cfs @ 13.05 hrs HW=91.56' (Free Discharge)
1=Culvert (Barrel Controls 6.77 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 1.08" for 10 YEAR event
Inflow = 20.31 cfs @ 13.55 hrs, Volume= 5.122 af
Outflow = 18.43 cfs @ 13.95 hrs, Volume= 5.097 af, Atten= 9%, Lag= 23.8 min
Primary = 18.43 cfs @ 13.95 hrs, Volume= 5.097 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 60.27' @ 13.95 hrs Surf.Area= 12,411 sf Storage= 15,699 cf

Plug-Flow detention time= 10.4 min calculated for 5.097 af (99% of inflow)
Center-of-Mass det. time= 8.9 min (909.7 - 900.7)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.43 cfs @ 13.95 hrs HW=60.27' (Free Discharge)
1=Culvert (Inlet Controls 18.43 cfs @ 5.87 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 50.61 cfs @ 12.62 hrs, Volume= 7.052 af, Depth> 2.41"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 89.59 cfs @ 13.56 hrs, Volume= 22.609 af, Depth> 1.47"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 75.94 cfs @ 13.13 hrs, Volume= 15.334 af, Depth> 2.12"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af, Depth> 1.35"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 147.70 cfs @ 13.19 hrs, Volume= 31.202 af, Depth> 1.50"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 48.09 cfs @ 12.72 hrs, Volume= 7.385 af, Depth> 2.85"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 32.74 cfs @ 13.14 hrs, Volume= 6.707 af, Depth> 1.50"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af, Depth> 2.64"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af, Depth> 2.94"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af, Depth> 2.85"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 34.82 cfs @ 13.51 hrs, Volume= 8.415 af, Depth> 1.77"

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 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.29" for 25 YEAR event
Inflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Outflow = 48.68 cfs @ 20.00 hrs, Volume= 16.519 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 10.7 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 13.5 min

Peak Storage= 31,184 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 1.37" for 25 YEAR event
Inflow = 161.60 cfs @ 13.61 hrs, Volume= 56.283 af
Outflow = 157.75 cfs @ 14.18 hrs, Volume= 54.212 af, Atten= 2%, Lag= 34.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 16.7 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 25.5 min

Peak Storage= 157,984 cf @ 13.90 hrs
Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 3.16" for 25 YEAR event
Inflow = 102.43 cfs @ 14.10 hrs, Volume= 48.482 af
Outflow = 102.29 cfs @ 14.28 hrs, Volume= 47.307 af, Atten= 0%, Lag= 10.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 8.9 min

Peak Storage= 37,020 cf @ 14.18 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 2.77" for 25 YEAR event
Inflow = 129.97 cfs @ 14.03 hrs, Volume= 55.683 af
Outflow = 129.92 cfs @ 14.12 hrs, Volume= 55.087 af, Atten= 0%, Lag= 5.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 4.1 min

Peak Storage= 21,954 cf @ 14.07 hrs
Average Depth at Peak Storage= 2.81'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



Summary for Reach 55R: Wetland below Site

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 2.41" for 25 YEAR event
Inflow = 50.61 cfs @ 12.62 hrs, Volume= 7.052 af
Outflow = 50.38 cfs @ 12.67 hrs, Volume= 7.029 af, Atten= 0%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 4.1 min

Peak Storage= 5,461 cf @ 12.64 hrs
Average Depth at Peak Storage= 1.30'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



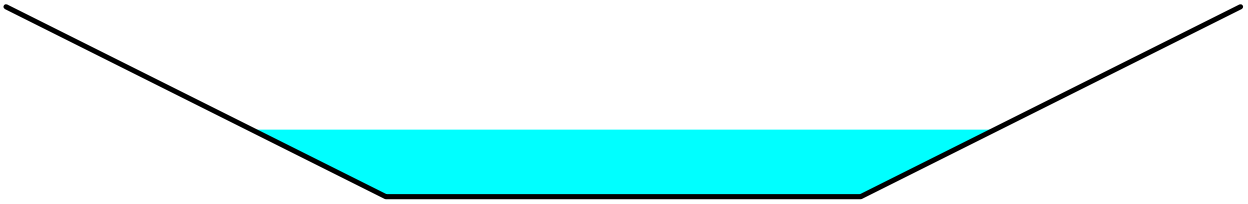
Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af
Outflow = 53.54 cfs @ 20.00 hrs, Volume= 26.636 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 13.4 min

Peak Storage= 29,848 cf @ 20.00 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 2.89" for 25 YEAR event
Inflow = 38.03 cfs @ 13.01 hrs, Volume= 6.894 af
Outflow = 37.70 cfs @ 13.16 hrs, Volume= 6.832 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 12.3 min

Peak Storage= 12,802 cf @ 13.07 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 2.41" for 25 YEAR event
Inflow = 50.38 cfs @ 12.67 hrs, Volume= 7.029 af
Outflow = 42.47 cfs @ 12.90 hrs, Volume= 6.985 af, Atten= 16%, Lag= 13.9 min
Primary = 31.37 cfs @ 12.90 hrs, Volume= 6.732 af
Secondary = 11.10 cfs @ 12.90 hrs, Volume= 0.253 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.30' @ 12.90 hrs Surf.Area= 16,501 sf Storage= 43,570 cf

Plug-Flow detention time= 14.8 min calculated for 6.985 af (99% of inflow)
Center-of-Mass det. time= 12.6 min (846.9 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=31.36 cfs @ 12.90 hrs HW=59.30' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 31.36 cfs @ 9.98 fps)

Secondary OutFlow Max=11.00 cfs @ 12.90 hrs HW=59.30' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 11.00 cfs @ 1.47 fps)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 2.74" for 25 YEAR event
Inflow = 129.92 cfs @ 14.12 hrs, Volume= 55.087 af
Outflow = 125.60 cfs @ 14.49 hrs, Volume= 54.586 af, Atten= 3%, Lag= 22.0 min
Primary = 125.60 cfs @ 14.49 hrs, Volume= 54.586 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.19' @ 14.49 hrs Surf.Area= 44,572 sf Storage= 69,240 cf

Plug-Flow detention time= 7.1 min calculated for 54.405 af (99% of inflow)
Center-of-Mass det. time= 5.0 min (979.3 - 974.3)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=125.59 cfs @ 14.49 hrs HW=59.19' (Free Discharge)
1=Box Culvert (Barrel Controls 125.59 cfs @ 8.18 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 1.38" for 25 YEAR event
Inflow = 250.10 cfs @ 13.75 hrs, Volume= 85.414 af
Outflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af, Atten= 80%, Lag= 375.0 min
Primary = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 122.82' @ 20.00 hrs Surf.Area= 1,208,890 sf Storage= 2,938,188 cf

Plug-Flow detention time= 265.8 min calculated for 17.951 af (21% of inflow)
Center-of-Mass det. time= 131.9 min (1,054.7 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.75 cfs @ 20.00 hrs HW=122.82' (Free Discharge)
1=60" Culvert (Inlet Controls 48.75 cfs @ 4.70 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 1.35" for 25 YEAR event
Inflow = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af
Outflow = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af, Atten= 46%, Lag= 58.9 min
Primary = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.65' @ 14.19 hrs Surf.Area= 195,136 sf Storage= 613,755 cf

Plug-Flow detention time= 87.6 min calculated for 40.813 af (89% of inflow)
Center-of-Mass det. time= 59.5 min (942.8 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=114.72 cfs @ 14.19 hrs HW=164.65' (Free Discharge)
└**1=48" Culvert** (Barrel Controls 114.72 cfs @ 8.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 1.47" for 25 YEAR event
Inflow = 89.59 cfs @ 13.56 hrs, Volume= 22.609 af
Outflow = 53.52 cfs @ 14.67 hrs, Volume= 21.846 af, Atten= 40%, Lag= 66.4 min
Primary = 53.52 cfs @ 14.67 hrs, Volume= 21.846 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.38' @ 14.67 hrs Surf.Area= 62,082 sf Storage= 242,793 cf

Plug-Flow detention time= 58.9 min calculated for 21.773 af (96% of inflow)
Center-of-Mass det. time= 49.2 min (948.0 - 898.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=53.52 cfs @ 14.67 hrs HW=76.38' (Free Discharge)
└**1=Culvert** (Inlet Controls 53.52 cfs @ 10.90 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 79.69 cfs @ 12.82 hrs, Volume= 14.217 af
Outflow = 52.21 cfs @ 13.48 hrs, Volume= 13.672 af, Atten= 34%, Lag= 39.8 min
Primary = 30.31 cfs @ 13.48 hrs, Volume= 11.812 af
Secondary = 21.90 cfs @ 13.48 hrs, Volume= 1.860 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 67.01' @ 13.48 hrs Surf.Area= 63,513 sf Storage= 323,207 cf (183,697 cf above start)

Plug-Flow detention time= 149.9 min calculated for 10.469 af (74% of inflow)
Center-of-Mass det. time= 54.5 min (892.7 - 838.2)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=30.30 cfs @ 13.48 hrs HW=67.01' (Free Discharge)
└**1=Culvert** (Inlet Controls 30.30 cfs @ 9.65 fps)

Secondary OutFlow Max=21.87 cfs @ 13.48 hrs HW=67.01' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 21.87 cfs @ 2.70 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.73% Impervious, Inflow Depth > 0.44" for 25 YEAR event
Inflow = 58.82 cfs @ 13.22 hrs, Volume= 30.100 af
Outflow = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af, Atten= 9%, Lag= 407.0 min
Secondary = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.86' @ 20.00 hrs Surf.Area= 56,623 sf Storage= 91,213 cf

Plug-Flow detention time= 28.7 min calculated for 27.913 af (93% of inflow)
Center-of-Mass det. time= 13.0 min (990.0 - 977.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=53.64 cfs @ 20.00 hrs HW=77.86' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 53.64 cfs @ 3.60 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 2.64" for 25 YEAR event
Inflow = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af
Outflow = 27.51 cfs @ 13.55 hrs, Volume= 6.874 af, Atten= 21%, Lag= 25.4 min
Primary = 27.51 cfs @ 13.55 hrs, Volume= 6.874 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 131.20' @ 13.55 hrs Surf.Area= 7,245 sf Storage= 28,832 cf

Plug-Flow detention time= 8.6 min calculated for 6.874 af (100% of inflow)
Center-of-Mass det. time= 8.2 min (863.0 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=27.51 cfs @ 13.55 hrs HW=131.20' (Free Discharge)
└**1=Culvert** (Inlet Controls 27.51 cfs @ 15.57 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.94" for 25 YEAR event
Inflow = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af
Outflow = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af, Atten= 14%, Lag= 14.0 min
Primary = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.46' @ 12.95 hrs Surf.Area= 26,457 sf Storage= 17,122 cf

Plug-Flow detention time= 12.3 min calculated for 4.952 af (99% of inflow)
Center-of-Mass det. time= 8.0 min (834.6 - 826.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=28.13 cfs @ 12.95 hrs HW=82.46' (Free Discharge)
1=Culvert (Inlet Controls 28.13 cfs @ 5.31 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af
Outflow = 10.00 cfs @ 13.03 hrs, Volume= 1.942 af, Atten= 21%, Lag= 18.6 min
Primary = 9.08 cfs @ 13.03 hrs, Volume= 1.927 af
Secondary = 0.91 cfs @ 13.03 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.06' @ 13.03 hrs Surf.Area= 12,502 sf Storage= 13,941 cf

Plug-Flow detention time= 19.9 min calculated for 1.936 af (99% of inflow)
Center-of-Mass det. time= 17.5 min (846.0 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.08 cfs @ 13.03 hrs HW=92.06' (Free Discharge)
1=Culvert (Barrel Controls 9.08 cfs @ 5.14 fps)

Secondary OutFlow Max=0.87 cfs @ 13.03 hrs HW=92.06' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.87 cfs @ 0.63 fps)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 1.77" for 25 YEAR event
Inflow = 34.82 cfs @ 13.51 hrs, Volume= 8.415 af
Outflow = 34.73 cfs @ 13.56 hrs, Volume= 8.376 af, Atten= 0%, Lag= 3.0 min
Primary = 23.15 cfs @ 13.56 hrs, Volume= 7.731 af
Secondary = 11.58 cfs @ 13.56 hrs, Volume= 0.644 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.12' @ 13.56 hrs Surf.Area= 16,704 sf Storage= 28,186 cf

Plug-Flow detention time= 13.2 min calculated for 8.348 af (99% of inflow)
Center-of-Mass det. time= 11.7 min (902.9 - 891.2)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.15 cfs @ 13.56 hrs HW=61.12' (Free Discharge)
1=Culvert (Inlet Controls 23.15 cfs @ 7.37 fps)

Secondary OutFlow Max=11.52 cfs @ 13.56 hrs HW=61.12' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 11.52 cfs @ 0.94 fps)

Summary for Subcatchment 3S:

Runoff = 87.89 cfs @ 12.61 hrs, Volume= 12.243 af, Depth> 4.19"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 184.27 cfs @ 13.47 hrs, Volume= 44.480 af, Depth> 2.90"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 137.65 cfs @ 13.11 hrs, Volume= 27.456 af, Depth> 3.80"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af, Depth> 2.73"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 303.09 cfs @ 13.13 hrs, Volume= 61.245 af, Depth> 2.94"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 79.28 cfs @ 12.71 hrs, Volume= 12.280 af, Depth> 4.74"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 66.86 cfs @ 13.10 hrs, Volume= 13.161 af, Depth> 2.94"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af, Depth> 4.47"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af, Depth> 4.85"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af, Depth> 4.74"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 66.64 cfs @ 13.49 hrs, Volume= 15.754 af, Depth> 3.32"

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 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.80" for 100 YEAR event
Inflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Outflow = 118.34 cfs @ 19.44 hrs, Volume= 46.702 af, Atten= 0%, Lag= 13.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.49 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 4.54 fps, Avg. Travel Time= 9.7 min

Peak Storage= 57,110 cf @ 19.30 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area = 492.700 ac, 4.81% Impervious, Inflow Depth > 2.74" for 100 YEAR event
Inflow = 290.98 cfs @ 13.29 hrs, Volume= 112.352 af
Outflow = 284.54 cfs @ 13.86 hrs, Volume= 109.040 af, Atten= 2%, Lag= 33.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 22.3 min

Peak Storage= 242,556 cf @ 13.62 hrs
Average Depth at Peak Storage= 3.41'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 7.01" for 100 YEAR event
Inflow = 261.29 cfs @ 13.80 hrs, Volume= 107.599 af
Outflow = 259.22 cfs @ 13.96 hrs, Volume= 105.450 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.36 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 3.25 fps, Avg. Travel Time= 7.6 min

Peak Storage= 71,695 cf @ 13.88 hrs
Average Depth at Peak Storage= 3.02'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 6.03" for 100 YEAR event
Inflow = 317.05 cfs @ 13.92 hrs, Volume= 121.136 af
Outflow = 316.18 cfs @ 13.99 hrs, Volume= 120.037 af, Atten= 0%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 3.6 min

Peak Storage= 42,060 cf @ 13.96 hrs
Average Depth at Peak Storage= 4.47'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'



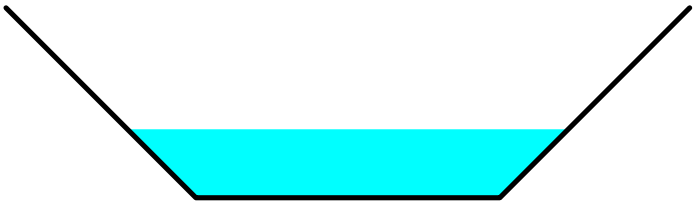
Summary for Reach 55R: Wetland below Site

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 4.19" for 100 YEAR event
Inflow = 87.89 cfs @ 12.61 hrs, Volume= 12.243 af
Outflow = 87.50 cfs @ 12.65 hrs, Volume= 12.214 af, Atten= 0%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 3.6 min

Peak Storage= 7,963 cf @ 12.62 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'



Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af
Outflow = 127.24 cfs @ 19.52 hrs, Volume= 64.849 af, Atten= 0%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 11.2 min

Peak Storage= 54,587 cf @ 19.40 hrs
Average Depth at Peak Storage= 2.27'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 4.78" for 100 YEAR event
Inflow = 55.03 cfs @ 12.87 hrs, Volume= 11.430 af
Outflow = 54.68 cfs @ 13.02 hrs, Volume= 11.350 af, Atten= 1%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 10.8 min

Peak Storage= 16,434 cf @ 12.94 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'



Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 4.18" for 100 YEAR event
Inflow = 87.50 cfs @ 12.65 hrs, Volume= 12.214 af
Outflow = 85.78 cfs @ 12.72 hrs, Volume= 12.154 af, Atten= 2%, Lag= 4.5 min
Primary = 33.34 cfs @ 12.72 hrs, Volume= 9.702 af
Secondary = 52.44 cfs @ 12.72 hrs, Volume= 2.452 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.86' @ 12.72 hrs Surf.Area= 19,291 sf Storage= 53,557 cf

Plug-Flow detention time= 13.1 min calculated for 12.154 af (100% of inflow)
Center-of-Mass det. time= 11.3 min (833.2 - 821.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.33 cfs @ 12.72 hrs HW=59.85' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 33.33 cfs @ 10.61 fps)

Secondary OutFlow Max=52.12 cfs @ 12.72 hrs HW=59.85' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 52.12 cfs @ 2.44 fps)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 5.97" for 100 YEAR event
Inflow = 316.18 cfs @ 13.99 hrs, Volume= 120.037 af
Outflow = 242.48 cfs @ 14.74 hrs, Volume= 117.051 af, Atten= 23%, Lag= 44.9 min
Primary = 242.48 cfs @ 14.74 hrs, Volume= 117.051 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.82' @ 14.74 hrs Surf.Area= 218,567 sf Storage= 361,063 cf

Plug-Flow detention time= 17.3 min calculated for 117.051 af (98% of inflow)
Center-of-Mass det. time= 11.6 min (984.3 - 972.6)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=242.46 cfs @ 14.74 hrs HW=61.82' (Free Discharge)
1=Box Culvert (Barrel Controls 242.46 cfs @ 9.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 2.75" for 100 YEAR event
Inflow = 523.45 cfs @ 13.47 hrs, Volume= 170.286 af
Outflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af, Atten= 77%, Lag= 344.6 min
Primary = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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

Peak Elev= 124.62' @ 19.21 hrs Surf.Area= 1,420,388 sf Storage= 5,304,855 cf

Plug-Flow detention time= 250.0 min calculated for 49.310 af (29% of inflow)
Center-of-Mass det. time= 121.4 min (1,039.2 - 917.7)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=118.47 cfs @ 19.21 hrs HW=124.62' (Free Discharge)
1=60" Culvert (Inlet Controls 118.47 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 2.73" for 100 YEAR event
Inflow = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af
Outflow = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af, Atten= 56%, Lag= 72.2 min
Primary = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.07' @ 14.34 hrs Surf.Area= 288,151 sf Storage= 1,441,429 cf

Plug-Flow detention time= 100.7 min calculated for 84.614 af (92% of inflow)
Center-of-Mass det. time= 78.0 min (947.2 - 869.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=197.65 cfs @ 14.34 hrs HW=168.07' (Free Discharge)
└**1=48" Culvert** (Barrel Controls 197.65 cfs @ 10.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 2.90" for 100 YEAR event
Inflow = 184.27 cfs @ 13.47 hrs, Volume= 44.480 af
Outflow = 173.11 cfs @ 13.80 hrs, Volume= 42.750 af, Atten= 6%, Lag= 19.8 min
Primary = 64.23 cfs @ 13.80 hrs, Volume= 33.301 af
Secondary = 108.88 cfs @ 13.80 hrs, Volume= 9.449 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.63' @ 13.80 hrs Surf.Area= 78,033 sf Storage= 401,106 cf

Plug-Flow detention time= 63.0 min calculated for 42.608 af (96% of inflow)
Center-of-Mass det. time= 51.7 min (937.5 - 885.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=64.23 cfs @ 13.80 hrs HW=78.63' (Free Discharge)
└**1=Culvert** (Inlet Controls 64.23 cfs @ 13.08 fps)

Secondary OutFlow Max=108.71 cfs @ 13.80 hrs HW=78.63' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 108.71 cfs @ 2.14 fps)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 126.47 cfs @ 12.83 hrs, Volume= 23.629 af
Outflow = 92.03 cfs @ 13.30 hrs, Volume= 22.900 af, Atten= 27%, Lag= 28.0 min
Primary = 33.71 cfs @ 13.30 hrs, Volume= 15.692 af
Secondary = 58.32 cfs @ 13.30 hrs, Volume= 7.208 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 67.97' @ 13.30 hrs Surf.Area= 78,744 sf Storage= 391,029 cf (251,519 cf above start)

Plug-Flow detention time= 115.2 min calculated for 19.697 af (83% of inflow)
Center-of-Mass det. time= 48.2 min (876.0 - 827.7)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=33.71 cfs @ 13.30 hrs HW=67.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 33.71 cfs @ 10.73 fps)

Secondary OutFlow Max=58.28 cfs @ 13.30 hrs HW=67.97' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 58.28 cfs @ 3.70 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.73% Impervious, Inflow Depth > 1.04" for 100 YEAR event
Inflow = 127.45 cfs @ 18.93 hrs, Volume= 71.503 af
Outflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af, Atten= 0%, Lag= 22.9 min
Secondary = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 79.31' @ 19.31 hrs Surf.Area= 68,498 sf Storage= 181,901 cf

Plug-Flow detention time= 24.1 min calculated for 67.123 af (94% of inflow)
Center-of-Mass det. time= 11.5 min (995.5 - 984.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=127.25 cfs @ 19.31 hrs HW=79.31' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 127.25 cfs @ 4.80 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 4.47" for 100 YEAR event
Inflow = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af
Outflow = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af, Atten= 43%, Lag= 45.3 min
Primary = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 136.14' @ 13.86 hrs Surf.Area= 20,365 sf Storage= 96,933 cf

Plug-Flow detention time= 24.1 min calculated for 11.602 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (867.4 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.38 cfs @ 13.86 hrs HW=136.14' (Free Discharge)
1=Culvert (Inlet Controls 33.38 cfs @ 18.89 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 4.85" for 100 YEAR event
Inflow = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af
Outflow = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af, Atten= 32%, Lag= 24.7 min
Primary = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 83.23' @ 13.12 hrs Surf.Area= 58,674 sf Storage= 49,853 cf

Plug-Flow detention time= 15.4 min calculated for 8.172 af (99% of inflow)
Center-of-Mass det. time= 12.5 min (827.9 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.94 cfs @ 13.12 hrs HW=83.23' (Free Discharge)
1=Culvert (Inlet Controls 35.94 cfs @ 6.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af
Outflow = 20.43 cfs @ 12.81 hrs, Volume= 3.231 af, Atten= 3%, Lag= 6.2 min
Primary = 10.34 cfs @ 12.81 hrs, Volume= 2.768 af
Secondary = 10.09 cfs @ 12.81 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.28' @ 12.81 hrs Surf.Area= 14,299 sf Storage= 16,973 cf

Plug-Flow detention time= 18.1 min calculated for 3.220 af (99% of inflow)
Center-of-Mass det. time= 15.8 min (833.0 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.34 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
1=Culvert (Barrel Controls 10.34 cfs @ 5.85 fps)

Secondary OutFlow Max=10.05 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 10.05 cfs @ 1.43 fps)

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 3.32" for 100 YEAR event
Inflow = 66.64 cfs @ 13.49 hrs, Volume= 15.754 af
Outflow = 66.55 cfs @ 13.50 hrs, Volume= 15.686 af, Atten= 0%, Lag= 0.9 min
Primary = 23.98 cfs @ 13.50 hrs, Volume= 10.862 af
Secondary = 42.57 cfs @ 13.50 hrs, Volume= 4.824 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.29' @ 13.50 hrs Surf.Area= 17,552 sf Storage= 31,088 cf

Plug-Flow detention time= 11.3 min calculated for 15.634 af (99% of inflow)
Center-of-Mass det. time= 9.9 min (889.0 - 879.1)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.98 cfs @ 13.50 hrs HW=61.29' (Free Discharge)
1=Culvert (Inlet Controls 23.98 cfs @ 7.63 fps)

Secondary OutFlow Max=42.49 cfs @ 13.50 hrs HW=61.29' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 42.49 cfs @ 1.45 fps)

1.71 Ac x 43560 SF/Ac. = 74,488 S.F. Impervious 12.11.2019

2.41 Ac x 43560 SF/Ac = 104,979 SF LAWN

STA 60+00

FOCALPOINT

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM

Cumberland Crossing Phase 2

MAINE – CHAPTER 500 DESIGN WORKSHEET/CHECKLIST

1. **FocalPoint Bed Area (min 174 square feet per acre of impervious area (e.g. 0.2 acres = 35 sf))**

- Tributary Impervious area = 1.71 ac. (1.71 x 174 = 297.54)
- Min FocalPoint bed area req'd = 297.54 sf.
- FocalPoint Bed Area provided * = 300 sf.

* see criteria 2. to determine if minimum size is appropriate.

2. **A 0.95 inch Type III 24hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6-12" above the mulch)**

- Temporary storage depth provided = 6" inches (typ 6" to 12")
- Temporary storage volume provided at above depth = 463 cubic feet.
- Peak ponding depth from 0.95" 24hr storm event = 8" inches

3. **Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less that 1:5**

- Ratio of FocalPoint Bed Area : Temporary Storage Vol = 300 : 1500 CF

4. **Subsurface Chamber Treatment Row must be sized to treat the peak flow from a 1 yr-24hr storm event.**

- 1yr 24hr Peak Flowrate = 6.29 cfs
- Chamber model selected
  - ☐ Cultec 330 XLHD (1 chamber per 0.227 cfs)
  - ☒ Cultec 150XLHD (1 chamber per 0.185 cfs) — 28 @ 330 ✓
- Number of Chambers required = 34 @ 150 ✓

5. **Controlled release of the Channel Protection over 24-48 hrs**

- Controlled release of the channel protection volume is being achieved by:
  - ☒ Expanded subsurface storage basin with OCS
  - ☐ Surface detention basin with OCS

WQV = STORE 1"
74,488 SF * .083' = 6183 C
RTANK MODULE 28" x 16" x 34"
= 8.25 C.F.

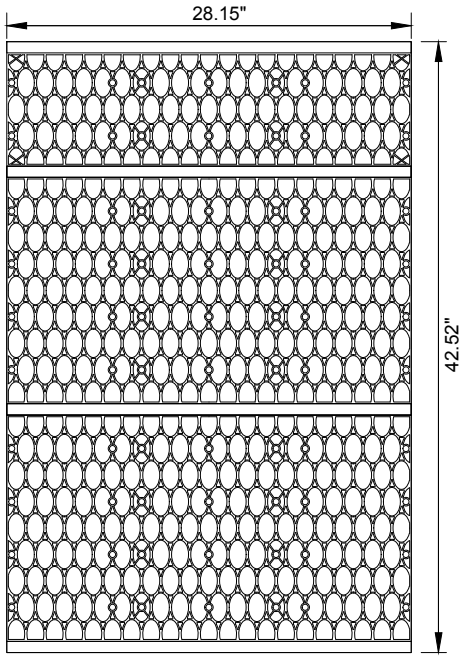
6. **The Design shall be reviewed by the manufacturer's representative prior to submission and installation will be overseen by the manufacturer's representative.**

- ☒ The Design has been reviewed by ACF Environmental
- ☒ Engineer will coordinate installation inspection with ACF

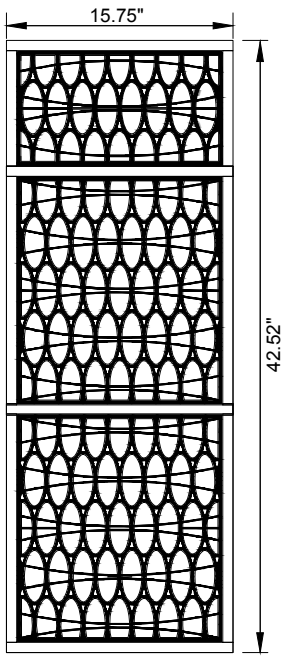
= 6183 CF ÷ 8.25 = = 750 UNITS
104,979 SF x .033' = 3500 C.F.
= 3500 CF ÷ 8.25 = 425 UNITS

Contact ACF Environmental at 1800 448 3636 with any questions
or contact Rob Woodman – Senior Stormwater Engineer at rwoodman@acfenv.com

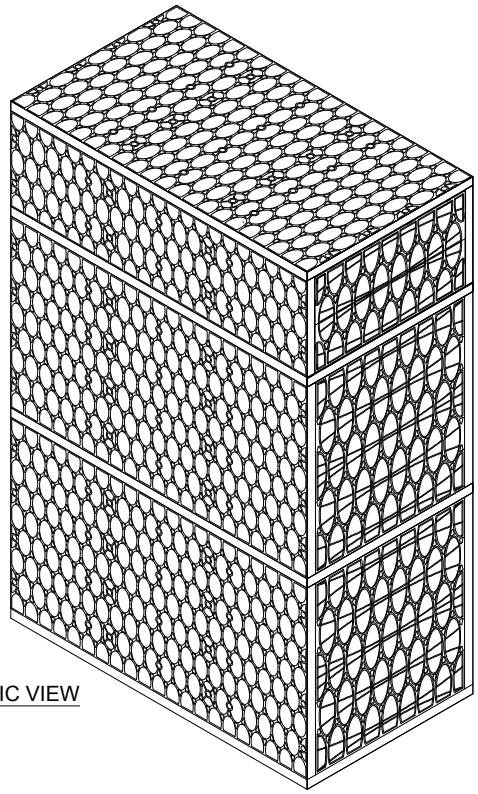
= 1174 UNITS



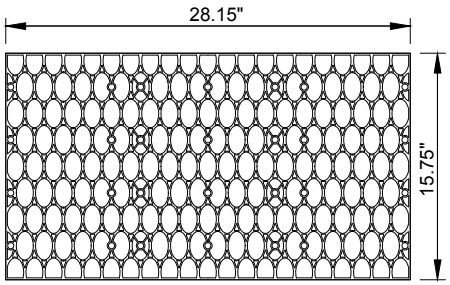
SECTION VIEW



FRONT VIEW



ISOMETRIC VIEW



PLAN VIEW

MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 42.52 IN. (1080 MM)
TANK VOLUME = 10.91 CF
STORAGE VOLUME = 10.36 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

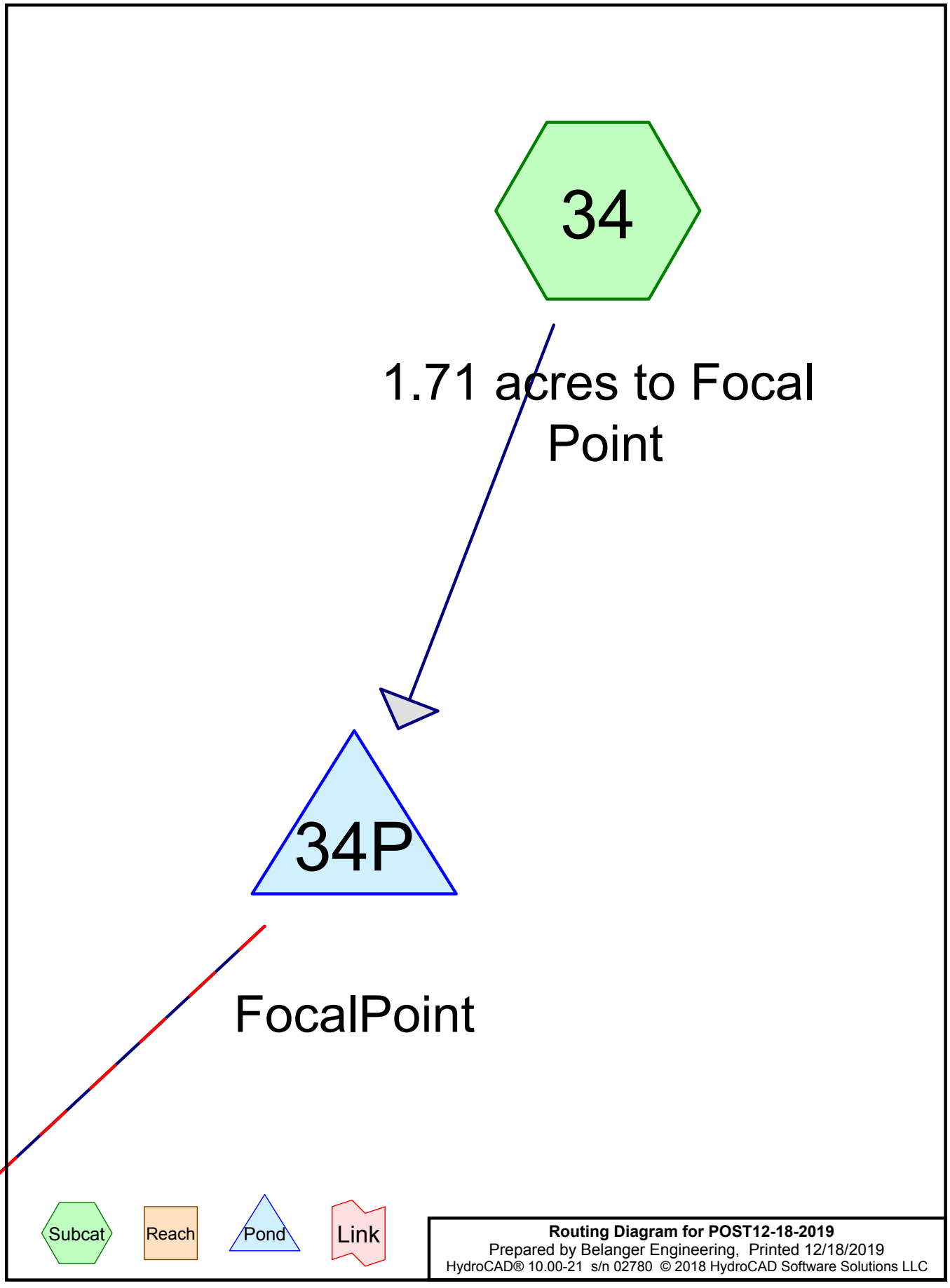
LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS25, (WITH ACF COVER SYSTEM)

MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES PER SEGMENT/TOTAL: 5/15

R-TANK^{HD} - DOUBLE + MINI MODULES

FOR ADDITIONAL INFORMATION PLEASE CONTACT: ACF ENVIRONMENTAL, 1-800-448-3636, www.acfenvironmental.com


34
1.71 acres to Focal Point
34P
FocalPoint
Subcat
Reach
Pond
Link
Routing Diagram for POST12-18-2019
Prepared by Belanger Engineering, Printed 12/18/2019
HydroCAD® 10.00-21 s/n 02780 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.710	98	NEW IMPERVIOUS PAVED AREA (34)
2.660	74	NEW LAWN C (34)
4.370	**83**	**TOTAL AREA**

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 0.47 cfs @ 12.06 hrs, Volume= 0.042 af, Depth> 0.12"

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 1 INCH Rainfall=1.00"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 0.12" for 1 INCH event
Inflow = 0.47 cfs @ 12.06 hrs, Volume= 0.042 af
Outflow = 0.47 cfs @ 12.07 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.2 min
Primary = 0.47 cfs @ 12.07 hrs, Volume= 0.042 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.07' @ 12.06 hrs Surf.Area= 300 sf Storage= 4 cf

Plug-Flow detention time= 0.1 min calculated for 0.042 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (856.3 - 856.2)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.45 cfs @ 12.07 hrs HW=61.07' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=61.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 6.30 cfs @ 12.03 hrs, Volume= 0.381 af, Depth> 1.05"

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 1 YEAR Rainfall=2.60"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 1.05" for 1 YEAR event
Inflow = 6.30 cfs @ 12.03 hrs, Volume= 0.381 af
Outflow = 6.42 cfs @ 12.05 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.8 min
Primary = 0.69 cfs @ 11.65 hrs, Volume= 0.271 af
Secondary = 5.73 cfs @ 12.05 hrs, Volume= 0.110 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 65.77' @ 12.05 hrs Surf.Area= 300 sf Storage= 1,432 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.3 min (808.9 - 800.6)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.65 hrs HW=61.32' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=5.62 cfs @ 12.05 hrs HW=65.77' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 5.62 cfs @ 1.68 fps)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PAUL MERCER
COMMISSIONER

February 2, 2017

Stormwater Systems ACF-Convergent Water Technologies Alliance
23 Faith Drive
Gorham, ME 04038
ATTN: Robert Woodman and Scott Gorneau

Dear Mr. Woodman and Mr. Gorneau:

This letter replaces the May 16, 2016 approval from the Department of Environmental Protection (Department) that authorized the use of the FocalPoint system. The FocalPoint system (a high performance modular biofiltration system), when installed in series with a subsurface chamber-based treatment row, meets the requirements of the General Standards (Section 4.C.) of the Stormwater Management Rules (Chapter 500), provided that the system is filled with the FocalPoint engineered filter media; it is sized to meet the requirements of the General Standards (Section 4.B.); and it is installed, operated and maintained in accordance with the following provisions:

1. The FocalPoint system must be sized in accordance with the manufacturer's latest field test results with the goal of treating 90% of the annual runoff volume. To accomplish this, the system must be modelled in HydroCAD (or similar TR-55 modelling software) to demonstrate that the entire volume of a 0.95 inch Type III 24-hr storm is treated prior to activation of the bypass/overflow (typically set at 6" to 12" above the mulch surface). When sizing the FocalPoint system to meet Chapter 500, note that runoff from the entire contributing drainage area, including pervious areas, must be included in the modeled runoff values.

2. The surface area of the media within the FocalPoint must be a minimum of 174 square feet per 1 acre of impervious area treated (26 sq. ft. per 0.15 acres). The thickness of the media is to be no less than 1.5 ft. (18 inches) and the ratio of the surface area of the filter media bed in square feet to the ponding volume in cubic feet must be no less than 1 to 5.

3. The FocalPoint system consists of five components that include: 1) an open cell underdrain; 2) a wide aperture separation mesh wrap around the underdrain; 3) a layer of clean washed, 3/8" diameter bridging stone; 4) advanced high flow rate engineered media with an infiltration rate of 100 inches per hour; and 5) double shredded hardwood mulch. These components are built from the bottom up to create a mostly permeable profile that measures 3 feet from bottom of underdrain to top of mulch. The ponding

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

depth above the mulch surface is typically 6 to 12 inches and varies based on site conditions. An overflow outlet should be placed above the ponding depth.

4. The FocalPoint system requires the establishment of vegetation that is tolerant of wet and dry conditions. Plants that are not performing as desired should be replaced as needed. A list of appropriate plants for use in the FocalPoint system is provided at: http://www.acfenvironmental.com/products/stormwater-management/filtration/focal-point/.

5. The FocalPoint biofiltration system must be placed in-line with a subsurface chamber-based treatment row that is approved by the Department such that both the treated discharge and the bypass discharge from the FocalPoint system drain to the treatment row. The treatment row must be sized to treat the peak flow from a 1-year, 24-hour storm event. The treatment row structure must be continuous and without obstacle for cleaning, and must have access at both ends for the removal of accumulated sediment and debris. The treatment row must be underlain with a bottom surface consisting of 2 layers of woven geotextile (e.g., ACF S300) that extends 18 to 24 inches beyond all sides of the bottom of the structure.

6. Additional storage downstream of the FocalPoint and treatment row will be required to store at least the sum of 1.0 inch of runoff from the impervious areas and 0.4 inches of runoff from the lawn and landscaped areas that drain to the system unless attenuation of the channel protection volume is not required (i.e. direct discharge to a lake, tidal waters, or a major river). An external outlet control structure must control the flow out of a downstream storage system, sized for the entire channel protection volume, and drain in no less than 24 hours or more than 48 hours.

7. If required for flooding control, the storage system can be sized to provide for the storage and release of the peak flow with a regulated flow rate from 24-hour storms of the 2, 10, and 25-year frequencies such that the peak flows from the project site do not exceed the peak flow prior to undertaking the project.

8. The applicant must demonstrate that the design meets all the manufacturer's specifications and shall be reviewed by the manufacturer prior to submission to the Department for approval. Review and approval of the design by the manufacturer will be sufficient to demonstrate conformance with the manufacturer's specifications. The FocalPoint system must be installed by a manufacturer's certified installer or under the supervision of a manufacturer's representative.

9. Components of the system that are delivered in bulk (i.e., mulch, high flow media and clean washed bridging stone), should be contained in nylon super sacks to promote ease of storage and protection during on-site construction activities.

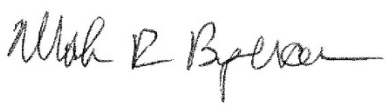
10. The FocalPoint and treatment row system should be inspected and maintained if necessary at least once every six months to maintain the established efficiency for pollutant removal. Prior to construction, a five-year binding inspection and maintenance contract must be provided prior to the Department for review and approval, and must be renewed before contract expiration. The contract will be with a professional with knowledge of erosion and stormwater control, including experience with the proposed system.

11. The overall stormwater management design must meet all Department criteria and sizing specifications and will be reviewed and approved by the Department prior to use.

12. This approval is conditional on full-scale, cold climate field testing results, performed in accordance with the Department's protocols, confirming that the pollutant removal efficiency and sizing of the FocalPoint system are appropriate. The "permit shield" provision (Section 14) of the Chapter 500 rules will apply, and the Department will not require the replacement of the system if, with proper maintenance, pollutant removals do not satisfy the General Standard Best Management Practices.

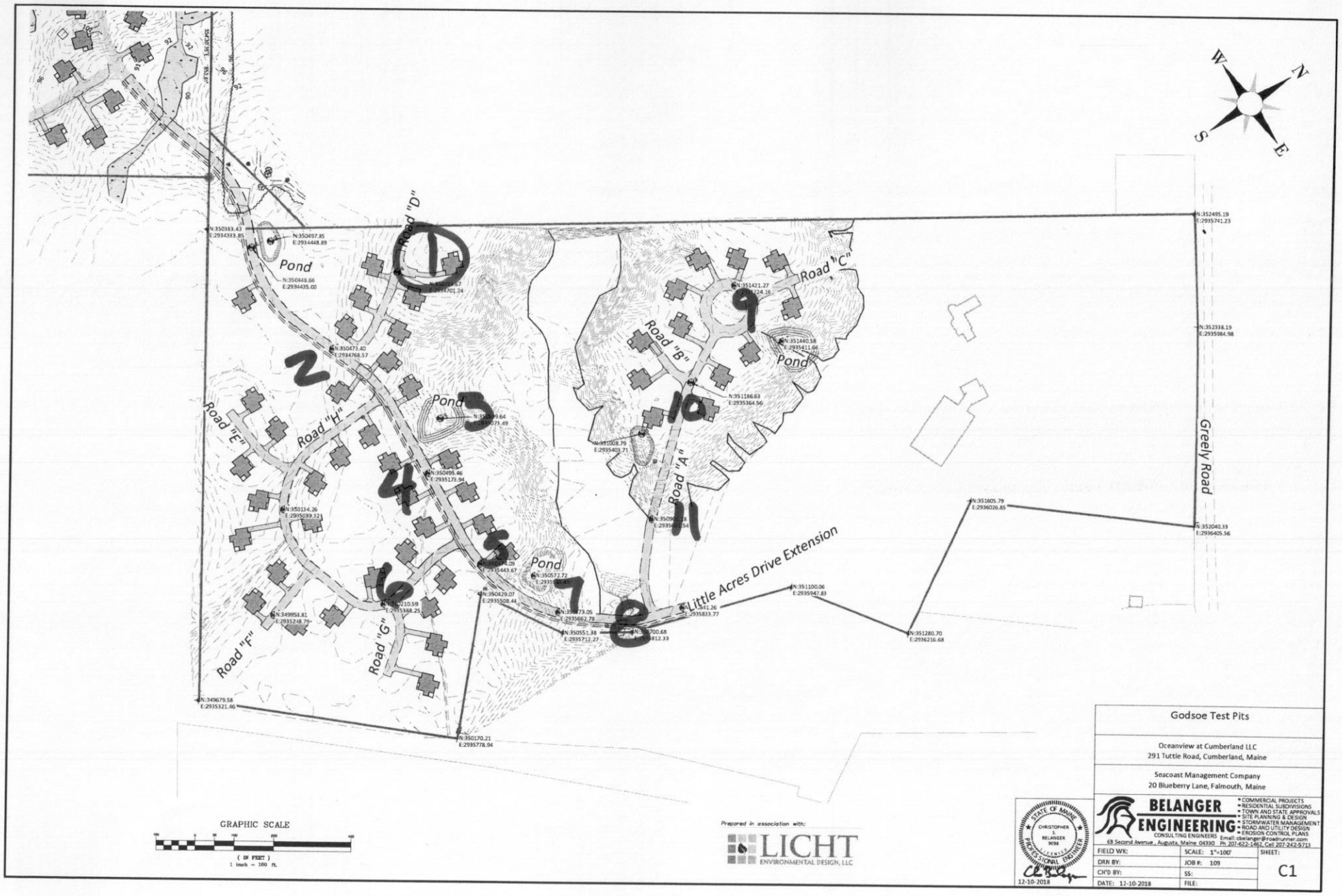
Questions concerning this decision should be directed to David Waddell at (207) 215-6932 or Jeff Dennis at (207) 215-6376.

Sincerely,



Mark Bergeron, P.E.
Director
Bureau of Land Resources

cc: Don Witherill, Maine DEP



GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

Prepared in association with:
LICHT
ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER L. BELANGER
9098
REGISTERED PROFESSIONAL ENGINEER
12-10-2018

Godsoe Test Pits

Oceanview at Cumberland LLC
291 Tuttle Road, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
68 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5711
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET:
DRN BY:	JOB #: 109	C1
CH'D BY:	SS:	
DATE: 12-10-2018	FILE:	

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # STP 1

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	dark brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	Olive Gray	Common Distinct
30				
40				
50				
84 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	C	2	16"	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 2

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
88 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	C	2	17"	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 3

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
96 / 60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	D	15	9"	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

Exploration Symbol # STP 4

☒ Test Pit ☐ Boring ☐ Probe

____" Organic horizon thickness Ground surface elev. ____

____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	sand	Friable	Brown	
20				
30	loamy sand	Friable	Olive	Common Distinct
40				
50			Water @ 54"	
84 / 60	sand	Friable	Olive	

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
5	C	2	24"	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: ____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mary J. Hampton Date: 12/16/18

Name Printed: MARY J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # STW 5

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	sand	Friable	Brown	
20				
30	loamy sand	Friable	gray	Common Distinct
40				
50		Water @ 46"		
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
5	C	2	22 "	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 6

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	loamy sand	Friable	Dark Brown	
10	loamy sand	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	18 "	☒	☐	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 7

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
8	C	12	16 "	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

Exploration Symbol # STW 8

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
8	D	2	12 "	☒	☒	☐

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Marc J. Hampton Date: 12/16/15

Name Printed: MARC J. Hampton Cert/Lic/Reg. #: 263 1216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase II

Applicant Name: Ocean View Cumberland

Project Location (municipality): Cumberland

Exploration Symbol # SPW9

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Loamy Sand	Friable	Dark Brown	
10	Sand	Friable	Brown	
20				
30	Sand	Friable	Gray	Common Distinct
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
5 (Profile)	C (Condition)	2 (Percent)	24	" (Depth)	☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # SPW10

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Loamy Sand	Friable	Dark Brown	
10				
20	Loamy Sand	Friable	Brown	
30				
40	Silty Clay Loam	Firm	Gray	Common Distinct
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
7 (Profile)	C (Condition)	2 (Percent)	40	" (Depth)	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # STW11

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt Loam	Friable	Dark Brown	
10	Silt Loam	Friable	Brown	
20	Silty Clay Loam	Firm	Gray	Common Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
9 (Profile)	C (Condition)	2 (Percent)	15	" (Depth)	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

Exploration Symbol # _____

☐ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
_____ (Profile)	_____ (Condition)	_____ (Percent)	_____	" (Depth)	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 12/16/18

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland, LLC
Cumberland, ME

Soil Narrative Report

DATE:	Soil Profiles observed on November 27 and December 16, 2018
BASE MAP:	Base plan provided by Titcomb Associates scale 1 inch equals 100 feet and two foot contours.
GROUND CONTROL:	Soil survey boundaries located by Mark Hampton Associates, Inc. for Class B Soil Survey

Class B-High Intensity Soil Survey (Minimum Standards)

Mapping units of 1 acre or larger.
Scale of 1"= 100 feet or larger.
Up to 25% inclusions in mapping units of which no more than 15% may be dissimilar soils.
Ground Control – test pits located accurately under direction of registered land surveyor
Base Map –2 foot contour intervals

Provided:

Mapping units of 1/2 acre or larger
Base map scale of 1"= 100 feet.
Up to 25 percent inclusions in mapping units of which no more than 15 percent is dissimilar soils.
Baseline information and test pits located by Mark Hampton Associates, Inc.
Ground topographic survey with one foot contours and ground control provided.

The accompanying soil profile descriptions, soil map, and this soil narrative report were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.

C.S.S. #216, L.S.E. #263 3/6/19

Mark J. Hampton Date



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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Elmwood
(Dystric Eutrochrepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Moderately well drained with a perched watertable from 1.5 to 3.0 feet below the surface at some time from November to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine loamy sand 0-9"
Subsurface Layer:	Olive brown loamy sand, 8-22"
Subsoil Layer:	Olive silty clay loam, 22-65"

HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None



INCLUSIONS

(Within Mapping Unit)

CONTRASTING: Lamoine, Buxton, Scantic

USE AND MANAGEMENT

DEVELOPMENT: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Man Made Land

SETTING

PARENT MATERIAL:	Derived from various materials found onsite and offsite.
LANDFORM:	N/A
POSITION IN LANDSCAPE:	N/A
SLOPE GRADIENT RANGES:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS:	Generally moderately well to somewhat poorly drained but varies.
TYPICAL PROFILE:	Varies in profile and onsite from fine loamy sand to silty clay loam
HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Usually very slow due to compaction
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Buxton, Lamoine

USE AND MANAGEMENT

Development: There may be limiting factors for building site development.



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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Buxton
(Aquic Dystric Eutrochrepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3 %, (B) 3-8%, (C) 8-15%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Moderately well drained with a perched watertable from 1.5 to 3.0 feet below the surface at some time from November to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine sandy loam 0-7"
Subsurface Layer:	Olive brown, silt loam, 8-15"
Subsoil Layer:	Olive gray silty clay loam, 15-32"
Substratum:	Gray silty clay loam +32"

HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 60 inches
HAZARD TO FLOODING:	None



INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Scantic, Lamoine, Elmwood

USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Lamoine
(Aeric Haplaquepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3%, (B) 3-8%, (D) 15-25%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Somewhat poorly drained with a perched watertable from 0.5 to 2.0 feet below the surface at some time from November to June or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine sandy loam 0-7"
Subsurface Layer:	Lt. Olive brown silt loam, 7-14"
Subsoil Layer:	Olive silty clay loam, 14-21"
Substratum:	Olive, silty clay loam, 21-65"

HYDROLOGIC GROUP:	Group D
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Buxton, Elmwood, Scantic



USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Oceanview at Cumberland Phase 2
Godsoe Property
Oceanview at Cumberland LLC
Cumberland, ME

Scantic
(Aquic Haplorthod)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Lower positions on landform
SLOPE GRADIENT RANGES:	(A) 3-8%, (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Poorly drained with a perched watertable from 0.0 to 1.0 feet below the surface at some time from October to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark grayish brown, silt loam 0-9"
Subsurface Layer:	Olive gray silt loam, 9-16"
Substratum:	Gray silty clay loam, 16"+

HYDROLOGIC GROUP:	Group D
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Lamoine, Buxton, Elmwood



USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✕ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
	SS1	☐	Lamoine SPD	12	N/A	12	32	2	
	SS2	☐	Lamoine SPD	14	N/A	14	34	2	
	SS3	☐	Scantic PD	4	N/A	4	34	2	
	SS4	☐	Lamoine SPD	14	N/A	14	36	2	
	SS5	☐	Lamoine SPD	12	N/A	12	34	4	
	SS6	☐	Scantic PD	6	N/A	6	20	2	
	SS7	☐	Elmwood MWD	17	N/A	17	36	2	
	SS8	☐	Lamoine SPD	14	N/A	14	32	6	
	SS9	☐	Scantic PD	6	N/A	6	22	2	
	SS10	☐	Scantic PD	6	N/A	6	24	2	
	SS11	☐	Elmwood MWD	17	N/A	17	38	2	
	SS12	☐	Elmwood MWD	18	N/A	18	38	2	
	SS13	☐	Lamoine SPD	10	N/A	10	30	20	
	SS14	☐	Buxton MWD	16	N/A	16	36	2	
	SS15	☐	Lamoine SPD	10	N/A	10	32	18	
	SS16	☐	Scantic PD	6	N/A	6	30	2	
	SS17	☐	Lamoine SPD	12	N/A	12	34	20	
	SS18	☐	Scantic PD	6	N/A	6	30	2	
	SS19	☐	Lamoine SPD	10	N/A	10	34	24	
	SS20	☐	Elmwood MWD	17	N/A	17	32	2	
	SS21	☐	Lamoine SPD	12	N/A	12	32	26	
	SS22	☐	Elmwood MWD	16	N/A	16	36	2	
	SS24	☐	Lamoine SPD	10	N/A	10	34	20	
	SS25	☐	Buxton MWD	15	N/A	15	38	2	
	SS26	☐	Scantic PD	4	N/A	4	36	2	
	SS27	☐	Lamoine SPD	12	N/A	12	38	18	
	SS28	☐	Lamoine SPD	13	N/A	13	36	20	
	SS29	☐	Scantic PD	4	N/A	4	34	2	
	SS30	☐	Buxton MWD	15	N/A	15	38	2	
	SS31	☐	Lamoine SPD	12	N/A	12	36	12	
	SS32	☐	Lamoine SPD	14	N/A	14	34	14	
	SS33	☐	Buxton MWD	17	N/A	17	40		

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	263/216

Qualification

- ☑ Licensed Site Evaluator
- ☐ Certified Geologist
- ☑ Certified Soil Scientist
- ☐ Other:

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST

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FORM E Rev. 07/11

SOIL CONDITIONS SUMMARY TABLE

SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	✖ if at SSWD Field	Description of subsurface materials by: • Soil profile/condition (if by S.E.), • Soil series name (if by C.S.S.), or by • Geologic unit (if by C.G.)	Depths to (inches): Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration	Ground Surface Slope (%)	Ground Surface Elevation
	SS34	☐	Buxton MWD	16	N/A	16	40	10	
	SS35	☐	Buxton MWD	16	N/A	16	38	4	
	SS 36	☐	Made Land	Varies	N/A	Varies	36		
	SS23	☐	Lamoine SPD	10	N/A	10	36	22	
		☐							
		☐							
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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Marc J. Hampton

Date: 3/6/19

Name Printed: Marc J. Hampton

Cert/Lic/Reg. #: 263/216

Qualification: ☒ Licensed Site Evaluator ☐ Certified Geologist ☒ Certified Soil Scientist ☐ Other:

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS 1

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth: 12	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 2

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth: 14	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 3

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	silt loam	Friable	Black	
10	silty clay loam	Firm	gray	common distinct
20				
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: C	Condition: E	Percent: 2	Depth: 4	"	

Soil Series/Phase Name: Scantic PD

■ Hydric ☐ Non-hydric

Hydrologic Soil Group: ___

Exploration Symbol # SS 4

■ Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	silty clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: B	Condition: D	Percent: 2	Depth	"	

Soil Series/Phase Name: Lamoine SPD

☐ Hydric ■ Non-hydric

Hydrologic Soil Group: ___

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ■ Licensed Site Evaluator ■ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # 555 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	4	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 556 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	Common + Distinct
20–60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 557 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	loamy sand	Friable	Dark Brown	
10–20	loamy sand	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
1	C	2	17"	☒	☒	☐

Soil Series/Phase Name: Elmwood mucky

Hydric: ☐ Non-hydric ☒ Hydrologic Soil Group:

Exploration Symbol # 558 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common + Distinct

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	6		☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☒ Non-hydric ☐ Hydrologic Soil Group:

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST affix professional seal

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 5/6/19

Name Printed: MARK J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS9

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	Gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS10

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	E	2	6"	☒	☒	☐

Soil Series/Phase Name: Scantic PD — Hydric ☒ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS11

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–30	Silty Clay loam	Firm	gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	17"	☐	☒	☐

Soil Series/Phase Name: Elmwood MWD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

Exploration Symbol # SS12

☒ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–30	Silty Clay loam	Firm	gray	Common Distinct

Soil Details by: S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2		☐	☒	☐

Soil Series/Phase Name: Elmwood MWD — Hydric ☐ Non-hydric — Hydrologic Soil Group: _____

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton	Date: 3/6/19
Name Printed: Mark J. Hampton	Cert/Lic/Reg. #: 263/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS13

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	20	10 "	☐	☒	☐

Soil Series/Phase Name: Lamoine SPD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS14

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	C	2	16 "	☐	☒	☐

Soil Series/Phase Name: Buxton MWD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS15

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	common distinct
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	18	10 "	☐	☒	☐

Soil Series/Phase Name: Lamoine SPD

Hydrologic: ☐ Hydric ☒ Non-hydric Soil Group: _____

Exploration Symbol # SS16

☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt loam	Friable	Black	
10	Silty Clay loam	Firm	gray	common distinct
20				
30				
40				
50				
60				

Soil Details by: ☒ S.E. ☐ S.S.

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	E	2	"	☐	☒	☐

Soil Series/Phase Name: Scantic PD

Hydrologic: ☒ Hydric ☐ Non-hydric Soil Group: _____

STATE OF MAINE MARK J. HAMPTON #215 CERTIFIED SOIL SCIENTIST

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INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 215

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS17

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	Common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	D	20	12"	Restrictive Layer	Lamoine SPD	Non-hydric	

Exploration Symbol # SS18

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty Clay loam	Firm	gray	common & distinct
20–60				

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	E	2	6"	Restrictive Layer	Scantic PD	Hydric	

Exploration Symbol # SS19

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
8	D	24	10"	Restrictive Layer	Lamoine SPD	Non-hydric	

Exploration Symbol # SS20

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Loamy Sand	Friable	Dark Brown	
10–20	Loamy Sand	Friable	Brown	
20–60	Silty Clay loam	Firm	gray	common & distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock	Soil Series/Phase Name	Hydric / Non-hydric	Hydrologic Soil Group
7	C	2	17"	Restrictive Layer	Elmwood MUD	Non-hydric	

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	263/216

Title ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST
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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # 5521

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
E	D	26	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5522

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Loamy sand	Friable	Dark Brown	
10–20	Loamy sand	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
7	C	2	16"	☐	☐	☐

Soil Series/Phase Name: Elmwood MWD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5523

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	22	10"	■	■	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

Exploration Symbol # 5524

■ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	common distinct

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater	Restrictive Layer	Bedrock
B	D	20	10"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric: ☐ Non-hydric ■ Hydrologic Soil Group: _____

STATE OF MAINE

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 5/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ■ Licensed Site Evaluator ■ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Oceanview at Cumberland 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # SS25 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Sandy loam	Friable	Dark Brown	
10–20	Sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: C	Percent: 2	Depth: 15	"	

Soil Series/Phase Name: Buxton MUD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS26 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	Silt loam	Friable	Black	
10–20	Silty clay loam	Firm	gray	Common & Distinct
20–60				

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: E	Percent: 2	Depth: 4	"	

Soil Series/Phase Name: Scantic PD — ☒ Hydric ☐ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS27 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: D	Percent: 18	Depth: 12	"	

Soil Series/Phase Name: Lamoine SPD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

Exploration Symbol # SS28 — Test Pit ☐ Boring ☐ Probe

___" Organic horizon thickness Ground surface elev. ___

___" Depth of exploration or to refusal

Depth below mineral soil surface (inches)

	Texture	Consistency	Color	Redox Features
0–10	fine sandy loam	Friable	Dark Brown	
10–20	fine sandy loam	Friable	Brown	
20–60	Silty clay loam	Firm	gray	Common & Distinct

Soil Details by S.E. ▸▸ / S.S. ▸▸

Soil Classification		Slope	Limiting Factor		Groundwater / Restrictive Layer / Bedrock
Profile: E	Condition: D	Percent: 20	Depth: 13	"	

Soil Series/Phase Name: Lamoine SPD — ☐ Hydric ☒ Non-hydric — Hydrologic Soil Group: ___

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	Date
Mark J. Hampton	3/6/19
Name Printed	**Cert/Lic/Reg. #**
MARK J. Hampton	2603/216

Title: ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE — MARK HAMPTON #216 — CERTIFIED SOIL SCIENTIST — affix professional seal

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FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS29

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Silt Loam	Friable	Black	
10	Silty Clay Loam	Firm	Gray	Common + Distinct
20				
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	E	2	4"	☐	☐	☐

Soil Series/Phase Name: Scantic SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS30

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	C	2	15"	☐	☑	☐

Soil Series/Phase Name: Buxton MWD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS31

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	D	12	12"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

Exploration Symbol # SS32

☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common + Distinct
30				
40				
50				
60				

Soil Details by: S.E. ▸▸ S.S. ▸▸

Soil Classification Profile	Condition	Slope Percent	Limiting Factor Depth	Groundwater	Restrictive Layer	Bedrock
B	D	14	14"	☐	☐	☐

Soil Series/Phase Name: Lamoine SPD

Hydric ☐ Non-hydric ☑

Hydrologic Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/6/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263/216

Title: ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

(Seal not professionally prepared)

PAGE ___ OF ___

4674

FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Oceanview at Cumberland 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # SS33

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	6	17 "	☑ Groundwater ☑ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS34

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	10	16 "	☑ Groundwater ☑ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS35

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy loam	Friable	Dark Brown	
10	Sandy loam	Friable	Brown	
20	Silty Clay loam	Firm	gray	Common & Distinct
30				
40				
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
B	C	4	16 "	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Buxton MWD

☐ Hydric ☑ Non-hydric

Hydrologic Soil Group: _____

Exploration Symbol # SS36

☑ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Varies	Friable	Mixed	
10	Mixed	Friable	Mixed	Varies
20				
30	Mixed	Firm	Gray	
40	Silty Clay loam			
50				
60				

Soil Details by S.E. ▸▸ S.S. ▸▸

Soil Classification: Profile	Condition	Slope: Percent	Limiting Factor: Depth	Groundwater / Restrictive Layer / Bedrock
				☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Soil Series/Phase Name: Made Land

☐ Hydric ☐ Non-hydric

Hydrologic Soil Group: _____

STATE OF MAINE

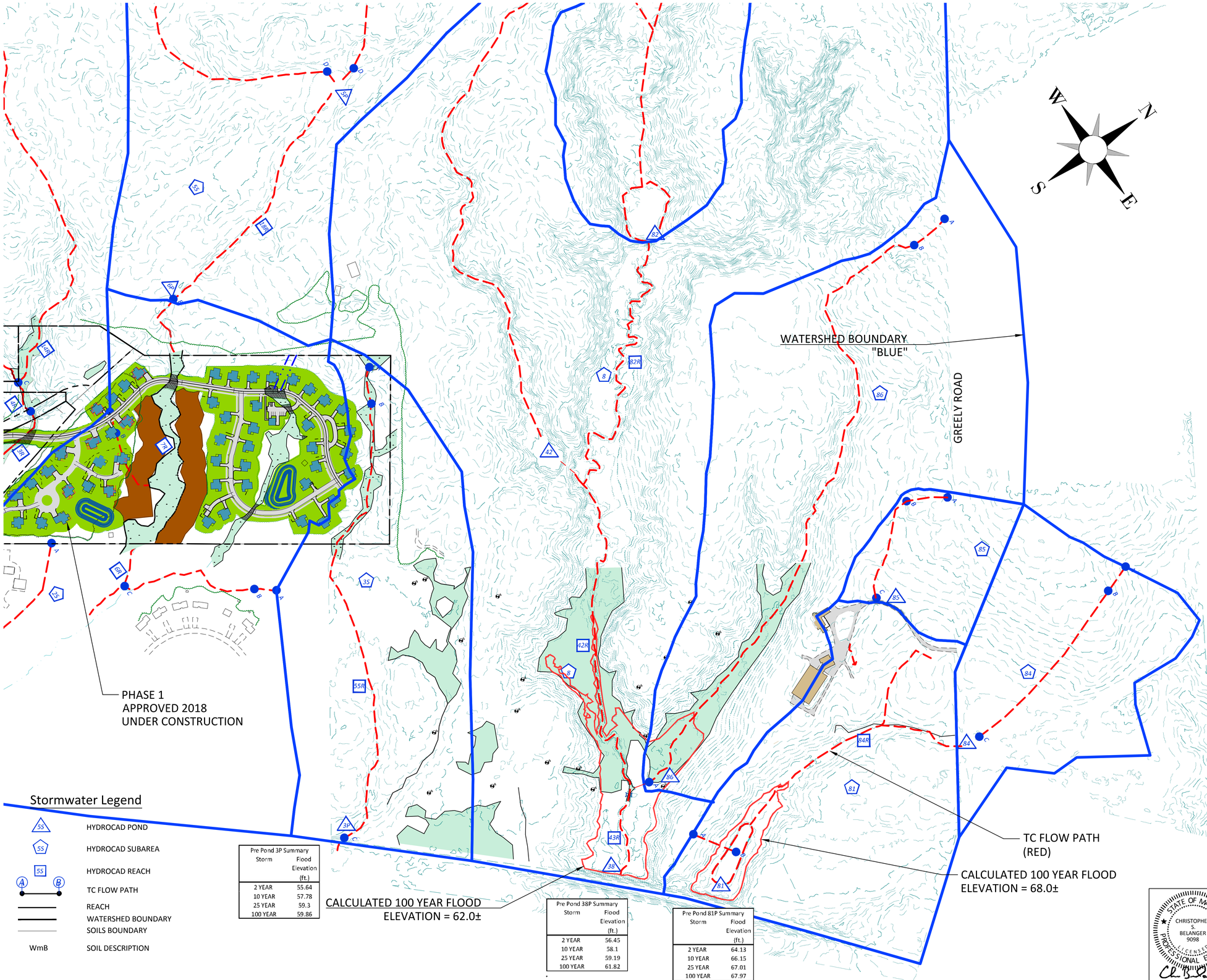
INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Mark J. Hampton Date: 3/16/19

Name Printed: Mark J. Hampton Cert/Lic/Reg. #: 263216

Title: ☑ Licensed Site Evaluator ☑ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST



Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 12-18-2019

Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.29	-30%
10 YEAR	25.22	20.6	-22%
25 YEAR	42.47	28.17	-51%
50 YEAR	64.8	41.49	-56%
100 YEAR	85.78	55.83	-54%

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Stormwater Legend

- 5S — HYDROCAD POND
- 5S — HYDROCAD SUBAREA
- 5S — HYDROCAD REACH
- A — B — TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB — SOIL DESCRIPTION

Pre Pond 3P Summary

Storm	Flood Elevation (ft.)
2 YEAR	55.64
10 YEAR	57.78
25 YEAR	59.3
100 YEAR	59.86

Pre Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

Pre Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

PRE DEVELOPMENT DRAINAGE PLAN

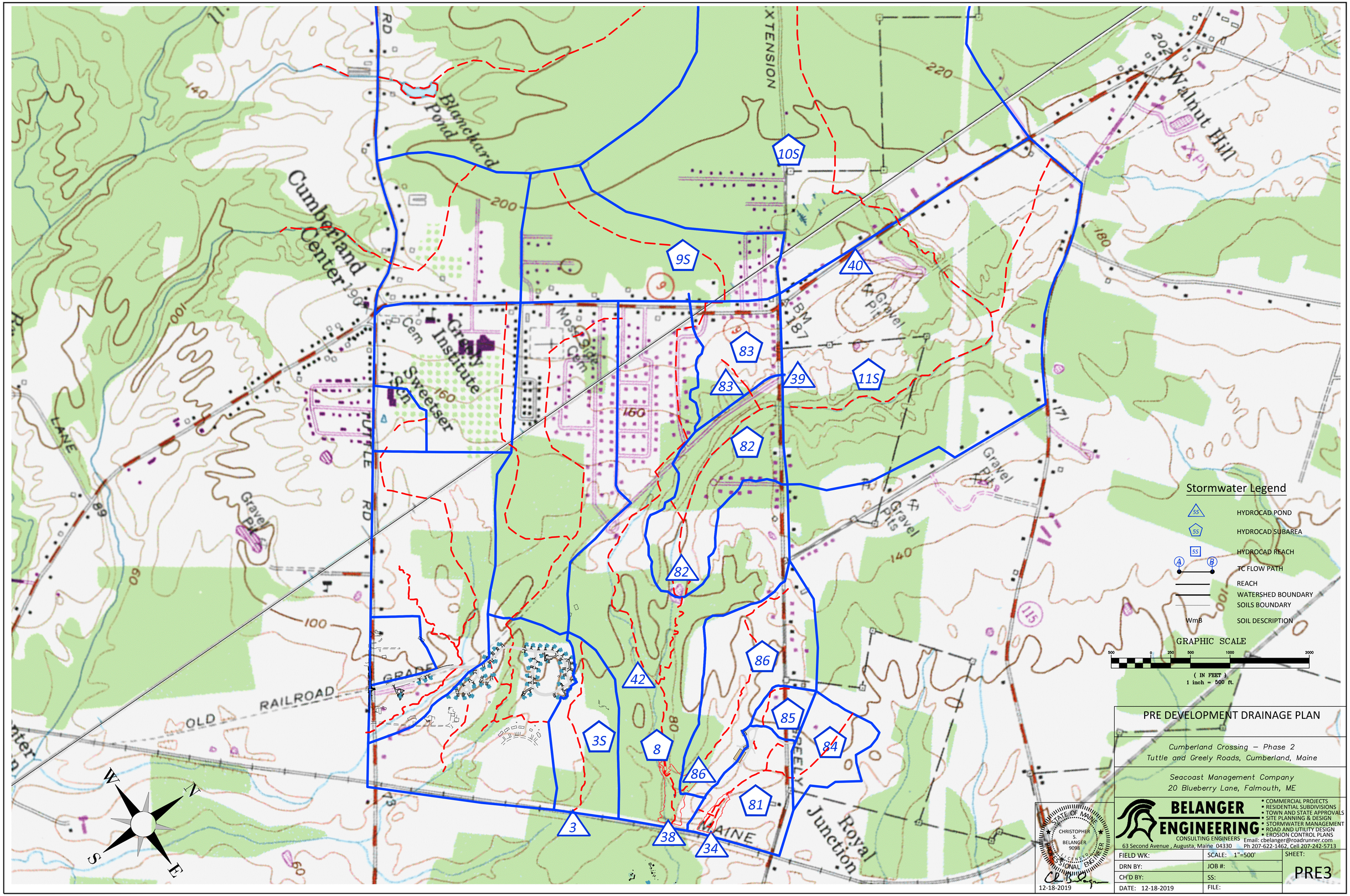
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=200'	SHEET: PRE
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



PRE DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

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20 Blueberry Lane, Falmouth, ME

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- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

STATE OF MAINE — CHRISTOPHER S. BELANGER 9098 — REGISTERED PROFESSIONAL ENGINEER
12-18-2019

FIELD WK:	SCALE: 1"=500'	SHEET: PRE3
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

UNDERDRAINED
FILTER POND 1
POND 47

BUFFER #1
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=278', S=9-15%, HSG C
FORESTED BUFFER

WETLAND
AND STREAM
100' BUFFER
FORESTED BUFFER

ROOF DRIPLINES
52 COTTAGE ROOFS

WETLAND
AND STREAM
100' BUFFER
FORESTED BUFFER

BUFFER #4
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=142', S=9-15%, HSG C
MEADOW BUFFER

GREELY ROAD

RAIL ROAD

FOCAL POINT
STORMWATER
TREATMENT SYSTEM
POND 34

NEW BOX
CULVERT
POND 43

BUFFER #3
WITH STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=34', S=0-8%, HSG C
FORESTED BUFFER

BUFFER #2
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=118', S=9-15%, HSG C
FORESTED BUFFER

EXISTING
5'X6'
BOX
CULVERT

CALCULATED 100 YEAR FLOOD
ELEVATION 62.0

CALCULATED 100 YEAR FLOOD
ELEVATION 68.0

STORMWATER LEGEND

- HYDROCAD POND
- HYDROCAD SUBAREA
- HYDROCAD REACH
- TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB SOIL DESCRIPTION
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED PAVEMENT
- EXISTING / APPROVED PAVEMENT
- PAVEMENT REMOVED
- PROPOSED DEVELOPED AREA LAWNS

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

Post Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.43
10 YEAR	58.07
25 YEAR	59.17
100 YEAR	61.54

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

Post Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

POST DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

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- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET: POST2
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

Phase 1
Approved 2018

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 12-18-2019

Subarea	Total Area	Total Area	Existing Impervious Area	New Impervious Area	New Impervious Area Treated	Existing Lawn Area	New Lawn Area	New Developed Area	New Developed Area Treated	Existing Woods/Field Undeveloped	Treatment BMP
	sf	acres	acres	acres	acres	acres	acres	acres	acres	acres	
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.16	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	368.16	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	121.75	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	9.03	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.46	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.41	4.12	4.12	0.82	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.26	0.84	0.84	0.24	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.05	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	5.82	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.05	721	
				>95%	98%	✓	>80%		80%	✓	

OV Cumberland Phase 2 Impervious Area Summary 12-18-2019

Description	Road Length feet	New Impervious Area s.f.	New Impervious Area acres	New Lawn Area s.f.	New Lawn Area acres	New Developed Area s.f.	New Developed Area acres	Comments
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Road 1 - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Road 2 - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Road 3 - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Road 4 - Sta 90+00-Sta92+30	230	4140	0.10					18', no curb
Road 5 - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Road 6 - Sta 96+00-Sta98+00	200	3600	0.08					18' no curb
Road 1 Spurs (2)	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5566	333733	7.66	459874	10.56	824534	18.93	

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.29	-30%
10 YEAR	25.22	20.6	-22%
25 YEAR	42.47	28.17	-51%
50 YEAR	64.8	41.49	-56%
100 YEAR	85.78	55.83	-54%

Cumberland Crossing Phase 2
Buffer Treatment Table

Treatment BMP	Soil Name	HSG	Slope	Buffer Length	Impervious Area Treated	Lawn Area Treated	Stone Berm Level Spreader Width (180' X Imp.+54' X lawn) FB (240' X Imp.+72' X lawn) MB
				Feet	Acres	Acres	Linear Feet
Forest Buffer #1	Lamoine	C	9-15%	100'	1.07	1.59	278
Forest Buffer #2	Lamoine	C	9-15%	100'	0.58	0.26	118
Forest Buffer #3	Lamoine	C	0-8%	100'	0.16	0.23	34
Meadow Buffer #4	Lamoine	C	9-15%	100'	0.54	0.17	142

STORMWATER LEGEND

- HYDROCAD POND
- HYDROCAD SUBAREA
- HYDROCAD REACH
- TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB — SOIL DESCRIPTION
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED PAVEMENT
- EXISTING / APPROVED PAVEMENT
- PAVEMENT REMOVED
- PROPOSED DEVELOPED AREA LAWNS

Post Pond 3P Summary

Storm	Flood Elevation (ft.)
2 YEAR	55.38
10 YEAR	56.85
25 YEAR	58.47
100 YEAR	59.5

CALCULATED 100 YEAR FLOOD ELEVATION 62.0

Post Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.43
10 YEAR	58.07
25 YEAR	59.17
100 YEAR	61.54

Post Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

CALCULATED 100 YEAR FLOOD ELEVATION 68.0

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · PROFESSIONAL ENGINEER · LICENSED
12-18-2019

POST DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

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- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=200'	SHEET: POST
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

CUMBERLAND CROSSING - PHASE 2
Tuttle & Greely Roads, Cumberland, Maine
December 18, 2019
DEP and Town Submission

LEGEND:

EXISTING		PROPOSED
● OR ▨	IRON PIPE OR MONUMENT	○ OR □
	BENCH MARK (SEE NOTES)	
	TRAVERSE STATION	
TP2	TEST PIT	TP2
	CATCH BASIN	
	SEWER MANHOLE	
	FIRE HYDRANT	
	WATER GATE VALVE	
	WATER SHUT–OFF	
	BLOW–OFF/CLEAN–OUT	
W	WELL	W
	UTILITY POLE	
	POLE W/SINGLE LIGHT	
	POLE W/DOUBLE LIGHT	
	SPOT LIGHT & WALL LIGHT	
	BOLLARD LIGHT	
	SIGN	
	RESIDENTIAL SEWER PUMP STATION	P
	GAS VALVE	
	HANDICAP SYMBOL	
	PAVEMENT PAINT MARKINGS	
	PARKING SPACE COUNT	15
	PROPERTY LINE	
	EASEMENTS	
	SETBACK/BUFFER	
WmB Au	SOILS BOUNDARY	WmB Au
	WETLAND BOUNDARY	
	STREAM	
	CULVERT	
	CONCRETE SLIPFORM	
	GRANITE CURB	
	VERTICAL CONCRETE CURB	
	EDGE OF PAVEMENT	
	ROAD CENTERLINE	
	BUILDING	
	STORM DRAIN(SEE PLAN FOR SIZE)	12"SD
S	SEWER LINE(SEE PLAN FOR SIZE)	S
FM	SEWER FORCE MAIN(SEE PLAN FOR SIZE)	FM
W	WATER LINE(SEE PLAN FOR SIZE)	W W W
GAS	NATURAL GAS LINE(SEE PLAN FOR SIZE)	GAS
UE	UNDERGROUND POWER,PHONE,CABLE CONDUIT	UE
SE	UNDERGROUND SECONDARY POWER LINES	SE
WC	CHILLER LINES	WC
x (100.00)	SPOT ELEVATION	x 100.00
	SPOT: CURB TOP & BOTTOM	T=106.9 B=106.4
100	CONTOURS	(100)
	CATCH BASIN HAY BALE BARRIER	
	CLEARING LIMIT	
	TREE LINE	
	SILT FENCE	
X	CHAIN LINK FENCE	X
	WOOD GUARD RAIL RIPRAP	
	CONSTRUCTION ENTRANCE	
	CONCRETE	
	PAVEMENT	
	PAVEMENT OVERLAY	
	BUILDING	
	EXISTING BUILDING	
"NIC"	NOT IN CONTRACT	"NIC"

PROJECT SCALES

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

GENERAL NOTES:

1. TOPOGRAPHIC DATA IS BASED ON COMPILATIONS OF INFORMATION INCLUDING AERIAL INFORMATION, ON THE GROUND SURVEY, APPROVED DESIGN PLANS, AND FIELD OBSERVATIONS. ON THE GROUND SURVEYS HAVE BEEN COMPLETED BY TITCOMB ASSOCIATES IN 2017
2. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR THE ELEVATION 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 HAS NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVES AND IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE (1-800-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
3. UNIT FOOTPRINTS AS SHOWN ARE FOR PLANNING PURPOSES ONLY. FINAL FOOTPRINTS MAY VARY. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS ETC.
4. LAYOUT DIMENSIONS ARE FROM FACE OF BUILDING, RETAINING WALLS, CURBS OR BERMS.
5. RIM ELEVATIONS OF PROPOSED DRAINAGE AND SANITARY SEWER MANHOLES AND ASSOCIATED STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH THE GRADING PLANS. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE WITHIN LIMITS OF WORK.
6. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC AND FIRE ALARM). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
7. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, INVERTS AND TYPES OF EXISTING PIPES AT ALL PROPOSED POINTS OF CONNECTION PRIOR TO ORDERING MATERIALS. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATIONS, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT.
8. ALL AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. ALL AREAS DISTURBED DURING CONSTRUCTION NOT COVERED WITH BUILDINGS, STRUCTURES, OR PAVEMENT SHALL RECEIVE 6 INCHES OF LOAM AND SEED.
9. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND SHALL BE RESPONSIBLE FOR PAYING ANY FEES FOR ANY POLE RELOCATION AND FOR THE ALTERATION OR ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
10. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS.
11. ALL PROPERTY MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE RESET TO THEIR ORIGINAL LOCATION BY A MAINE REGISTERED PROFESSIONAL LAND SURVEYOR (PLS) AT THE CONTRACTOR'S EXPENSE.
12. THE CONTRACTOR SHALL PREPARE/PROVIDE AN AS-BUILT SURVEY SHOWING LOCATIONS OF ALL CONSTRUCTED SURFACE FEATURES AND SUBSURFACE UTILITY SYSTEMS INCLUDING THE GPS POINT LOCATION, TYPE, SIZE AND INVERTS. THE CONTRACTOR SHALL PROVIDE SURVEY POINTS AND DATA TO THE ENGINEER.
13. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES PRIOR TO EARTHWORK OPERATION AND MAINTAIN ALL EROSION CONTROL MEASURES AND SEEDED EMBANKMENTS DURING CONSTRUCTION. EROSION CONTROL SHALL BE REMOVED ONLY UPON THE ESTABLISHMENT OF ALL LANDSCAPED AREAS. AL WORK SHALL BE IN COMPLIANCE WITH THE ENVIRONMENTAL QUALITY HANDBOOK FOR EROSION AND SEDIMENT CONTROL, LATEST EDITION, AS ADOPTED BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
14. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
15. ALL MATERIALS AND CONSTRUCTION METHODS USED WITHIN THE PUBLIC RIGHT-OF-WAY SHALL CONFORM TO ALL LOCAL MUNICIPAL STANDARDS AND MAINE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
16. ALL HANDICAP ACCESSIBLE PARKING SPACES, RAMPS AND SIDEWALKS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA).
17. ALL SITE SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

LAYOUT NOTES:

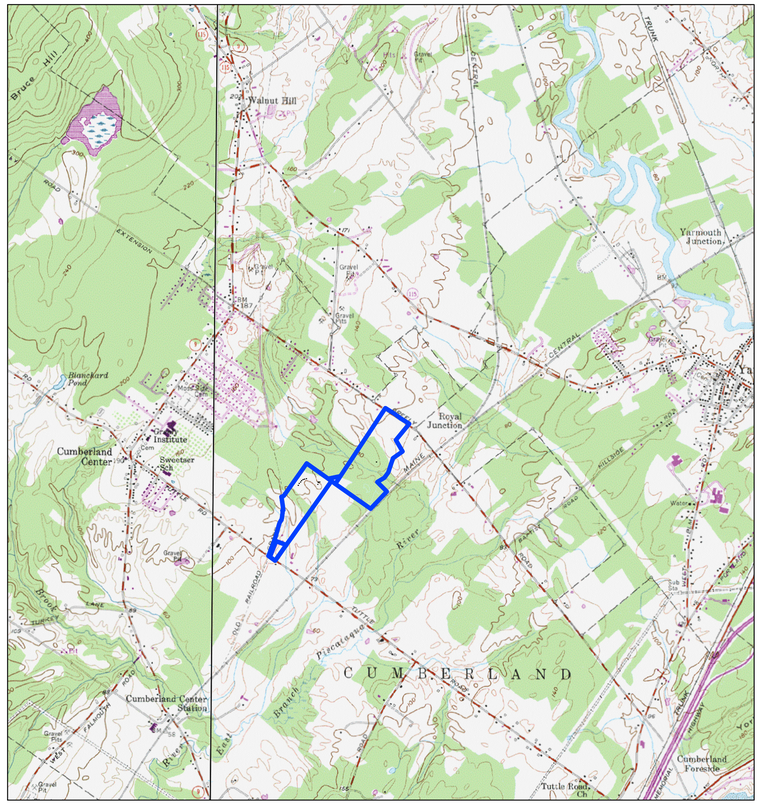
1. ALL DIMENSIONING, UNLESS NOTED OTHERWISE, IS TO THE FACE OF CURB OR BUILDING.
2. OFFSETS TO CATCH BASINS AND MANHOLES ARE TO THE CENTER OF THE FRAME.
3. PIPE LENGTH EQUALS THE CENTER TO CENTER DISTANCES BETWEEN CATCH BASINS AND/OR MANHOLES MINUS ONE HALF THE DIAMETER OF EACH CATCH BASIN OR MANHOLE.
4. BOUNDARY INFORMATION ON LAYOUT PLAN IS FOR REFERENCE ONLY, REFER TO SUBDIVISION PLAT AND ACTUAL SURVEY AND BOUNDARY SURVEY REFERENCES BY TITCOMB ASSOCIATES.

GRADING AND DRAINAGE NOTES:

1. UNLESS OTHERWISE NOTED, ALL STORM DRAIN PIPE SHALL BE IN ACCORDANCE WITH MDOT SPECIFICATIONS SECTION 603. PIPE CULVERTS AND STORM DRAINS, LATEST REVISION WITH THE EXCEPTION THAT THE ONLY ACCEPTABLE TYPES OF PIPE ARE AS FOLLOWS:
   REINFORCED CONCRETE PIPE
   POLYVINYL CHLORIDE PIPE (PVC)
   SMOOTH BORE HDPE POLYETHYLENE PIPE
2. TOPSOIL STRIPPED IN AREAS OF CONSTRUCTION THAT IS SUITABLE FOR REUSE AS LOAM SHALL BE STOCKPILED ON SITE AT A LOCATION TO BE DESIGNATED BY OWNER. UNSUITABLE SOIL SHALL BE SEPARATED, REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFF SITE.
3. THE CONTRACTOR SHALL ANTICIPATE THAT GROUNDWATER WILL BE ENCOUNTERED DURING CONSTRUCTION AND SHALL INCLUDE SUFFICIENT COSTS WITHIN THEIR BID TO PROVIDE DEWATERING AS NECESSARY. NO SEPARATE PAYMENT SHALL BE MADE TO THE CONTRACTOR FOR DEWATERING.

EROSION CONTROL NOTES:

1. LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED IN A MANNER AND SEQUENCE THAT CAUSES THE LEAST PRACTICAL DISTURBANCE OF THE SITE. SEE EROSION CONTROL PLAN FOR EROSION CONTROL SEQUENCING.
2. ALL EROSION CONTROL METHODS IMPLEMENTED SHALL CONFORM TO THE "MAINE EROSION AND SEDIMENT CONTROL EST MANAGEMENT PRACTICES (BMP'S) MANUAL" DATED OCTOBER 2016 BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION. http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf
3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PLACE THE EROSION CONTROL BMPS INCLUDING SILT FENCE, BERMS, EROSION CONTROL MIX, ETC.. THE CONTRACTOR SHALL INSPECT THE BARRIER AND OTHER PREVENTATIVE MEASURES BI-WEEKLY, BEFORE ANY PREDICTED RAIN EVENT, AND AFTER ANY RAIN EVENT. THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SILT AND/OR MAKE REPAIRS AS NECESSARY.
4. THE CONTRACTOR IS CAUTIONED THAT FAILURE TO COMPLY WITH THE SEQUENCE OF CONSTRUCTION, EROSION/SEDIMENT CONTROL PLAN, AND OTHER PERMIT REQUIREMENTS MAY RESULT IN MONETARY PENALTIES. THE CONTRACTOR SHALL BE ASSESSED ALL SUCH PENALTIES AT NO COST TO THE OWNER OR PERMITTEE.



LOCATION MAP
1"=2000'

SHEET INDEX:

C0	COVER SHEET
4 sheets	SUBDIVISION PLAT BY TITCOMB ASSOCIATES
1 OF 1	TOPOGRAPHIC SITE PLAN BY TITCOMB ASSOCIATES
C1	OVERALL PHASING PLAN *1"=100'*
C2	OVERALL SITE DEVELOPMENT PLAN *SCALE: 1" = 60'*
C3-C6A	SITE DEVELOPMENT PLANS *SCALE: 1" = 40'*
C7-C10	PLAN & PROFILES *SCALE: 1" = 40'*
C11A-C11B	LANDSCAPE PLANS 1"=60'
C12	TRAIL AND WALKWAY MASTER PLAN 1" = 100'
C13	ROADWAY SECTIONS, EROSION DETAILS, AND GENERAL NOTES
C14-C15.	SITE DEVELOPMENT DETAILS
C16-C17	EROSION CONTROL NOTES AND DETAILS
C18	LOW PRESSURE SEWER MAIN DETAILS
C19	CIVIL DETAILS
C20-C21	PIPE AND STRUCTURE TABLES
C22-C23	VACANT
C24	STONE STRONG BLOCK WALL DETAILS
C25	FILTER POND DETAILS AND COTTAGE DRIPLINE DETAILS
C26	BOX CULVERT 3 DETAILS
C27	FOCALPOINT 10 SCALE PLAN VIEW
C28-C30	FOCALPOINT DETAILS
C32	CLASS B HIGH INTENSITY SOIL SURVEY BY MARK HAMPTON
C33	SH 1 PORTLAND WATER DISTRICT STANDARD DETAILS
C34	SH 2 PORTLAND WATER DISTRICT STANDARD DETAILS
ES1	MANCINI ELECTRICAL PHOTOMETRIC PLAN
CMP	CMP 905 PLAN - PENDING
PRE	PRE DEVELOPMENT DRAINAGE PLAN - SUBMITTED SEPARATELY
PRE2	USGS MAP OVERLAY
POST	POST DEVELOPMENT DRAINAGE PLAN - SUBMITTED SEPARATELY
POST2	POST DEVELOPMENT DRAINAGE PLAN - SUBMITTED SEPARATELY

UTILITY INFO & CONTACTS:

SUMMIT NATURAL GAS: 12 INCH MAIN, W. SIDE TUTTLE RD.
CONTACT: MICHAEL STINCHFIELD, PROJECT MANAGER 207.620.8000

WATER: PORTLAND WATER DISTRICT: 12 C.I.INCH MAIN, E. SIDE TUTTLE RD.
CONTACT: ROBERT BARTELS, MEANS DEPT. 207.774.5961 X3199

SANITARY SEWER: PORTLAND WATER DISTRICT - 8 INCH GRAVITY SS, W. SIDE TUTTLE RD.
CONTACT: ROBERT BARTELS, MEANS DEPT. 207.774.5961 X3199

ELECTRIC CENTRAL MAINE POWER: 3 PHASE OVERHEAD, W. SIDE TUTTLE RD.
CONTACT: HERB STEVENS, 800.750.4000

COMMUNICATIONS/CTV: SPECTRUM COMMUNICATIONS, OVERHEAD, W. SIDE TUTTLE ROAD
CONTACT: PETER DETESO, 207.318.6542

TELE; FAIRPOINT & CONSOLIDATED, OVERHEAD, W. SIDE TUTTLE ROAD
CONTACT MATT FREE (CONSOLIDATED), 207.626.2007

STREET OPENING: TOWN OF CUMBERLAND URBAN COMPACT& (MDOT)
CONTACT: MDOT SCARBOROGH, REGION 1, 207.885.7000
CONTACT: CUMBERLAND DPW: CHRIS BOLDUC, 207.829.2220

APPROVALS OBTAINED AND REQUIRED.

1. TOWN OF CUMBERLAND PLANNING BOARD. THE PLANNING BOARD CONDITIONALLY APPROVED PHASE 1 OF THE PROJECT ON AUGUST 21, 2018. TAX MAP R4 LOTS 4B, 4D, 4E, & 5. SEE NOTICE OF DECISION DATED AUGUST 22, 2018. PHASE 2 IS BEING SUBMITTED FOR APPROVAL.
2. MAINE DEP SITE LOCATION OF DEVELOPMENT PERMIT. MAINE DEP APPROVED PHASE 1 OF THE PROJECT ON SEPTEMBER 8, 2018. SEE DEP # L-27834-26-A-N & L-27834-TC-B-N. PHASE 2 HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.
3. MAINE DEP NRPA TIER 1 PERMIT. MAINE DEP APPROVED PHASE 1 OF THE PROJECT ON SEPTEMBER 8, 2018. SEE DEP # L-27834-26-A-N & L-27834-TC-B-N. A DEP TIER 2 PERMIT HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.
4. MAINE DOT ENTRANCE PERMIT. SEE PERMIT NUMBER 25667 - ENTRANCE ID: 1 DATED MARCH 16, 2018.
5. U.S. ARMY CORPS OF ENGINEERS PERMIT. ACOE APPROVED PHASE 1 OF THE PROJECT ON AUGUST 14, 2018. SEE CORPS PERMIT # NAE-2018-00545. PHASE 2 HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.

DESIGN CONSULTANTS:

BELANGER ENGINEERING
63 SECOND AVENUE
AUGUSTA, ME 04330
(207) 622-0543

ANTHONY MANCINI, INC.
179 SHERIDAN STREET
PORTLAND, MAINE 04101
(207) 774-5829

LICHT ENVIRONMENTAL DESIGN
35 FRAN CIRCLE
GRAY, ME 04330
(207) 749-4924

GAWRON / TURGEON ARCHITECTS
29 BLACK PT. ROAD
SCARBOROUGH, MAINE 04074
207-883-6307

DAVE HAYNES
MAINE REGISTERED LANDSCAPE ARCHITECT
OCEAN VIEW RETIREMENT COMMUNITY
207-653-9427

TITCOMB ASSOCIATES
39 COURT STREET
BATH, ME 04530
(207) 443-9199

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
PROFESSIONAL ENGINEER
LICENSED
12-18-2019

Cover Page

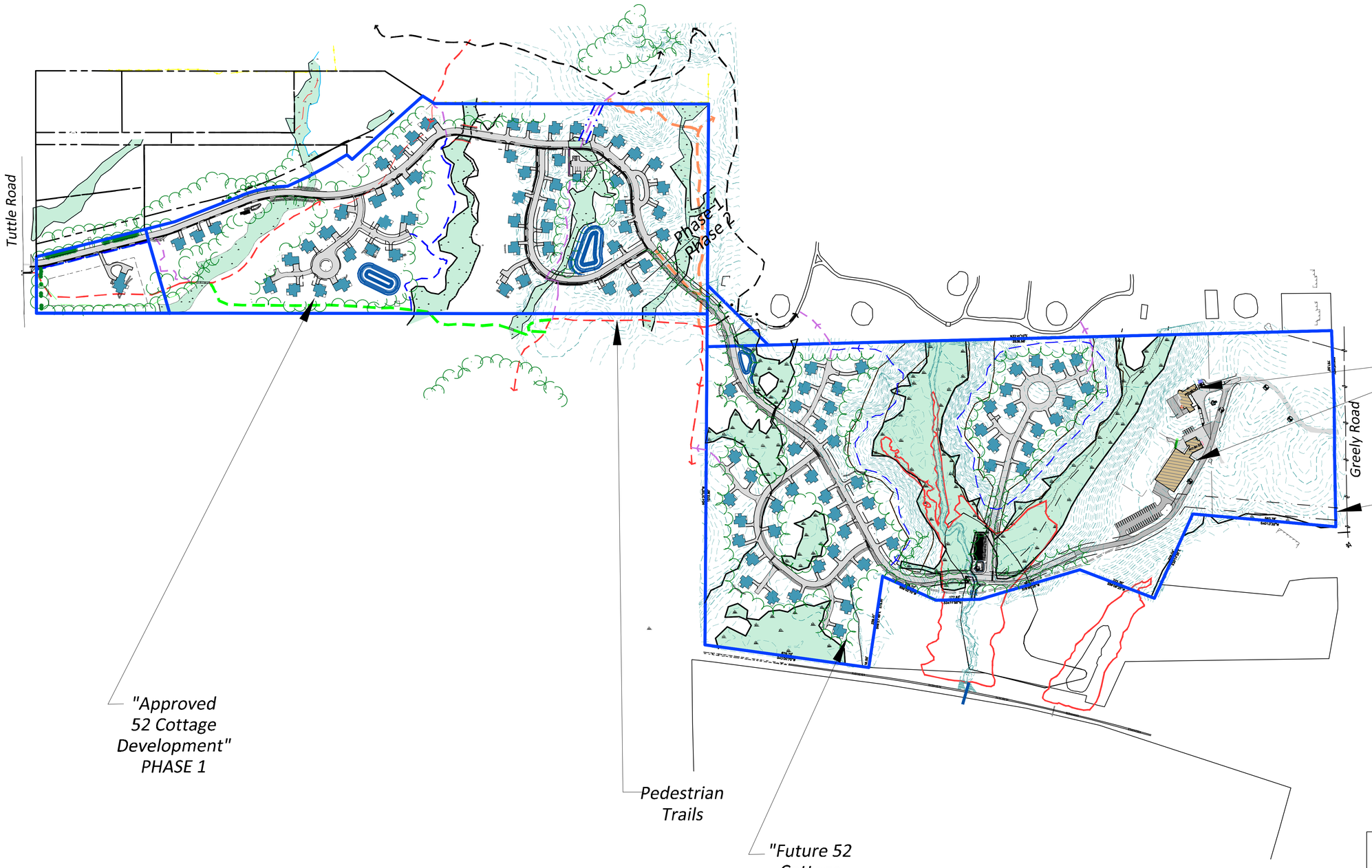
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C0
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



PROGRESS PLAN
NOT FOR CONSTRUCTION

THIS DOCUMENT IS ISSUED FOR INFORMATIONAL PURPOSES ONLY. THE DATA SHOWN HEREON IS SUBJECT TO REVISION.

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
REGISTERED PROFESSIONAL ENGINEER
12-18-2019

Cumberland Crossing - Phases 1 and 2
Overall Context Plan

Tax Map R04 Parcel 34 A
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
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63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713 Email: cbelanger@roadrunner.com

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FIELD WK:	SCALE: 1"=200'	SHEET: C1
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

N/F
Oceanview at
Cumberland LLC
Tax Map R4 Lot 4E
36.34 Acres

Existing Val Halla
Easement
to OV at
Cumberland LLC

N/F
Town of
Cumberland
Val Halla Golf Course
Tax Map R4 Lot 41

EXISTING
HOUSE

NEW 2" WATER
SERVICE AND
METER PIT
COORDINATE
WITH PWD.

EXISTING
14.5' DRIVEWAY
TO REMAIN

50' Buffer

Filter
Pond

ROAD 3

ROAD 1

Buffer1

ROAD 4

ROAD 5

ROAD 6

ROAD 7

50' Buffer

PROPERTY LINE

Buffer3

Buffer2

Buffer4

Focal
Point

N/F
Godsoe Trust
Tax Map R4 Lot 34A
59.53 Acres

Godsoe Farm

BARN

septic
tank

leach
field

PROPOSED
UTILITY
EXTENSIONS
TO GREELY
ROAD

Greely Road

PROPERTY LINE

EXISTING
POND

EXISTING
5'x6' BOX
CULVERT UNDER
RAILROAD

50' Buffer

PROPERTY LINE

50' Buffer

PROPERTY LINE

Prepared in association with:

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ENVIRONMENTAL DESIGN, LLC

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

PROGRESS PLAN
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STATE OF MAINE
CHRISTOPHER
S.
BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER

12-18-2019

Cumberland Crossing - Phase 2
Overall Plan

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

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- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET: C2
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

N/F
Town of
Cumberland
Val Halla Golf Course
Tax Map R4 Lot 41

50' Buffer

50' Buffer

Pond

Buffer

50' Buffer

Buffer

Buffer

Focal
Point

50' Buffer

Godsoe Farm

N/F
Godsoe Trust
Tax Map R4 Lot 34A
59.53 Acres

FFE: 95.14

FFE: 89.23

AERIAL OVERLAY

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

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ENVIRONMENTAL DESIGN, LLC

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63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=100'
JOB #: 134
DATE: 12-18-2019
SHEET:
C2A

EXTEND NEW 12" D.I. WATER LINE
4" SEWER FORCE MAIN, GAS MAIN,
UTILITY CONDUITS, TO SERVE RESIDENTIAL
COTTAGES. COORDINATE WITH UTILITY

PROPOSED TREE LINE
AND CLEARING LIMIT (TYP)

PROPOSED FILTER POND
(SEE DETAILS)

EDGE OF
WETLAND

4" GAS MAIN

RIPRAP CULVERT
INLET AND OUTLET
D50=6"

PROPERTY LINE

4" SEWER FORCE MAIN

12" D.I. WATERLINE
ALONG LITTLE ACRES DRIVE

Little Acres Drive

EDGE OF
WETLAND

22' WIDE
ROAD, CURB,
AND SIDEWALK

PROPOSED
LIGHT

PROPOSED TREE LINE
AND CLEARING LIMIT (TYP)

18' WIDE

PROPERTY LINE

ROAD 3

SMH4

SMH2

SMH3

100' BUFFER ADJACENT
TO WETLAND AND STREAM
(BOTH SIDES)

100'

STORMWATER FORESTED
BUFFER #1 AND STONE BERMED
LEVEL SPREADER TO PROVIDE
STORMWATER TREATMENT

PROPOSED
WATER VALVES

INSTALL STREET
AND STOP SIGN

INSTALL STOP BAR
AND CROSSWALK

PROGRESS PLAN
NOT FOR CONSTRUCTION

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IS SUBJECT TO REVISION.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Cumberland Crossing - Phase 2

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

BELANGER ENGINEERING
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- COMMERCIAL PROJECTS
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- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=40'	SHEET: C3
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N54°31'05"W 1212.80'

PROPERTY LINE

BUFFER

EDGE OF WETLAND

ROAD 1

ROAD 2

ROAD 4

ROAD 5

ROAD 6

Little Acres Drive

MAINE DEP JURISDICTIONAL STREAM

STORMWATER FORESTED BUFFER #1 AND STONE BERMED LEVEL SPREADER TO PROVIDE STORMWATER TREATMENT

4" SEWER FORCE MAIN

4" GAS MAIN

12" D.I. WATERLINE ALONG LITTLE ACRES DRIVE

100' BUFFER ADJACENT TO WETLAND AND STREAM (BOTH SIDES)

PROPOSED WATER VALVE

PROPOSED LIGHT

PROPOSED FIRE HYDRANT

EXTEND NEW 8" D.I. WATER LINE 2" SEWER FORCE MAIN, GAS MAIN, UTILITY CONDUITS, TO SERVE RESIDENTIAL COTTAGES. COORDINATE WITH UTILITY

STORMWATER FORESTED BUFFER #2 AND STONE BERMED LEVEL SPREADER TO PROVIDE STORMWATER TREATMENT

S59°02'16"W 239.70'

BUFFER

N27°45"E 375.91'

359.41'

22' WIDE ROAD, CURB, AND SIDEWALK

STORMWATER FORESTED BUFFER #4 AND STONE BERMED LEVEL SPREADER TO PROVIDE STORMWATER TREATMENT

18' WIDE

EDGE OF WETLAND

18' WIDE

Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
NOT FOR CONSTRUCTION

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STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Cumberland Crossing - Phase 2

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

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- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=40'	SHEET: C4
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

MAINE DEP
JURISDICTIONAL STREAM

STORMWATER FORESTED
BUFFER #1 AND STONE BERMED
LEVEL SPREADER TO PROVIDE
STORMWATER TREATMENT

100' BUFFER ADJACENT
TO WETLAND AND STREAM
(BOTH SIDES)

STORMWATER MEADOW
BUFFER #4 AND STONE BERMED
LEVEL SPREADER TO PROVIDE
STORMWATER TREATMENT

EXTEND NEW 8" D.I. WATER LINE
2" SEWER FORCE MAIN, GAS MAIN,
UTILITY CONDUITS, TO SERVE RESIDENTIAL
COTTAGES. COORDINATE WITH UTILITY

FOCAL POINT
DRAINAGE SYSTEM
(SEE DETAILS)

STONE STRONG
RETAINING WALL
(SEE DETAILS)

RIPRAP
INLET
D50=6"

STORMWATER FORESTED
BUFFER #2 AND STONE BERMED
LEVEL SPREADER TO PROVIDE
STORMWATER TREATMENT

INSTALL STONE STRONG
RETAINING WALLS
COORDINATE FINAL DESIGN
WITH SUMMIT GEOENGINEERING
(SEE DETAILS)

PROPERTY LINE
PROPOSED
10' WIDE X 8' TALL
BOX CULVERT
(SEE DETAILS)

PROPOSED
LIGHT

EXISTING PEDESTRIAN BRIDGE
TO REMAIN

PROPOSED TREE LINE
AND CLEARING LIMIT (TYP)

3:1 FILL SLOPE
INSTALL EROSION
CONTROL BLANKETT

PROPERTY LINE

ROAD 1
ROAD 2
ROAD 6
Little Acres Drive

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

Prepared in association with:
LICHT
ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
NOT FOR CONSTRUCTION
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STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Cumberland Crossing - Phase 2

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713 Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=40'	SHEET: C5
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

N33°41'10"E
2536.98'

50' BUFFER

30' wide
Cul-de-sac

18' Road
Road 8

Residential
Cottage (typ)

EDGE OF WETLAND

100' SETBACK
FROM WETLAND
AND STREAM

MEADOW BUFFER #4
100' DEEP
WITH STONE BERMED
LEVEL LIP SPREADER

22' WIDE ROAD
ROAD 1

ROAD 1

100'

18"CMP
inv.: 89.8

inv.: 89.7

FFE: 95.14

HOUSE

POOL

septic
tank

leach
field

rim: 88.29'

FFE: 89.23

BARN

20' WIDE ACCESS
DRIVEWAY

Little Acres Drive

PROPOSED
LIGHT

PROPOSED
PARKING

STRUCTURE

GRAPHIC SCALE

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(IN FEET)
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STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
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Cumberland Crossing - Phase 2

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FIELD WK:	SCALE: 1"=40'	SHEET: C6
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

EXTEND NEW 2" CTS
TO HOUSE (WATER SERVICE)

18" CMP
inv.: 89.86'

inv.: 89.79'

5' METER PIT

EXISTING WATER MAIN
IN GREELY

SAWCUT AND REPAIR
UTILITY TRENCH
(SEE DETAIL)

PROPOSED POOL
AND PATIO

FFE: 95.14'

POOL

septic
tank

leach
field

EXISTING PAVED
DRIVEWAY TO REMAIN
W=14.5'

EXISTING LANDSCAPE
WALLS TO REMAIN

rim: 88.29'

FFE: 89.23'

20' WIDE ACCESS
DRIVEWAY

100'

500' SETBACK
FROM GREELY

GREELY ROAD

PROPERTY LINE

EXTEND 3 OR 4" SEWER FORCE MAIN
TO GREELY ROAD

EXTEND 12" D.I. WATER MAIN
TO GREELY ROAD

EXTEND 4" GAS MAIN
TO GREELY ROAD

15" hdpe
outlet

PROPERTY LINE

PROPERTY LINE

Little Acres Drive

GRAPHIC SCALE

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LICENSED PROFESSIONAL ENGINEER
12-18-2019

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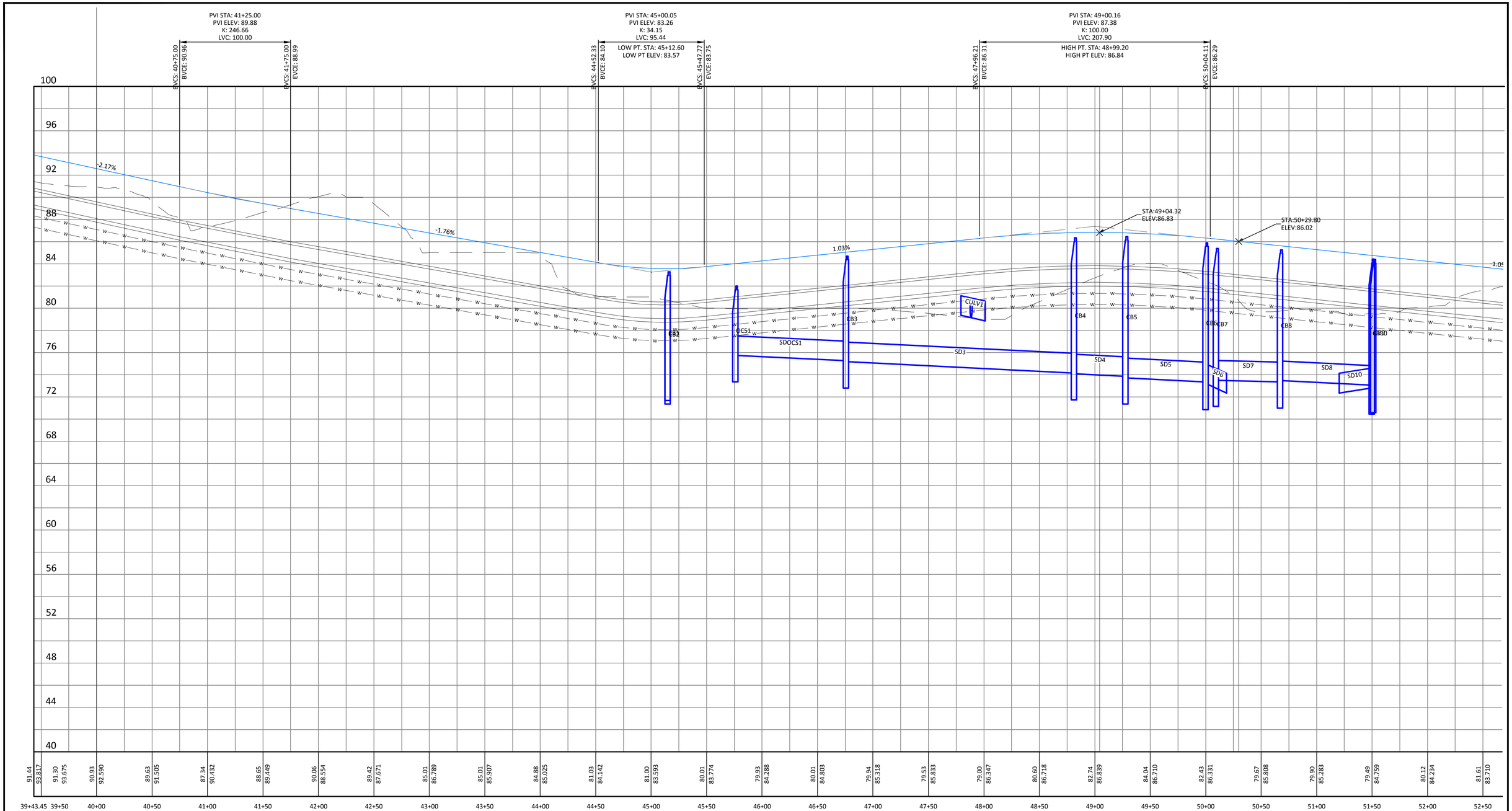
Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

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20 Blueberry Lane, Falmouth, Maine 04105

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FIELD WK:	SCALE: 1"=40'	SHEET: C6A
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



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12-18-2019

Profile
Little Acres Drive Extension

Cumberland Crossing – Phase 2

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63 Second Avenue
Augusta, Maine 04330


SCALE: 1"=40' H, 4' V

JOB #: 134

DATE: 12-18-2019

SHEET: C7

Little Acres Extension PROFILE



GRAPHIC SCALE

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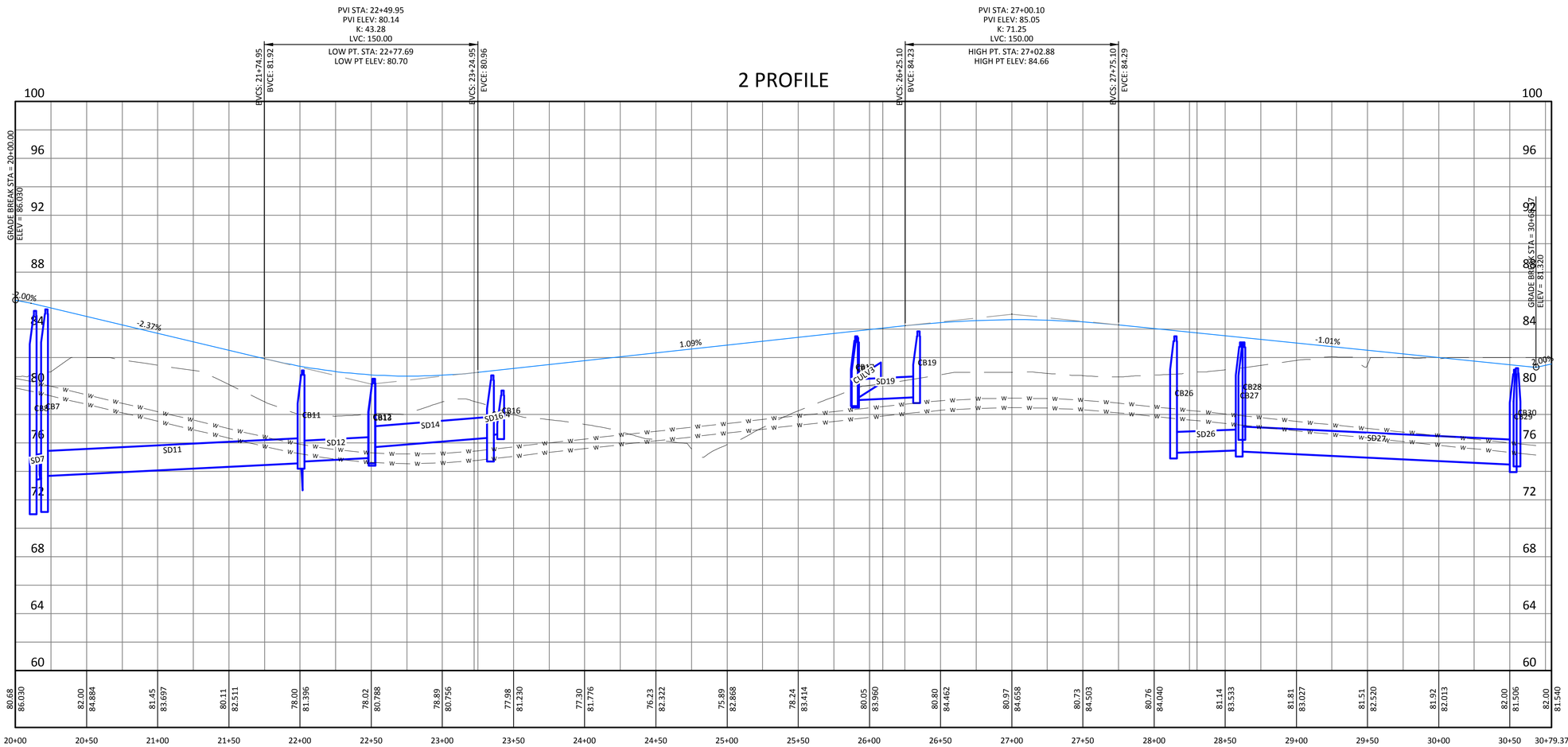
Profile
Little Acres Drive Extension

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Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 12-18-2019
SHEET: C8

2 PROFILE



GRAPHIC SCALE

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(IN FEET)
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12-18-2019

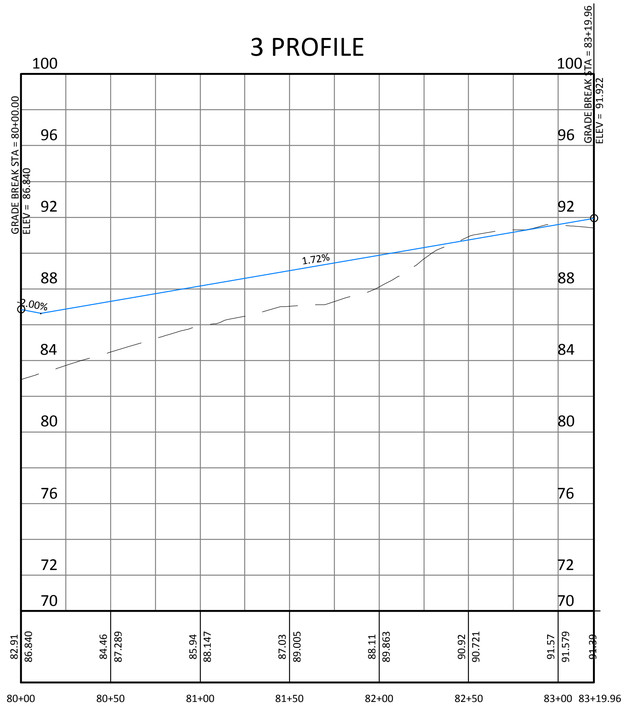
Profile
alignment 2 loop road

Cumberland Crossing – Phase 2

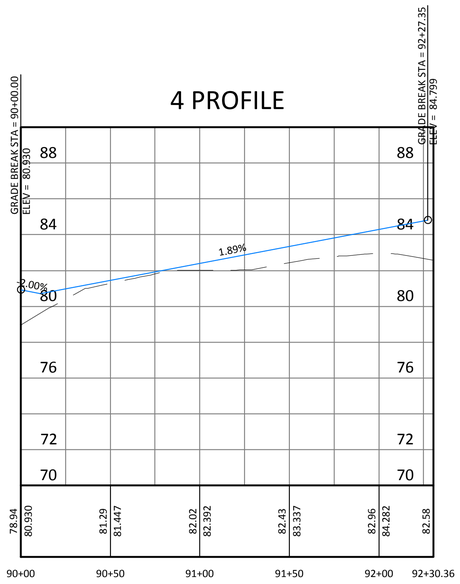
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63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 12-18-2019
SHEET: C9

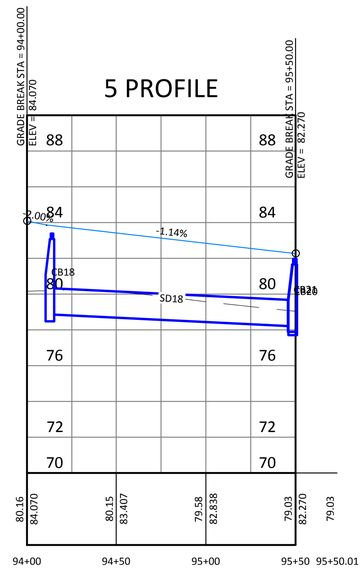
3 PROFILE



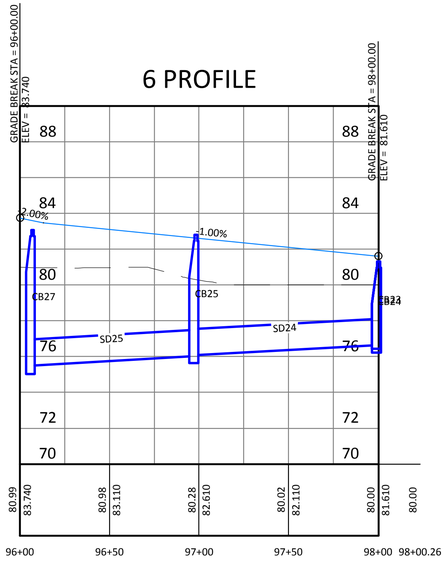
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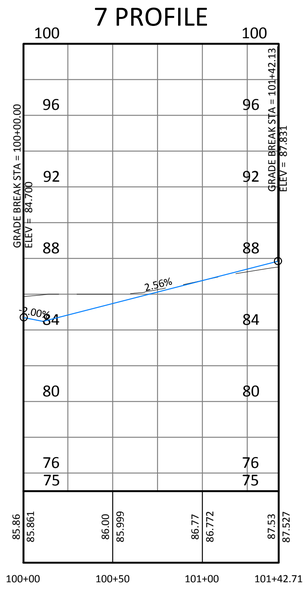
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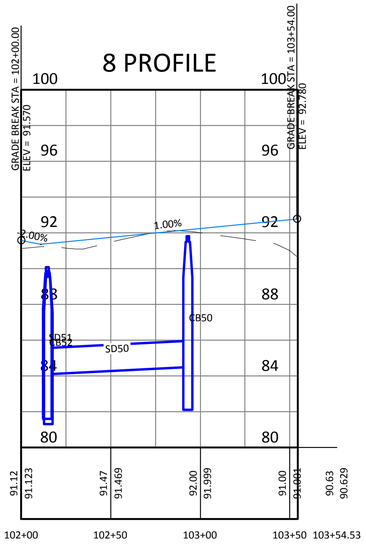
6 PROFILE



7 PROFILE



8 PROFILE



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
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STATE OF MAINE
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9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Profiles

Cumberland Crossing – Phase 2

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Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 12-18-2019
SHEET: C10

W
N
S
E

leach field

24" CPP
inv.: 56.71'

inv.: 57.78'

Landscape Plan

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

REGISTERED LANDSCAPE ARCHITECT
J. DAVID HAYNES
No. 5
STATE OF MAINE

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

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FIELD WK:	SCALE:	SHEET: C11A
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

Buffer Tree and Shrub Specifications

[quantity as indicated following individual plant listings below (x)]

Trees:

Abies balsamea phanerolepis	6-7 ft.	
Canaan Balsam Fir		
Acer pensylvanicum	#7 cont.	
Striped Maple		
Acer rubrum	2-2.5 in.	
Red/Swamp Maple		
Amelanchier x grandiflora	6-7 ft.	clump
Betula nigra "Heritage"	10-12 ft.	clump
Heritage River Birch		
Carpinus caroliniana	1.5-1.75 in.	
American Hornbeam		
Crataegus crus-galli inermis	1.5 in. cal.	
Cockspur Thornless Hawthorn		
Picea glauca	6-7 ft.	
White Spruce		
Picea abies	6-7 ft.	
Norway Spruce		
Pinus strobus	7-8 ft.	
White Pine		
Quercus alba	2.5-3 in.	
White Oak		
Quercus bicolor	2 in.	
Swamp White Oak		
Quercus rubrum	2.5-3 in.	
Red Oak		
Tsuga canadensis	6-7 ft.	
Canadian Hemlock		

Shrubs:

Aronia arbutifolia "Brilliantissima"	#3 cont.	
Red Chokeberry		
Azalea viscosum	#2 cont.	
Swamp Azalea		
Cephalanthus occidentalis	#3 cont.	
Buttonbush		
Clethra alnifolia	#3 cont.	
Sweet Pepperbush		
Cornus alternifolia	#5 cont.	
Pagoda Dogwood		
Cornus sericea "Baileyi"	#3 cont.	
Red Twig Dogwood		
Hamamelis intermedia "Pallida"	#3 cont.	
Pallida Witchhazel		
Ilex verticillata "Jim Dandy/Red Sprite"	#3 cont.	m/f
Winterberry (var.)		
Itea virginica "Little Henry"	#3cont.	
"Little Henry" Sweetspire		
Lindera benzoin	#3 cont.	
Spicebush		
Vaccinium corymbosum	#3 cont.	var.
Highbush Blueberry		
Viburnum cassinoides	#5 cont.	
Withrod Viburnum		
Viburnum dentatum "Christom"	#5 cont.	
Blue Muffin Arrowwood Viburnum		
Viburnum lentago	#5 cont.	
Nannyberry Viburnum		
Viburnum nudum "Brandywine"	#5 cont.	
Brandywine Viburnum		

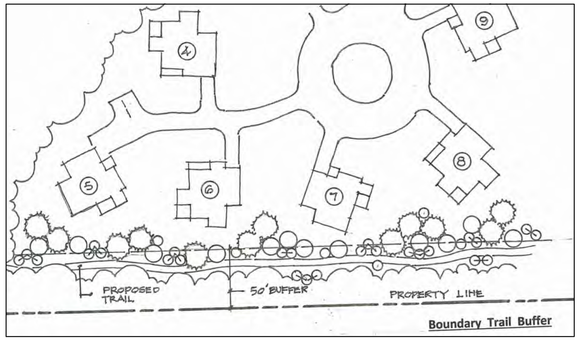
Street Tree Plant Schedule

Key	Quan.	Botanical and Common Name	Ht.
A	37	Acer rubrum "Red Sunset"	2-2.5" cal.
		Red Sunset Maple	
W	15	Quercus alba	2-2.5" cal.
		White Oak	
S	17	Quercus bicolor	2-2.5" cal.
		Swamp White Oak	
R	24	Quercus rubra	2-2.5" cal.
		Red Oak	
B	9	Tilia americana	2-2.5" cal.
		Basswood	
Z	16	Zelkova serrata "Green Vase"	2-2.5" cal.
		Green Vase Zelkova	
V	13	Ulmus "Valley Forge"	2-2.5" cal.
		Valley Forge Elm	

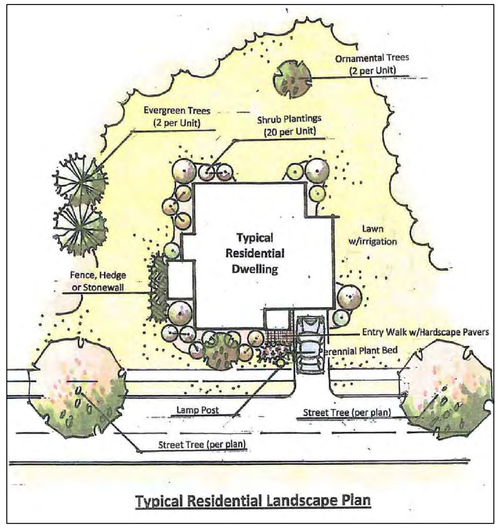
Native Vegetative Buffers

Trees and understory buffers around property perimeter and disturbed common areas such as around storm water management basins to be supplemented in various locations with indigenous plant materials as selected from, but not limited to, the following list. Placement of trees and shrubs to be field adjusted for "best fit" to supplement existing vegetation.

- Acer pennsylvanicum - Striped Maple
- Acer rubrum - Red/Swamp Maple
- Pinus strobus - White Pine
- Betula nigra - River Birch
- Abies balsamea - Balsam Fir
- Picea glauca - White Spruce
- Quercus rubrum - Northern Red Oak
- Quercus bicolor - Swamp White Oak
- Amelanchier Canadensis - Shadblow
- Cornus alternifolia - Pagoda Dogwood
- Cornus sericea - Shrub Dogwood
- Hammamelis vernalis - Witchhazel
- Ilex verticillata - Winterberry
- Aronia (var.) - Chokeberry
- Clethra alnifolia - Summersweet
- Azalea viscosum - Swamp Azalea
- Vaccinium corymbosum - Highbush Blueberry
- Cephalanthus occidentalis - Buttonbush
- Viburnum (var.) - Viburnum



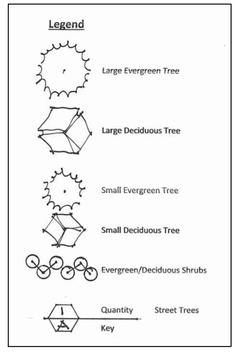
Boundary Trail Buffer



Typical Residential Landscape Plan

Landscape Notes:

1. All disturbed construction areas to be re-vegetated with grass shall receive a minimum of 4 in. topsoil loam with hydro-seed or sod as indicated on plans.
2. Prior to plant installation the contractor shall meet with the landscape architect on site for a pre-construction meeting.
3. Plant beds shall receive 10-12 in. of prepared topsoil loam.
4. The landscape architect shall approve plant spacing and layout prior to planting.
5. Contractor shall verify plant schedule with planting plans. If conflicts exist, the contractor shall provide higher number of plants.
6. Installation of plant materials; materials and plantings shall meet requirements as specified by "American standard for nursery stock, may 2004 and as shown on construction detail drawings.
7. Landscape contractor shall construct curvilinear plant beds around and under all shrub plantings to outside limit of branching. plant beds shall be mulched with 3 in. deep dark decomposed mulch.
8. All tags, labels or other foreign material shall be removed from plant material limbs and stems.
9. All plant material substitutions shall be applied for in writing for approval by the landscape architect. Approval of plant variety substitutions shall be based on similar characteristics of the specified plant – mature size, color, bloom times, branching habit, shape, solar and soil preferences.
10. Final spacing of street trees to be field determined based upon driveway curb cuts, utility service stops, view sheds and landscape buffers to be preserved.
11. Precise locations of buffer plant materials to be field selected based on view sheds, existing plant materials and general field conditions. Placement of trees and shrubs to be field adjusted for "best fit" to supplement existing vegetation.



REGISTERED LANDSCAPE ARCHITECT J. DAVID HAYNES No. 5 STATE OF MAINE

STATE OF MAINE CHRISTOPHER S. BELANGER 9098 LICENSED PROFESSIONAL ENGINEER
12-18-2019

Landscape Plan

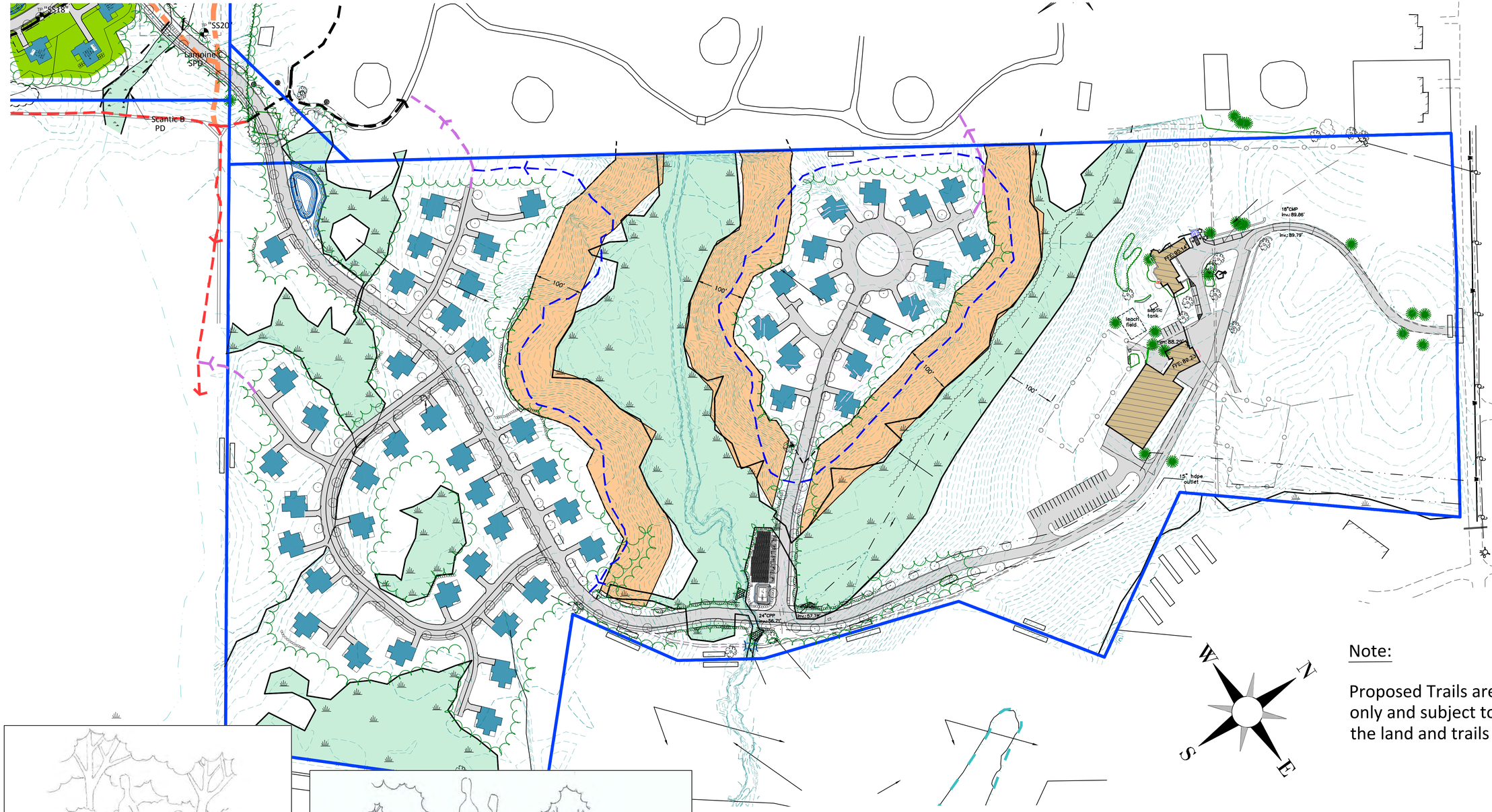
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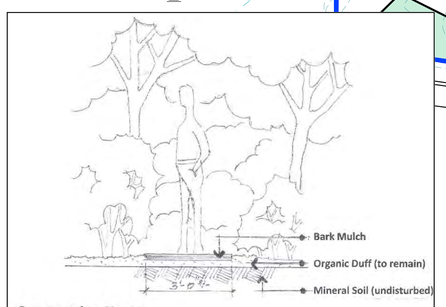
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FIELD WK:	SCALE:	SHEET: C11B
DRN BY:	JOB #:	
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Note:

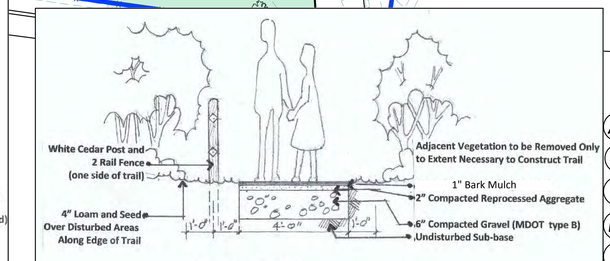
Proposed Trails are preliminary only and subject to review with the land and trails committee.



Construction Notes:

1. Alignment of trail to meander through woods along "path of least resistance".
2. Trail to be 3 ft. +/- wide.
3. Path of trail to be cleared of small trees and brush and grubbed to remove small stumps and roots.
4. Meandering trail surfacing to be 2-3 in. depth of wood chips and/or well rotted bark mulch.

Woodland Buffer Trail
Typical Section



Access Trail - Typical Section

Trail & Pedestrian Ways Key

- A — *Existing Snowmobile and Pedestrian Trails*
- B — *Proposed Sidewalk and Pedestrian Access*
- C — *6-8' Wide Grass/Gravel Trail*
- D — *4' Bark Mulch / Access Trail*
- E — *3' Hand Cut/Woodland Buffer Trail*
- F — *Proposed 6' Snowmobile Trail*

Proposed Boardwalk or Culvert

Crosswalk

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CHRISTOPHER S. BELANGER 9098
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12-18-2019

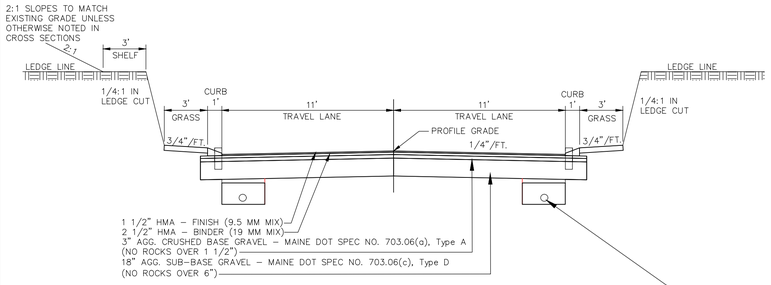
Trail and Walkway Master Plan

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Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

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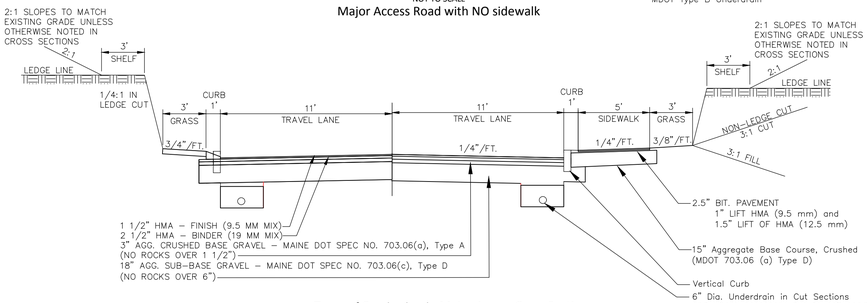
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DATE: 12-18-2019	FILE:	



Town of Cumberland - Major Access Cross Section

NOT TO SCALE

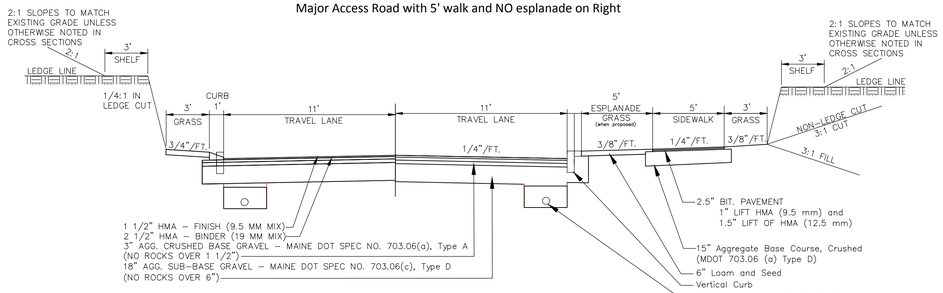
Major Access Road with NO sidewalk



Town of Cumberland - Major Access Cross Section

NOT TO SCALE

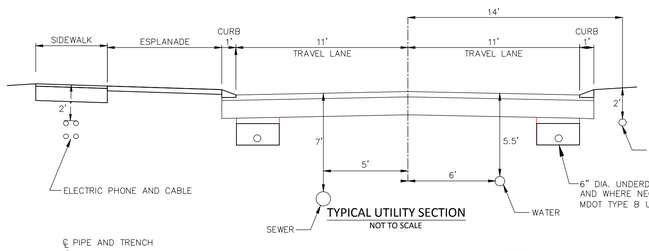
Major Access Road with 5' walk and NO esplanade on Right



Town of Cumberland - Major Access Cross Section

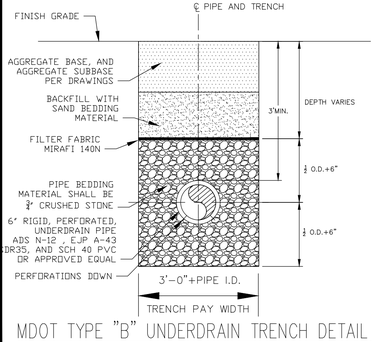
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Major Access Road with 5' walk and esplanade on Right



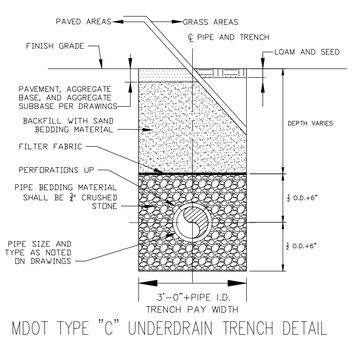
TYPICAL UTILITY SECTION

NOT TO SCALE



MDOT TYPE "B" UNDERDRAIN TRENCH DETAIL

NOT TO SCALE



MDOT TYPE "C" UNDERDRAIN TRENCH DETAIL

NOT TO SCALE

ROAD CONSTRUCTION NOTES:

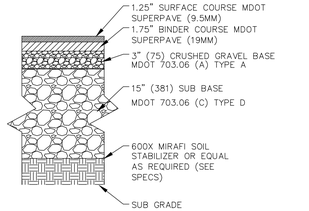
1. IN FILL AREAS 3:1 SLOPES ARE TO BE USED UNLESS ENOUGH USEABLE WASTE MATERIAL HAS BEEN STOCKPILED TO USE 4:1 FILL SLOPES.

2. IN FILL AREAS THE GRANULAR MATERIAL TO BE USED SHALL CONFORM TO SECTION 703.19 OF THE STATE OF MAINE STANDARDS SPECIFICATIONS FOR GRANULAR BORROW.

3. UNDERDRAIN SHALL BE INSTALLED IN ALL AREAS WHERE LEDGE IS ENCOUNTERED. CONTRACTOR SHALL ASSUME UNDERDRAIN IS REQUIRED IN CUT AND LEDGE CONDITIONS AND SHALL BE PART OF THE BASE BID.

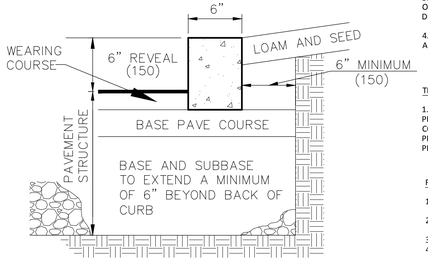
4. INSTALL FABRIC (Mirafi 500X) UNDER ROAD BASE WHEN SOFT CLAY IS ENCOUNTERED DURING CONSTRUCTION. WHEN FOUND CONTRACTOR SHALL CONTACT ENGINEER FOR SPECIFIC RECOMMENDATION BASED ON FIELD CONDITIONS.

5. CONTRACTOR MAY PERFORATE STORM DRAIN IF AVAILABLE TO SUBSTITUTE UNDERDRAIN ON THAT SIDE OF ROAD. UNDERDRAIN IS STILL REQUIRED ON OTHER SIDE OF ROAD TO MEET TOWN SPECIFICATION. INSTALL TYPE C UNDERDRAIN WITH PERFORATED STORM DRAIN (HOLES UP). INSTALL TYPE B UNDERDRAIN FOR 6" UNDERDRAIN IS USED (HOLES DOWN). TIE UNDERDRAIN INTO CATCH BASINS AS AVAILABLE OR OUTLET TO DITCH OR SWALE.



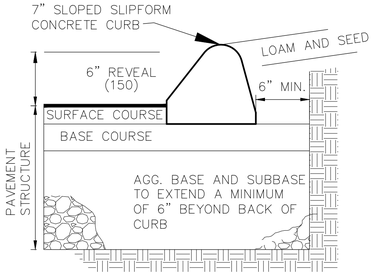
BIUMINOUS CONCRETE DRIVE

NOT TO SCALE



VERTICAL SLIPFORM CONCRETE CURB

NOT TO SCALE – SIDEWALK SIDE PER TOWN STANDARDS



7" SLOPED SLIPFORM CONCRETE CURB

NOT TO SCALE – NON-SIDEWALK AREAS

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL METHODS SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION BEST MANAGEMENT PRACTICES BY THE CUMBERLAND COUNTY SOIL WATER CONSERVATION DISTRICT, AND THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

2. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PLACE THE SILT FENCE. THE CONTRACTOR SHALL INSPECT THE BARRIER AND OTHER PREVENTATIVE MEASURES BI-WEEKLY, BEFORE ANY PREDICTED RAIN EVENT, AND AFTER ANY RAIN EVENT. THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SILT AND/OR MAKE REPAIRS AS NECESSARY.

3. ALL TOPSOIL SHALL BE SAVED TO LOAM LANDSCAPED AREAS TO A DEPTH OF 4". LOAM SHALL BE STOCKPILED ON SITE IN A LOCATION CONVENIENT TO THE CONTRACTOR. THE STOCKPILE WILL BE TEMPORARILY SEEDED WITH RYE GRASS AND MULCHED AT 75 90 LBS/1000SF. ALL SOIL STOCKPILES ARE TO BE ENCLOSED WITH SILT FENCE. STOCKPILES SHALL NOT BE LOCATED IN WETLAND STEEP SLOPES, OR AREAS OF CONCERTRATING FLOW.

4. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE PERMANENTLY SEEDED. SEEDING SHALL BE PERFORMED IN ACCORDANCE WITH MDOT SPECIFICATION: LIME AT 3 TONS/ACRE: FERTILIZER 10-10-10 AT 13.8LBS/1000 SF: SEED MDOT PARK MIX AT 3 LBS/1000 SF. - SEEDING SHALL BE PERFORMED BETWEEN APRIL 15 - JUNE 15 OR AUGUST 15 - SEPTEMBER 15, WINTER RYE SHALL BE USED AS TEMPORARY SEED BETWEEN SEPTEMBER 15 - OCTOBER 15. ALL FINISHED SLOPES EXCEEDING 15% SHALL ALSO HAVE MULCH NETTING INSTALLED AND PINNED DOWN. AFTER SEPTEMBER 15, THE SAME APPLIES TO ALL SLOPES EXCEEDING 8%.

5. ALL AREAS TO BE SEEDED SHALL BE MULCHED. MULCH SHALL BE LONG FIBERED HAY OR STRAW AND SPREAD UNIFORMLY. 1.5 TO 2.0 TONS PER ACRE. TO BE MAINTAINED MOIST TO MINIMIZE BLOWING AS NECESSARY. IN WINTER CONDITIONS, NO MULCH IS TO BE APPLIED OVER SNOW. THE SNOW MUST FIRST BE REMOVED AND THEN MULCH APPLIED ACCORDING TO SPECIFICATIONS STATED PRIOR. IN ALL CASES MULCH SHALL BE APPLIED SUCH THAT THE SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. DURING NOVEMBER 1 THROUGH APRIL 1 MULCHING SHALL BE COMPLETED DAILY BY THE END OF THE WORK DAY.

6. PLACE SILT SACKS IN CATCH BASIN INLET DURING CONSTRUCTION. CONTACT AH HARRIS IN PORTLAND (207) 775-5764 OR AUGUSTA (207) 622-0821 SILT SACKS SHALL BE REMOVED AFTER FINAL PAVEMENT OVERLAY.

7. ALL SEDIMENT CONTROL FENCING AND SILT SACKS BARRIERS WILL REMAIN IN PLACE UNTIL SEEDLINGS HAVE BEEN ESTABLISHED.

8. ALL EARTH CHANGES WILL BE CONSTRUCTED AND COMPLETED IN SUCH A MANNER SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND WILL BE LIMITED TO THE SHORTEST PERIOD OF TIME POSSIBLE. THE CONTRACTOR SHALL COMPLETE FINAL GRADING, SEEDING, AND MULCHING IN CONJUNCTION WITH THE COMPLETION OF THE CORRESPONDING BUILDINGS WHENEVER POSSIBLE. IF FINAL GRADING CANNOT BE COMPLETED THEN THE CONTRACTOR IS TO MULCH ANY DISTURBED LAND AND WORK ON TOP OF THE MULCH. AREAS OF DISTURBED SOIL WILL BE TEMPORARILY MULCHED OR SEEDED WITHIN 30 DAYS OF INITIAL DISTURBANCE.

9. SEDIMENT CAUSED BY ACCELERATED SOIL EROSION WILL BE REMOVED FROM RUNOFF WATER BEFORE IT LEAVES THE DEVELOPMENT SITE.

10. ALL TEMPORARY OR PERMANENT FACILITY CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR FROM THE DEVELOPMENT SITE WILL BE CONSTRUCTED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.

11. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA WILL BE COMPLETED WITHIN 15 DAYS AFTER FINAL GRADING HAS BEEN COMPLETED.

12. IN THE EVENT THAT TEMPORARY OR PERMANENT SEEDLINGS HAVE NOT BEEN ESTABLISHED (90% SURFACE COVERAGE) BY SEPTEMBER 15, TEMPORARY MULCHING SHALL BE APPLIED FOR PROTECTION OVER WINTER (PAST THE GROWING SEASON) IN ACCORDANCE WITH THE TEMPORARY MULCHING BMP OF THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK.
A. MULCHING FOR OVER WINTER PROTECTION WILL BE COMPLETED BY NOVEMBER 15.
B. WINTER MULCH ON SLOPES 8% OR GREATER WILL BE ANCHORED WITH NETTING.
C. ALL SOILS DISTURBED PRIOR TO NOVEMBER 1 AND NOT HAVING THE REQUIRED COVER OF VEGETATION WILL BE STABILIZED WITH ANCHORED MULCH BY NOVEMBER 15.

13. PROVIDE TWO TEMPORARY CMP RISERS AT EXISTING CATCH BASIN AND WRAP WITH EROSION CONTROL FABRIC TO CONTROL POTENTIAL SEDIMENTATION. INSTALL STONE BERM OR HAY BALES AROUND CATCH DURING CONSTRUCTION..

14. NO EARTH MOVING OR CONSTRUCTION OPERATIONS ARE ANTICIPATED ON THE EXISTING STEEP SLOPE EXCEPT FOR RIP-RAP SLOPE PROTECTION. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH OTHER EROSION CONTROL NOTES.

15. DURING WINTER CONSTRUCTION THE CONTRACTOR SHALL INSTALL AN EROSION CONTROL FILTER BERM. THE CONTRACTOR SHALL INSTALL THE BERMS AS SEDIMENT BARRIERS DURING FROZEN GROUND CONDITIONS.

PAVING, GRADING & DRAINAGE NOTES:

1. VERTICAL DATUM IS NATIONAL GEODETIC DATUM 1929 DEFINITION. BENCHMARK LOCATIONS ARE SPECIFIED ON TITCOMB SURVEY.

2. CLEARING LIMITS WILL BE FLAGGED BY THE ENGINEER AND THE OWNER. THE CONTRACTOR SHALL NOT CUT BEYOND THE LIMITS OR REMOVE A TREE DESIGNATED TO BE SAVED WITHOUT THE OWNER'S AND ENGINEER'S CONSENT.

3. ALL CURBS AND WALKS SHALL BE STAKED OUT BY THE CONTRACTOR AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. SIDEWALKS TO BE 4' WIDE FROM DRIVEWAY TO THE FRONT DOOR AND SET BACK 4' FROM THE HOUSE.

4. DRIVEWAYS TO BE 24' WIDE AT THE GARAGE DOOR AND MAY TRANSITION TO 20' WIDTH AS APPROPRIATE TO MEET SITE CONDITIONS.

TRAIL SYSTEM NOTES:

1. A TRAIL SYSTEM SHALL BE INSTALLED THROUGH OCEANVIEW AT CUMBERLAND PROPERTY TO PROVIDE PEDESTRIAN ACCESS. THE TRAIL SYSTEM WILL FORM LINKS TO ABUTTING PARCELS AND CONNECTION TO TOWN TRAIL SYSTEMS. THE TRAIL SYSTEM WILL BE AVAILABLE FOR PUBLIC & PRIVATE USE. THE DETAILED DESIGN WILL BE COORDINATED WITH THE TOWN PLANNER, PLANNING BOARD, AND THE OWNER.

FAIRPOINT NOTES:

1. ALL CONSTRUCTION TO BE IN COMPLIANCE WITH FAIRPOINT CONSTRUCTION STANDARDS.

2. ALL TRENCHING, CONDUIT AND BACK FILLING IS THE CONTRACTOR'S RESPONSIBILITY.

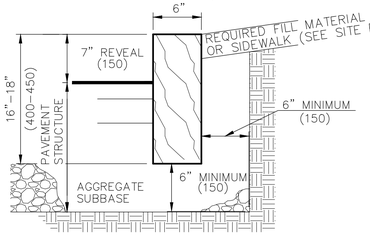
3. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED ROADS, DRIVEWAYS AND WALKWAYS. 4" FOR THE MAIN CABLE AND 2" FOR SERVICE WIRES.

4. CONDUITS FOR SERVICE WIRES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INITIAL INSTALLATION OF THE MAIN CABLE.

5. THE TRENCH MUST BE FILLED WITH "SUITABLE" BACK FILL, I.E. , SAND BACK FILL WITH NO STONE LARGER THAN 1/4" IN DIAMETER.

6. FAIRPOINT WILL SUPPLY THE CABLE AND LABOR TO INSTALL SAME.

7. A SEPARATION OF 12" HORIZONTAL OR VERTICAL MUST BE MAINTAINED BETWEEN FAIRPOINT AND ALL OTHER UTILITIES SUCH AS ELECTRIC, CABLE TV, OR OTHERS.



VERTICAL GRANITE CURB

NOT TO SCALE AT ALL ROAD ENTRANCE RADII AT INTERSECTIONS

UTILITIES GENERAL NOTES:

1. ALL UTILITIES TO BE LOCATED UNDERGROUND.

2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES WITH THE RESPECTIVE OWNERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF UTILITY AN STRUCTURE OWNERS REGARDING NOTIFICATION OF WORK AND PROTECTION OF EXISTING FACILITIES.

3. CONTRACTOR SHALL VERIFY ALL CRITICAL DIMENSIONS AND GRADES TO HIS SATISFACTION BEFORE WORK BEGINS. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.

4. ALL UTILITIES ARE TO BE CONSTRUCTED TO THE STANDARDS SET BY THE RESPECTIVE UTILITY. PRE- CONSTRUCTION CONFERENCE MUST BE HELD WITH ALL UTILITY REPRESENTATIVES.

5. A MINIMUM OF 12" HORIZONTAL SPACING IS NECESSARY BETWEEN CABLES.

6. 4" CABLE & TELEPHONE SERVICE WILL BE CONSTRUCTED IN THE SAME TRENCH AS ELECTRIC.

7. THE ROAD CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ELECTRIC, TELEPHONE, & CABLE UP TO AND INCLUDING THE INSTALLATION OF JUNCTION BOXES AND TRANSFORMER PADS. THE ROAD CONTRACTOR SHALL INSTALL ANY ADDITIONAL CONDUIT NEEDED WHERE INDIVIDUAL UNIT SERVICES CROSS THE ROADWAY. THE SITE CONTRACTOR SHALL BE RESPONSIBLE TO EXTEND INDIVIDUAL SERVICE FROM THE TRANSFORMER PAD TO THE BUILDING. THE SITE CONTRACTOR IS REQUIRED TO INSTALL CONDUIT AT ALL PAVEMENT CROSSINGS OTHER THAN THE ROADWAY.

8. THE ROADWAY CONTRACTOR SHALL SET UP A SCOPING MEETING WITH THE SITE CONTRACTOR TO CONFIRM LIMITS OF WORK, SCHEDULING, AND CONSTRUCTION SEQUENCE BEFORE CONSTRUCTION.

CMP NOTES:

1. THE PROPOSED DISTRIBUTION SYSTEM PLAN SHALL BE COORDINATED WITH CENTRAL MAINE POWER COMPANY.

2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CMP'S CONSTRUCTION STANDARDS AND THE LATEST REVISION OF THE NATIONAL ELECTRICAL SAFTEY CODE.

3. ALL TRENCHING, CONDUIT AND BACK FILLING IS THE CONTRACTOR'S RESPONSIBILITY.

4. CONDUITS SHALL BE A MINIMUM OF SCHEDULE 40 PVC OR EQUIVALENT.

5. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED AREAS, ROADWAYS, AND DRIVEWAYS. PRIMARY CABLES ARE TO BE INSTALLED IN CONDUIT IF DRIVEWAYS ARE NOT ROUGH GRADED.

6. CONDUITS FOR SECONDARY CABLES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INITIAL INSTALLATION OF THE PRIMARY CABLE.

7. PRIMARY CABLE TO BE #2 AL 15 KV.

8. SEE CMP'S CONTRACTOR HANDBOOK, SECTION IX, PARAGRAPHS 910, 911, AND 912 FOR SPECIFICATIONS ON BACK-FILL MATERIALS AND DEPTHS, ETC.

9. ALL TRANSFORMER PADS MUST BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. PAD DESIGNS MUST CONFORM TO CMP SPECIFICATIONS. SEE ILLUSTRATIONS NO. 19, NO. 20, NO. 21 IN SECTION XII OF THE CONTRACTOR'S HANDBOOK.

10. ALL JUNCTION BOXES WILL BE PURCHASED AND INSTALLED BY THE CONTRACTOR. CMP WILL PROVIDE THE JUNCTION BOX, HOWEVER, THE EXCESS COST WILL BE BILLED TO THE OWNER.FIBERGLASS OR CONCRETE PADS REQUIRED FOR STELL CABINETS AND JUNCTION BOXES.

11. CMP WILL SUPPLY THE CABLE, TRANSFORMERS AND LABOR TO INSTALL SAME.

12. ALL METERING ENCLOSURES WILL BE PUNCHED AND INSTALLED BY THE CONTRACTOR.

13. A SEPARATION OF 12" MUST BE MAINTAINED BETWEEN CMP AND ALL OTHER UTILITIES AND/OR TELEPHONE, CABLE ETC.

CABLE TV NOTES:

1. ALL TRENCHING, CONDUIT & BACK FILLING IS THE CONTRACTORS RESPONSIBILITY.

2. CONDUITS SHALL BE SCHEDULE 40 PVC AND WILL BE ROPED WITH 1/4" ROPE.

3. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED ROADS, DRIVEWAYS AND WALKWAYS AS NOTED OR SHOWN ON THE PLAN; 4" FOR THE MAIN CABLE AND 2" FOR THE SERVICE WIRES.

4. CONDUITS FOR SERVICE WIRES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INSTALLATION OF THE MAIN CABLE.

5. THE CABLE COMPANY WILL SUPPLY THE MAIN CABLE AND PEDESTALS AND THE LABOR TO INSTALL SAME.

6. THE CABLE COMPANY WILL SUPPLY THE SERVICE WIRES.

7. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE CABLE COMPANY FOR INTERNAL WIRING SPECIFICATIONS AND SERVICE WIRE INSTALLATIONS.

8. ALL SERVICE WIRE INSTALLATIONS AND INTERIOR WIRING SHALL CONFORM TO THE CABLE COMPANY SPECIFICATIONS.

9. A SEPARATION OF 12" HORIZONTAL OR VERTICAL MUST BE MAINTAINED BETWEEN THE CABLE COMPANY AND ALL OTHER UTILITIES SUCH AS ELECTRIC, TELEPHONE OR OTHERS.

10. CONTRACTOR SHALL EXPOSE GROUND ROD AT ALL PAD LOCATIONS TO INSURE PROPER GROUNDING FOR THE CABLE COMPANY.

SEWER CONSTRUCTION NOTES:

1. SEWER LINE CONSTRUCTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CUMBERLAND STANDARD SPECIFICATIONS.

2. MINIMUM DIAMETER FOR MAINLINE SEWER IS EIGHT INCH (8") WITH A MINIMUM SLOPE OF 0.005.

3. SANITARY SEWER SERVICE STUBS TO BE SIX INCH (6") DIAMETER MINIMUM AND TO BE INSTALLED BEYOND THE EDGE OF PAVEMENT, AND UTILITY TRENCH AS SHOWN ON PLAN.

4. SANITARY SEWER SERVICE STUBS TO BE CONNECTED TO THE MAIN LINE BY USE OF 8X8X6 WYES. TEE STUBS WILL NOT BE ALLOWED.

5. SANITARY SEWER MANHOLES TO BE PER ASTM SPECIFICATIONS, WITH TWO (2) COATS OF BITUMINOUS COATING, WITH SMOOTH CHANNELED INVERTS, AND PROPERLY SIZED AND ORIENTED PRECAST PIPE OPENINGS WITH FLEXIBLE PIPE BOOTS. STEPS TO BE INSTALLED PARALLEL TO INVERT CHANNEL. SERVICE CONNECTIONS TO BE INCORPORATED IN INVERT CHANNEL.

6. MANHOLE FRAMES AND COVERS TO BE SUITABLE FOR HIGHWAY LOADING AND TO BE TO DISTRICT STANDARDS.

7. DESIGN AND CONSTRUCTION OF PROJECT SANITARY SEWER UTILITY WILL BE CARRIED OUT TO SPECIFICALLY EXCLUDE THE INTRODUCTION OF NON-SANITARY GROUND AND / OR SURFACE WATER INTO THE SANITARY SEWER SYSTEM.

8. ALL GRAVITY SEWER TO BE LOW PRESSURE AIR AND DEFLECTION TESTED AFTER BACK FILLING AND COMPACTION AND PRIOR TO CONNECTION OF BUILDING SEWER.

9. PRIOR TO THE START OF CONSTRUCTION, DEVELOPER TO PROVIDE TO DISTRICT TWO (2) COPIES OF UTILITY PLAN.

10. MINIMUM HORIZONTAL CLEARANCES TO BE MAINTAINED BETWEEN UTILITIES, TO PERMIT FUTURE MAINTENANCE OPERATIONS WITHOUT DISTURBING ADJACENT UTILITIES,

WATER CONSTRUCTION NOTES:

1. TEST PITS SHALL BE EXCAVATED AT CROSSINGS OF UTILITIES TO DETERMINE LOCATION AND DEPTH SUFFICIENTLY IN ADVANCE OF WATER MAIN CONSTRUCTION TO PERMIT ADJUSTMENT OF WATER MAIN LOCATION BY DEFLECTION OF THE PIPE.

2. MINIMUM DEPTH OF COVER FOR ALL WATER LINES SHALL BE 5.5' FROM FINISHED GRADE UNLESS OTHERWISE DIRECTED.

3. PROPOSED PIPELINE, VALVE, AND HYDRANT LOCATIONS ARE APPROXIMATE. FINAL LOCATION MAY BE ADJUSTED AS REQUIRED TO AVOID CONFLICTS WITH OTHER UTILITIES AND STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR EXCAVATION AND BACK FILL BEYOND THE TRENCH LIMITS SHOWN.

4. ANY EXISTING PIPELINE , UTILITY OR STRUCTURE, INCLUDING EXISTING WATER MAINS, DAMAGED BY CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER.

5. ALL PROPERTY REMOVED, DAMAGED OR ALTERED IN THE COURSE OF THE WORK SHALL BE REPLACED OR RESTORED TO EQUAL OR BETTER CONDITION TO THAT WHICH EXISTED BEFORE THE WORK COMMENCED.

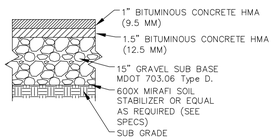
6. ALL FITTINGS, VALVES, AND HYDRANTS SHALL HAVE MECHANICAL JOINTS RESTRAINED WITH GRIP-RING RETAINER GLANDS.

7. CONSTRUCTION SHALL FOLLOW PORTLAND WATER DISTRICT STANDARDS. ALL MATERIALS FOR THE PROJECT INCLUDING PIPE, COUPLINGS, VALVES, FITTINGS, HYDRANTS, TAPPING SLEEVES AND VALVES, VALVE BOXES, CORPORATION STOPS, CURB STOPS, SERVICE PIPING, CURB BOXES, RETAINER GLANDS, AND ACCESSORIES SUCH AS GASKETS, BOLTS, NUTS, AND GLANDS AS REQUIRED TO MAKE THE PIPING SYSTEMS COMPLETE SHALL MEET PWD SPECIFICATIONS. ALL CONCRETE AND EARTH MATERIALS INCLUDING CRUSHED STONE, GRAVEL, SAND, AND BORROW SHALL BE FURNISHED BY THE CONTRACTOR.

8. A SEPARATION OF 12" VERTICAL CLEARANCE MUST BE MAINTAINED BETWEEN THE WATER MAIN AND ALL OTHER UTILITIES.

9. ALL WATER MAIN SIZES ARE AS INDICATED ON THE PLAN/PROFILES. EACH UNIT SHALL BE SERVICED BY A 1 1/2" LINE OFF THE MAIN, SPLIT AT THE UNIT TO PROVIDE A 1"CTS DOMESTIC SUPPLY AND A 1 1/2" SPRINKLER SUPPLY INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE PORTLAND WATER DISTRICT. SIZES SHALL BE CONFIRMED BY THE SPRINKLER INSTALLER PRIOR TO CONSTRUCTION.

10. THE COMPLETE PIPING SYSTEM SHALL BE FLUSHED, CHLORINATED, AND PRESSURE TESTED BY THE CONTRACTOR PRIOR TO ACCEPTANCE BY THE OWNER. SERVICES SHALL BE INSTALLED UNDER LINE PRESSURE AFTER THE MAIN HAS BEEN SUCCESSFULLY PRESSURE TESTED.



BIUMINOUS CONCRETE WALK

Roadway Sections and Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

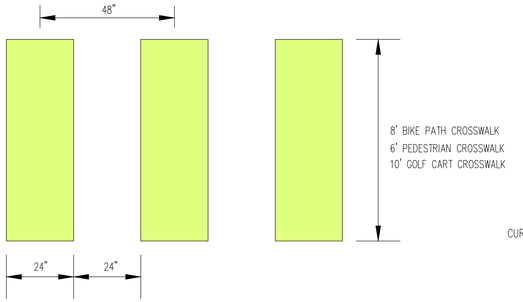
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · LICENSED PROFESSIONAL ENGINEER
12-18-2019

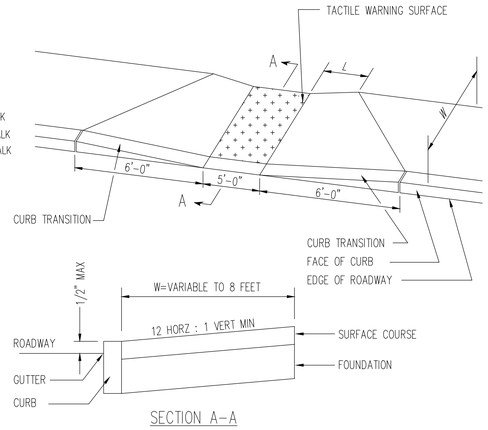
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CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



CROSSWALK

NOT TO SCALE

RD-MARKS-CROSSWALK/10-02



SECTION A-A

NOTES:

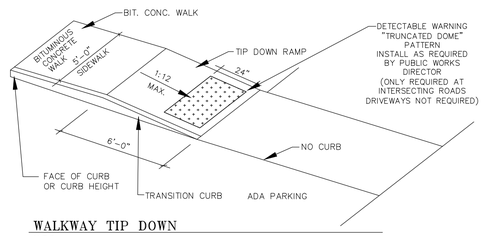
1. THE DIMENSIONS SHOWN AT ROADWAY EDGE ARE FIXED DISTANCES.
2. RAMP CROSS SECTION TO BE SAME AS ADJACENT SIDEWALK; I.E. DEPTH OF SURFACE AND FOUNDATION.
3. IN NO CASE ARE THE RAMPS TO BE PLACED BEHIND THE STOP LINE.

W	L
4'-0"	3'-6"±
5'-0"	2'-9"±
6'-0"	2'-0"±
7'-0"	1'-3"±
8'-0"	0'-0"

WHEEL CHAIR RAMP

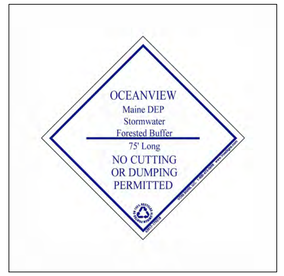
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HC-RAMP-CONC-GCURB/5-95



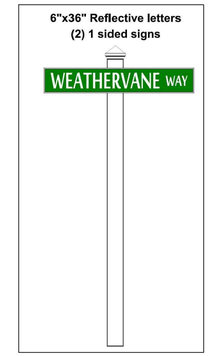
WALKWAY TIP DOWN

N.T.S.



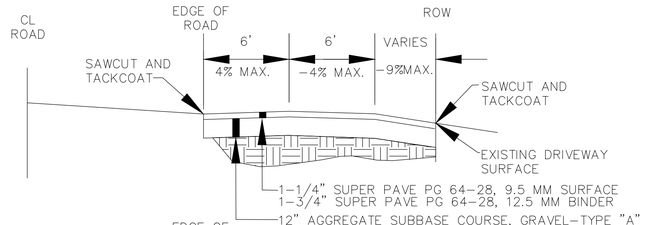
TYPICAL STORMWATER BUFFER SIGN

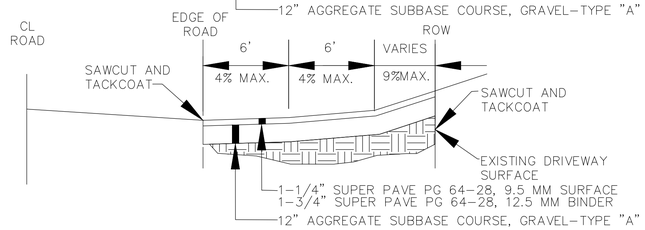
NOT TO SCALE



TYPICAL STREET SIGN

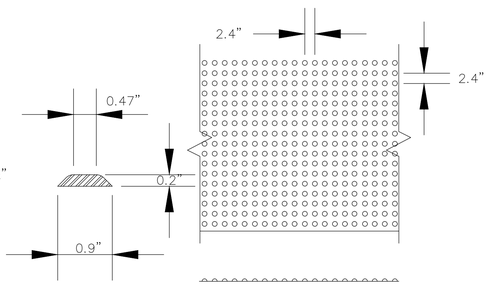
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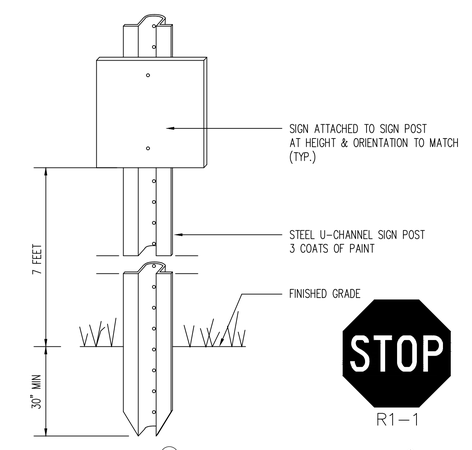
DRIVEWAY APRON DETAIL

NOT TO SCALE



TRUNCATED DOME DETAIL

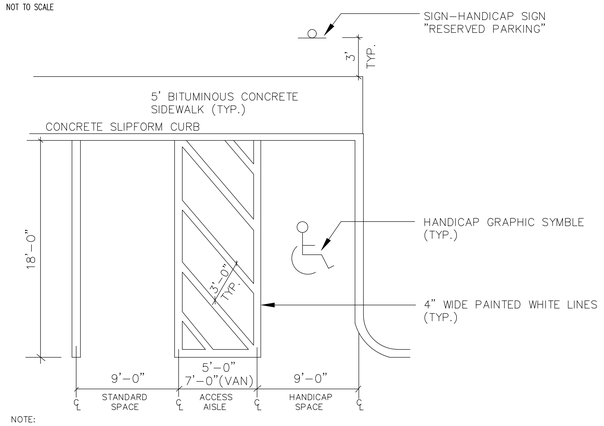
NOT TO SCALE





SIGN & POST

NOT TO SCALE



NOTE:

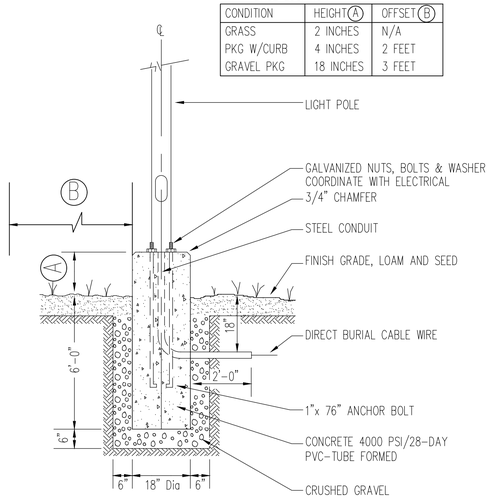
1. SYMBOLS AND PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT.
2. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT WITH SILICA SAND FOR SKID RESISTANCE, MEETING THE REQUIREMENTS OF OSHTA M248-TYPE N. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.

PARKING SPACE LAYOUT

NOT TO SCALE

BASE LOCATION

CONDITION	HEIGHT (A)	OFFSET (B)
GRASS	2 INCHES	N/A
PKG W/CURB	4 INCHES	2 FEET
GRAVEL PKG	18 INCHES	3 FEET

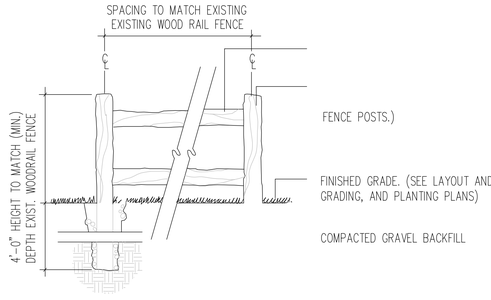


NOTES:

1. SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO INSTALLATION.
2. COORDINATE WITH ELECTRICAL SPECIFICATIONS.
3. COLD-GALVANIZE ALL CUTS.
4. FORM WITH FIBERGLASS OR PVC SMOOTH-FACED FORMS.
5. SEE ELECTRICAL PLANS FOR SIZES

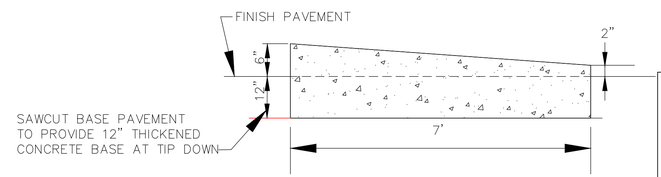
CONCRETE LIGHT POLE BASE

NOT TO SCALE



NEW & REINSTALLED WOOD RAIL FENCE

NOT TO SCALE



TYPICAL TIPDOWN CURB INSTALLATION

NOT TO SCALE

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
PROFESSIONAL ENGINEER
LICENSED
12-18-2019

1. 12-18-2019 Submit to Town and DEP CSB

Civil Details

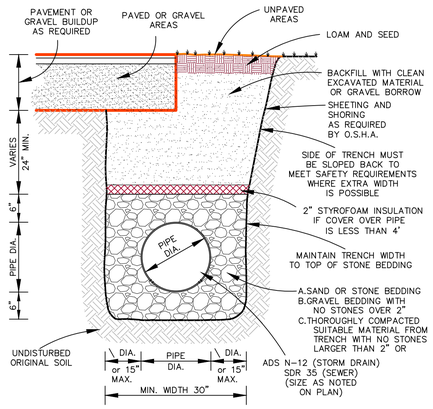
Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

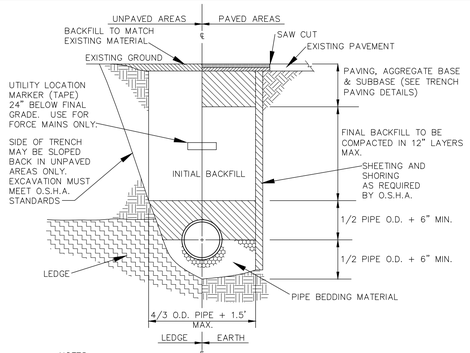
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C14
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



STORM DRAIN / SEWER TRENCH DETAIL

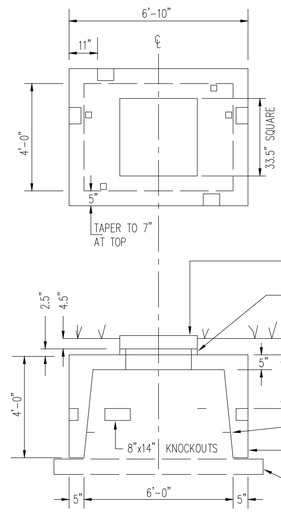
NOT TO SCALE



NOTES:
1. INSTALL 3 FOOT LONG IMPERVIOUS DAMS IN BEDDING/INITIAL BACKFILL MATERIAL EVERY 100 FEET TO PREVENT TRENCH GROUNDWATER FROM BEING CHANNELED ALONG BEDDING/INITIAL BACKFILL
2. REFER TO LATEST MDOT SPECIFICATIONS FOR BEDDING AND BACKFILL REQUIREMENTS.
3. INITIAL BACKFILL TO BE 12 INCHES OVER TOP OF PVC PIPE ONLY.

TYPICAL TRENCH DETAIL

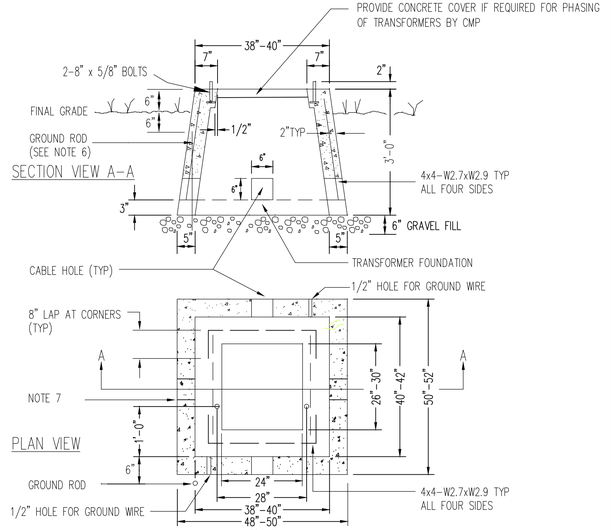
NOT TO SCALE



NOTES:
1. #5 REBAR VERTICAL 5" O.C. CANTILEVERED OVER TOP TO OPENING.
2. #4 REBAR HORIZONTAL 8" O.C. EACH WALL.
3. 4 EXTRA #4 REBAR AROUND KNOCKOUTS. KNOCKOUTS TO LINE UP WITH TRENCHES.
4. #4 REBAR 5" O.C. BOTH WAYS ON TOP.
5. REFER TO SPECS OF CMP CO.
6. IF INSTALLED IN PAVED AREAS, ORDER PRECAST SLAB AND INSTALL UNDER HAND-HOLE FOR ADDITIONAL TRAFFIC LOAD.
7. FINAL DESIGN SUBJECT TO CMP CO. APPROVAL.

ELECTRIC PULLBOX DETAIL

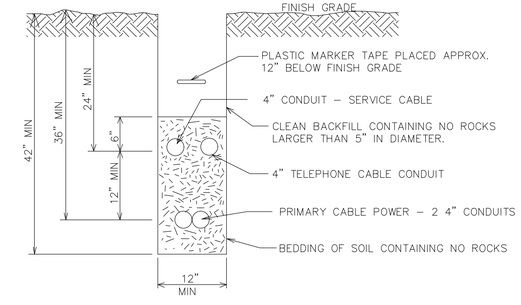
NOT TO SCALE



NOTES:
1. CONCRETE FOUNDATION IS SUITABLE FOR BOTH 7200/12470 VOLT & 20/34.5 KV SINGLE-PHASE TRANSFORMER & PRIMARY JUNCTION BOX INSTALLATIONS.
2. SET FOUNDATION ON SUITABLE GRAVEL FILL AND PROVIDE ADEQUATE DRAINAGE. LOCATION TO BE ACCESSIBLE BY TRUCK & SUITABLY PROTECTED FROM FLOW AND TRAFFIC DAMAGE.
3. FRONT DENOTES THE SIDE ON WHICH THE ACCESS DOORS ARE LOCATED. THE FOUNDATION MUST BE INSTALLED SO THE "FRONT" IS READILY ACESSIBLE.
4. OTHER CMP-APPROVED PADMOUNT TRANSFORMER FOUNDATIONS MAY BE USED.
5. PROVIDE 6" SQUARE CABLE HOLES (BOND OUT) 3" UP THE WALL FROM THE BASE, ONE PER WALL, LINE UP W/TRENCHES.
6. CMPCO. TO FURNISH A 3/4"x8' GALVANIZED ROD TO BE INSTALLED 6" IN FRONT OF THE LEFT FRONT CORNER OF TRANSFORMER FOUNDATION. THE TOP OF THE GROUND ROD IS TO BE 6" BELOW FINAL GRADE.
7. PULLING EYE INSERT, FOR USE WITH 3/4" NATIONAL COURSE THREAD EYE-BOLT (RICHMOND LCB-1 OR EQ.). LOCATED OPPOSITE EACH CABLE HOLE & APPROX. 16" FROM THE BOTTOM.
8. CAN BE USED AS A FOUNDATION FOR 3 PHASE JUNCTION CABINET CU UDCUT3 (S/C 62-1490) WITH CU UDCUT3S (S/C 67-3921) SKIRT.

TRANSFORMER PAD DETAIL 25 TO 167 KVA 1 ϕ

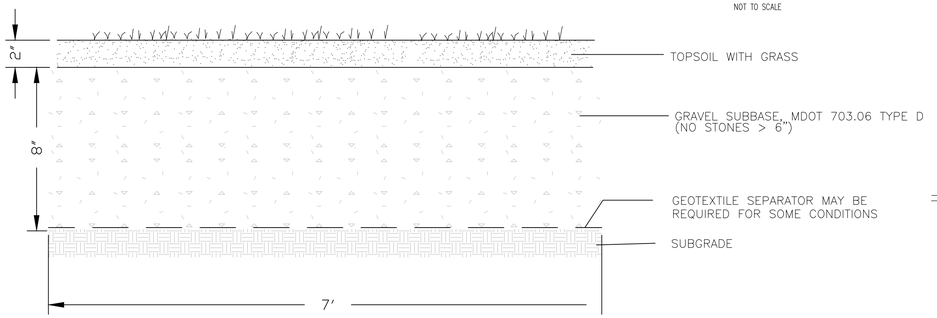
NOT TO SCALE



NOTES:
1. SECONDARY OR SERVICE CABLES AND COMMUNICATION CABLES MAY BE PLACED IN THE SAME TRENCH AT THE SAME DEPTH WITHOUT A REQUIRED CLEARANCE OR SEPARATION BETWEEN THE CABLES.
2. INSTALLATION SHOULD NOT ALLOW THE INTER-TWINING OF CABLES.
3. BEDDING AND BACKFILL SHALL BE FREE OF ROCKS, STUMPS AND OTHER DEBRIS.

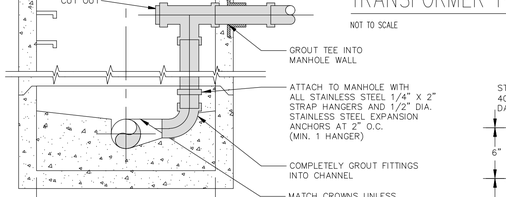
TYPICAL ELECTRICAL TRENCH

NOT TO SCALE



TYPICAL SECTION THRU STABILIZED TRAIL / CART PATH

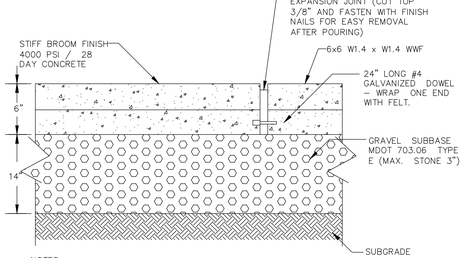
NOT TO SCALE



*FOR MANHOLE WITH 12" DIA. DROP PIPE, USE 5" DIAMETER, OR AS INDICATED. FOR MANHOLES WITH TWO OR MORE DROP STRUCTURES, USE 6"DIA, OR AS INDICATED

INSIDE DROP MANHOLE WITH PVC PIPE

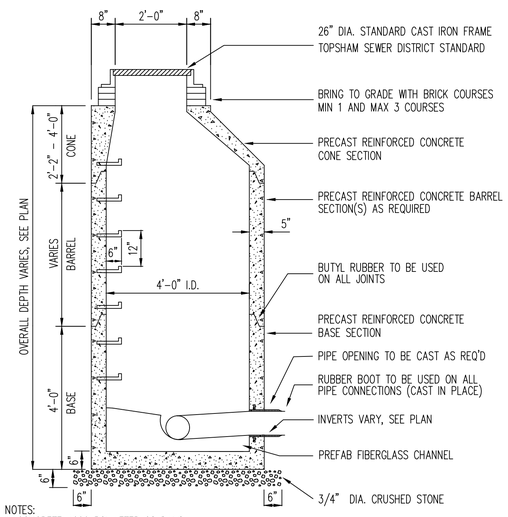
N.T.S.



NOTES:
–DO NOT PLACE CONCRETE DURING COLD OR RAINY WEATHER CONDITIONS (SEE SPECS.) –SEE PLAN DRAWINGS FOR EXPANSION JOINT LOCATIONS.

CONCRETE PAD – SECTION

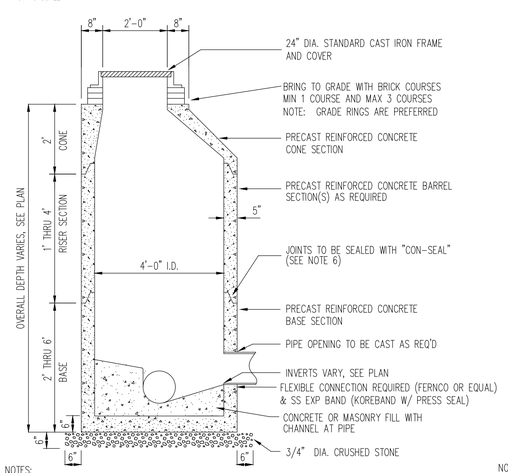
NOT TO SCALE



NOTES:
1. CONCRETE 4000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. MANHOLE STEPS TO BE ALUMINUM OR HIGH IMPACT PLASTIC.
5. APPLY TWO COATS OF BITUMASTIC PAINT ON ALL EXTERIOR SECTIONS.

SANITARY SEWER MANHOLE

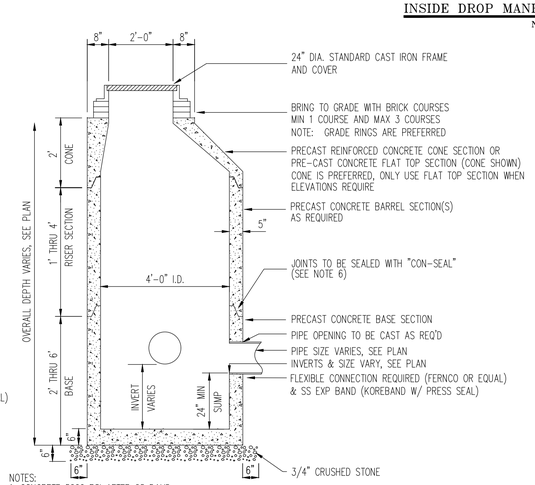
NOT TO SCALE



NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM. SLAB TOP – NO. 5 BARS.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. ONE POUR MONOLITHIC BASE SECTION
5. CEMENT: TYPE III PER ASTM C150-81.
6. JOINTS TO BE SEALED WITH "CON-SEAL". (CONFORMS TO ASTM C443 SPEC. AND FEDERAL SPEC. SS-S-210A)
7. ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING.

PRECAST CONCRETE DRAIN MANHOLE

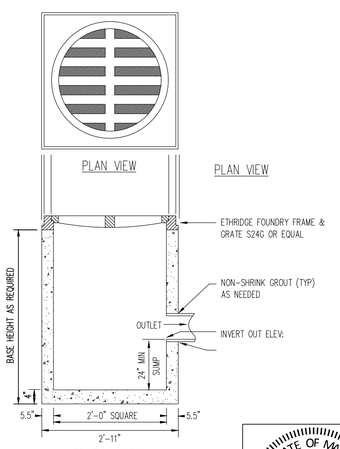
NOT TO SCALE ST-DMH/9-02



NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM. SLAB TOP – NO. 5 BARS.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. ONE POUR MONOLITHIC BASE SECTION
5. CEMENT: TYPE III PER ASTM C150-81.
6. JOINTS TO BE SEALED WITH "CON-SEAL". (CONFORMS TO ASTM C443 SPEC. AND FEDERAL SPEC. SS-S-210A)
7. ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING.

TYPICAL PRECAST CONCRETE CATCH BASIN

NOT TO SCALE



SECTION VIEW

NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING: 1 LAYER 4x4 / 4x4 WWM.
3. FIELD INLET IS USED FOR SHALLOW, OFF-DRIVE, DEAD END DRAINAGE AREAS.

FIELD INLET

NOT TO SCALE

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

1.	12-18-2019	Submit to Town and Maine DEP CSB

Civil Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
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- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C15
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

EROSION AND SEDIMENTATION NOTES:

1. The Site Contractor shall follow the "Maine Erosion and Sediment Control BMPs" published by the Maine DEP in 2003 and the "Maine Erosion and Sediment Control Practices Field Guide for Contractors published in 2016 or most current update". The manuals can be found on the Maine DEP web site. A Link to the field guide is shown below:

http://www.maine.gov/dep/land/erosion/escbmps/index.html

THE CONTRACTOR SHALL ALSO FOLLOW THE GUIDELINES LISTED IN APPENDICES A, B, C IN MAINE DEP CHAPTER 500 RULES (2015 NOTES PROVIDED ON THIS SHEET).

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES:

EROSION/SEDIMENT CONTROL DEVICES:

THE FOLLOWING EROSION SEDIMENTATION CONTROL DEVICES ARE PROPOSED FOR CONSTRUCTION ON THIS PROJECT. INSTALL THESE DEVICES AS INDICATED ON THE PLANS.

1 SILT FENCE: SILT FENCE WILL BE INSTALLED ALONG THE DOWN GRADING EDGES OF DISTURBED AREAS TO TRAP RUNOFF BORNE SEDIMENTS UNTIL THE SITE IS STABILIZED. IN AREAS WHERE STORMWATER DISCHARGES THE SILT FENCE WILL BE REINFORCED WITH HAY BALES TO HELP MAINTAIN THE INTEGRITY OF THE SILT FENCE AND TO PROVIDE ADDITIONAL TREATMENT.

2. HAY BALES: HAY BALES TO BE PLACED IN LOW FLOW DRAINAGE SWALES AND PATHS TO TRAP SEDIMENTS AND REDUCE RUNOFF VELOCITIES. DO NOT PLACE HAY BALES IN FLOWING WATER OR STREAMS.

3. RIPRAP: PROVIDE RIPRAP IN AREAS WHERE CULVERTS DISCHARGE OR AS SHOWN ON THE PLANS.

4. LOAM, SEED, & MULCH: ALL DISTURBED AREAS, WHICH ARE NOT OTHERWISE TREATED, SHALL RECEIVE PERMANENT SEEDING AND MULCH TO STABILIZE THE DISTURBED AREAS. THE DISTURBED AREAS WILL BE REVEGETATED WITHIN 5 DAYS OF FINAL GRADING. SEEDING REQUIREMENTS ARE PROVIDED AT THE END OF THIS SPECIFICATION.

5. STRAW AND HAY MULCH: USED TO COVER DENUDED AREAS UNTIL PERMANENT SEED OR EROSION CONTROL MEASURES ARE IN PLACE. MULCH BY ITSELF CAN BE USED ON SLOPES LESS THAN 15% IN SUMMER AND 8% IN WINTER. JUTE MESH IS TO BE USED OVER MULCH ONLY. CURLEX II AND EXCELSIOR MAY BE USED IN PLACE OF JUTE MESH OVER MULCH.

6. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.

TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES:

PROVIDE THE FOLLOWING TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION OF THE DEVELOPMENT:

1. SILTATION FENCE ALONG THE DOWNGRADIENT SIDE OF THE PARKING AREAS AND OF ALL FILL SECTIONS. THE SILTATION FENCE WILL REMAIN IN PLACE UNTIL THE SITE IS 90% REVEGETATED. REMOVE SILTATION FENCE, WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED. REMOVE ANY ACCUMULATED SEDIMENT AND STABILIZE.

2. HAY BALES PLACED AT KEY LOCATIONS TO SUPPLEMENT THE SILT FENCE.

3. PROTECT TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS, OR COMMON EXCAVATION AS FOLLOWS:
A. SOIL STOCKPILE SIDE SLOPES SHALL NOT EXCEED 2:1.
B. AVOID PLACING TEMPORARY STOCKPILES IN AREAS WITH SLOPES OVER 10 PERCENT, OR NEAR DRAINAGE SWALES. SEE ITEM 3 IN CONSTRUCTION PHASE NOTES BELOW.
C. STABILIZE STOCKPILES WITHIN 15 DAYS BY TEMPORARILY SEEDING WITH A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH.
D. SURROUND STOCKPILE SOIL WITH SILTATION FENCE AT BASE OF PILE.

4. ALL DENUDED AREAS WHICH HAVE BEEN ROUGH GRADED AND ARE NOT LOCATED WITHIN THE BUILDING PAD, OR PARKING AND DRIVEWAY SUBBASE AREA THAT WILL NOT BE WORKED FOR MORE THAN 7 DAYS SHALL RECEIVE MULCH OR NON-ERODABLE COVER. STABILIZE AREAS WITHIN 75 FEET OF A WETLAND OR WATERBODY WITHIN 48 HOURS OF THE INITIAL DISTURBANCE OR THE SOIL OR PRIOR TO ANY STORM EVENT, WHICHEVER COMES FIRST. IN THE EVENT THE CONTRACTOR COMPLETES FINAL GRADING AND INSTALLATION OF LOAM AND SOD WITHIN THE TIME PERIODS PRESENTED ABOVE, INSTALLATION OF MULCH AND NETTING, WHERE APPLICABLE, IS NOT REQUIRED.

5. IF WORK IS CONDUCTED BETWEEN OCTOBER 15 AND APRIL 15, ALL DENUDED AREAS ARE TO BE COVERED WITH HAY MULCH, APPLIED AT TWICE THE NORMAL APPLICATION RATE, AND ANCHORED WITH FABRIC NETTING. THE PERIOD BETWEEN FINAL GRADING AND MULCHING SHALL BE REDUCED TO A 15 DAY MAXIMUM.

6. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE HAS BEEN STABILIZED OR IN AREAS WHERE PERMANENT EROSION CONTROL MEASURES HAVE BEEN INSTALLED.

PERMANENT EROSION CONTROL MEASURES:

THE FOLLOWING PERMANENT CONTROL MEASURES ARE REQUIRED BY THIS EROSION/SEDIMENTATION CONTROL PLAN:

1. ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.), WILL BE LOAMED, LIMED, FERTILIZED AND SEEDED. NATIVE TOPSOIL SHALL BE STOCKPILED AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.

2. IF AN AREAS WILL NOT BE WORKED FOR MORE THAN ONE YEAR OR HAS BEEN BROUGHT TO FINAL GRADE, THEN PERMANENTLY STABILIZE THE AREA WITHIN 7 DAYS BY PLANTING VEGETATION, SEEDING, SOD, OR THROUGH THE USE OF PERMANENT MULCH, OR RIPRAP, OR ROAD SUB-BASE. IF USING VEGETATION FOR STABILIZATION, SELECT THE PROPER VEGETATION FOR THE LIGHT, SOIL, AND MOISTURE CONDITIONS; AMEND AREAS OF DISTURBED SUBSOILS WITH TOPSOIL, COMPOST, OR FERTILIZERS; PROTECT SEEDED AREAS WITH MULCH OR, IF NECESSARY, EROSION CONTROL BLANKETS; AND SCHEDULE SODDING, PLANTING, AND SEEDING TO AVOID DIE-OFF FROM SUMMER DROUGHT AND FALL FROSTS. NEWLY SEEDED OR SODDED AREAS MUST BE PROTECTED FROM VEHICLE TRAFFIC, EXCESSIVE PEDESTRIAN TRAFFIC, AND CONCENTRATED RUNOFF UNTIL THE VEGETATION IS WELL ESTABLISHED. IF NECESSARY, AREAS MUST BE SEEDED AND MULCHED AGAIN IF GERMINATION IS SPARCE, PLANT COVERAGE IS SPOTTY, OR TOPSOIL EROSION IS EVIDENT. ONE OR MORE OF THE FOLLOWING MAY APPLY TO A PARTICULAR SITE.

(a) Seeded areas. For seeded areas, permanent stabilization means a 90% cover of 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 a 90% cover of healthy vegetation, with a well-graded riprap lining, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

3. SLOPES GREATER THAN 2:1 WILL RECEIVE RIPRAP.

POST-CONSTRUCTION REVEGETATION:

THE FOLLOWING GENERAL PRACTICES WILL BE USED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING.

1. A MINIMUM OF 4" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE, OR STONE WILL BE PLACED ON SLOPES TO STABILIZE SURFACES.

2. IF FINAL GRADING IS REACHED DURING THE NORMAL GROWING SEASON (4/15 TO 9/15), PERMANENT SEEDING WILL BE DONE AS SPECIFIED BELOW. PRIOR TO SEEDING, LIMESTONE SHALL BE APPLIED AT A RATE OF 138 LBS/1000 SQ. FT. AND 10:20:20 FERTILIZER AT A RATE OF 18.4 LBS/1000 SQ.FT WILL BE APPLIED. BROADCAST SEEDING AT THE FOLLOWING RATES:

LAWNS	SWALES
KENTUCKY BLUEGRASS 0.46 LBS/1000 SF.	RED TOP 0.05 LBS/1000 SF.
CREEPING RED FESCUE 0.46 LBS/1000 SF.	TALL FESCUE 0.46 LBS/1000 SF.
PERENNIAL RYE GRASS 0.11 LB/1000 SF.	

3. AN AREA SHALL BE MULCHED IMMEDIATELY AFTER IS HAS BEEN SEEDED. MULCHING SHALL CONSIST OF HAY MULCH, HYDRO-MULCH, JUTE NET OVER MULCH, PRE-MANUFACTURED EROSION MATS OR ANY SUITABLE SUBSTITUTE DEEMED ACCEPTABLE BY THE DESIGNER.
A. HAY MULCH SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE. HAY MULCH SHALL BE SECURED BY EITHER: (NOTE: SOIL SHALL NOT BE VISIBLE)
I. BEING DRIVEN OVER BY TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
II. BLANKETED BY TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING, OR WITH SPRAY, ON GRADES GREATER THAN 5%.
III. SEE NOTE 6, GENERAL NOTES, AND NOTE 8, WINTER CONSTRUCTION.
B. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF EITHER ASPHALT, WOOD FIBER OR PAPER FIBER AND WATER SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 9/15 AND 4/15.

4. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN SEPTEMBER 15 AND APRIL 15. SHOULD SEEDING BE NECESSARY BETWEEN SEPTEMBER 15 AND APRIL 15 THE FOLLOWING PROCEDURE SHALL BE FOLLOWED. ALSO REFER TO NOTE 9 OF WINTER CONSTRUCTION.
A. ONLY UNFROZEN LOAM SHALL BE USED.
B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS/1000 SQ.FT) SHALL BE ADDED TO THE PREVIOUSLY NOTED AREAS.
D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.6 LBS/1000 SQ. FT.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
E. FERTILIZING, SEEDING AND MULCHING SHALL BE APPLIED TO LOAM THE DAY THE LOAM IS SPREAD BY MACHINERY.
F. ALTERNATIVE HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE.

5. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE ENGINEER THAT THE EXISTING CATCH IS INADEQUATE.

MONITORING SCHEDULE:

THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS OR APPOINTING A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. AFTER EACH RAINFALL, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. HAY BALE BARRIERS, SILT FENCE, AND STONE CHECK DAMS SHALL BE INSPECTED AND REPAIRED ONCE A WEEK OR IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING. SHOULD THE HAY BALE BARRIERS PROVE TO BE INEFFECTIVE, THE CONTRACTOR SHALL INSTALL SILT FENCE BEHIND THE HAY BALES.

2. VISUALLY INSPECT RIPRAP ONCE A WEEK OR AFTER EACH SIGNIFICANT RAINFALL AND REPAIR AS NEEDED. REMOVE SEDIMENT TRAPPED BEHIND THESE DEVICES ONCE IT ATTAINS A DEPTH EQUAL TO 1/2 THE HEIGHT OF THE DAM OR RISER. DISTRIBUTE REMOVED SEDIMENT OFF-SITE OR TO AN AREA UNDERGOING FINAL GRADING.

3. REVEGETATION OF DISTURBED AREAS WITHIN 25' OF DRAINAGE-COURSE/STREAM WILL BE SEEDED WITH THE "MEADOW AREA MIX" AND INSPECTED ON A WEEKLY BASIS OR AFTER EACH SIGNIFICANT RAINFALL AND RESEEDED AS NEEDED. EXPOSED AREAS WILL BE RESEEDED AS NEEDED UNTIL THE AREA HAS OBTAINED 100% GROWTH RATE. PROVIDE PERMANENT RIPRAP FOR SLOPES IN EXCESS OF 3:1 AND WITHIN 25' OF DRAINAGE COURSE.

EROSION CONTROL DURING WINTER CONSTRUCTION:

1. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.

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

3. EXPOSED AREA SHALL BE LIMITED TO THOSE AREAS TO BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT. AT THE END OF EACH WORK WEEK NO AREAS MAY BE LEFT UNSTABILIZED OVER THE WEEKEND.

4. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

5. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR HAY AT A RATE OF 150 LB. PER 1000 S.F. (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ANCHORED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. NOTE: AN AREA IS ALSO CONSIDERED STABLE IF SODDED, COVERED WITH GRAVEL (PARKING LOTS) OR STRUCTURAL SAND.

6. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1 AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED WITH A UNIFORM SURFACE, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE CONTINUOUSLY GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNEXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW, DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY, SILT FENCE OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS SHOWN ON THE DESIGN DRAWINGS. NOTE: DORMANT SEEDING SHOULD NOT BE ATTEMPTED UNLESS SOIL TEMPERATURE REMAINS BELOW 50 DEGREES AND DAY TIME TEMPERATURES REMAIN IN THE 30'S.

7. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%. VEGETATED DRAINAGE SWALES SHALL BE LINED WITH EXCELSIOR OR CURLEX.

8. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1 THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

9. BETWEEN THE DATES OF OCTOBER 15 TO NOVEMBER 1, WINTER RYE IS RECOMMENDED FOR STABILIZATION. AFTER NOVEMBER 1, WINTER RYE IS NOT EFFECTIVE. AROUND NOVEMBER 15 OR LATER, ONCE TEMPERATURES OF THE AIR AND SOIL PERMIT, DORMANT SEEDING IS EFFECTIVE.

10. IN THE EVENT OF SNOWFALL (FRESH OR CUMULATIVE) GREATER THAN 1 INCH DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM THE AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

Construction Plan

CONSTRUCTION OF THE PROJECT IS EXPECTED TO COMMENCE IN LATE SUMMER 2018 FOLLOWING ISSUE OF TOWN AND DEP PERMITS AND ONCE UNITS ARE PRE-SOLD. THE CONSTRUCTION OF THE ROAD AND UTILITY INFRASTRUCTURE IS EXPECTED TO CONTINUE INTO THE SPRING OF 2019. CONSTRUCTION OF UNITS WILL DEPEND ON MARKET CONDITIONS BUT BASED ON THE RECENT SUCCESS WE WOULD EXPECT THE UNITS TO BE CONSTRUCTED WITHIN 2-3 YEARS. CONSTRUCTION SEQUENCING WILL INCLUDE THE FOLLOWING:

- TREE CLEARING AND STUMP REMOVAL.
- REMOVAL OF THE THREE HOUSES AND ASSOCIATED DRIVES AND INFRASTRUCTURE.
- ROUGH GRADING, SITE BLASTING FOR ROADWAYS AND UNITS AND INSTALLATION OF UTILITIES AND STORMWATER SYSTEMS.
- FINISH GRAVELS AND SURFACES & PAVING
- LOAM, SEED AND STABILIZATION.

CONSTRUCTION PHASE:

THE FOLLOWING GENERAL PRACTICES WILL BE USED TO PREVENT EROSION DURING CONSTRUCTION OF THIS PROJECT.

1. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. IF FINAL GRADING, LOAMING AND SEEDING WILL NOT OCCUR WITHIN 7 DAYS, SEE ITEM NO. 4.

2. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING AND/OR HAY BALES WILL BE INSTALLED AT THE TOE OF SLOPE AND IN AREAS AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION. IMMEDIATELY FOLLOWING CONSTRUCTION OF CULVERTS AND SWALES, RIP RAP APRONS SHALL BE INSTALLED, AS SHOWN ON THE PLANS.

3. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM THE EXISTING DRAINAGE COURSE. NO STOCKPILE SHALL BE CLOSER THEN 100' OF A RESOURCE INCLUDING, BUT NOT LIMITED TO, WETLANDS, STREAMS, AND OPEN WATER BODIES. ALL STOCKPILES SHALL HAVE A SILTATION FENCE BELOW THEM REGARDLESS OF TIME OF PRESENCE. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 15 DAYS SHALL BE:
A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
B. SEEDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
C. INSTALL SILT FENCE AROUND STOCKPILE AT BASE OF PILE. STOCKPILES TO HAVE SILT FENCE INSTALLED AT TIME OF ESTABLISHMENT AT BASE OF PILE.

4. ALL DISTURBED AREAS THAT WILL NOT BE WORKED FOR MORE THAN 7 DAYS SHALL BE EITHER:
A. TREATED WITH ANCHORED MULCH IMMEDIATELY, OR
B. SEEDED WITH CONSERVATION MIX OF ANNUAL RYE GRASS (0.9 LBS/1000 SQ. FT) AND MULCHED IMMEDIATELY.

5. ALL GRADING WILL BE HELD TO A MAXIMUM 2:1 SLOPE WHERE PRACTICAL. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING, OR WITH STONE, WITHIN 7 DAYS AFTER FINAL GRADING IS COMPLETE. (SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION.)

6. ALL CULVERTS WILL BE PROTECTED WITH STONE RIPRAP (D50 = 6" UNLESS OTHERWISE SPECIFIED) AT INLETS AND OUTLETS.

Maine DEP Chapter 500, APPENDIX C. Housekeeping

These performance standards apply to all projects except for stormwater PBR projects.

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 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at : http://www.maine.gov/dep/spills/emergspillresp/

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. 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 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 swept 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 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. 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 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.

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 exist, they 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 washdown, 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.

Maine DEP Chapter 500, APPENDIX A. Erosion and sedimentation control (2015 Update)

This appendix applies to all projects.

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.

NOTE: Other requirements may apply, including, but not limited to the Natural Resources Protection Act 38 M.R.S. §480-B.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection."

1. Pollution prevention. Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable. Control stormwater volume and velocity within the site to minimize soil erosion. Minimize the disturbance of steep slopes. Control stormwater discharges, including both peak flow rates and volume, to minimize erosion at outlets. The discharge may not result in erosion of any open drainage channels, swales, stream channels or stream banks, upland, or coastal or freshwater wetlands off the project site.

Whenever practicable, no disturbance activities should take place within 50 feet of any protected natural resource. If disturbance activities take place between 30 feet and 50 feet of any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled. If disturbance activities take place less than 30 feet from any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled and disturbed areas must be temporarily or permanently stabilized within 7 days.

NOTE: Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Minimizing disturbed areas through phasing limits the amount of exposed soil on the site through retention of natural cover and by retiring areas as permanently stabilized. Less exposed soil results in fewer erosion controls to install and maintain. If work within an area is not anticipated to begin within two weeks' time, consider leaving the area in its naturally existing cover.

NOTE: Many construction activities within 75 feet of a protected natural resource require a permit under the Natural Resources Protection Act prior to initiation. For more information regarding the applicability of the NRPA to your project, you can visit the Department's website at http://www.maine.gov/dep/land/nrpa/index.html or contact staff of the Division of Land Resource Regulation at the nearest regional office.

2. Sediment barriers. Prior to construction, properly install sediment barriers at the downgradient edge of any area to be disturbed and adjacent to any drainage channels within the disturbed area. Sediment barriers should be installed downgradient of soil or sediment stockpiles and stormwater prevented from running onto the stockpile. Maintain the sediment barriers by removing accumulated sediment, or removing and replacing the barrier, until the disturbed area is permanently stabilized. Where a discharge to a storm drain inlet occurs, if the storm drain carries water directly to a surface water and you have authority to access the storm drain inlet, you must install and maintain protection measures that remove sediment from the discharge.

3. Stabilized construction entrance. Prior to construction, properly install a stabilized construction entrance (SCE) at all points of egress from the site. The SCE is a stabilized pad of aggregate, underlain by a geotextile filter fabric, used to prevent traffic from tracking material away from the site onto public ROWs. Maintain the SCE until all disturbed areas are stabilized.

4. Temporary stabilization. Within 7 days of the cessation of construction activities in an area that will not be worked for more than 7 days, stabilize any exposed soil with mulch, or other non-erodible cover. Stabilize areas within 75 feet of a wetland or waterbody within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.

5. Removal of temporary measures. Remove any temporary control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

NOTE: It is recommended that silt fences be removed by cutting the fence materials at ground level to avoid additional soil disturbance.

6. Permanent stabilization. If the area will not be worked for more than one year or has been brought to final grade, then permanently stabilize the area within 7 days by planting vegetation, seeding, sod, or through the use of permanent mulch, or riprap, or road sub-base. If using vegetation for stabilization, select the proper vegetation for the light, moisture, and soil conditions; amend areas of disturbed subsoils with topsoil, compost, or fertilizers; protect seeded areas with mulch or, if necessary, erosion control blankets; and schedule sodding, planting, and seeding so to avoid die-off from summer drought and fall frosts. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established with 90% cover by healthy vegetation. If necessary, areas must be reworked and restabilized if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. One or more of the following may apply to a particular site.

(a) Seeded areas. For seeded areas, permanent stabilization means a 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, provided it is free of fine materials that may runoff with a rain event

(g) Ditches, channels, and swales. For open channels, permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation, with a well-graded riprap lining, turf reinforcement mat, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

7. Winter Construction. "Winter construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

(a) Site Stabilization. For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.

(b) Sediment Barriers. All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.

(c) Ditch. 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.

(d) Slopes. Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation during the winter months. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection."

8. Stormwater channels. Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using measures that achieve long-term erosion control. Ditches, swales and other open stormwater channels must be sized to handle, at a minimum, the expected volume run-off. Each channel should be constructed in sections so that the section's grading, shaping, and installation of the permanent lining can be completed the same day. If a channel's final grading or lining installation must be delayed, then diversion berms must be used to divert stormwater away from the channel, properly-spaced check dams must be installed in the channel to slow the water velocity, and a temporary lining installed along the channel to prevent scouring. Permanent stabilization for channels is addressed under Appendix A(5)(g) above.

(a) The channel should receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

(b) When the watershed draining to a ditch or swale is less than 1 acre of total drainage and less than ¼ acre of impervious area, diversion of runoff to adjacent wooded or otherwise vegetated buffer areas is encouraged where the opportunity exists.

9. Sediment basins. Sediment basins must be designed to provide storage for either the calculated runoff from a 2-year, 24-hour storm or provide for 3,600 cubic feet of capacity per acre draining to the basin. Outlet structures must discharge water from the surface of the basin whenever possible. Erosion controls and velocity dissipation devices must be used if the discharging waters are likely to create erosion. Accumulated sediment must be removed as needed from the basin to maintain at least ½ of the design capacity of the basin.

The use of cationic treatment chemicals, such as polymers, flocculants, or other chemicals that contain an overall positive charge designed to reduce turbidity in stormwater must receive prior approval from the Department. When requesting approval to use cationic treatment chemicals, you must describe appropriate controls and implementation procedures to ensure the use will not lead to a violation of water quality standards. In addition, you must specify the type(s) of soil likely to be treated on the site, chemicals to be used and how they are to be applied and in what quantity, any manufacturer's recommendations, and any training had by personnel who will handle and apply the chemicals.

10. Roads. Gravel and paved roads must be designed and constructed with crowns or other measures, such as water bars, to ensure that stormwater is delivered immediately to adjacent stable ditches, vegetated buffer areas, catch basin inlets, or street gutters.

NOTE: (1) Gravel and paved roads should be maintained so that they continue to conform to this standard in order to prevent erosion problems. (2) The Department recommends that impervious surfaces, including roads, be designed and constructed so that stormwater is distributed in sheet flow to natural vegetated buffer areas wherever such areas are available. Road ditches should be designed so that stormwater is frequently (at least every 100 to 200 feet) discharged via ditch turnouts in sheet flow to adjacent natural buffer areas wherever possible.

11. Culverts. Culverts must be sized to avoid unintended flooding of upstream areas or frequent overtopping of roadways. Culvert inlets must be protected with appropriate materials for the expected entrance velocity, and protection must extend at least as high as the expected maximum elevation of storage behind the culvert. Culvert outlet design must incorporate measures, such as aprons, to prevent scour of the stream channel. Outlet protection measures must be designed to stay within the channel limits. The design must take account of tailwater depth.

12. Parking areas. Parking areas must be constructed to ensure runoff is delivered to adjacent swales, catch basins, curb gutters, or buffer areas without eroding areas downslope. The parking area's subbase compaction and grading must be done to ensure runoff is evenly distributed to adjacent buffers or side slopes. Catch basins must be located and set to provide enough storage depth at the inlet to allow inflow of peak runoff rates without by-pass of runoff to other areas.

13. Additional requirements. Additional requirements may be applied on a site-specific basis.

Maine DEP Chapter 500, APPENDIX B. Inspection and maintenance (2015 Update)

This appendix applies to all projects, except that a project that is eligible for stormwater PBR need only meet the standards in Section 1.

See Appendix D(5) for additional maintenance requirements related to infiltration of stormwater.

1. During construction. The following standards must be met during construction.

(a) Inspection and corrective action. Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

(b) Maintenance. If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.

(c) Documentation. Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to Department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

2. Post-construction. The following standards must be met after construction.

(a) Plan. Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 7(C)(2) for submission requirements.

(b) Inspection and maintenance. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.

NOTE: Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(i) 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. See permanent stabilization standards in Appendix A(5).

(ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to 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 adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

(iii) 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, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

(iv) Inspect and clean out catch basins. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

(v) 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's or turnout's 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.

(vi) Inspect at least once per year, each stormwater management pond or basin, including the pond's embankments, outlet structure, and emergency spillway. Remove and dispose of accumulated sediments in the pond. Control woody vegetation on the pond's embankments.

(vii) Inspect at least one per year, each underdrained filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

(viii) Inspect each manufactured system installed on the site, including the system's inlet, treatment chamber(s), and outlet at least once per year, or in accordance with the maintenance guidelines recommended by the manufacturer based on the estimated runoff and pollutant load expected to the system from the project. Remove and dispose of accumulated sediments, debris, and contaminated waters from the system and, if applicable, remove and replace any clogged or spent filter media.

(c) Regular maintenance

(i) Clear accumulations of winter sand in parking lots and 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. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.

(ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

NOTE: Contact the Department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(d) Documentation. 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 log must be made accessible to Department staff and a copy provided to the Department upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

3. Re-certification. Submit a certification of the following to the Department within three months of the expiration of each five-year interval from the date of issuance of the permit.

(a) Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

(c) Maintenance. The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

4. Duration of maintenance. Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the Department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with Department standards. Upon such assumption of responsibility, and approval by the Department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

5. Additional requirements. Additional requirements may be applied on a site-specific basis.

1.	12-18-2019	Submit to Town and DEP	CSB

Erosion Control Notes

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

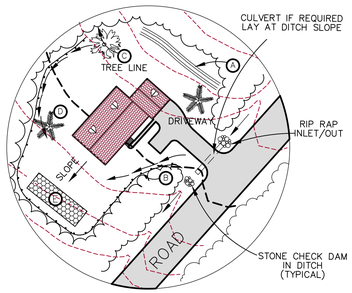
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
12-18-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C16
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

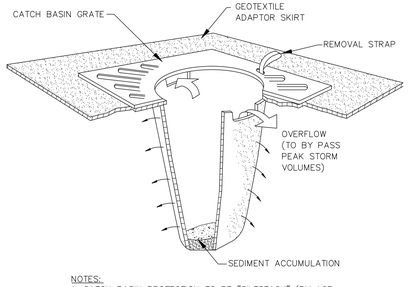


BUILDING SITE EROSION CONTROL

(TYPICAL DETAIL)

NOTES:
THIS SKETCH IS INDICATING THE INTENT OF THE SOIL EROSION MEASURES. ACTUAL SITE CONDITIONS AND LAYOUTS WILL VARY FROM SITE TO SITE. BUILDING CONTRACTORS MUST COMPLY WITH THE EROSION CONTROL NOTES SHOWN ON THESE DRAWINGS AND WITH THE "MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES."

A.) CONSTRUCT DIVERSION DITCH TO KEEP UPSLOPE DRAINAGE AREA FROM ENTERING SITE.
B.) INSTALL SILT FENCE BELOW ALL DISTURBED AREAS.
C.) KEEP CLEARING TO A MINIMUM.
D.) RE-SEED ALL DISTURBED AREAS. SEE SEEDING NOTES.



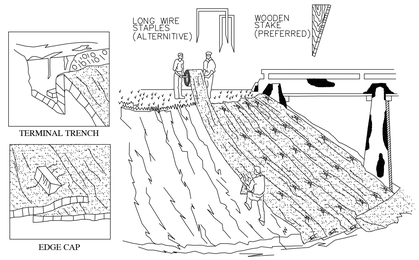
NOTES:
1. CATCH BASIN PROTECTION TO BE "SILTSTACK" (BY ACF ENVIRONMENTAL) OR "STREAM GUARD" (BY FOSS ENVIRONMENTAL SERVICES).

2. INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.

3. INSTALL SILT SACK SEDIMENT BARRIER IN ALL CATCH BASIN AND MAINTAIN UNTIL PROJECT COMPLETION.

TEMPORARY INLET PROTECTION

NOT TO SCALE



–UNROLL MAT ONTO GROUND IN DIRECTION OF WATER FLOW.
–MAT SHOULD LIE FLAT. DO NOT STRETCH MAT OVER GROUND. STRETCHING MAY CAUSE MAT TO BRIDGE DEPRESSIONS IN THE SURFACE AND ALLOW EROSION UNDERNEATH.
–BURY TRANSVERSE TERMINAL ENDS OF MAT TO SECURE AND PREVENT EROSIVE FLOW UNDERNEATH.
–SECURE MAT SNUGLY INTO ALL TRANSVERSE CHECK SLOTS.
–BACKFILL AND COMPACT TRENCHES AND CHECK SLOTS AFTER STAKING THE MAT IN BOTTOM OF TRENCH.
–OVERLAP ROLL ENDS BY THREE (3) FEET (MIN.) WITH UPSLOPE MAT ON TOP TO PREVENT UPLIFT OF MAT END BY WATER FLOW. IF INSTALLING IN THE DIRECTION OF A CONCENTRATED WATER FLOW, START NEW ROLLS IN A TRANSVERSE DITCH.
–WOOD STAKES ARE RECOMMENDED FOR PINNING MAT TO THE GROUND SURFACE. STAKES SHOULD BE 1"x 3" NOMINAL STOCK CUT IN A TRIANGULAR SHAPE. STAKES SHOULD BE 12" TO 18" LONG, DEPENDING ON SOIL DENSITY.
–DRIVE WOODEN STAKES TO WITHIN THREE (3) INCHES OF GROUND SURFACE. DO NOT DRIVE FLUSH TO SURFACE.
–IN ALL TRANSVERSE TERMINAL TRENCHES AND CHECK SLOTS, STAKE EACH MAT AT IS CENTER AND OVERLAP EDGES BEFORE BACKFILLING AND COMPACTING.
–STAKE OVERLAPS LONGITUDINALLY AT THREE (3) TO FIVE (5) FOOT INTERVALS.

GENERAL INSTALLATION GUIDELINES FOR EROSION CONTROL BLANKET

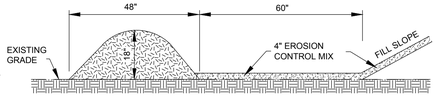
NOT TO SCALE

THE FILTER BERM SHALL CONSIST OF AN EROSION CONTROL MIX(BARK MULCH MIX OR RECYCLED COMPOSTED BARK FLUME GRIT AND FRAGMENTED WOOD GENERATED FROM WATER FLUME LOG HANDLING SYSTEMS. COMPARABLE COMPOSTED MIXES CAN BE USED UPON WRITTEN APPROVAL OF THE ENGINEER.

THE MIX SHALL CONFORM TO THE FOLLOWING: pH BETWEEN 5.0-8.0. PARTICLE SIZE - 100% PASSING THROUGH A 6" SCREEN AND 80% RETAINED ON A 3/4" SCREEN. SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 mmhos/cm.

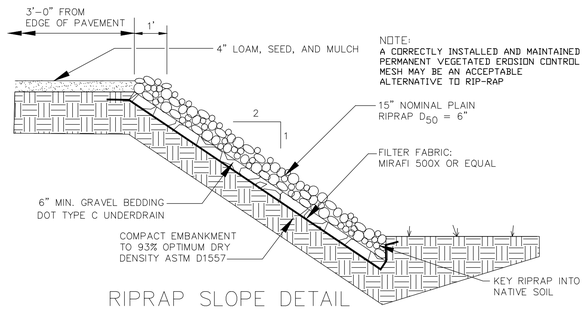
THE COMPOSTED BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL CONTOUR.

THE BERM MAY BE USED IN COMBINATION WITH SILT FENCE TO IMPROVE SEDIMENT REMOVAL AND PREVENT CLOGGING OF THE BERM BY LARGER SEDIMENT PARTICLES (SILT FENCE PLACED ON THE UPHILL SIDE OF BERM).



Erosion Control Mix Filter Berm

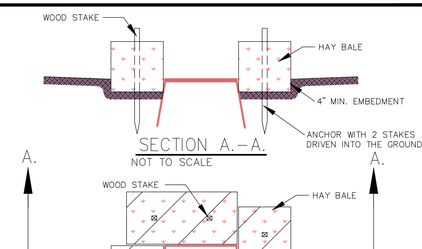
NOT TO SCALE



NOTE:
A CORRECTLY INSTALLED AND MAINTAINED PERMANENT VEGETATED EROSION CONTROL MESH MAY BE AN ACCEPTABLE ALTERNATIVE TO RIP-RAP

RIPRAP SLOPE DETAIL

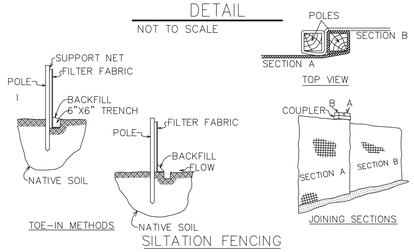
NOT TO SCALE



NOTE: INSTALL BARRIER AT EACH CATCH BASIN

CATCH BASIN HAY BALE BARRIER DETAIL

NOT TO SCALE

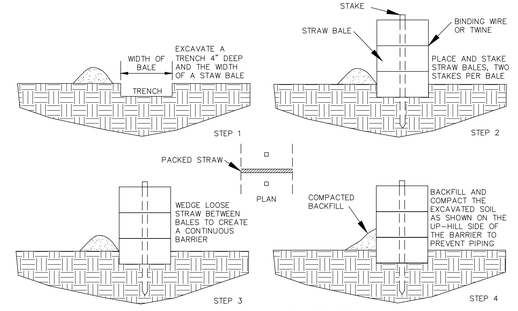


SILTATION FENCING

1. INSTALL DOWNSLOPE OF ALL CONSTRUCTION ACTIVITIES AS NECCESSARY.

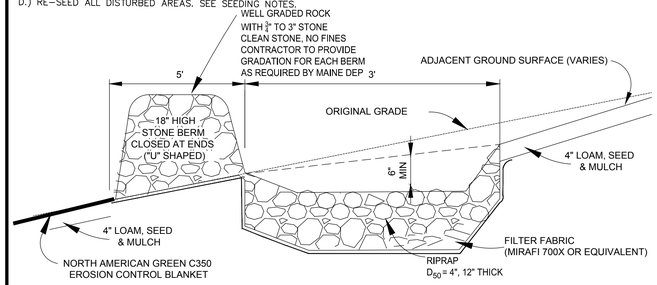
2. INSPECTION SHOULD BE FREQUENT AND REPAIR OR REPLACEMENT MADE PROMPTLY AS NEEDED. CHECK AFTER EACH RAINFALL.

3. BARRIERS SHOULD BE REMOVED WHEN THAY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.



HAY BALE BARRIER INSTALLATION IN DITCHES

NOT TO SCALE



NOTE: THE DESIGN ENGINEER SHALL OVERSEE THE LOCATION AND INSTALLATON OF THE STONE BERM LEVEL SPREADER

THE STONE BERM SHALL BE INSTALLED ALONG THE CONTOUR TO THE EXTENT POSSIBLE

THE BERM MUST BE WELL-GRADED AND CONTAIN SOME SMALL STONE TO FORCE FLOWS TO SPREAD OUT BEHIND THE BERM

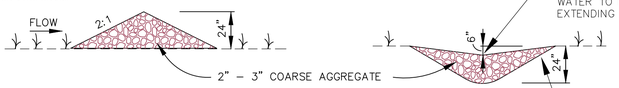
STONE BERM MUST BE AT LEAST 1.5' HIGH AND 2' ACROSS THE TOP WIDTH WITH 2:1 SIDE SLOPES.

SEE MAINE DEP BMP 5.2.2 BUFFER WITH STONE BERMED LEVEL LIP SPREADER

STONE BERM LEVEL SPREADER

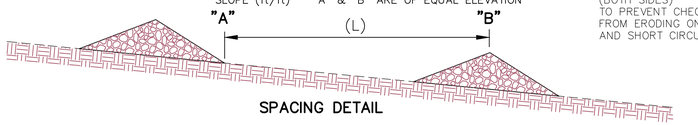
NOT TO SCALE

Construction Oversight:
"The applicant will retain the services of a professional engineer to inspect the construction and stabilization of the stone bermed level spreaders to be built on the site. The engineer shall inspect the stone berm material and its placement, and the upgradient conveyance structure construction. If necessary, the inspecting engineer will interpret the stone bermed level lip spreader's location and construction plan for the contractor. Once the stone bermed level lip spreaders are constructed and stabilized, the inspecting engineer will notifil the department in writing within 30 days to state that the level lips have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media."



CROSS SECTIONS

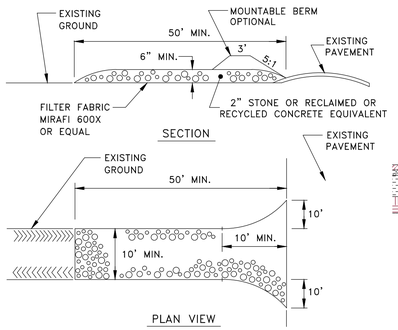
$L = \frac{2'}{\text{SLOPE (ft/ft)}}$ = THE DISTANCE SUCH THAT POINTS "A" & "B" ARE OF EQUAL ELEVATION



SPACING DETAIL

STONE CHECK DAM DETAILS

NOT TO SCALE



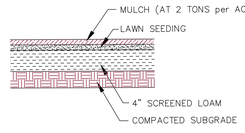
SECTION

PLAN VIEW

NOTE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH AGGREGATE WHICH DRAINS INTO AN APPROVED SEDIMENT OR WATERWAYS.

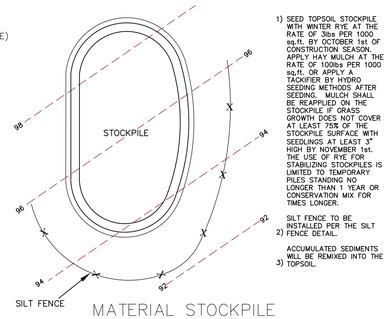
STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



LOAM AND SEED

NOT TO SCALE



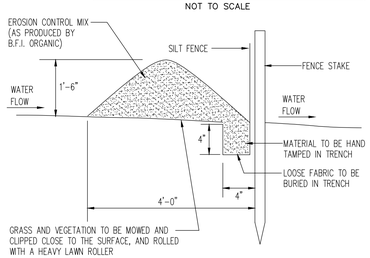
1) SEED TOPSOIL STOCKPILE WITH WINTER RYE AT THE RATE OF 3lbs PER 1000 sq.ft. BY OCTOBER 1st OF CONSTRUCTION SEASON. APPLY HAY MULCH AT THE RATE OF 100lbs PER 1000 sq.ft. OR APPLY A TACKIFIER BY HYDRO SEEDING METHODS AFTER SEEDING. MULCH SHALL BE REAPPLIED ON THE STOCKPILE IF GRASS GROWTH DOES NOT COVER AT LEAST 75% OF THE STOCKPILE SURFACE WITH SEEDLINGS AT LEAST 3" HIGH BY NOVEMBER 1st. THE USE OF RYE FOR STABILIZING STOCKPILES IS LIMITED TO TEMPORARY PILES STANDING NO LONGER THAN 1 YEAR OR CONSERVATION MIX FOR TIMES LONGER.

SILT FENCE TO BE INSTALLED PER THE SILT 2) FENCE DETAIL.

ACCUMULATED SEDIMENTS WILL BE REMIXED INTO THE 3) TOPSOIL.

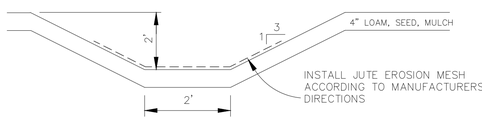
MATERIAL STOCKPILE EROSION PREVENTION DETAIL

NOT TO SCALE



SILT FENCE AND FILTER BERM DETAIL

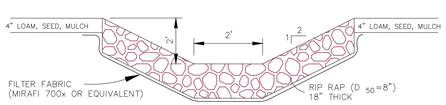
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GRASSED DITCH CROSS SECTION

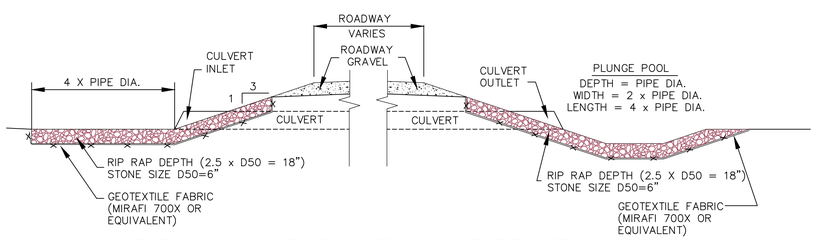
NOT TO SCALE

NOTE:
A CORRECTLY INSTALLED AND MAINTAINED PERMANENT VEGETATED EROSION CONTROL MESH MAY BE AN ACCEPTABLE ALTERNATIVE TO RIP-RAP



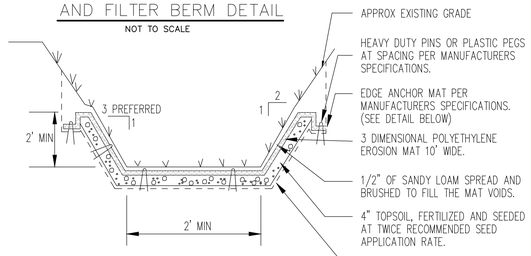
RIP RAP DITCH CROSS SECTION

NOT TO SCALE



TYPICAL CULVERT INLET & OUTLET DETAIL

NOT TO SCALE



EROSION MAT INSTALLATION IN DITCHES

NOT TO SCALE

1. 12-18-2019 Submit to Town and Maine DEP CSB

Erosion Control Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

• COMMERCIAL PROJECTS
• RESIDENTIAL SUBDIVISIONS
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• SITE PLANNING & DESIGN
• STORMWATER MANAGEMENT
• ROAD AND UTILITY DESIGN
• EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C17
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

www.cranepumps.com

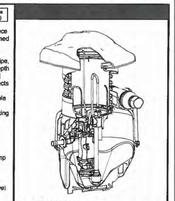
EcoTRAN™ System

Simplex

EcoTRAN™ System

Specifications:

BASIN	Engineered Polypropylene Copolymer, 2-piece construction, factory assembled with preformed corrosion resistant rebar installed. Includes POD for pump support and orientation
RISER	HDPE 18" Dia. (457mm) corrugated drainpipe, stay-of-installation adjustment sets basin depth (limit 9ft, 6inches (2.9m) to bottom of basin)
DISCHARGE OUTLET	1-1/4" NPT Flexible, stainless steel. Connects to a basin mounted bronze tank receiver.
INLET	3 positions, 4" (Sch 40/80 or SDR35) Flexible Inlet Flange (For Field Installation)
COVER	Rock-Shaped Polyethylene Cover, Interlocking with Riser Adapter, vented or unvented. Keyed lock included. Load rating of 150 lb per sq ft.
ALARM BOX	Model1500 Alarm Panel, NEMA 4X Non-metallic Enclosure with Keyed Lock, Alarm Light, Alarm Horn w/Push Button, Pump and Alarm Circuit Breakers
DIRECT BURIAL CABLE	12/5 Type TC, STOOOW Round U.L. Listed, 30ft (9m) length standard
MOVEABLE DISCHARGE FITTING w/ CHECK VALVE: (Removed with Pump)	
Housing	Powder Coated Cast Iron
Diaphragm	Fiber Reinforced Neoprene
Flapper	Fiber Reinforced Nitrile
Size	1-1/4" Full Port
Valve Seat	Bronze
BALL VALVE	Toggle actuated via polypropylene harness from top side, removable without basin entry
Material	Bronze, with Stainless Steel ball & stem, and Teflon seats
Size	1-1/4" Full Port
LIFTING HARNESS	1/8" x 3/4" Polypropylene (POD), 1/2" Dia. Polypropylene (PUMP) Breaking strength 3750 lbs.
HARDWARE	300 Series Stainless Steel
LEVEL CONTROL	ESPS™ – Environmentally sealed pressure switch with CPVC housing, Nitrile diaphragm. Custom molded quick connect for sealing and strain relief.
ANTI-SIPHON	Integral to cast iron motor housing:
Flapper	Fiber Reinforced Nitrile
Seat	Valox with stainless steel rivet
PUMP	OGP2022CE (Std), 240 Volt, 1 Phase
OPTIONS	Direct Burial Cable lengths, Rock Cover Vented or Flood Plain. Depth, OGVF2222CE Pump, Model 1550 Alarm Panel w/Generator Receptacle



EcoTRAN™ System
For use with OGP and OGV pumps, 1½" NPT

Vented 52"-74" Depth
Vented 76"-114" Depth
Flood Plain 52"-74" Depth
Flood Plain 76"-114" Depth

This product may be covered by one or more of the following patents and other patent(s) pending: US Patent 7,357,341 & US Patent 7,578,657

SP® LR16627 NSF 46

NSF CERTIFIED TO STD / ANSI 46

BARNES ECO TRAN SYSTEM

UL LISTED BASIN ASSEMBLY E161664 2N87 UL1091

CRANE PUMPS & SYSTEMS
A Crane Co. Company USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

SECTION ECO
PAGE 1
DATE 10/09

www.cranepumps.com

EcoTRAN™ System

Simplex

EcoTRAN™ System

1. Depth
   52"-74" (1.3m-1.8m) Vented
   76"-114" (1.9m-2.9m) Vented
   52"-74" (1.3m-1.8m) Flood Plain
   76"-114" (1.9m-2.9m) Flood Plain
2. Pump Type (240V / 1 Phase)
   2 HP OGP2022CE (STD.)
   2 HP OGVF2022CE
3. Direct Burial Cable Length
   30 Feet (STD.)
   50 Feet
   100 Feet
4. Rock Cover Options (Select One)
   Sandstone
   Flood Plain, Sandstone
5. Alarm Box Options
   Model 1500 w/Alarm Light, Horn, Silence Button & Circuit Breaker
   Model 1550, includes 1500 features, Plus Generator Receptacle and Automatic Transfer Switch

NOTES!

1. Unit shipped boxed complete including Basin Package, Pump, Level Control and Alarm Box (Riser shipped separately).
2. Riser depth can be shortened in the field during installation.
3. All moving parts and seals serviceable from ground level without entry into the basin.

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SECTION ECO
PAGE 2
DATE 12/08

EcoTRAN™ System

Simplex

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Short Set EcoTRAN Package - Vented Cover

Direct Burial Cable Length	OGP Pump: Standard Alarm Box Part No.	OGP Pump: Standard Alarm Box SC	OGP Pump: Alarm with Generator Receptacle Part No.	OGP Pump: Alarm with Generator Receptacle SC	OGV Pump: Standard Alarm Part No.	OGV Pump: Standard Alarm SC	OGV Pump: Alarm with Generator Receptacle Part No.	OGV Pump: Alarm with Generator Receptacle SC
30 Ft.	122848	NS	122854	CF	122851	NS	122857	CF
50 Ft.	122849	NS	122855	CF	122852	NS	122858	CF
100 Ft.	122850	NS	122856	CF	122853	NS	122859	CF

Long Set EcoTRAN Package - Vented Cover

Direct Burial Cable Length	OGP Pump: Standard Alarm Box Part No.	OGP Pump: Standard Alarm Box SC	OGP Pump: Alarm with Generator Receptacle Part No.	OGP Pump: Alarm with Generator Receptacle SC	OGV Pump: Standard Alarm Part No.	OGV Pump: Standard Alarm SC	OGV Pump: Alarm with Generator Receptacle Part No.	OGV Pump: Alarm with Generator Receptacle SC
30 Ft.	124145	NS	124152	CF	124149	NS	124155	CF
50 Ft.	124147	NS	124153	CF	124150	NS	124156	CF
100 Ft.	124148	NS	124154	CF	124151	NS	124157	CF

Short Set EcoTRAN Package - Non-Vented Cover

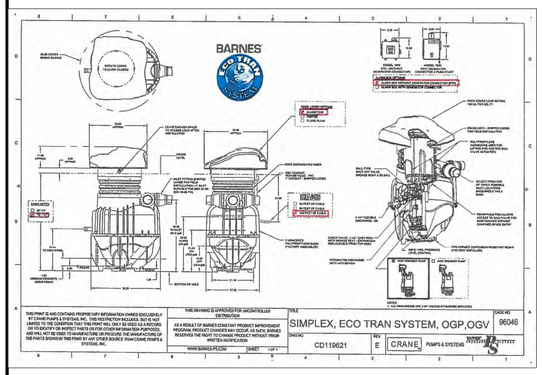
Direct Burial Cable Length	OGP Pump: Standard Alarm Box Part No.	OGP Pump: Standard Alarm Box SC	OGP Pump: Alarm with Generator Receptacle Part No.	OGP Pump: Alarm with Generator Receptacle SC	OGV Pump: Standard Alarm Part No.	OGV Pump: Standard Alarm SC	OGV Pump: Alarm with Generator Receptacle Part No.	OGV Pump: Alarm with Generator Receptacle SC
30 Ft.	122860	CF	122866	CF	122863	CF	122869	CF
50 Ft.	122861	CF	122867	CF	122864	CF	122870	CF
100 Ft.	122862	CF	122868	CF	122865	CF	122871	CF

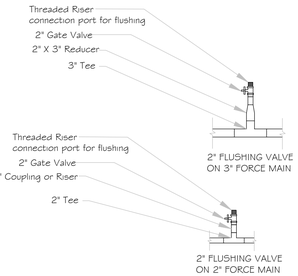
Long Set EcoTRAN Package - Non-Vented Cover

Direct Burial Cable Length	OGP Pump: Standard Alarm Box Part No.	OGP Pump: Standard Alarm Box SC	OGP Pump: Alarm with Generator Receptacle Part No.	OGP Pump: Alarm with Generator Receptacle SC	OGV Pump: Standard Alarm Part No.	OGV Pump: Standard Alarm SC	OGV Pump: Alarm with Generator Receptacle Part No.	OGV Pump: Alarm with Generator Receptacle SC
30 Ft.	124158	CF	124164	CF	124161	CF	124167	CF
50 Ft.	124159	CF	124165	CF	124162	CF	124168	CF
100 Ft.	124160	CF	124166	CF	124163	CF	124169	CF

SECTION ECO
PAGE 3
DATE 12/08

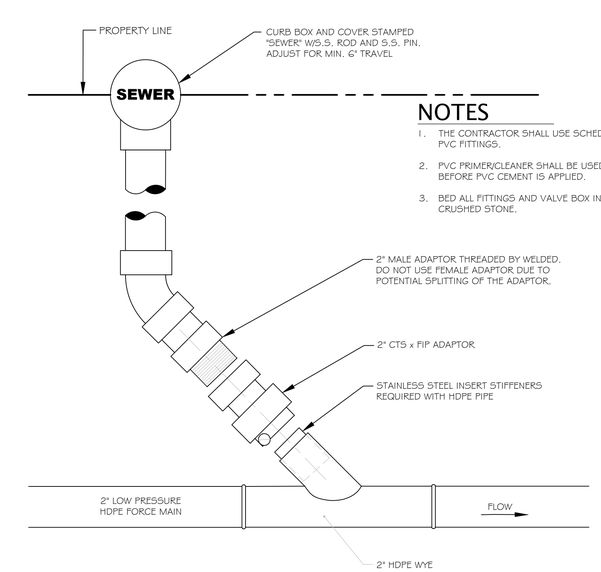
CRANE PUMPS & SYSTEMS
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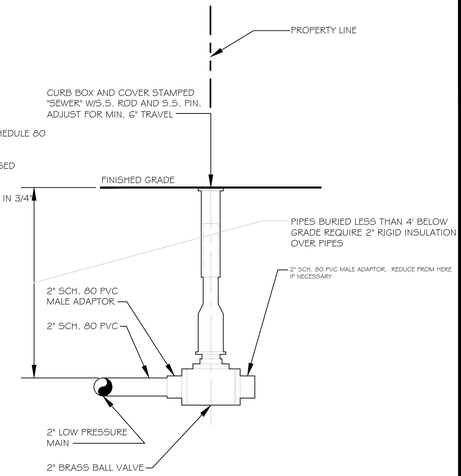
2" Sanitary Sewer Flushing Valve Detail

NOT TO SCALE



NOTES

1. THE CONTRACTOR SHALL USE SCHEDULE 80 PVC FITTINGS.
2. PVC PRIMER/CLEANER SHALL BE USED BEFORE PVC CEMENT IS APPLIED.
3. BED ALL FITTINGS AND VALVE BOX IN 3/4" CRUSHED STONE.

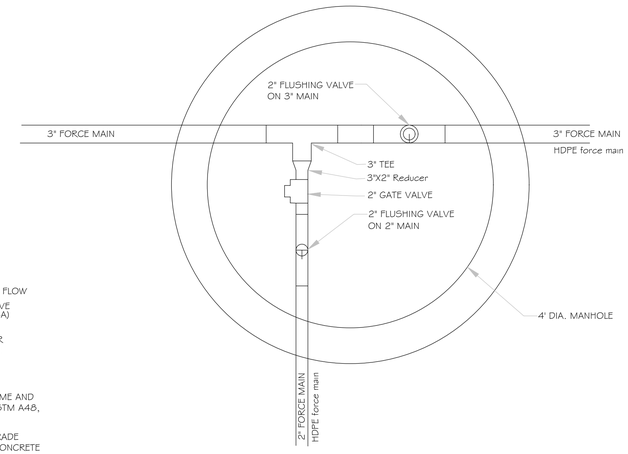


PLAN VIEW

PROFILE VIEW

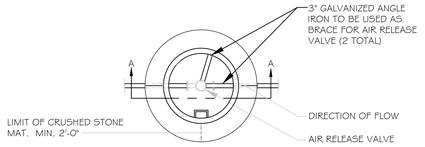
LOW PRESSURE SEWER CONNECTION SERVICE DETAIL

NOT TO SCALE

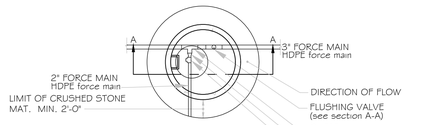


2" Sanitary Sewer Flushing Valve and 2" isolation valve inside SMH's 8 and 9

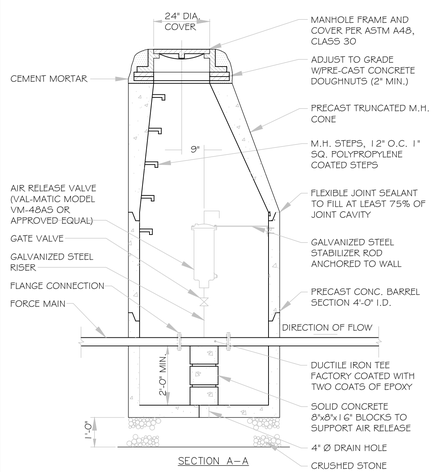
NOT TO SCALE



PLAN VIEW

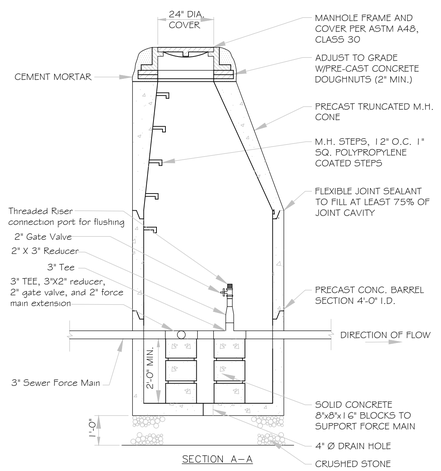


PLAN VIEW



AIR RELEASE MANHOLE

NOT TO SCALE



2" Sanitary Sewer Flushing Valve and 2" isolation valve inside 4' dia. manhole

NOT TO SCALE

PE 4710 IPS – MUNICIPAL & INDUSTRIAL PIPE

Designed for: Municipal Water, Sewer and Industrial Applications

- Iron Pipe Size - HDPE
- Black Pipe

Specifications:

- PE 4710 Resin formulation listed in PPI TR4
- Hydrostatic Design Basis: 1600 psi @ 73° F, 1000 psi @ 140° F
- Cell Classification per ASTM D3350 = 445574C and 445576C
- Chlorine Resistance: CC 2 or CC 3 avail. per ASTM F2263
- ½" – 3" pipe: ASTM D3035 and AWWA/ANSI C901
- 4" – 24" pipe: ASTM F714 and AWWA/ANSI C906
- NSF/ANSI Standards: 14 and 61

Pressure Ratings:
If temperatures exceed 80°F, contact Charter Plastics for a working pressure de-rating.

Joining:
Charter Plastics Black IPS pipe is based on outside diameter. Heat fusion is the preferred method for joining this pipe. All personnel conducting heat fusions should be experienced and follow guidelines published by the pipe manufacturer or by PPI in TR 33.

IPS may also be joined with OD Mechanical fittings designed for pipe made to ASTM F714 or ASTM D3035 Standards. A stiffener should be inserted when using OD Compression type fittings on pipe < 2".

Never use any lubricant on the pipe. Do not expose the pipe to direct flame.

Installing:
All Charter Plastics IPS pipe can be direct buried and can be installed with a vibrating plow, pulled or horizontally directionally drilled. Buried pipe must be supported by proper embedment material like sand or gravel. Refer to PPI's "Handbook of Polyethylene Pipe" and follow all local, state or federal guidelines.

To safely handle and store polyethylene, refer to PPI's Material Handling Guide.

***This pipe is not designed for use inside the building or for hot water applications.**

Disinfection:
New water mains and service lines should be disinfected according to AWWA C651. The disinfection should take place after the initial flushing and pressure testing. Prolonged exposure or concentrated levels of disinfection chemicals may cause damage to the inside diameter of the pipe. The disinfection chemicals should never contain more than 12% active chlorine. Charter Plastics recommends the test duration not exceed 24 hours and that upon completion, the system be thoroughly flushed with fresh water.

Testing:
All pipe should be hydrostatically tested after installation.
Pneumatic testing is not recommended.
Refer to PPI's Handbook of Polyethylene Pipe for Guidelines.

Charter Plastics
Polyethylene Pipe Partners

Pipe for a New World.

PE 4710 IPS – MUNICIPAL & INDUSTRIAL PIPE

Designed for: Municipal Water, Sewer and Industrial Applications

- Iron Pipe Size - HDPE
- Black Pipe

PIPE SIZE	O.D ACTUAL		DR 7.0 PC 333	DR 9 PC 250	DR 11 PC 200	DR 13.5 PC 160	DR 15.5 PC 139	DR 17 PC 125	DR 21 PC 100
.75"	1.050	MIN WALL	.150	.117	.095				
		NOM. ID.	.722	.796	.860	N/A	N/A	N/A	N/A
		WEIGHT PER FT	.185	.153	.130				
1"	1.315	MIN WALL	.188	.146	.120				
		NOM. ID.	.917	1.063	1.055	N/A	N/A	N/A	N/A
		WEIGHT PER FT	.291	.226	.291				
1.25"	1.660	MIN WALL	.271	.184	.151	.123	.107	.098	
		NOM. ID.	1.157	1.370	1.338	1.394	1.426	1.444	N/A
		WEIGHT PER FT	.463	.314	.316	.266	.236	.219	
1.5"	1.900	MIN WALL	.271	.211	.173	.141	.123	.112	
		NOM. ID.	1.324	1.453	1.533	1.598	1.634	1.656	N/A
		WEIGHT PER FT	.607	.490	.412	.345	.307	.284	
2"	2.375	MIN WALL	.339	.264	.216	.176	.153	.140	
		NOM. ID.	1.656	1.815	1.917	2.002	2.049	2.075	N/A
		WEIGHT PER FT	.948	.767	.643	.534	.471	.436	
2.5" Straight	2.875	MIN WALL			.261			.169	
		NOM. ID.	N/A	N/A	2.322	N/A	N/A	2.517	N/A
		WEIGHT PER FT			.935			.832	
3"	3.500	MIN WALL	.508	.389	.318	.259	.226	.206	.167
		NOM. ID.	2.440	2.675	2.826	2.951	3.021	3.063	3.146
		WEIGHT PER FT	2.058	1.665	1.356	1.158	1.021	.937	.769

Weight calculations per PPITR7

Charter Plastics
Polyethylene Pipe Partners

1. 12-18-2019 Submit to Town and Maine DEP CSB

Low Pressure Sewer Pump Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

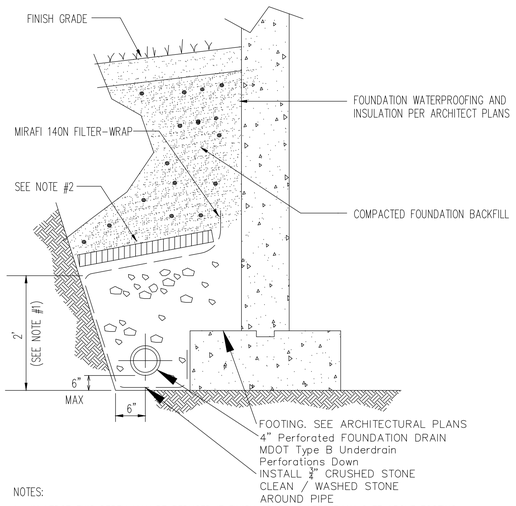
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · LICENSED PROFESSIONAL ENGINEER
12-18-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C18
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

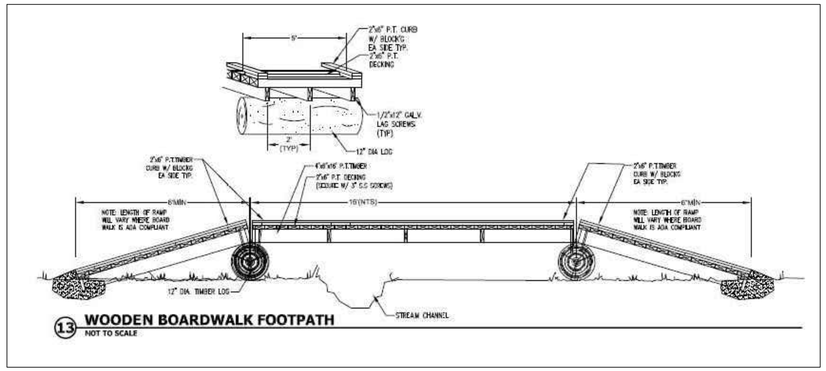


NOTES:

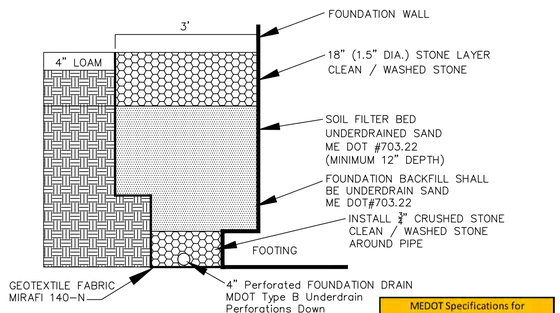
1. IN LEDGE THIS DEPTH MAY BE REDUCED IF FINISH GRADE IS LESS THAN 2 FT ABOVE FOOTING.
2. PROVIDE POLYSTYRENE INSULATION BOARD OVER PIPE WHERE COVER IS LESS THAN 4 FT AND/OR AS NOTED ON PLANS.
3. SEE PLANS FOR LOCATIONS OF DRAINBOARD AND PERIMETER DRAINS.

PERIMETER OR FOUNDATION DRAIN DETAIL

NOT TO SCALE ST-UD-FOUND/02-97



13 WOODEN BOARDWALK FOOTPATH
NOT TO SCALE



ROOF DRIPLINE BMP DETAIL

NOT TO SCALE OV @ CUMBERLAND SENIOR HOUSING

MEDOT Specifications for Underdrains (ME DOT #703.22)	
Sieve Size	% Passing by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
Underdrain Type C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

CONSTRUCTION OVERSIGHT ROOF DRIPLINE INSTALLATION

The Contractor will retain the services of a professional engineer of the clients choosing to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Roof Dripline Filtration

Construction inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the geotextile lining, after the foundation drain pipe is installed but not yet backfilled, after the pipe bedding gravel is placed but prior to the placement of the gravel filter media, after the gravel filter media has been placed but prior to installing the crushed stone surface layer, and after the surface crushed stone surface layer is installed.

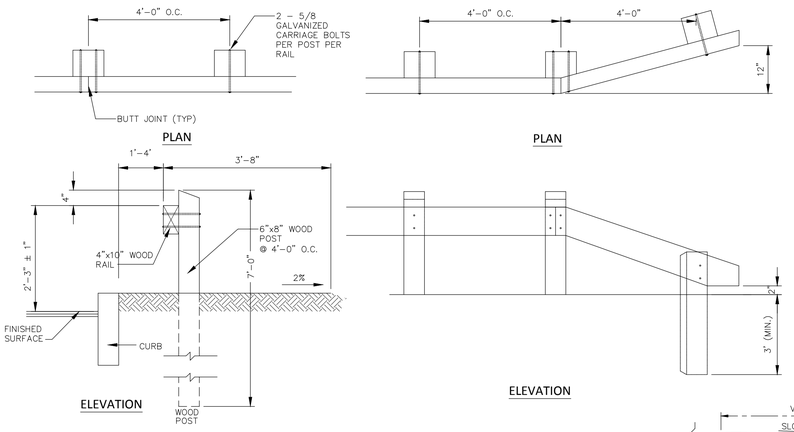
Testing and submittals: The gravel filter media and pipe bedding media used in the roof dripline filtration BMP must be confirmed as suitable by testing. The contractor shall identify the source of these gravels and obtain samples for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the gravel is placed as part of the dripline filter's construction.

- Obtain a sample of the gravel filter media. The sample must be a composite of three different locations (grabs) from the gravel stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the sand filter media showing it meets the following gradation:

Sieve Size	% Passing by Weight
3"	100
#200	4-7

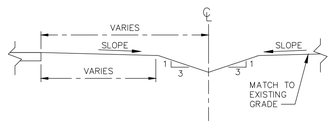
- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.

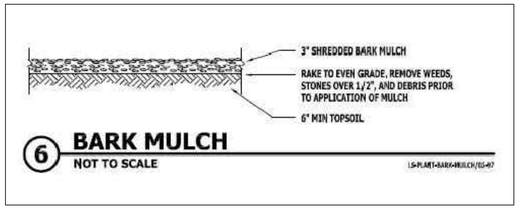


WOOD GUARD RAIL
NOT TO SCALE

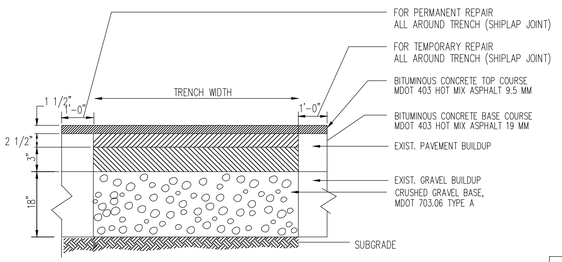
WOOD GUARD RAIL- TAPERED END
NOT TO SCALE



TYPICAL DRAINGE SWALE
N.T.S.



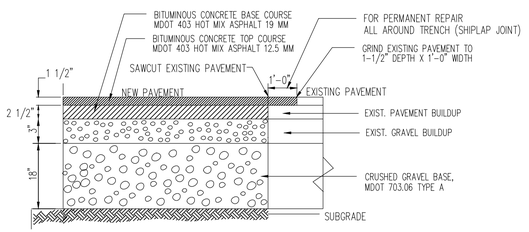
6 BARK MULCH
NOT TO SCALE LS-PLANT-BARK-MULCH/02-97



NOTE:
TRENCH REPAIR TO MEET TOWN OF CUMBERLAND DPW REQUIREMENTS

TRENCH REPAIR
BITUMINOUS CONCRETE

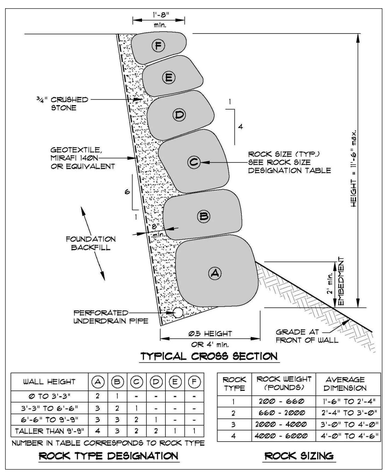
NOT TO SCALE



NOTE:
TRENCH REPAIR TO MEET TOWN OF CUMBERLAND DPW REQUIREMENTS

PAVEMENT BUTT JOINT DETAIL
BITUMINOUS CONCRETE

NOT TO SCALE



TYPICAL CROSS SECTION

WALL HEIGHT	A	B	C	D	E	F
Ø TO 3'-3"	2	1	-	-	-	-
3'-3" TO 6'-6"	3	2	1	-	-	-
6'-6" TO 9'-9"	3	3	2	1	-	-
TALLER THAN 9'-9"	4	3	2	2	1	1

NUMBER IN TABLE CORRESPONDS TO ROCK TYPE

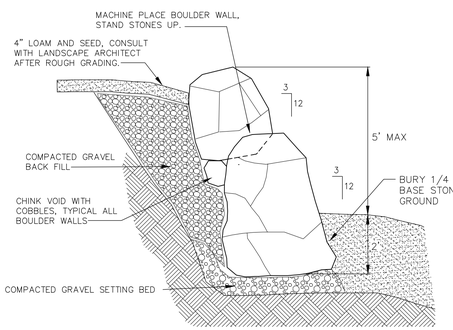
ROCK TYPE DESIGNATION

ROCK TYPE	ROCK WEIGHT (POUNDS)	AVERAGE DIMENSION
1	200 - 600	1'-6" TO 2'-4"
2	600 - 2000	2'-4" TO 3'-0"
3	2000 - 4000	3'-0" TO 4'-0"
4	4000 - 6000	4'-0" TO 4'-6"

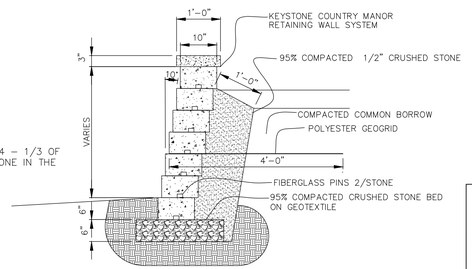
ROCK SIZING

BOULDER RETAINING WALL 4-11' HIGH

NOT TO SCALE



RETAINING BOULDER WALL
NOT TO SCALE



KEYSTONE COUNTRY MANOR
SEGMENTAL RETAINING WALL
NOT TO SCALE

1. 12-18-2019 Submit to Town and Maine DEP CSB

Roof Dripline BMP and Misc. Details

Cumberland Crossing - Phase 2
Tuttle and Greely Road, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
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- EROSION CONTROL PLANS

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · LICENSED PROFESSIONAL ENGINEER
12-18-2019

FIELD WK:	SCALE:	SHEET: C19
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

Storm Drain Structure Table		
Structure Name	Structure Details	
CB1	RIM = 83.284 SUMP = 72.176 SD1 INV OUT = 76.176	Sta=45+14.88 OFF=-10.000 R N=350434.6522 E=2934442.4111
CB2	RIM = 83.285 SUMP = 71.876 SD1 INV IN = 75.976 SD2 INV OUT = 75.876	Sta=45+14.88 OFF=-10.000 L N=350453.0695 E=2934450.2087
CB3	RIM = 84.702 SUMP = 73.316 SDOCS1 INV IN = 75.400 SD3 INV OUT = 75.316	Sta=46+75.53 OFF=-10.742 L N=350433.4933 E=2934602.2004
CB4	RIM = 86.340 SUMP = 72.232 SD3 INV IN = 74.300 SD4 INV OUT = 74.232	Sta=48+81.28 OFF=-13.133 L N=350496.9257 E=2934795.3215
CB5	RIM = 86.466 SUMP = 71.871 SD4 INV IN = 74.000 SD5 INV OUT = 73.871	Sta=49+27.61 OFF=-13.524 L N=350512.4640 E=2934838.9684
CB6	RIM = 85.904 SUMP = 71.357 SD5 INV IN = 73.500 SD6 INV OUT = 73.357	Sta=49+99.74 OFF=-8.870 L N=350526.2539 E=2934911.9748
CB7	RIM = 85.392 SUMP = 71.651 SD11 INV IN = 73.800 SD7 INV OUT = 73.651	Sta=50+09.27 OFF=19.750 R N=350498.9210 E=2934924.5991
CB8	RIM = 85.269 SUMP = 71.500 SD7 INV IN = 73.500 SD8 INV OUT = 73.619	Sta=50+67.08 OFF=10.578 R N=350508.2935 E=2934979.3596
CB9	RIM = 84.393 SUMP = 71.100 SD8 INV IN = 73.200 SD9 INV OUT = 73.100	Sta=51+51.03 OFF=10.233 R N=350499.1179 E=2935062.5590
CB10	RIM = 84.418 SUMP = 70.960 SD9 INV IN = 73.100 SD10 INV OUT = 72.960	Sta=51+49.80 OFF=-9.632 L N=350518.9925 E=2935063.6144
CB11	RIM = 81.102 SUMP = 74.702 SD12 INV IN = 74.800 CULV2 INV IN = 74.800 SD11 INV OUT = 74.702	Sta=49+94.95 OFF=199.912 R N=350319.0790 E=2934937.9827
CB12	RIM = 80.501 SUMP = 75.055 SD13 INV IN = 75.200 SD14 INV IN = 75.810 SD12 INV OUT = 75.055	Sta=49+66.28 OFF=250.493 R N=350268.1330 E=2934940.8306
CB13	RIM = 80.515 SUMP = 74.902 SD13 INV OUT = 74.902	Sta=50+75.83 OFF=248.524 R N=350271.0167 E=2934960.5400
CB14	RIM = 80.737 SUMP = 75.200 SD16 INV IN = 76.600 SD15 INV IN = 75.200 SD14 INV OUT = 76.477	Sta=50+91.26 OFF=335.474 R N=350182.8712 E=2934965.9062
CB15	RIM = 80.679 SUMP = 75.713 SD15 INV OUT = 75.713	Sta=23+31.45 OFF=-9.923 L N=350199.6127 E=2934987.6453
CB16	RIM = 79.671 SUMP = 76.777 SD16 INV OUT = 76.777	Sta=23+41.01 OFF=33.693 R N=350167.1080 E=2934956.8661
CB17	RIM = 83.501 SUMP = 79.100 CULV3 INV IN = 79.100 SD17 INV OUT = 79.216	Sta=53+32.47 OFF=373.194 R N=350117.7509 E=2935201.2036
CB18	RIM = 83.395 SUMP = 78.981 SD19 INV IN = 79.100 SD17 INV IN = 79.100 SD18 INV OUT = 78.981	Sta=25+90.12 OFF=13.488 R N=350095.6682 E=2935208.2665
CB19	RIM = 83.833 SUMP = 79.316 SD19 INV OUT = 79.316	Sta=26+33.29 OFF=12.683 R N=350108.4962 E=2935249.4985
CB20	RIM = 81.985 SUMP = 78.200 SD21 INV IN = 78.300 SD18 INV IN = 78.300 SD20 INV OUT = 78.200	Sta=26+06.63 OFF=148.665 R N=349970.4768 E=2935261.8623
CB21	RIM = 81.984 SUMP = 78.394 SD21 INV OUT = 78.394	Sta=54+23.51 OFF=505.893 R N=349975.4917 E=2935276.4301
CB23	RIM = 81.313 SUMP = 76.950 SD23 INV OUT = 76.950	Sta=55+70.57 OFF=363.228 R N=350109.4265 E=2935536.2409
CB24	RIM = 81.313 SUMP = 76.736 SD23 INV IN = 76.800 SD24 INV OUT = 76.736	Sta=55+75.60 OFF=356.411 R N=350118.4771 E=2935549.0022

Storm Drain Structure Table		
Structure Name	Structure Details	
CB25	RIM = 82.804 SUMP = 76.135 SD24 INV IN = 76.200 SD25 INV OUT = 76.135	Sta=55+60.40 OFF=256.016 R N=350212.4153 E=2935496.8518
CB26	RIM = 83.492 SUMP = 75.405 SD26 INV OUT = 75.405	Sta=28+13.70 OFF=12.299 R N=350209.3449 E=2935401.2213
CB27	RIM = 83.073 SUMP = 75.538 SD25 INV IN = 75.600 SD26 INV IN = 75.600 SD28 INV IN = 75.600 SD27 INV OUT = 75.538	Sta=55+14.79 OFF=208.726 R N=350260.2365 E=2935401.1737
CB28	RIM = 83.058 SUMP = 76.705 SD28 INV OUT = 76.705	Sta=54+94.30 OFF=213.545 R N=350257.7985 E=2935380.2607
CB29	RIM = 81.155 SUMP = 74.460 SD27 INV IN = 74.600 SD30 INV IN = 76.627 SD29 INV OUT = 74.460	Sta=54+67.51 OFF=27.102 R N=350446.0829 E=2935375.0243
CB30	RIM = 81.255 SUMP = 74.862 SD30 INV OUT = 76.862	Sta=54+44.19 OFF=24.447 R N=350451.3932 E=2935352.1626
CB31	RIM = 81.740 SUMP = 74.163 SD29 INV IN = 74.200 SD31 INV OUT = 74.163	Sta=54+48.60 OFF=-21.340 L N=350496.3735 E=2935361.7915
CB32	RIM = 75.833 SUMP = 73.605 SD31 INV IN = 73.700 SD32 INV OUT = 73.605	Sta=54+52.86 OFF=-113.934 L N=350587.8687 E=2935376.6385
CB33	RIM = 79.687 SUMP = 73.272 SD32 INV IN = 73.300 SD33 INV OUT = 73.272	Sta=55+13.44 OFF=-121.057 L N=350588.0003 E=2935437.6330
CB34	RIM = 81.357 SUMP = 75.700 SD34 INV OUT = 77.700	Sta=54+23.02 OFF=9.686 R N=350468.4842 E=2935332.8211
CB35	RIM = 81.550 SUMP = 75.500 SD34 INV IN = 77.604 SD35 INV OUT = 77.500	Sta=54+23.58 OFF=-9.462 L N=350487.4416 E=2935335.5695
CB36	RIM = 79.416 SUMP = 72.500 SD35 INV IN = 74.600 SD36 INV OUT = 74.500	Sta=55+98.74 OFF=-9.893 L N=350484.0998 E=2935505.2634
CB37	RIM = 77.100 SUMP = 70.400 SD38 INV IN = 72.500 SD36 INV IN = 72.500 SD37 INV OUT = 72.400	Sta=56+99.14 OFF=-10.021 L N=350533.1821 E=2935585.9107
CB38	RIM = 77.113 SUMP = 70.599 SD38 INV OUT = 72.599	Sta=56+98.71 OFF=9.866 R N=350518.9483 E=2935599.8059
CB39	RIM = 73.175 SUMP = 65.442 SD37 INV IN = 67.540 SD39 INV OUT = 67.442	Sta=58+48.87 OFF=-10.114 L N=350660.4841 E=2935658.1590
CB40	RIM = 70.535 SUMP = 62.500 SD41 INV IN = 64.600 SD42 INV IN = 64.602 SD39 INV IN = 64.600 SD40 INV OUT = 64.500	Sta=59+61.06 OFF=-9.373 L N=350750.5150 E=2935727.5377
CB41	RIM = 70.528 SUMP = 62.694 SD41 INV OUT = 64.694	Sta=59+61.27 OFF=9.504 R N=350738.9112 E=2935742.4286
CB42	RIM = 70.155 SUMP = 62.730 SD43 INV IN = 64.825 SD42 INV OUT = 64.730	Sta=59+85.61 OFF=-16.679 L N=350774.2639 E=2935737.1218
CB43	RIM = 69.001 SUMP = 63.000 SD60 INV IN = 65.070 SD46 INV IN = 65.067 SD43 INV OUT = 65.000	Sta=60+20.50 OFF=-19.303 L N=350803.1863 E=2935756.8165
CB45	RIM = 69.511 SUMP = 63.500 SD45 INV OUT = 65.500	Sta=60+67.04 OFF=9.857 R N=350821.9096 E=2935808.6933
CB46	RIM = 69.507 SUMP = 63.300 SD45 INV IN = 65.400 SD46 INV OUT = 65.300	Sta=60+66.71 OFF=-10.078 L N=350833.3681 E=2935792.3776
CB47	RIM = 91.576 SUMP = 87.700 SD47 INV OUT = 87.700	Sta=73+62.06 OFF=-601.008 L N=351624.6483 E=2935227.0229
CB48	RIM = 91.117 SUMP = 85.200 SD49 INV IN = 85.314 SD47 INV IN = 85.300 SD48 INV OUT = 85.200	Sta=73+25.89 OFF=-682.038 L N=351545.2972 E=2935187.3039

Storm Drain Structure Table		
Structure Name	Structure Details	
CB49	RIM = 89.625 SUMP = 85.600 SD49 INV OUT = 85.600	Sta=73+02.15 OFF=-734.013 L N=351493.9831 E=2935162.1676
CB50	RIM = 91.812 SUMP = 82.600 SD48 INV IN = 84.706 SD50 INV OUT = 84.600	Sta=72+50.76 OFF=-617.720 L N=351527.9882 E=2935284.6774
CB52	RIM = 89.852 SUMP = 81.800 SD51 INV IN = 83.934 SD52 INV OUT = 83.800	Sta=70+31.60 OFF=-660.168 L N=351446.6652 E=2935293.0938
CB53	RIM = 87.850 SUMP = 80.900 SD52 INV IN = 83.068 SD54 INV IN = 83.100 SD53 INV OUT = 82.900	Sta=63+93.53 OFF=-596.295 L N=351301.8399 E=2935313.9284
CB54	RIM = 88.384 SUMP = 81.900 SD54 INV OUT = 83.900	Sta=63+91.10 OFF=-626.417 L N=351301.8297 E=2935282.6691
CB55	RIM = 83.829 SUMP = 79.316 SD53 INV IN = 79.400 SD56 INV IN = 79.400 SD55 INV OUT = 79.316	Sta=63+31.39 OFF=-505.016 L N=351179.5650 E=2935379.8309
CB56	RIM = 83.958 SUMP = 77.529 SD57 INV IN = 79.600 SD56 INV OUT = 79.529	Sta=63+14.07 OFF=-524.195 L N=351166.4143 E=2935357.5916
CB57	RIM = 85.131 SUMP = 79.766 SD57 INV OUT = 79.766	Sta=63+37.93 OFF=-547.201 L N=351194.3751 E=2935339.7913
CB58	RIM = 76.229 SUMP = 71.700 SD58 INV OUT = 71.700	Sta=60+09.55 OFF=-301.413 L N=350970.4450 E=2935529.3724
CB59	RIM = 76.279 SUMP = 71.500 SD55 INV IN = 71.604 SD58 INV IN = 71.610 SD59 INV OUT = 71.500	Sta=60+29.05 OFF=-298.663 L N=350983.9792 E=2935543.6747
CB60	RIM = 73.328 SUMP = 66.900 SD59 INV IN = 69.000 SD60 INV OUT = 68.900	Sta=60+13.12 OFF=-173.545 L N=350893.5460 E=2935631.5958
J1	RIM = 77.089 SUMP = ??? UD2 INV IN = 76.523 UD1 INV OUT = 76.523	Sta=45+65.32 OFF=-35.315 L N=350462.5492 E=2934502.3222
J2	RIM = 77.395 SUMP = ??? UD2 INV OUT = 76.829	Sta=44+96.43 OFF=-35.858 L N=350483.9012 E=2934444.9622
J3	RIM = 76.605 SUMP = ??? UD4 INV IN = 76.214 UD3 INV OUT = 76.134	Sta=45+88.32 OFF=-51.693 L N=350474.8164 E=2934524.7698
J4	RIM = 76.660 SUMP = ??? UD5 INV IN = 76.270 UD4 INV OUT = 76.273	Sta=45+76.62 OFF=-58.664 L N=350483.3448 E=2934516.5793
J5	RIM = 76.791 SUMP = ??? UD6 INV IN = 76.400 UD5 INV OUT = 76.404	Sta=45+50.61 OFF=-76.254 L N=350505.1758 E=2934501.1359
J6	RIM = 76.927 SUMP = ??? UD7 INV IN = 76.540 UD6 INV OUT = 76.539	Sta=45+13.16 OFF=-77.216 L N=350515.4679 E=2934475.2408
J7	RIM = 77.061 SUMP = ??? UD8 INV IN = 76.670 UD7 INV OUT = 76.674	Sta=44+85.95 OFF=-65.835 L N=350515.4679 E=2934448.4082
J8	RIM = 77.298 SUMP = ??? UD8 INV OUT = 76.911	Sta=44+58.34 OFF=-26.238 L N=350491.6090 E=2934406.4457
OCS1	RIM = 81.997 SUMP = 73.872 O1 INV IN = 80.500 UD1 INV IN = 76.399 UD3 INV IN = 76.000 SDOCS1 INV OUT = 75.872	Sta=45+75.81 OFF=-27.284 L N=350452.6999 E=2934509.7911
SD51	RIM = 90.087 SUMP = 82.100 SD50 INV IN = 84.206 SD51 INV OUT = 84.100	Sta=72+07.97 OFF=-683.973 L N=351452.8892 E=2935260.5804

Storm Drain Pipe Table						
NAME	SIZE	LENGTH	SLOPE			MATERIAL
Box Culvert 3	144"	76.87'	0.65%	INV IN=54.500	INV OUT=54.000	Concrete Box Culvert
CULV1	18"	72.35'	0.69%	INV IN=79.500	INV OUT=79.000	18" N-12 ADS
CULV2	18"	26.66'	-7.46%	INV IN=72.813	INV OUT=74.800	N-12 ADS
CULV3	15"	28.32'	4.24%	INV IN=80.300	INV OUT=79.100	N-12 ADS
O1	6"	8.18'	0.00%	INV IN=80.500	INV OUT=80.500	6" N-12 ADS
Pipe - (55)	24"	111.08'	0.90%	INV IN=57.500	INV OUT=56.500	24" N-12 ADS
SD1	15"	20.00'	1.00%	INV IN=76.176	INV OUT=75.976	15" N-12 ADS
SD2	15"	19.02'	1.00%	INV IN=75.876	INV OUT=75.686	15" N-12 ADS
SD3	18"	203.27'	0.50%	INV IN=75.316	INV OUT=74.300	18" N-12 ADS
SD4	18"	46.33'	0.50%	INV IN=74.232	INV OUT=74.000	N-12 ADS
SD5	18"	74.30'	0.50%	INV IN=73.871	INV OUT=73.500	N-12 ADS
SD6	18"	200.27'	0.43%	INV IN=73.357	INV OUT=72.500	N-12 ADS
SD7	18"	55.56'	0.27%	INV IN=73.651	INV OUT=73.500	N-12 ADS
SD8	18"	83.70'	0.50%	INV IN=73.619	INV OUT=73.200	N-12 ADS
SD9	18"	19.90'	-0.00%	INV IN=73.100	INV OUT=73.100	N-12 ADS
SD10	18"	70.99'	0.65%	INV IN=72.960	INV OUT=72.500	N-12 ADS
SD11	18"	180.34'	0.50%	INV IN=74.702	INV OUT=73.800	N-12 ADS
SD12	15"	51.03'	0.50%	INV IN=75.055	INV OUT=74.800	N-12 ADS
SD13	15"	19.92'	-1.50%	INV IN=74.902	INV OUT=75.200	N-12 ADS
SD14	15"	88.87'	0.75%	INV IN=76.477	INV OUT=75.810	N-12 ADS
SD15	15"	27.44'	1.87%	INV IN=75.713	INV OUT=75.200	N-12 ADS
SD16	15"	18.17'	0.98%	INV IN=76.777	INV OUT=76.600	N-12 ADS
SD17	15"	23.18'	0.50%	INV IN=79.216	INV OUT=79.100	N-12 ADS
SD18	15"	136.18'	0.50%	INV IN=78.981	INV OUT=78.300	N-12 ADS
SD19	15"	43.18'	0.50%	INV IN=79.316	INV OUT=79.100	N-12 ADS
SD20	15"	46.84'	0.43%	INV IN=78.200	INV OUT=78.000	N-12 ADS
SD21	15"	15.41'	0.61%	INV IN=78.394	INV OUT=78.300	N-12 ADS
SD23	15"	15.64'	0.96%	INV IN=76.950	INV OUT=76.800	N-12 ADS
SD24	15"	107.44'	0.50%	INV IN=76.736	INV OUT=76.200	N-12 ADS
SD25	15"	106.96'	0.50%	INV IN=76.135	INV OUT=75.600	N-12 ADS
SD26	15"	50.89'	-0.38%	INV IN=75.405	INV OUT=75.600	N-12 ADS
SD27	18"	187.68'	0.50%	INV IN=75.538	INV OUT=74.600	N-12 ADS
SD28	15"	21.05'	5.25%	INV IN=76.705	INV OUT=75.600	N-12 ADS
SD29	18"	52.00'	0.50%	INV IN=74.460	INV OUT=74.200	N-12 ADS
SD30	15"	23.47'	1.00%	INV IN=76.862	INV OUT=76.627	N-12 ADS
SD31	18"	92.69'	0.50%	INV IN=74.163	INV OUT=73.700	N-12 ADS
SD32	18"	60.99'	0.50%	INV IN=73.605	INV OUT=73.300	N-12 ADS
SD33	18"	54.31'	0.50%	INV IN=73.272	INV OUT=73.000	N-12 ADS
SD34	12"	19.16'	0.50%	INV IN=77.700	INV OUT=77.604	N-12 ADS
SD35	15"	169.73'	1.71%	INV IN=77.500	INV OUT=74.600	N-12 ADS
SD36	15"	94.41'	2.12%	INV IN=74.500	INV OUT=72.500	N-12 ADS
SD37	15"	146.37'	3.32%	INV IN=72.400	INV OUT=67.540	N-12 ADS
SD38	15"	19.89'	0.50%	INV IN=72.599	INV OUT=72.500	N-12 ADS
SD39	15"	113.66'	2.50%	INV IN=67.442	INV OUT=64.600	N-12 ADS
SD40	18"	20.81'	0.45%	INV IN=64.500	INV OUT=64.406	N-12 ADS
SD41	15"	18.88'	0.50%	INV IN=64.694	INV OUT=64.600	N-12 ADS
SD42	15"	25.61'	0.50%	INV IN=64.730	INV OUT=64.602	N-12 ADS
SD43	15"	34.99'	0.50%	INV IN=65.000	INV OUT=64.825	N-12 ADS
SD45	15"	19.94'	0.50%	INV IN=65.500	INV OUT=65.400	N-12 ADS
SD46	15"	46.64'	0.50%	INV IN=65.300	INV OUT=65.067	N-12 ADS
SD47	15"	88.74'	2.70%	INV IN=87.700	INV OUT=85.300	N-12 ADS
SD48	15"	98.90'	0.50%	INV IN=85.200	INV OUT=84.706	N-12 ADS
SD49	15"	57.14'	0.50%	INV IN=85.600	INV OUT=85.314	N-12 ADS
SD50	15"	78.87'	0.50%	INV IN=84.600	INV OUT=84.206	N-12 ADS
SD51	15"	33.10'	0.50%	INV IN=84.100	INV OUT=83.934	N-12 ADS
SD52	15"	146.32'	0.50%	INV IN=83.800	INV OUT=83.068	N-12 ADS
SD53	15"	138.90'	2.52%	INV IN=82.900	INV OUT=79.400	N-12 ADS
SD54	15"	31.26'	2.56%	INV IN=83.900	INV OUT=83.100	N-12 ADS
SD55	15"	255.14'	3.02%	INV IN=79.316	INV OUT=71.604	N-12 ADS
SD56	15"	25.84'	0.50%	INV IN=79.529	INV OUT=79.400	N-12 ADS
SD57	15"	33.15'	0.50%	INV IN=79.766	INV OUT=79.600	N-12 ADS
SD58	15"	19.69'	0.45%	INV IN=71.700	INV OUT=71.610	N-12 ADS
SD59	15"	126.13'	1.98%	INV IN=71.500	INV OUT=69.000	N-12 ADS
SD60	15"	154.42'	2.48%	INV IN=68.900	INV OUT=65.070	N-12 ADS
SDOCS1	18"	94.38'	0.50%	INV IN=75.872	INV OUT=75.400	18" N-12 ADS
UD1	6"	12.36'	1.00%	INV IN=76.523	INV OUT=76.399	6" N-12 ADS

Storm Drain Pipe Table						
NAME	SIZE	LENGTH	SLOPE			MATERIAL
UD2	6"	61.21'	0.50%	INV IN=76.829	INV OUT=76.523	6" N-12 ADS
UD3	4"	26.71'	0.50%	INV IN=76.134	INV OUT=76.000	4" N-12 ADS
UD4	4"	11.82'	0.50%	INV IN=76.273	INV OUT=76.214	4" N-12 ADS
UD5	4"	26.74'	0.50%	INV IN=76.404	INV OUT=76.270	4" N-12 ADS
UD6	4"	27.87'	0.50%	INV IN=76.539	INV OUT=76.400	4" N-12 ADS
UD7	4"	26.83'	0.50%	INV IN=76.674	INV OUT=76.540	4" N-12 ADS
UD8	4"	48.27'	0.50%	INV IN=76.911	INV OUT=76.670	4" N-12 ADS

PROGRESS PLAN
NOT FOR CONSTRUCTION

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Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Structure and Pipe Tables

Cumberland Crossing – Phase 2

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CONSULTING ENGINEERS
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63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 12-18-2019
SHEET: C20

Sewer Structure Table

Structure Name	Structure Details		
SMH1	RIM = 84.924 SUMP = 80.600 SP1A INV IN = 80.600 SP1B INV IN = 80.600	Sta=43+99.90 OFF=-5.000 L N=350494.5846 E=2934342.4724	
SMH2	RIM = 86.732 SUMP = 82.400 SP2A INV IN = 82.400 SP2B INV IN = 82.400 SP2C INV IN = 82.400	Sta=48+99.41 OFF=-5.049 L N=350495.2237 E=2934815.0977	
SMH3	RIM = 85.876 SUMP = 81.600 SP3A INV IN = 81.600 SP3B INV IN = 81.600 SP3C INV IN = 81.600	Sta=50+34.74 OFF=-5.000 L N=350525.0549 E=2934947.9487	
SMH4	RIM = 91.678 SUMP = 87.400 SP4A INV OUT = 87.400	Sta=48+40.43 OFF=-300.448 L N=350755.0294 E=2934662.6517	
SMH5	RIM = 80.884 SUMP = 76.500 SP5A INV IN = 76.500 SP5C INV IN = 76.500 SP5B INV OUT = 76.500	Sta=51+04.69 OFF=316.359 R N=350200.3211 E=2934981.4343	
SMH6	RIM = 83.501 SUMP = 79.200 SP6A INV OUT = 79.200	Sta=47+91.99 OFF=319.259 R N=350153.6190 E=2934819.7796	
SMH7	RIM = 84.020 SUMP = 79.700 SP7A INV IN = 79.700 SP7B INV OUT = 79.700	Sta=53+57.04 OFF=367.954 R N=350120.1402 E=2935226.2131	
SMH8	RIM = 83.602 SUMP = 79.300 SP8A INV IN = 79.300 SP8C INV IN = 79.300 SP8B INV OUT = 79.300	Sta=55+05.12 OFF=236.093 R N=350234.1589 E=2935388.4270	
SMH9	RIM = 82.076 SUMP = 77.700 SP9A INV OUT = 77.700	Sta=55+65.20 OFF=307.983 R N=350162.1166 E=2935514.2833	
SMH10	RIM = 81.492 SUMP = 77.200 SP10A INV IN = 77.200 SP10C INV IN = 77.200 SP10B INV OUT = 77.200	Sta=54+51.92 OFF=-5.000 L N=350479.7599 E=2935363.2191	
SMH11	RIM = 72.091 SUMP = 67.700 SP11A INV IN = 67.700 SP11B INV OUT = 67.700	Sta=58+99.90 OFF=-5.000 L N=350699.9562 E=2935692.8365	
SMH12	RIM = 70.172 SUMP = 65.800 SP12A INV IN = 65.800 SP12B INV IN = 65.800 SP12C INV OUT = 65.800	Sta=59+99.59 OFF=-5.049 L N=350777.9517 E=2935754.9320	
SMH13	RIM = 84.425 SUMP = 80.100 SP13B INV IN = 80.100 SP13C INV IN = 80.100 SP13A INV OUT = 80.100	Sta=63+29.05 OFF=-523.244 L N=351180.9058 E=2935361.5033	
SMH14	RIM = 86.450 SUMP = 82.100 SP14A INV OUT = 82.100	Sta=62+90.37 OFF=-602.197 L N=351158.7028 E=2935276.4339	
SMH15	RIM = 88.909 SUMP = 84.600 SP15A INV IN = 84.600 SP15B INV OUT = 84.600	Sta=63+97.72 OFF=-631.846 L N=351325.7116 E=2935283.8559	
SMH16	RIM = 90.349 SUMP = 86.000 SP16B INV IN = 86.000 SP16C INV IN = 86.000 SP16A INV OUT = 86.000	Sta=64+23.62 OFF=-682.035 L N=351431.0100 E=2935268.3075	
SMH17	RIM = 92.492 SUMP = 88.200 SP17A INV OUT = 88.200	Sta=72+74.51 OFF=-583.592 L N=351567.9900 E=2935296.0087	
SMH18	RIM = 89.867 SUMP = 85.500 SP18A INV OUT = 85.500	Sta=63+94.52 OFF=-676.603 L N=351327.1942 E=2935237.6466	
Structure - (96)	RIM = 85.442 SUMP = 80.442	Sta=68+82.21 OFF=-5.000 L N=351603.1880 E=2935946.5943	Concentric Structure 48 dia 18 frame 24 cone
Structure - (97)	RIM = 80.545 SUMP = 75.545	Sta=64+99.84 OFF=-5.000 L N=351240.2322 E=2935923.2614	Concentric Structure 48 dia 18 frame 24 cone

Sewer Pipe Table

NAME	SIZE	LENGTH	SLOPE	MATERIAL
SP1A	4"	3.16'	0.00%	4" HDPE FM
SP1B	4"	4.69'	0.00%	4" HDPE FM
SP2A	4"	3.73'	0.00%	4" HDPE FM
SP2B	4"	5.49'	0.00%	4" HDPE FM
SP2C	4"	5.80'	0.00%	4" HDPE FM
SP3A	4"	4.36'	22.08%	4" HDPE FM
SP3B	4"	3.55'	0.00%	4" HDPE FM
SP3C	4"	5.54'	0.00%	4" HDPE FM
SP4A	4"	3.46'	0.00%	4" HDPE FM
SP5A	4"	3.80'	0.00%	4" HDPE FM
SP5B	4"	5.05'	0.00%	4" HDPE FM
SP5C	4"	4.34'	25.35%	4" HDPE FM
SP6A	4"	5.17'	0.00%	4" HDPE FM
SP7A	4"	4.18'	0.00%	4" HDPE FM
SP7B	4"	2.93'	0.00%	4" HDPE FM
SP8A	4"	3.42'	0.00%	4" HDPE FM
SP8B	4"	5.92'	0.00%	4" HDPE FM
SP8C	4"	4.80'	0.00%	4" HDPE FM
SP9A	4"	3.73'	0.00%	4" HDPE FM
SP10A	4"	4.23'	0.00%	4" HDPE FM

Sewer Pipe Table

NAME	SIZE	LENGTH	SLOPE	MATERIAL
SP10B	4"	4.48'	0.00%	4" HDPE FM
SP10C	4"	5.10'	0.00%	4" HDPE FM
SP11A	4"	5.25'	0.00%	4" HDPE FM
SP11B	4"	6.25'	0.00%	4" HDPE FM
SP12A	4"	5.01'	0.00%	4" HDPE FM
SP12B	4"	5.36'	0.00%	4" HDPE FM
SP12C	4"	7.29'	0.00%	4" HDPE FM
SP13A	4"	6.20'	0.00%	4" HDPE FM
SP13B	4"	5.32'	0.00%	4" HDPE FM
SP13C	4"	8.68'	0.00%	4" HDPE FM
SP14A	4"	5.96'	0.00%	4" HDPE FM
SP15A	4"	5.40'	14.80%	4" HDPE FM
SP15B	4"	9.20'	0.00%	4" HDPE FM
SP16A	4"	7.54'	0.00%	4" HDPE FM
SP16B	4"	5.82'	0.00%	4" HDPE FM
SP16C	4"	4.87'	0.00%	4" HDPE FM
SP17A	4"	5.16'	0.00%	4" HDPE FM
SP18A	4"	4.59'	0.00%	4" HDPE FM

Little Acres Extension

Number	Radius	Length	Line/Chord Direction	A Value
L1		120.47	N83° 42' 40.60"E	
C1	300.00	51.92	N78° 45' 11.90"E	
L2		111.93	N73° 47' 43.20"E	
C2	300.00	218.33	S85° 21' 21.92"E	
L3		55.45	S64° 30' 27.04"E	
C3	300.00	233.55	S86° 48' 35.01"E	
L4		204.33	N70° 53' 17.02"E	
C4	300.00	134.53	N83° 44' 06.12"E	
L5		442.92	S83° 25' 04.77"E	
C5	200.00	248.80	N60° 56' 40.75"E	
L6		68.42	N25° 18' 26.28"E	
C6	200.00	46.24	N31° 55' 48.61"E	
L7		175.54	N38° 33' 10.94"E	
C7	250.00	118.16	N25° 00' 48.22"E	
L8		200.78	N11° 28' 25.50"E	
C8	250.00	51.69	N17° 23' 47.61"E	
L9		146.87	N23° 19' 09.72"E	
C9	250.00	74.09	N14° 49' 47.28"E	
L10		73.15	N6° 20' 24.83"E	
C10	250.00	142.48	N9° 59' 13.41"W	
L11		226.96	N26° 18' 51.64"W	
C11	250.00	56.89	N32° 50' 02.20"W	
L12		216.36	N39° 21' 12.77"W	

1

Number	Radius	Length	Line/Chord Direction	A Value
L25		183.77	N51° 57' 10.65"W	
C19	250.00	48.59	N46° 23' 05.50"W	
L26		286.85	N40° 49' 00.36"W	
C20	250.00	54.91	N34° 31' 27.48"W	
L27		154.08	N28° 13' 54.59"W	
C21	60.00	375.91	S62° 16' 55.82"W	

2

Number	Radius	Length	Line/Chord Direction	A Value
L16		224.36	S1° 26' 12.44"E	
C14	200.00	365.74	S53° 49' 30.44"E	
L17		121.00	N73° 47' 11.56"E	
C15	100.00	151.85	N30° 17' 02.92"E	
L18		103.10	N13° 13' 05.72"W	
C16	200.00	69.12	N3° 19' 05.25"W	
L19		44.20	N6° 34' 55.23"E	

3

Number	Radius	Length	Line/Chord Direction	A Value
L13		75.96	N18° 17' 12.28"W	
C12	160.00	35.26	N24° 36' 02.06"W	
L14		92.06	N30° 54' 51.84"W	
C13	160.00	28.48	N36° 00' 47.51"W	
L15		88.20	N41° 06' 43.17"W	

4

Number	Radius	Length	Line/Chord Direction	A Value
L20		60.53	S62° 33' 45.81"W	
C17	125.00	55.04	S75° 10' 37.43"W	
L21		114.79	S87° 47' 29.05"W	

5

Number	Radius	Length	Line/Chord Direction	A Value
L22		150.01	S18° 05' 53.08"E	

6

Number	Radius	Length	Line/Chord Direction	A Value
L23		16.79	S84° 27' 18.60"E	
C18	125.00	106.54	S60° 02' 17.05"E	
L24		76.93	S35° 37' 15.50"E	

7

Number	Radius	Length	Line/Chord Direction	A Value
L28		18.69	S61° 46' 05.41"W	
C22	125.00	58.69	S75° 13' 08.64"W	
L29		65.33	S88° 40' 11.88"W	

8

Number	Radius	Length	Line/Chord Direction	A Value
L30		154.53	N11° 25' 57.44"E	

PROGRESS PLAN
NOT FOR CONSTRUCTION

THIS DOCUMENT IS ISSUED FOR INFORMATIONAL PURPOSES ONLY. THE DATA SHOWN HEREON IS SUBJECT TO REVISION.

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

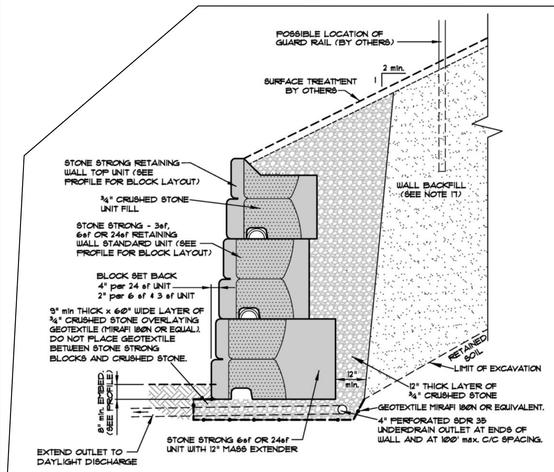
STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

Structure and Pipe Tables

Cumberland Crossing – Phase 2

BELANGER ENGINEERING
CONSULTING ENGINEERS
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 12-18-2019
SHEET: C21



TYPICAL WALL CROSS SECTION
NOT TO SCALE

GENERAL NOTES

1) WALL PLAN & PROFILE IS BASED UPON A SET OF PLANS ENTITLED "OCEANVIEW AT CUMBERLAND", DATED AUGUST 21, 2018, PREPARED BY BELANGER ENGINEERING. REFERENCE IS SPECIFICALLY MADE TO SHEET C21 OF THE PLAN SET FOR BOX CULVERT INFORMATION.

2) IT IS THE RESPONSIBILITY OF THE OWNER, CONTRACTOR OR THEIR RESPECTIVE REPRESENTATIVES TO ENSURE THAT CONSTRUCTION OF THE WALL AND MATERIALS USED IN THE CONSTRUCTION OF THE WALL ARE IN ACCORDANCE WITH THESE SPECIFICATIONS AND/OR THE CONTRACT SPECIFICATIONS WHICH EVER ARE MORE STRINGENT.

3) THE CONTRACTOR SHALL VERIFY THE CULVERT LOCATION PRIOR TO INSTALLING THE WALLS. THE CONTRACTOR SHALL CONTACT SGS PRIOR TO INSTALLING ANY BLOCKS IN IF ADJUSTMENTS ARE NEEDED BASED ON THE CULVERT LOCATION.

4) SUMMIT GEOENGINEERING SERVICES (SGS) ACCEPTS NO RESPONSIBILITY NOR LIABILITY IN THE DETERMINATION OF THE ADEQUACY OF SITE MATERIALS AND WALL LAYOUT.

5) PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL VERIFY THAT ALL ELEVATIONS AND ASSUMED SITE CONDITIONS SHOWN ON THESE DRAWINGS ARE ACCURATE TO THE GIVEN SITE CONDITIONS. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF SGS PRIOR TO THE START OF CONSTRUCTION.

6) TEST PITS WERE PERFORMED AT THE SITE BY SGS. THE FOLLOWING PARAMETERS WERE USED IN THE DESIGN:
   A) SLOPE AT TOP = 2(H) : 1(V)
   B) SLOPE AT BASE = LEVEL
   C) GROUNDWATER CONTROLLED TO BELOW BASE OF WALL
   D) MAXIMUM CONTACT PRESSURE AT WALL BASE 2,400 psf
   E) RETAINED SOIL - γ_{dry} = 135 pcf, ϕ = 32°
   F) FOUNDATION SOIL - γ_{dry} = 120 pcf, ϕ = 32°
   G) PEAK GROUND ACCELERATION COEFFICIENT = 0.20

   IF ACTUAL CONDITIONS VARY FROM THOSE LISTED ABOVE, SGS SHALL BE NOTIFIED IMMEDIATELY.

7) WALL INSPECTION AND CERTIFICATION ARE NOT PART OF THE SGS SCOPE OF DESIGN SERVICES. IT IS THE OWNERS RESPONSIBILITY TO CONFIRM WITH THE JURISDICTIONAL AUTHORITY PRIOR TO CONSTRUCTION OF THE WALL WHETHER A CONSTRUCTION CERTIFICATION IS REQUIRED. A CONSTRUCTION CERTIFICATION WILL REQUIRE ON-SITE INSPECTIONS, MATERIAL TESTING, PHOTOGRAPHIC DOCUMENTATION AND OTHER QUALITY CONTROL MEASURES AND AS-BUILT DOCUMENTATION. SGS CAN PROVIDE CERTIFICATION, IF REQUIRED, UNDER A SEPARATE CONTRACT.

8) THE OWNER IS RESPONSIBLE TO RETAIN THE SERVICES OF A QUALIFIED CONSTRUCTION MATERIALS FIRM TO PERFORM COMPACTION TESTS ON WALL BACKFILL TO CONFIRM THAT THE MINIMUM COMPACTION REQUIREMENTS ARE MET.

WALL INSTALLATION

9) THE STONE STRONG WALL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE STONE STRONG MANUALS (www.stonestrong.com).

10) FOUNDATION EXCAVATION SHALL EXTEND TO COMPETENT SOIL. ALL EXISTING TOPSOIL, LOOSE MATERIAL, FILL, ORGANIC SOIL AND OTHER SOFT OR UNSTABLE FOUNDATION SOILS SHALL BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE WALL AND REPLACED WITH GEOTEXTILE AND ¾" CRUSHED STONE IN ACCORDANCE WITH THESE PLANS AND AS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER.

11) UPON COMPLETION OF THE EXCAVATION, THE WALL BASE SUBGRADE SHALL BE PROOF ROLLED BY MAKING A MINIMUM OF 6 PASSES USING A LARGE VIBRATORY PLATE COMPACTOR. THE WALL SUBGRADE SHALL BE DE-WATERED TO A MINIMUM OF 12" BELOW THE CRUSHED STONE BASE.

12) INSTALL A 9" (MINIMUM THICK) LAYER OF COMPACTED ¾" CRUSHED STONE ON TOP OF THE GEOTEXTILE LAYER FOR BLOCK WALL LEVELING PAD. EXTEND LEVELING PAD (1) ONE FOOT HORIZONTALLY IN ALL DIRECTIONS BEYOND LIMITS OF THE STONE STRONG BLOCKS.

13) INSTALL THE BASE COURSE OF BLOCKS ON A PREPARED FOUNDATION LEVELING PAD. ENSURE THAT THE BASE COURSE IS LEVEL SIDE TO SIDE AND PLUMB. ADJUST BLOCKS AS REQUIRED TO PROVIDE A STRAIGHT AND LEVEL BASE COURSE. PLACE AND BACKFILL ONLY ONE COURSE OF BLOCKS AT A TIME. DO NOT STACK BLOCKS PRIOR TO BACKFILLING.

14) PLACE CRUSHED STONE AND WALL BACKFILL WITH A MAXIMUM LIFT THICKNESS OF 18", COMPACT WALL BACKFILL TO A MINIMUM OF 95% OF ASTM D1557. FIELD DENSITY TESTS SHALL BE PERFORMED AT A MINIMUM RATE OF 3 TESTS PER EVERY OTHER LIFT.

15) AT THE END OF EACH WORKDAY, BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE A MINIMUM OF 2% SLOPE. THE BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH DRUM ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL. A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE CREST OF THE GRAVITY STRUCTURES TO PREVENT SURFACE WATER RUNOFF FROM OVERTOPPING THE WALLS.

MATERIAL SPECIFICATIONS

16) ¾" CRUSHED DRAINAGE STONE SHALL BE CLEAN ANGULAR CRUSHED STONE MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422.

SIEVE SIZE	PERCENT PASSING
1"	100
1/4"	90 - 100
3/8"	20 - 55
No. 4	0 -10
No. 8	0 - 5

17) WALL BACKFILL SHALL MEET THE FOLLOWING GRADATION SPECIFICATIONS (MDOT 703.06 TYPE D)

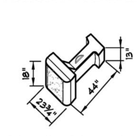
SIEVE SIZE	PERCENT PASSING
3"	100
1/2"	35 - 80
1/4"	25 - 65
No. 40	0 - 30
No. 200	0 - 7

18) THE MAXIMUM PARTICLE SIZE SHALL BE LIMITED TO 6".

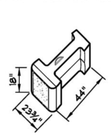
19) BLOCKS SHALL BE 3 s.f., 6 s.f., 9 s.f. AND 24 s.f. "STONE STRONG", MANUFACTURED BY PRECAST CONCRETE PRODUCTS OF MAINE, INC.

20) GEOTEXTILE SHALL CONSIST OF MIRAFI 180N OR APPROVED EQUIVALENT.

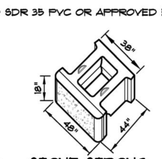
21) UNDERDRAIN PIPE SHALL CONSIST OF 4" PERFORATED SDR 35 PVC OR APPROVED EQUIVALENT.



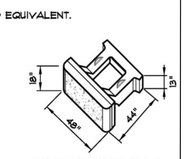
STONE STRONG 3 S.F. TOP UNIT
NOT TO SCALE



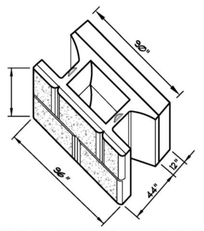
STONE STRONG 3 S.F. UNIT
NOT TO SCALE



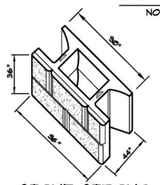
STONE STRONG 6 S.F. UNIT
NOT TO SCALE



STONE STRONG 6 S.F. TOP UNIT
NOT TO SCALE



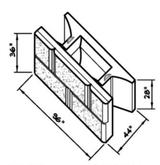
STONE STRONG 24 SF UNIT WITH 12" MASS EXTENDER
NOT TO SCALE



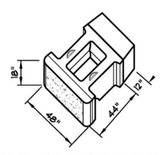
STONE STRONG 24 SF UNIT
NOT TO SCALE



STONE STRONG 9 S.F. END UNIT
NOT TO SCALE



STONE STRONG 24 SF TOP UNIT
NOT TO SCALE



STONE STRONG 6 S.F. UNIT WITH 12" MASS EXTENDER
NOT TO SCALE

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · LICENSED PROFESSIONAL ENGINEER
12-18-2019

Stone Strong Block Notes and Detail
(coordinate design with Summit Engineering)

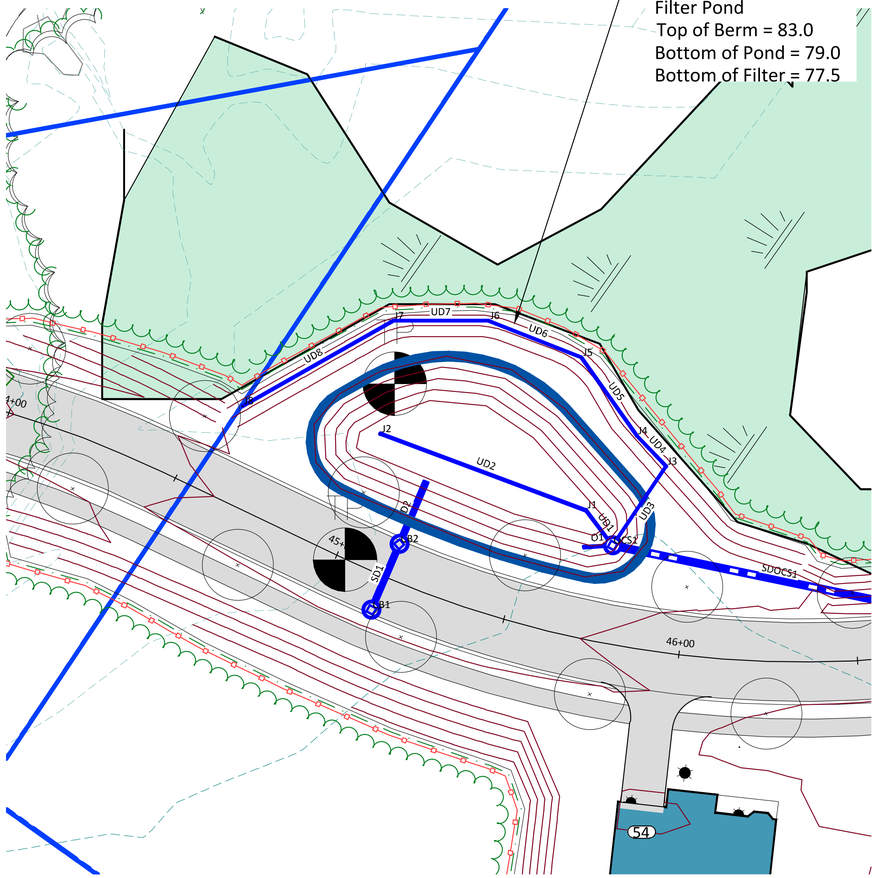
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

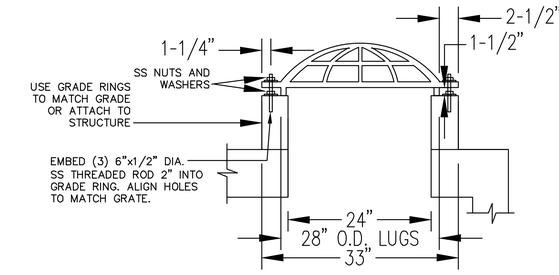
BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
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- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
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- SITE PLANNING & DESIGN
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- EROSION CONTROL PLANS

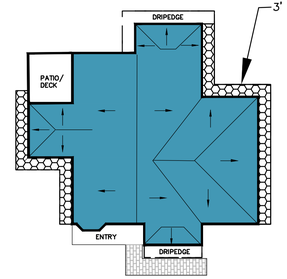
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DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



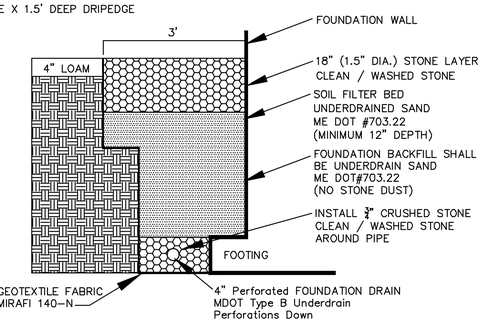
Plan View
1"=40'



2 OUTLET STRUCTURE TOP SECTION
NOT TO SCALE



ROOF DRIPLINE BMP PLAN DETAIL
NOT TO SCALE HG COTTAGES – PHASES 4 A-C



ROOF DRIPLINE BMP SECTION DETAIL
NOT TO SCALE HG COTTAGES – PHASES 4 A-C

Highland Green Cottage

Cross Sectional Area of Dripedge = (((3'X1.5')X0.4) = 1.8 s.f./l.f.
Linear Feet of Dripedge = 120'
Volume of voids = 1.8 s.f./l.f. X 120 l.f. = 216 c.f.

Area of building roof = 2,000 s.f.
Store 1"
Volume of dripedge required = 2,000 s.f. X .083' (1 inch) = 166 c.f.

CONSTRUCTION OVERSIGHT ROOF DRIPLINE INSTALLATION

The applicant/owner will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Roof Dripline Filtration

Construction Inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the geotextile lining, after the foundation drain pipe is installed but not yet backfilled, after the pipe bedding gravel is placed but prior to the placement of the gravel filter media, after the gravel filter media has been placed but prior to installing the crushed stone surface layer, and after the surface crushed stone surface layer is installed.

Testing and submittals: The gravel filter media and pipe bedding media used in the roof dripline filtration BMP must be confirmed as suitable by testing. The contractor shall identify the source of these gravels and obtain samples for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the gravel is placed as part of the dripline filter's construction.

- Obtain a sample of the gravel filter media. The sample must be a composite of three different locations (grabs) from the gravel stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the sand filter media showing it meets the following gradation:

Sieve Size	% Passing by Weight
3"	100
#200	4-7

- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.

MEDOT Specifications for Underdrains (ME DOT#703.22)	
Sieve Size	% Passing by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
Underdrain Type C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

FILTER POND 47P CONTROL STRUCTURE DETAIL (OCS1)
(NOT TO SCALE)

FILTER POND 47P
SOIL FILTER DETAIL
(NOT TO SCALE)

NOTE:
FILTER POND SOIL FILTER DETAILS DEPICTS ELEVATIONS AT THE BOTTOM PERIMETER OF THE POND AND NOT THE LOW POINT OF THE POND. SEE SITE PLAN GRADING AND SECTION FOR LOW POINT OF ELEVATION (TYPICALY NEAR THE CONTROL STRUCTURE)

CONSTRUCTION OVERSIGHT

The applicant will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

VEGETATED UNDERDRAINED SOIL FILTER BASINS

Construction inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the embankment fill, after the underdrain pipes are installed but not backfilled, after the pipe bedding fill is placed but prior to the placement of the filter media, and after the filter media has been placed and the filter surface seeded.

Testing and submittals: All the soil, mulch, and aggregate used for the construction of the vegetated underdrained soil filter basin must be confirmed as suitable by testing. The contractor shall identify the source of each material and obtain samples for each material for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the fill or aggregate is placed as part of the vegetated underdrained soil filter basin's construction.

- Obtain a sample of the filter media consisting of a blend of sand, topsoil, and wood fiber mulch (or other approved organic source). The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform analyses of the blended filter media showing it has 8% to 12% by weight passing the #200 sieve as determined by ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A), has a clay content of less than 2%, and has an organic matter content of no less than 10% by dry weight.

- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

- If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.

SOIL FILTER MEDIA (OPTION 2)		
DEPTH	FILTER MEDIA	SPECIFICATION
0" – 4"	TOPSOIL	LOAMY COARSE SAND WITH 8-15% FINES PASSING THE #200 SIEVE SEE TABLE 7.1.3
4" – 6"	WOOD CHIPS	pH BETWEEN 5.0-8.0, SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 mmhos/cm.
6" – 18"	GRAVELY COARSE SAND MIX	GRAVELY COURSE SAND MIXED WITH 20-30% WOOD FIBER MULCH, LESS THAN 12% FINES PASSING THE #200 SIEVE

INSTALLATION NOTES:
THE FILTER MEDIA IS TO BE INSTALLED IN THE BASIN ONLY AFTER THE AREA DRAINING TO THE BASIN HAS BEEN STABILIZED WITH PERMANENT MEASURES.

THE FILTER MEDIA IN THE BASIN IS TO BE ONLY LIGHTLY COMPACTED TO NO MORE THAN 92% STANDARD PROCTOR.

Table 7.1.3 Loamy Coarse Sand Specifications	
Sieve Size #	% Passing by Weight
No. 10	85-100
No. 20	70-100
No. 60	15-40
No. 200	8-15
(200 Clay Size)	< 2.0

Table 7.1.2 Sandy Loam to Fine Sandy Loam Specifications	
Sieve Size #	% Passing by Weight
No. 4	75-95
No. 10	60-90
No. 40	35-85
No. 200	20-70
(200 Clay Size)	< 2.0

SOIL FILTER MEDIA SCHEDULE

Underdrained Soil Filter Pond Details
Cottage Roof Drip Line Details

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

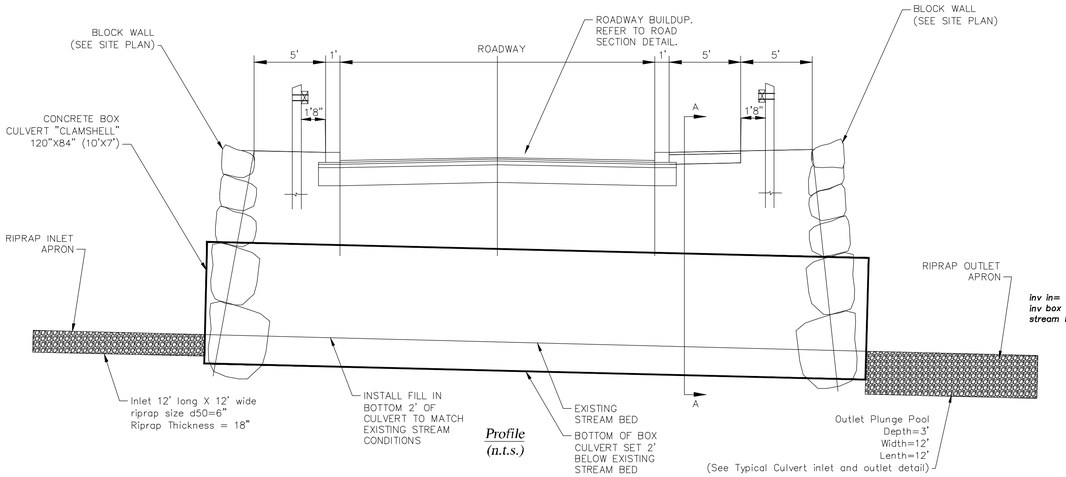
STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
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- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

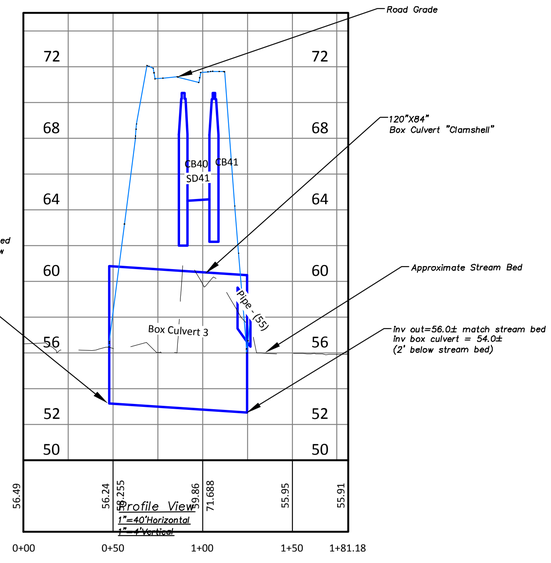
FIELD WK:	SCALE:	SHEET: C25
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

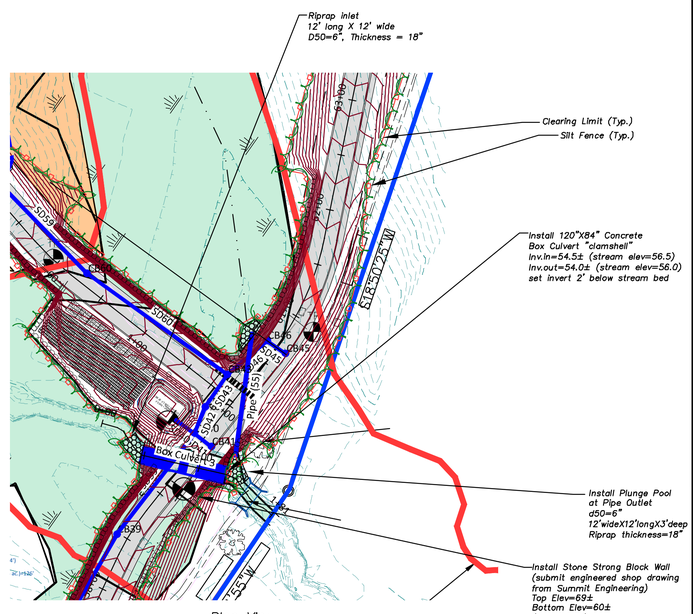
NOTES:
1. COMMON BORROW USED FOR BACKFILL SHALL CONSIST OF EARTH, SUITABLE FOR EMBANKMENT CONSTRUCTION. IT SHALL BE FREE FROM FROZEN MATERIAL, PERISHABLE RUBISSH, PEAT, AND OTHER UNSUITABLE MATERIALS INCLUDING MATERIAL CURRENTLY OR PREVIOUSLY CONTAMINATED BY CHEMICAL, RADIOLOGICAL, OR BIOLOGIAL AGENTS. ALL MATERIAL SHALL HAVE NO ROCKS WITH A MAXIMUM DIMENSION OVER 6 INCHES. ON-SITE MATERIAL MAY BE USED IF IT MEETS THE ABOVE SPECIFIED REQUIREMENTS.



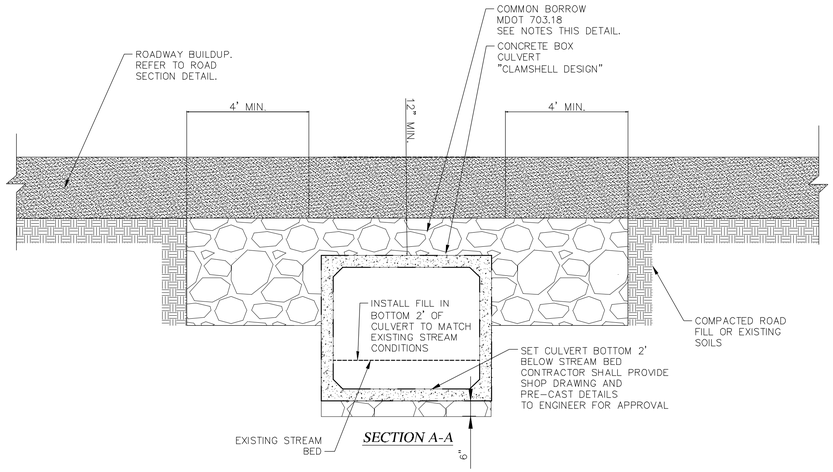
Profile (n.t.s.)

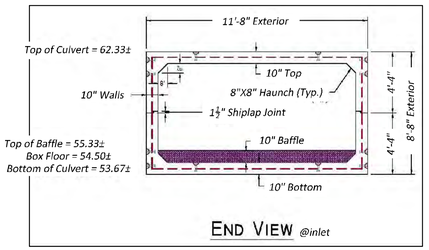
Box Culvert 3 Profile PROFILE





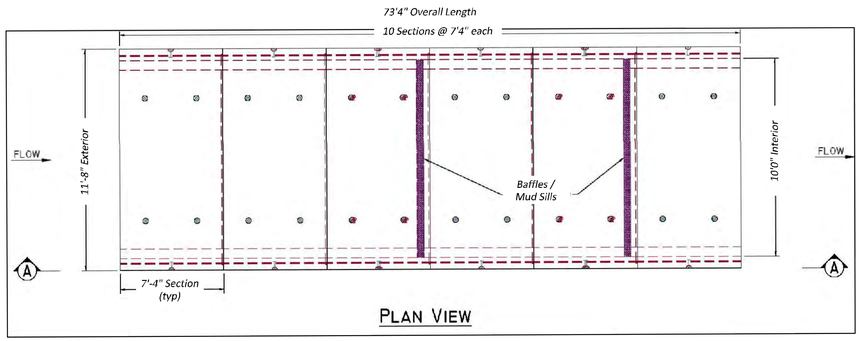
Plan View
1"=40'



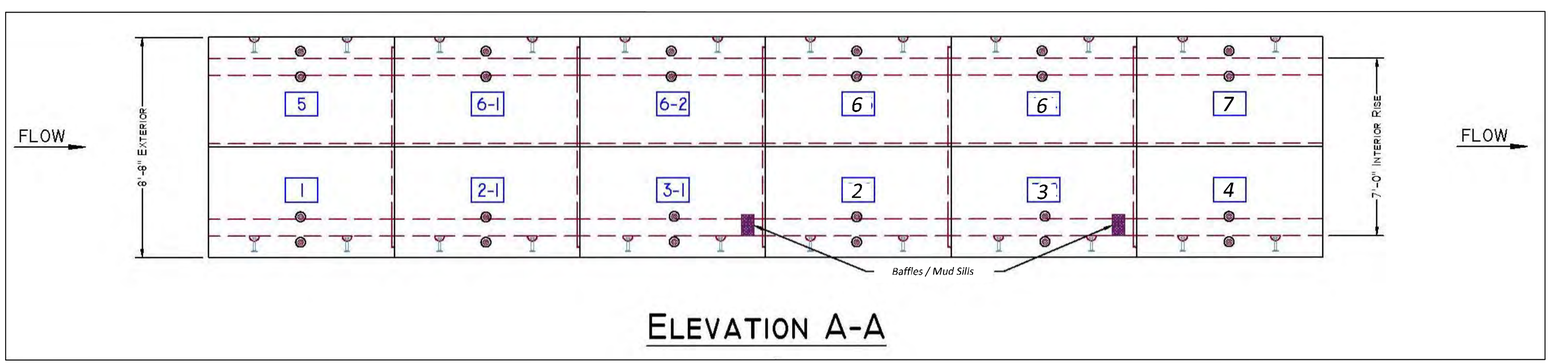


END VIEW @inlet

Note:
1. CONTRACTOR SHALL PROVIDE SHOP DRAWING TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.



PLAN VIEW



ELEVATION A-A

American Concrete Industries
1717 Stillwater Ave. Veazie, ME
Tel: 207-947-8334
Fax: 207-947-3590

982 Minot Ave. Auburn, ME
Tel: 207-784-1388
Fax: 207-783-4039

ITEM	QTY	BILL OF MATERIALS
1	(1)	7'-4" UPSTREAM END BOTTOM (21,150 #)
5	(1)	7' 4" UPSTREAM END TOP (20,975 #)
2	(4)	7' 4" MID SECTION BOTTOM (21,350 # EA)
6	(8)	7'-4" MID SECTION TOP (21,150 # EA)
3	(4)	7'-4" MID BOTTOM W/ SHOULL (22,200 # EA)
4	(1)	7'-4" DOWNSTREAM END BOTTOM (21,550 #)
7	(1)	7'-4" DOWNSTREAM END TOP (21,350 #)

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

CHRISTOPHER S. BELANGER 9098 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE
12-18-2019

Box Culvert 3 Details

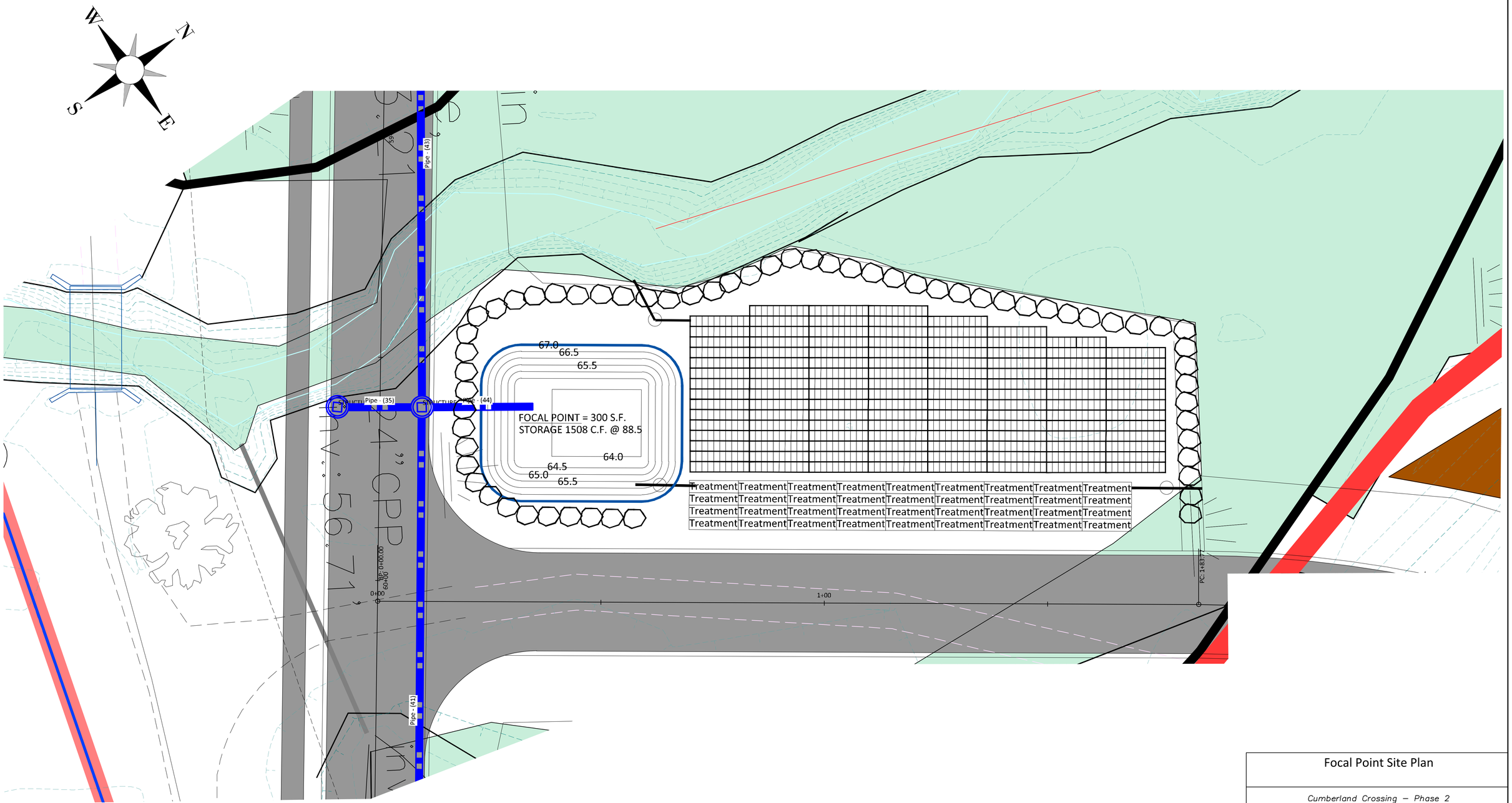
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

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- TOWN AND STATE APPROVALS
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- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C26
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
PROFESSIONAL ENGINEER
LICENSED

12-18-2019

Focal Point Site Plan

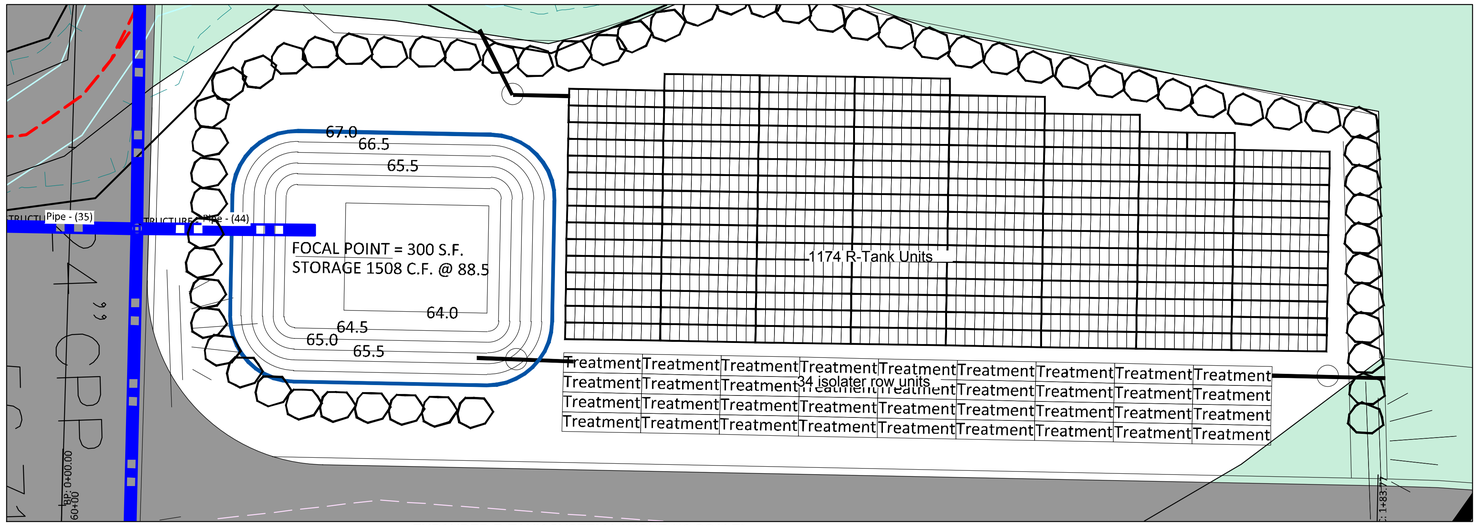
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
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63 Second Avenue , Augusta, Maine 04330
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FIELD WK:	SCALE: 1"=10'	SHEET: C27
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



EXPANDED R-TANK SYSTEM LAYOUT (10 SCALE)

R-TANK SYSTEM DIMESIONAL DATA			
R-TANK SYSTEM I.D.	FP-1		
R-TANK^{HD} MODULE	DOUBLE		
# TANKS WIDE	see plan		
# TANKS LONG	see plan		
STONE PERIMETER WIDTH	2 FT		
SYSTEM WIDTH	see plan		
SYSTEM LENGTH	see plan		
R-TANK INVERT	58.0		
STONE BASE ELEV	57.5		
R-TANK TOP ELEV	61.0		
MIN COVER (20")	2'		
MAX COVER (7 FT)	2'		

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
8-3-2018

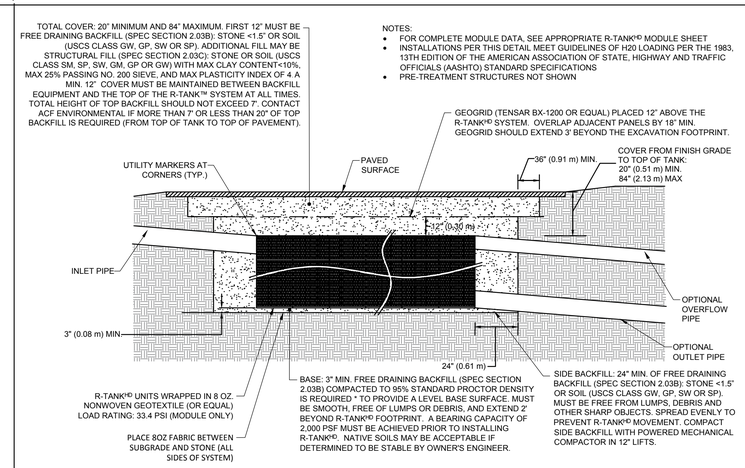
DATE	REVISION
-	-

X-REF PROJECT SPECIFIC MODULE DETAIL

MODULE DATA

1

R-TANK^{HD} DOUBLE - MODULE DETAIL



NOTES:
- FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{HD} MODULE SHEET
- INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF H20 LOADING PER THE 1983, 13TH EDITION OF THE AMERICAN ASSOCIATION OF STATE, HIGHWAY AND TRAFFIC OFFICIALS (AASHTO) STANDARD SPECIFICATIONS
- PRE-TREATMENT STRUCTURES NOT SHOWN

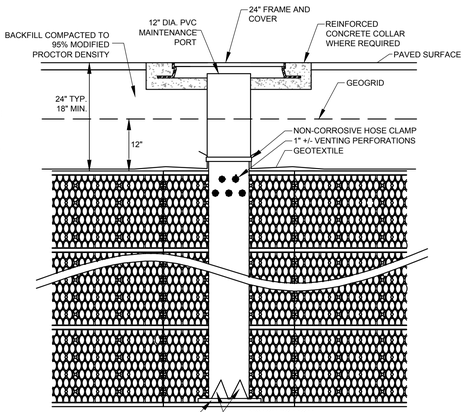
* FOR INFILTRATION APPLICATIONS, BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03B) TO PROVIDE A LEVEL BASE SURFACE. MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT. A BEARING CAPACITY OF 2,000 PSF MUST BE ACHIEVED PRIOR TO INSTALLING R-TANK^{HD}.

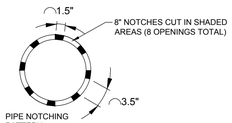
2

R-TANK^{HD} - H-20 LOADS

MAINTENANCE PORT

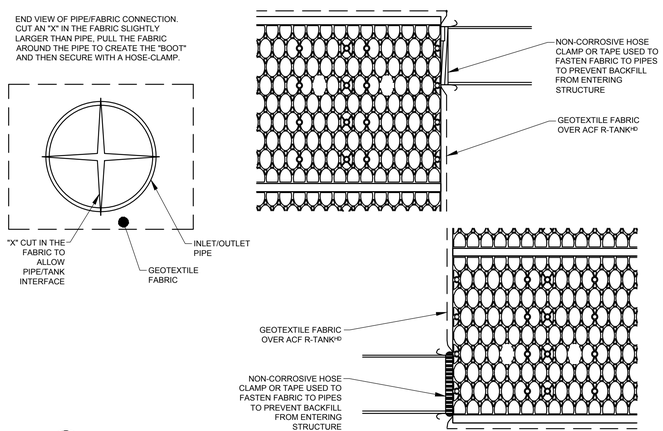
THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.





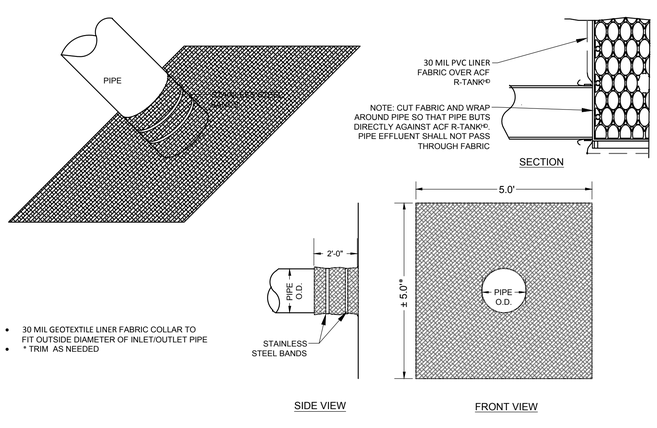
3

R-TANK^{HD} TYPICAL MAINTENANCE PORT



4

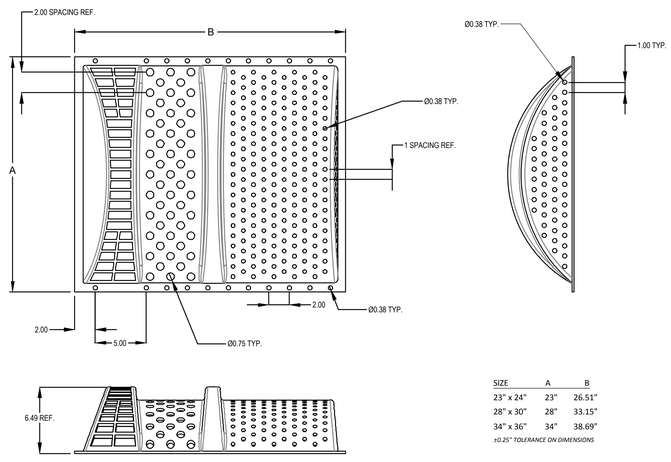
R-TANK^{HD} TYPICAL TANK INLET/OUTLET DETAIL



- 30 MIL GEOTEXTILE LINER FABRIC COLLAR TO FIT OUTSIDE DIAMETER OF INLET/OUTLET PIPE
- * TRIM AS NEEDED

5

GEOTEXTILE PIPE BOOT FOR R-TANK^{HD}



SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

6

TRASH GUARD PLUS DETAIL

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF ENVIRONMENTAL 1-800-448-3636
www.acfenvironmental.com

ACF ENVIRONMENTAL
LET'S GET IT DONE

R-TANK^{HD} DETAILS FOR EXPANDED FOCALPOINT SYSTEM UNDERDRAINS

PROJECT NAME
CITY, STATE

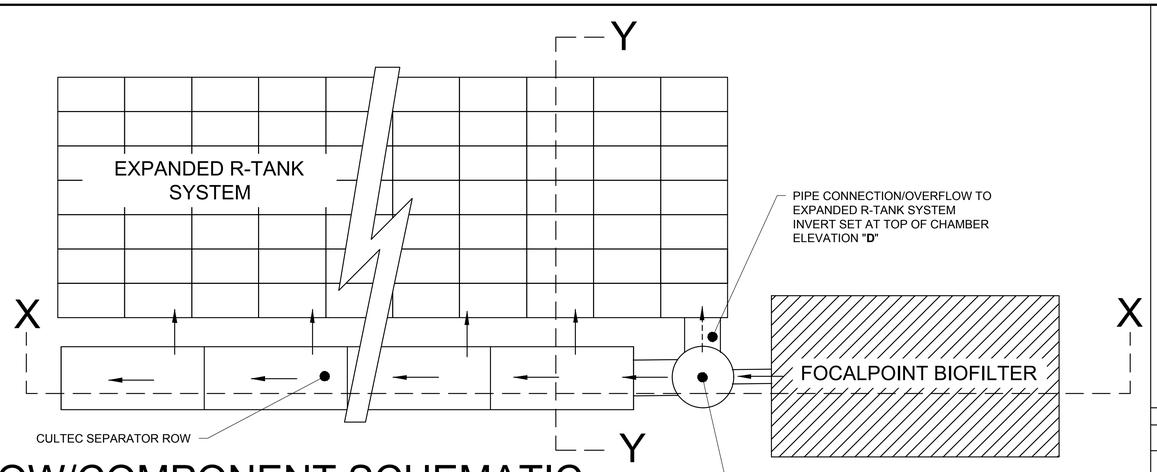
PROJECT NO.
109

DATE
September 18, 2018

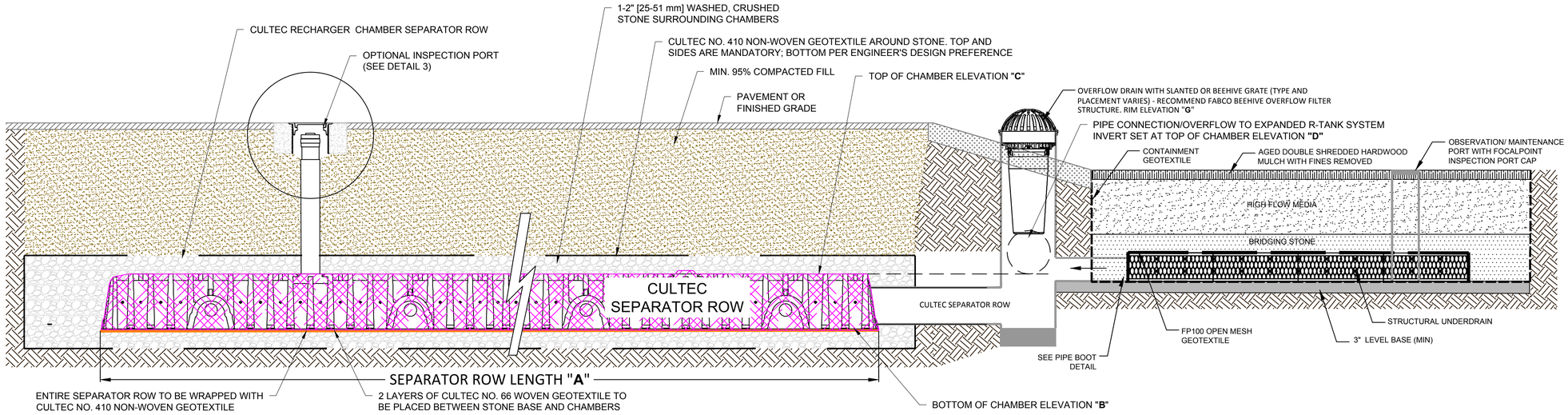
SHEET NO.
C28

REV 3/18/16

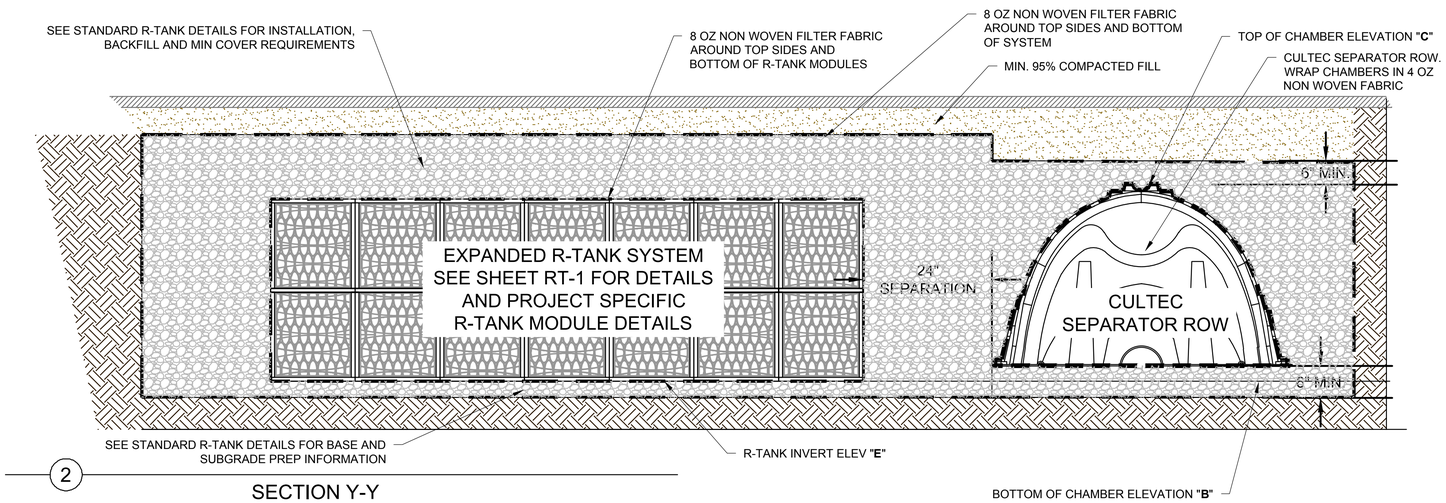
SEPARATOR ROW KEY DIMENSIONAL DATA				
FOCALPOINT I.D.		FP#1-Sta 60+00 left		
	CULTEC CHAMBER	150XLHD		
	# CULTEC CHAMBERS	34		
A	SEPARATOR ROW LENGTH	99' (9 units X 11')		
B	BOTTOM OF CHAMBER ELEV	58.5		
C	TOP OF CHAMBER ELEV	61.0		
D	OVERFLOW PIPE TO R-TANK ELEV	61.0		
E	R-TANK INVERT	57.5 (verify)		
F	R-TANK MODULE	DOUBLE		
G	BEEHIVE OVERFLOW RIM	65.5		



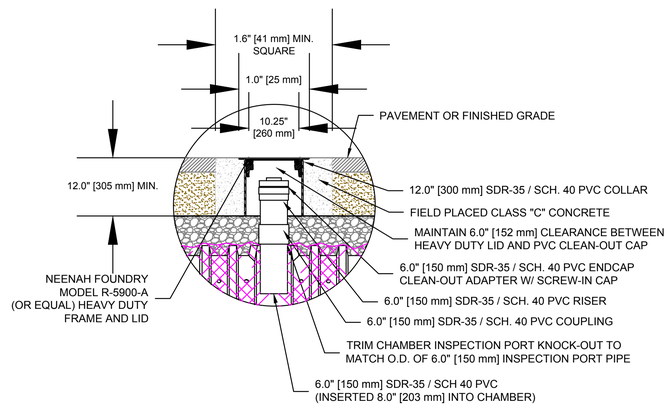
FLOW/COMPONENT SCHEMATIC



1 SECTION X-X (NTS)



2 SECTION Y-Y



3 CULTEC SEPARATOR ROW INSPECTION PORT DETAIL

NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

DATE	REVISION
-	-

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF ENVIRONMENTAL 1-800-448-3636
www.acfenvironmental.com

SEPARATOR ROW SYSTEM DETAILS

Oceanview @ Cumberland
291 Tuttle Road, Cumberland, Maine

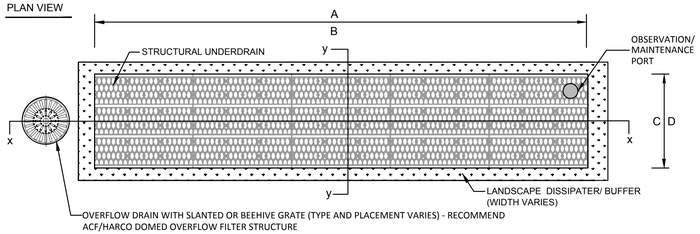
PROJECT NO.
134

DATE
December 18, 2019

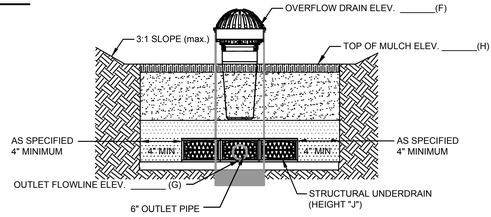
SHEET NO.
C29

FOCALPOINT KEY DIMENSIONAL DATA								
FOCALPOINT I.D.		#1-Sta 60+00 lt.						
A	FOCALPOINT LENGTH	20'						
B	# UNDERDRAIN LONG	20'						
C	FOCALPOINT WIDTH	15'						
D	# UNDERDRAIN WIDE	3'						
E	WATER QUALITY VOLUME	9683 c.f.						
F	OVERFLOW ELEVATION	65.5						
G	OUTLET FLOWLINE	61.0						
H	TOP OF MULCH	64.0						
J	UNDERDRAIN HEIGHT	MINI						

PLAN VIEW

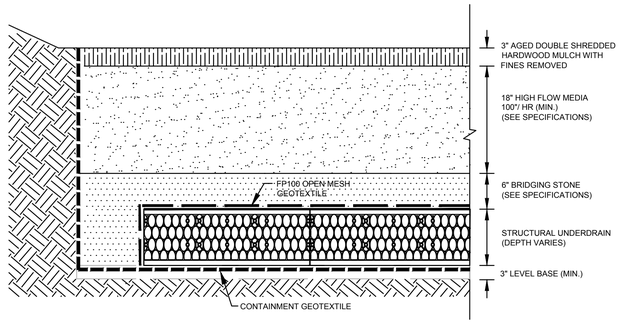


SECTION Y-Y



1

FOCALPOINT CONSTRUCTION GUIDE



FOCALPOINT HP PERFORMANCE SPECIFICATION:

HIGH PERFORMANCE MEDIA

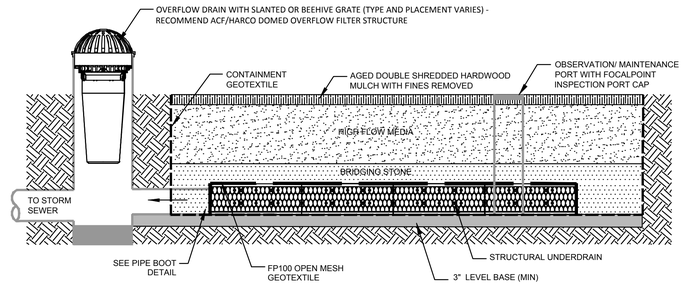
HIGH PERFORMANCE MEDIA MUST MEET A MINIMUM OF 100" PER HOUR INFILTRATION RATE.

HIGH PERFORMANCE STRUCTURAL UNDERDRAIN

MUST HAVE A MINIMUM OF 19 SQUARE INCHES OF ORIFICE OPENING PER SQUARE FOOT.
MUST MEET H20 LOADING REQUIREMENTS.
MUST BE MODULAR IN NATURE AND ASSEMBLED ON SITE.
MUST HAVE MINIMUM 90% INTERIOR VOID SPACE.

2

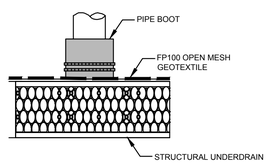
FOCALPOINT DETAILED CROSS SECTION



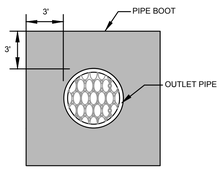
3

FOCALPOINT SECTION X-X

OBSERVATION/ MAINTENANCE PORT CONNECTION

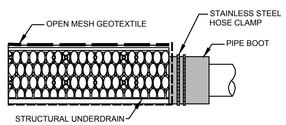


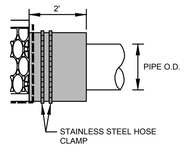
PIPE BOOT DETAIL



FRONT VIEW

OUTLET/ INLET PIPE CONNECTION





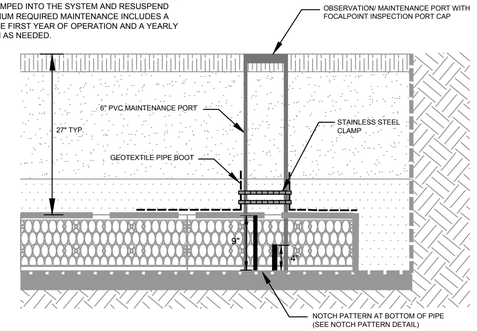
SIDE VIEW

4

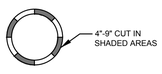
FOCALPOINT PIPE CONNECTION DETAIL

OBSERVATION/ MAINTENANCE PORT

PORT USED FOR INSPECTION PURPOSES AND FOR SYSTEM MAINTENANCE AS REQUIRED. WATER SHALL BE PUMPED INTO THE SYSTEM AND RESUSPEND ACCUMULATED SEDIMENT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION FOR THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER FLUSH AS NEEDED.



PIPE NOTCH PATTERN DETAIL

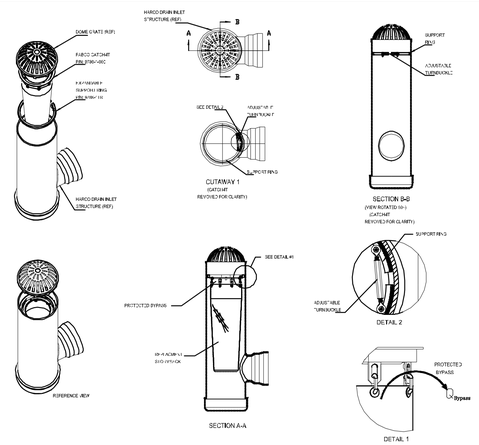


5

FOCALPOINT OBSERVATION PORT DETAIL

NOTES:
1. STORMSACK WEIGHT (EMPTY): 12 LB MAX
2. MATERIAL:
A) SHROUD: HIGH DENSITY POLYETHYLENE (TYPICAL WALL THICKNESS .125")
B) SUPPORT HUB: CRS, POWDER COATED
C) STORMSACK: WOVEN POLYPROPYLENE GEOTEXTILE (GEOTEX 117F)
D) HARDWARE: ALUMINUM POP-RIVETS
3. RECOMMENDED MINIMUM VAULT DEPTH: 24-IN BELOW CARTRIDGE
4. TYPICAL INSTALLATION: RAISE STORM GRATE, PUSH CATCH-IT SHROUD DOWN ON FRAME SUPPORT LEDGE UNTIL LOCKING CLIPS CLICK IN PLACE, LOWER STORM GRATE.
5. USE ONLY WITH FABCO REPLACEABLE STORMSACK.

STRUCTURE GRATE "X" W-CH ES	DEBRIS CAPACITY (CF)	% FILTERED FLOWRATE (GPS)	BYPASS FLOWRATE (CFS)	TOTAL SYSTEM FLOWRATE (CFS)
-7	0.77	2.2	1.2	3.4
-9	1.63	2.2	1.3	3.5
24	3.00	4.5	2.7	7.2
36	6.00	4.5	2.7	7.2



6

ACF/HARCO DOMED OVERFLOW FILTER RISER

REV 12/14/19

NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

DATE	REVISION
-	-

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF ENVIRONMENTAL 1-800-448-3636
www.acfenvironmental.com

FOCALPOINT SYSTEM DETAILS

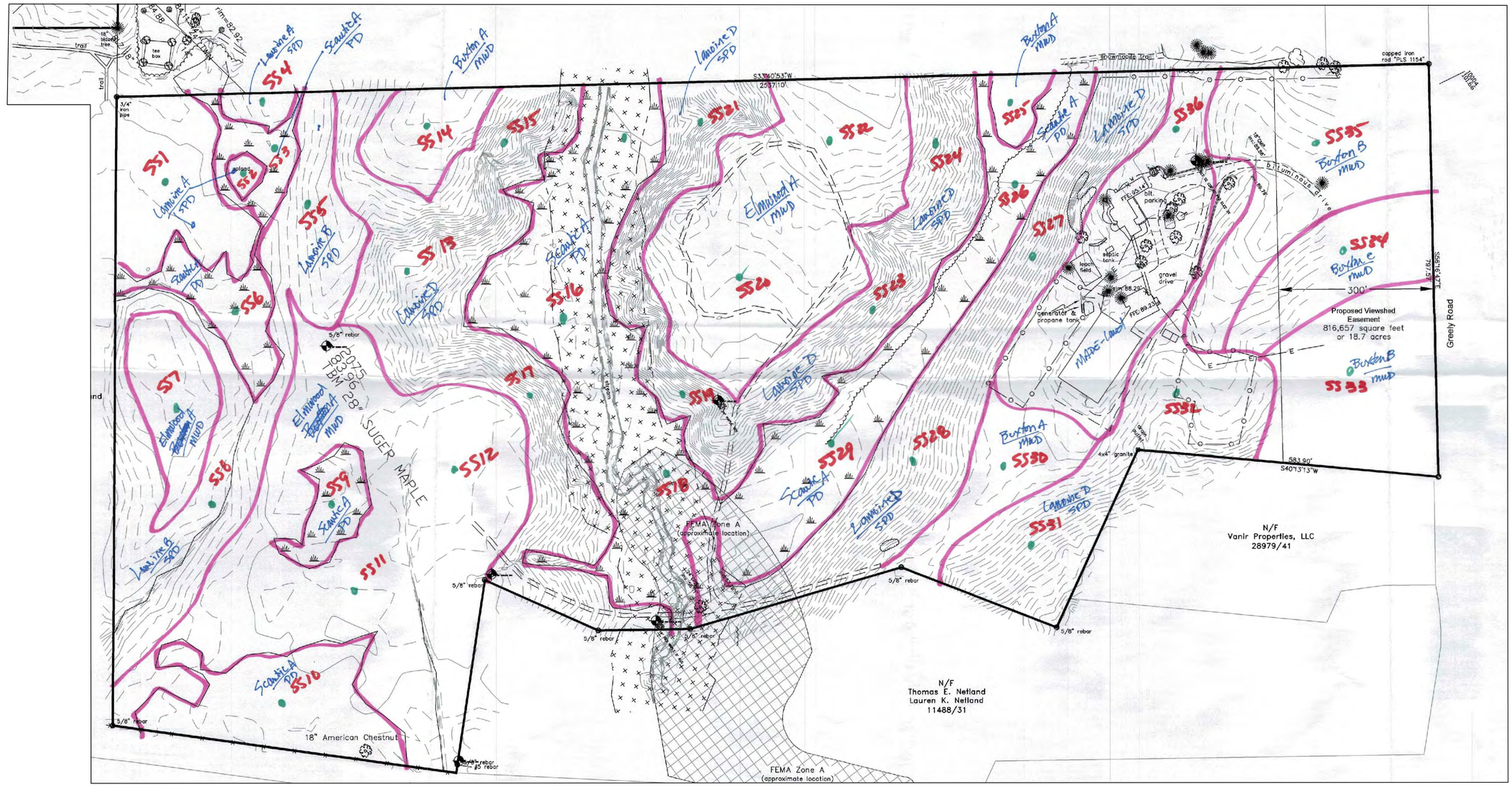
Oceanview @ Cumberland

Tuttle Road, Cumberland, Maine

PROJECT NO.
134

DATE
December 18, 2019

SHEET NO.
C30



Legend for Soil Maps

1. Drainage Class

Excessively Well Drained	*EWD*
Well Drained	*WD*
Moderately Well Drained	*MWD*
Somewhat Poorly Drained	*SPD*
Poorly Drained	*PD*
Very Poorly Drained	*VPD*

2. Slope Designation

0-3%	*A*
3-8%	*B*
8-15%	*C*
15-25%	*D*
>25%	*E*

3. Note: High Intensity Soil Survey has been prepared by Mark Hampton Associates, Inc. in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft.

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER

Class B High Intensity Soil Survey

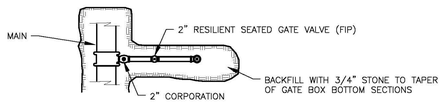
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

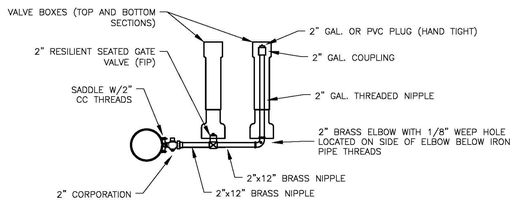
BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Ph 207-622-1462, Cell 207-242-5713
Email: cbelanger@roadrunner.com

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET: C32
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

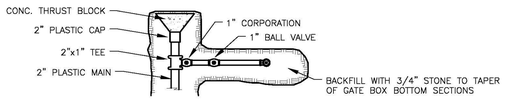


TOP VIEW

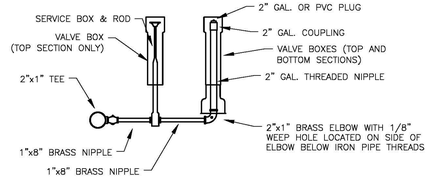


SIDE VIEW

SIDE–ARM BLOW–OFF (4" & LARGER MAINS)

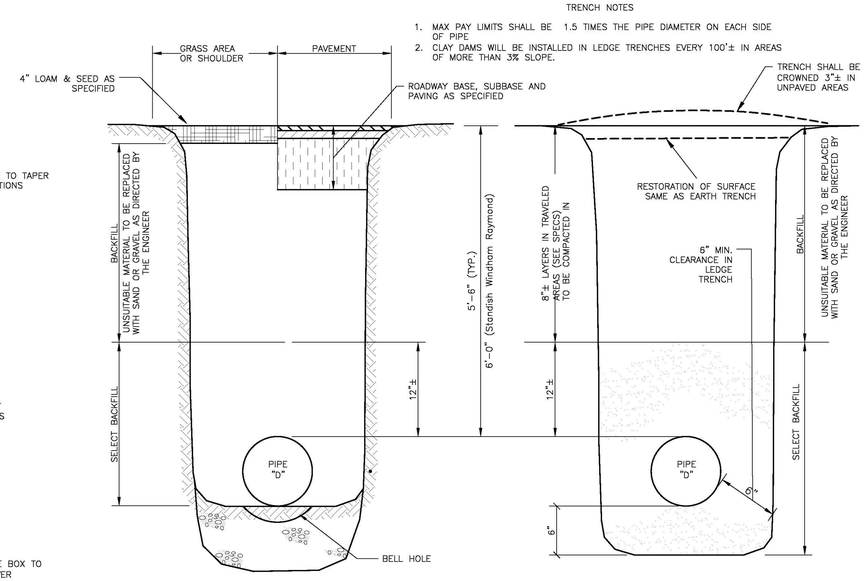


TOP VIEW



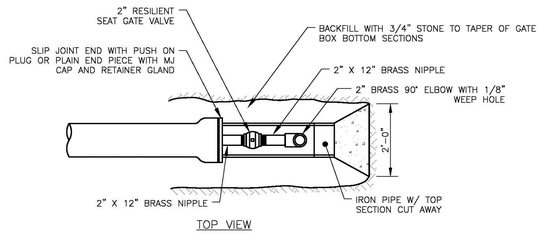
SIDE VIEW

SIDE–ARM BLOW–OFF (2" MAIN)



SECTION THRU EARTH TRENCH

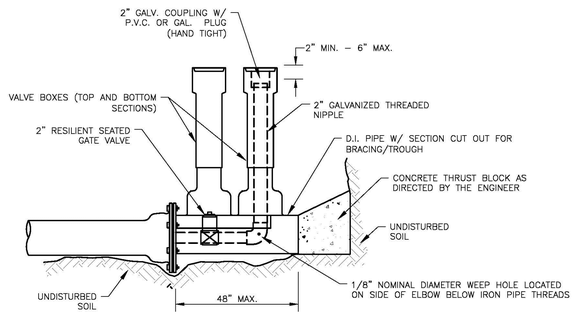
SECTION THRU LEDGE TRENCH



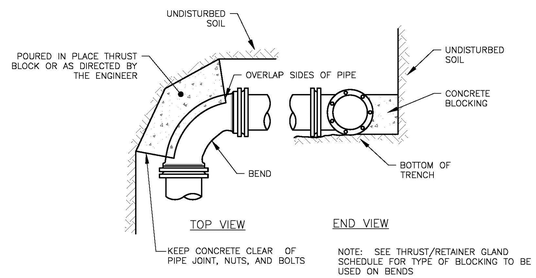
TOP VIEW

TYPICAL AIR VALVE (1")

TYPICAL HYDRANT INSTALLATION DETAIL



STANDARD 2" BLOW OFF



TOP VIEW END VIEW

STANDARD BEND BLOCKING

1. 12-18-2019 Submit to Town and Maine DEP CSB

PORTLAND WATER DISTRICT STANDARD DETAILS 1

Cumberland Crossing
Tuttle and Greely Roads, Cumberland, Maine

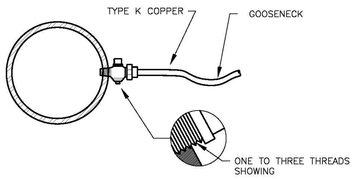
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

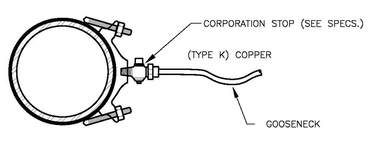
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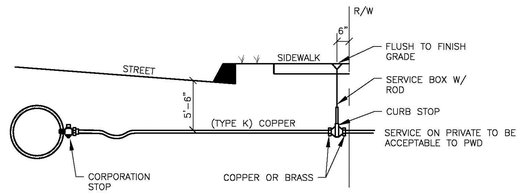
FIELD WK:	SCALE:	SHEET: C33
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



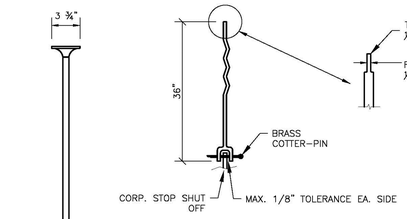
SERVICE TAP
(3/4" AND 1" C.C. THREAD)



SERVICE SADDLE
(1-1/2" AND 2" C.C. THREAD)

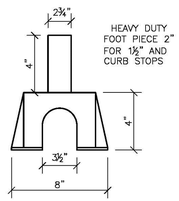


TYPICAL SERVICE CONNECTION

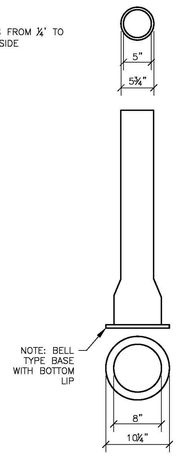


SERVICE BOX

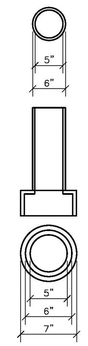
SERVICE ROD



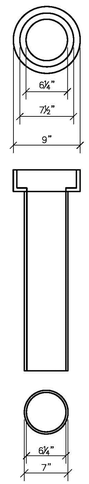
FOOT PIECE



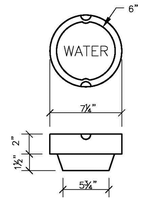
BASE SECTION NO. 645



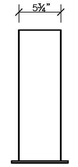
INTERMEDIATE SECTION NO.58



TOP SECTION NO.56



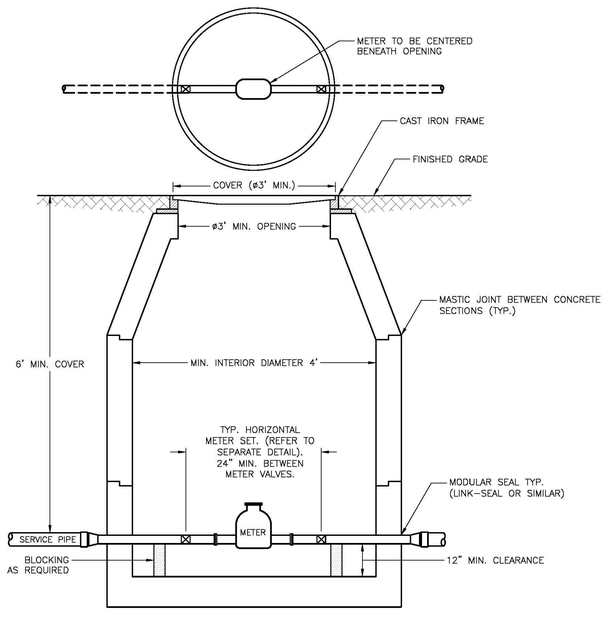
DROP STYLE COVER



(NUMBERS ARE FOR 5 ¼" BUFFALO VALVE BOXES)
(BASE SECTION MAY BE USED AS INTERMEDIATE SECTION)

VALVE BOX & COVER

NOTE: ANY EXTENSION OF SERVICE BOX REQUIRES:
1. 1" FEMALE IRON PIPE COUPLING
2. 1" THREADED PIPE (THIS IS TO BE A NON-WELDED, TWO PIECE ARRANGEMENT. SLIP ON ADAPTERS ARE NOT PERMISSIBLE.)



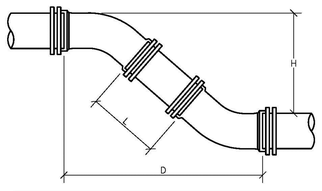
TYPICAL SMALL METER PIT
(⅝" TO 2" METER)

METER PIT AND COVER NOTES

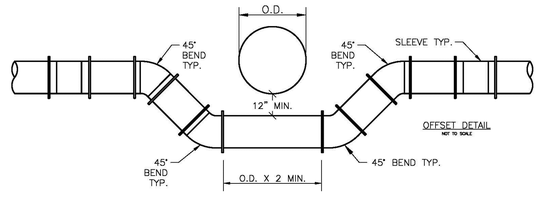
1. THE METER PIT SHALL BE SUPPLIED AND INSTALLED BY THE CUSTOMER AND LOCATED ON PRIVATE PROPERTY BETWEEN 10' AND 20' FROM THE PROPERTY LINE.
2. THE METER PIT SHALL BE MADE OF PRECAST CONCRETE OF SUFFICIENT SIZE TO PROVIDE 5.5' MINIMUM GROUND COVER FROM FINISHED GRADE TO THE TOP OF THE SERVICE PIPE. ANY SEAMS BETWEEN CONCRETE SECTIONS SHALL BE SEALED WITH MASTIC JOINT. ALL OPENINGS IN THE CONCRETE FOR SERVICE PIPING SHALL BE SEALED WITH A MODULAR SEAL (LINK-SEAL OR SIMILAR).
3. THE INTERIOR OF THE METER PIT SHALL BE A MINIMUM OF 4' IN DIAMETER, AND THE METER PIT OPENING SHALL BE A MINIMUM OF 30" IN DIAMETER WITH A CAST IRON FRAME. THE METER PIT COVER SHALL BE CAST IRON, 32" MINIMUM IN DIAMETER, AND BE EITHER PERMANENTLY LABELED "WATER" OR HAVE NO LABEL. ANY STEEL PLATE MATERIAL SHALL BE COATED WITH A RUST INHIBITOR PAINT.
4. WALL-MOUNTED LADDER RUNGS SHALL NOT BE INSTALLED WITHIN METER PIT.
5. ALL PIPING INSIDE AND EXTENDING THROUGH THE METER PIT SHALL BE MADE OF COPPER, WITH A MINIMUM OF 6" CLEARANCE FROM THE METER PIT FLOOR. BLOCKING SHALL BE INSTALLED AS REQUIRED TO SUPPORT THE PIPE.
6. CUSTOMER SHALL ENSURE THE METER PIT AND COVER ARE PROPERLY RATED FOR TRAFFIC FLOW, IF APPLICABLE.

METER NOTES

7. ONLY PWD PERSONNEL ARE AUTHORIZED TO INSTALL WATER METERS. PWD PERSONNEL ARE ADDITIONALLY AUTHORIZED TO OPERATE METER VALVES AS NEEDED FOR INSTALLATION AND MAINTENANCE.
8. PWD WILL SUPPLY THE WATER METER. ALL OTHER FITTINGS, INCLUDING A METER RESETTER FOR 1" OR SMALLER METERS, SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER.
9. FOR 1.5" AND 2" METERS, CUSTOMER SHALL INSTALL A FLANGED METER SPOOL PIECE, SUPPLIED BY PWD AT NO ADDITIONAL CHARGE, PRIOR TO METER SET. THE METER SPOOL WILL BE MADE AVAILABLE FOR CUSTOMER PICKUP AT PWD CUSTOMER SERVICE, 225 DOUGLASS STREET, PORTLAND DURING NORMAL BUSINESS HOURS.
10. CUSTOMER WILL INSTALL TWO BALL VALVES AT LEAST 24" APART FOR METER INSTALLATION, ALLOWING FOR THE WATER METER TO BE CENTERED UNDER THE METER PIT OPENING. THE BALL VALVES SHALL BE SOLDERED IN PLACE.
11. THE METER PIT MAY HOUSE UP TO TWO 5/8", 3/4" OR 1" METERS WITH PRIOR APPROVAL FROM PWD.



	6" PIPE		8" PIPE		12" PIPE	
H	D	L	D	L	D	L
12"	1' 8-1/2"	0' 10-1/2"	1' 7-1/2"	0' 9-1/2"	1' 11-1/2"	0' 5-1/2"
13"	1' 7-1/2"	0' 11-7/8"	1' 8-1/2"	0' 10-7/8"	2' 0-1/2"	0' 6-7/8"
14"	1' 8-1/2"	1' 1-5/16"	1' 9-1/2"	1' 0-5/16"	2' 1-1/2"	0' 8-5/16"
15"	1' 9-1/2"	1' 2-11/16"	1' 10-1/2"	1' 1-11/16"	2' 2-1/2"	0' 9-11/16"
16"	1' 10-1/2"	1' 4-1/8"	1' 11-1/2"	1' 3-1/8"	2' 3-1/2"	0' 11-1/8"
17"	1' 11-1/2"	1' 5-9/16"	2' 0-1/2"	1' 4-9/16"	2' 4-1/2"	1' 0-9/16"
18"	2' 0-1/2"	1' 8-15/16"	2' 1-1/2"	1' 5-15/16"	2' 5-1/2"	1' 1-15/16"
19"	2' 1-1/2"	1' 8-3/8"	2' 2-1/2"	1' 7-3/8"	2' 6-1/2"	1' 3-3/8"
20"	2' 2-1/2"	1' 9-13/16"	2' 3-1/2"	1' 8-13/16"	2' 7-1/2"	1' 4-13/16"
21"	2' 3-1/2"	1' 11-3/16"	2' 4-1/2"	1' 10-3/16"	2' 8-1/2"	1' 6-3/16"
22"	2' 4-1/2"	2' 0-5/8"	2' 5-1/2"	1' 11-5/8"	2' 9-1/2"	1' 7-5/8"
23"	2' 5-1/2"	2' 2"	2' 6-1/2"	2' 1"	2' 10-1/2"	1' 9"
24"	2' 6-1/2"	2' 3-7/16"	2' 7-1/2"	2' 2-7/16"	2' 11-1/2"	1' 10-7/16"
25"	2' 7-1/2"	2' 4-7/8"	2' 8-1/2"	2' 3-7/8"	3' 0-1/2"	1' 11-7/8"
26"	2' 8-1/2"	2' 6-1/4"	2' 9-1/2"	2' 5-1/4"	3' 1-1/2"	2' 1-1/4"
27"	2' 9-1/2"	2' 7-11/16"	2' 10-1/2"	2' 6-11/16"	3' 2-1/2"	2' 2-11/16"
28"	2' 10-1/2"	2' 9-1/8"	2' 11-1/2"	2' 8-1/8"	3' 3-1/2"	2' 4-1/8"
29"	2' 11-1/2"	2' 10-1/2"	3' 0-1/2"	2' 9-1/2"	3' 4-1/2"	2' 5-1/2"
30"	3' 0-1/2"	2' 11-15/16"	3' 1-1/2"	2' 10-15/16"	3' 5-1/2"	2' 6-15/16"
31"	3' 1-1/2"	3' 1-5/16"	3' 2-1/2"	3' 0-5/16"	3' 6-1/2"	2' 8-5/16"
32"	3' 2-1/2"	3' 2-3/4"	3' 3-1/2"	3' 1-3/4"	3' 7-1/2"	2' 9-3/4"
33"	3' 3-1/2"	3' 4-3/16"	3' 4-1/2"	3' 3-3/16"	3' 8-1/2"	2' 11-3/16"
34"	3' 4-1/2"	3' 5-9/16"	3' 5-1/2"	3' 4-9/16"	3' 9-1/2"	3' 0-9/16"
35"	3' 5-1/2"	3' 7"	3' 6-1/2"	3' 6"	3' 10-1/2"	3' 2"
36"	3' 6-1/2"	3' 8-7/16"	3' 7-1/2"	3' 7-7/16"	3' 11-1/2"	3' 3-7/16"
37"	3' 7-1/2"	3' 9-13/16"	3' 8-1/2"	3' 8-13/16"	4' 0-1/2"	3' 4-13/16"
38"	3' 8-1/2"	3' 11-1/4"	3' 9-1/2"	3' 10-1/4"	4' 1-1/2"	3' 6-1/4"
39"	3' 9-1/2"	4' 0-11/16"	3' 10-1/2"	3' 11-11/16"	4' 2-1/2"	3' 7-11/16"
40"	3' 10-1/2"	4' 2-1/8"	3' 11-1/2"	4' 1-1/16"	4' 3-1/2"	3' 9-1/16"
41"	3' 11-1/2"	4' 3-1/2"	4' 0-1/2"	4' 2-1/2"	4' 4-1/2"	3' 10-1/2"
42"	4' 0-1/2"	4' 4-7/8"	4' 1-1/2"	4' 3-7/8"	4' 5-1/2"	3' 11-7/8"
43"	4' 1-1/2"	4' 6-5/16"	4' 2-1/2"	4' 5-5/16"	4' 6-1/2"	4' 1-5/16"
44"	4' 2-1/2"	4' 7-3/4"	4' 3-1/2"	4' 6-3/4"	4' 7-1/2"	4' 2-3/4"
45"	4' 3-1/2"	4' 9-1/8"	4' 4-1/2"	4' 8-1/8"	4' 8-1/2"	4' 4-1/8"
46"	4' 4-1/2"	4' 10-9/16"	4' 5-1/2"	4' 9-9/16"	4' 9-1/2"	4' 5-9/16"
47"	4' 5-1/2"	4' 11-15/16"	4' 6-1/2"	4' 10-15/16"	4' 10-1/2"	4' 6-15/16"
48"	4' 6-1/2"	5' 1-3/8"	4' 7-1/2"	5' 0-3/8"	4' 11-1/2"	4' 8-3/8"
49"	4' 7-1/2"	5' 2-13/16"	4' 8-1/2"	5' 1-13/16"	5' 0-1/2"	4' 9-13/16"
50"	4' 8-1/2"	5' 4-3/16"	4' 9-1/2"	5' 3-3/16"	5' 1-1/2"	4' 11-3/16"
51"	4' 9-1/2"	5' 5-5/8"	4' 10-1/2"	5' 4-5/8"	5' 2-1/2"	5' 0-5/8"
52"	4' 10-1/2"	5' 7-1/16"	4' 11-1/2"	5' 6-1/16"	5' 3-1/2"	5' 2-1/16"
53"	4' 11-1/2"	5' 8-7/16"	5' 0-1/2"	5' 7-7/16"	5' 4-1/2"	5' 3-7/16"
54"	5' 0-1/2"	5' 9-7/8"	5' 1-1/2"	5' 8-7/8"	5' 5-1/2"	5' 4-7/8"
55"	5' 1-1/2"	5' 11-5/16"	5' 2-1/2"	5' 10-5/16"	5' 6-1/2"	5' 6-5/16"



NOTE: DIMENSIONS APPLICABLE FOR SIGMA COMPACT BENDS. FOR TYLER COMPACT BENDS, ADD 1/2" TO "D" DIMENSION AND SUBTRACT 1/2" FROM "L" DIMENSION. FOR OTHER FITTINGS REFER TO MANUFACTURER'S RECOMMENDATIONS.

TYPICAL MAIN OFFSET

1.	12-18-2019	Submit to Town and Maine DEP — CSB

PORTLAND WATER DISTRICT STANDARD DETAILS 2

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE — CHRISTOPHER S. BELANGER 9098 — LICENSED PROFESSIONAL ENGINEER
12-18-2019

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330 Email: cbelanger@roadrunner.com Ph 207-622-1462, Cell 207-242-5713

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- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET: C34
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

Phase 1
Approved 2018

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 12-18-2019

Subarea	Total Area	Total Area	Existing Impervious Area	New Impervious Area	New Impervious Area Treated	Existing Lawn Area	New Lawn Area	New Developed Area	New Developed Area Treated	Existing Woods/Field Undeveloped	Treatment BMP
	sf	acres	acres	acres	acres	acres	acres	acres	acres	acres	
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.16	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	368.16	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	121.75	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	9.03	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.46	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.41	4.12	4.12	0.82	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.26	0.84	0.84	0.24	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.05	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	5.82	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.05	721	
				>95%	98%	✓	>80%		80%	✓	

OV Cumberland Phase 2 Impervious Area Summary 12-18-2019

Description	Road Length feet	New Impervious Area s.f.	New Impervious Area acres	New Lawn Area s.f.	New Lawn Area acres	New Developed Area s.f.	New Developed Area acres	Comments
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Road 1 - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Road 2 - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Road 3 - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Road 4 - Sta 90+00-Sta92+30	230	4140	0.10					18', no curb
Road 5 - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Road 6 - Sta 96+00-Sta98+00	200	3600	0.08					18' no curb
Road 1 Spurs (2)	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5566	333733	7.66	459874	10.56	824534	18.93	

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.29	-30%
10 YEAR	25.22	20.6	-22%
25 YEAR	42.47	28.17	-51%
50 YEAR	64.8	41.49	-56%
100 YEAR	85.78	55.83	-54%

Cumberland Crossing Phase 2
Buffer Treatment Table

Treatment BMP	Soil Name	HSG	Slope	Buffer Length	Impervious Area Treated	Lawn Area Treated	Stone Berm Level Spreader Width (180' X Imp.+54' X lawn) FB (240' X Imp.+72' X lawn) MB
				Feet	Acres	Acres	Linear Feet
Forest Buffer #1	Lamoine	C	9-15%	100'	1.07	1.59	278
Forest Buffer #2	Lamoine	C	9-15%	100'	0.58	0.26	118
Forest Buffer #3	Lamoine	C	0-8%	100'	0.16	0.23	34
Meadow Buffer #4	Lamoine	C	9-15%	100'	0.54	0.17	142

STORMWATER LEGEND

- HYDROCAD POND
- HYDROCAD SUBAREA
- HYDROCAD REACH
- TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB — SOIL DESCRIPTION
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED PAVEMENT
- EXISTING / APPROVED PAVEMENT
- PAVEMENT REMOVED
- PROPOSED DEVELOPED AREA LAWNS

Post Pond 3P Summary

Storm	Flood Elevation (ft.)
2 YEAR	55.38
10 YEAR	56.85
25 YEAR	58.47
100 YEAR	59.5

CALCULATED 100 YEAR FLOOD ELEVATION 62.0

Post Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.43
10 YEAR	58.07
25 YEAR	59.17
100 YEAR	61.54

Post Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

CALCULATED 100 YEAR FLOOD ELEVATION 68.0

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.

STATE OF MAINE · CHRISTOPHER S. BELANGER 9098 · PROFESSIONAL ENGINEER · LICENSED
12-18-2019

POST DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING CONSULTING ENGINEERS
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FIELD WK:	SCALE: 1"=200'	SHEET: POST
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

UNDERDRAINED
FILTER POND 1
POND 47

BUFFER #1
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=278', S=9-15%, HSG C
FORESTED BUFFER

WETLAND
AND STREAM
100' BUFFER
FORESTED BUFFER

ROOF DRIPLINES
52 COTTAGE ROOFS

WETLAND
AND STREAM
100' BUFFER
FORESTED BUFFER

BUFFER #4
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=142', S=9-15%, HSG C
MEADOW BUFFER

GREELY ROAD

RAIL ROAD

FOCAL POINT
STORMWATER
TREATMENT SYSTEM
POND 34

NEW BOX
CULVERT
POND 43

BUFFER #3
WITH STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=34', S=0-8%, HSG C
FORESTED BUFFER

BUFFER #2
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=118', S=9-15%, HSG C
FORESTED BUFFER

EXISTING
5'X6'
BOX
CULVERT

CALCULATED 100 YEAR FLOOD
ELEVATION 62.0

CALCULATED 100 YEAR FLOOD
ELEVATION 68.0

STORMWATER LEGEND

- HYDROCAD POND
- HYDROCAD SUBAREA
- HYDROCAD REACH
- TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB SOIL DESCRIPTION
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED PAVEMENT
- EXISTING / APPROVED PAVEMENT
- PAVEMENT REMOVED
- PROPOSED DEVELOPED AREA LAWNS

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
100 YEAR	242.48	228.96	-6%

Post Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.43
10 YEAR	58.07
25 YEAR	59.17
100 YEAR	61.54

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

Post Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

POST DEVELOPMENT DRAINAGE PLAN

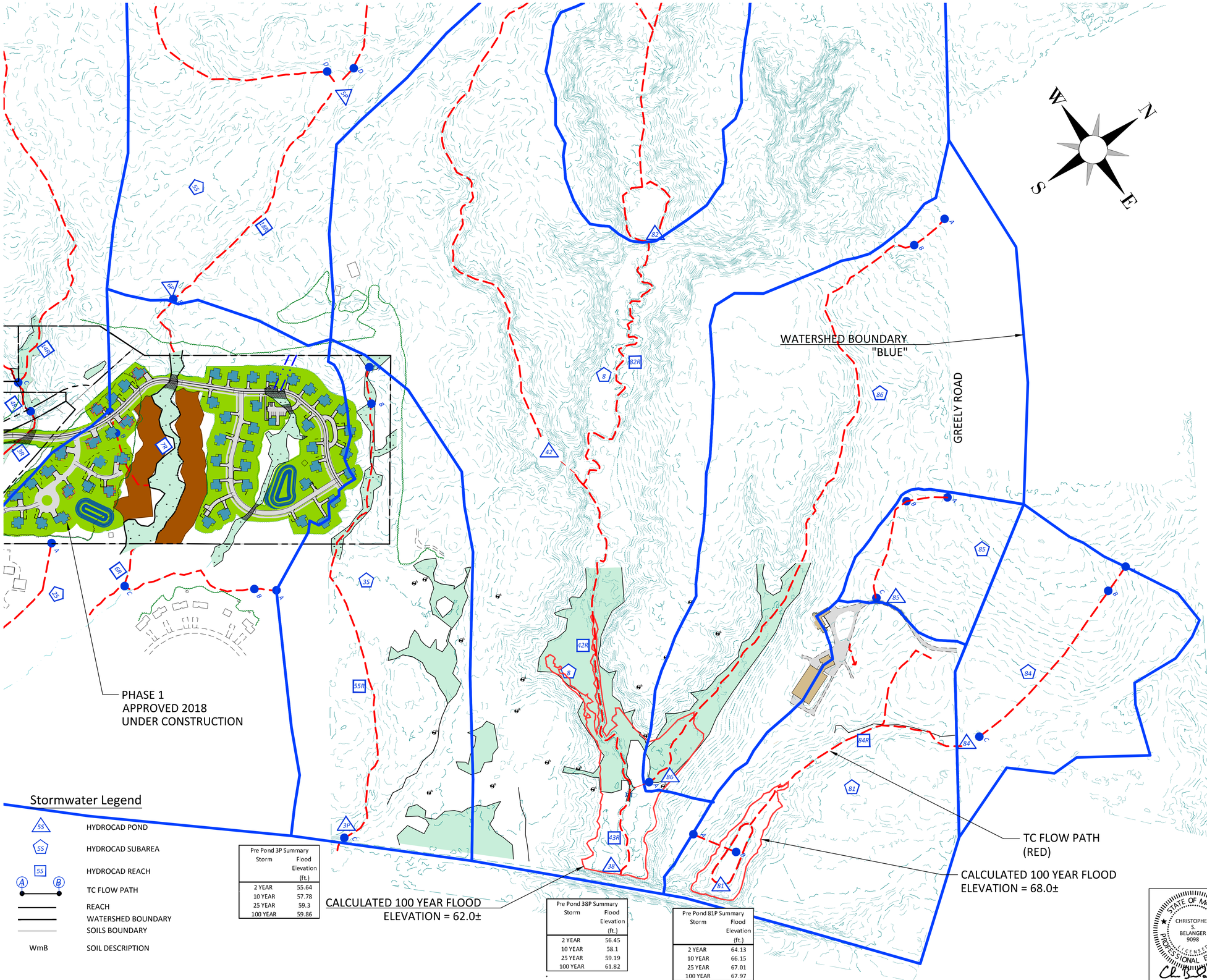
Cumberland Crossing – Phase 2
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FIELD WK:	SCALE: 1"=100'	SHEET: POST2
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 12-18-2019

Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.65	-2%
10 YEAR	83.43	82.04	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	161.69	-10%
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FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
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25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.29	-30%
10 YEAR	25.22	20.6	-22%
25 YEAR	42.47	28.17	-51%
50 YEAR	64.8	41.49	-56%
100 YEAR	85.78	55.83	-54%

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

Stormwater Legend

- 5S — HYDROCAD POND
- 5S — HYDROCAD SUBAREA
- 5S — HYDROCAD REACH
- A — B — TC FLOW PATH
- REACH
- WATERSHED BOUNDARY
- SOILS BOUNDARY
- WmB — SOIL DESCRIPTION

Pre Pond 3P Summary

Storm	Flood Elevation (ft.)
2 YEAR	55.64
10 YEAR	57.78
25 YEAR	59.3
100 YEAR	59.86

Pre Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

Pre Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

STATE OF MAINE
CHRISTOPHER S. BELANGER 9098
LICENSED PROFESSIONAL ENGINEER
12-18-2019

PRE DEVELOPMENT DRAINAGE PLAN

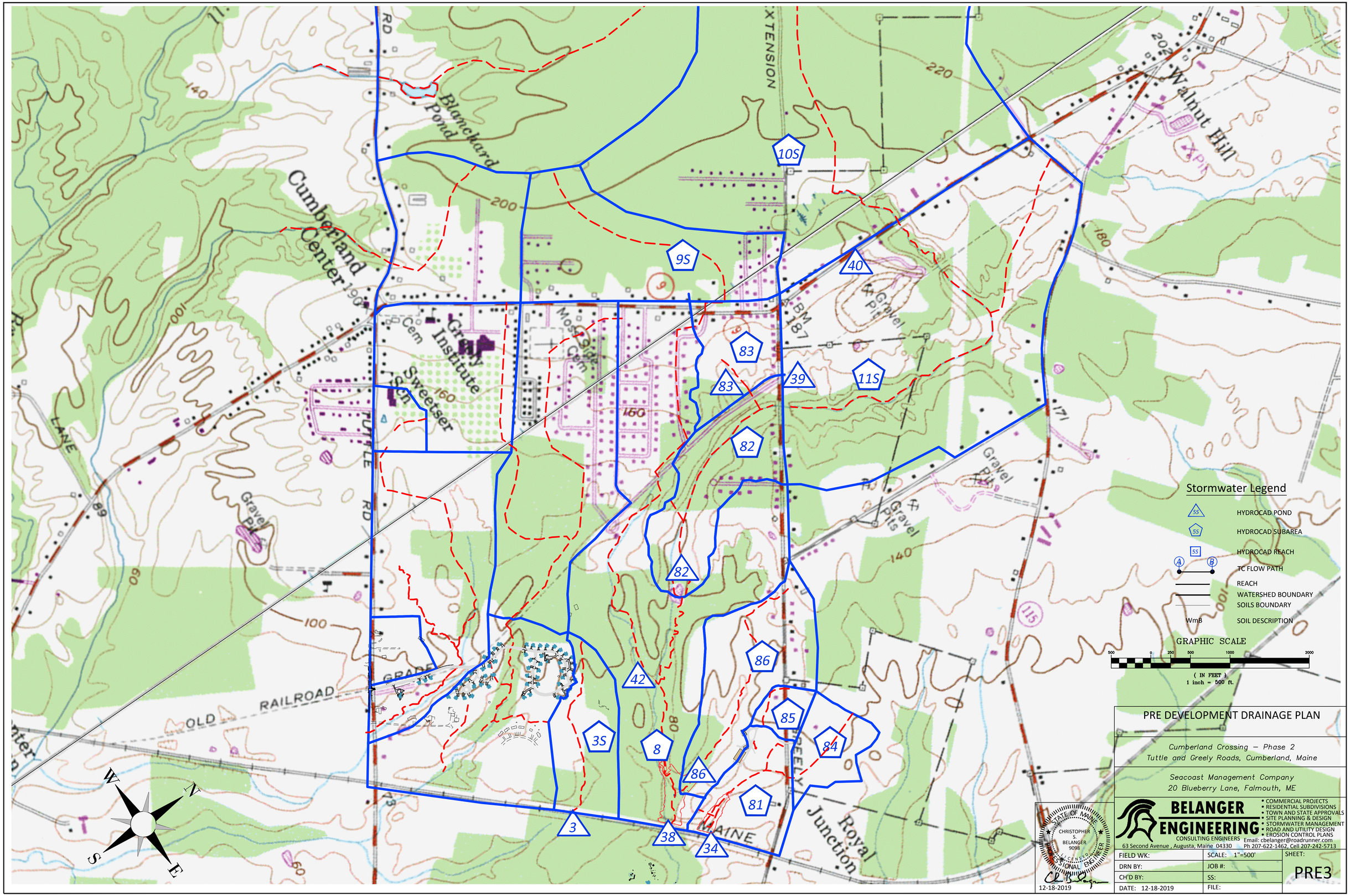
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FIELD WK:	SCALE: 1"=200'	SHEET: PRE
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	



PRE DEVELOPMENT DRAINAGE PLAN

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STATE OF MAINE — CHRISTOPHER S. BELANGER 9098 — REGISTERED PROFESSIONAL ENGINEER
12-18-2019

FIELD WK:	SCALE: 1"=500'	SHEET: PRE3
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	