SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

www.northeastcivilsolutions.com

41041
April 30, 2018

City of Portland, Planning and Development
389 Congress Street
Portland, Maine 04101

RE: Level III Subdivision Review – Preliminary Submission (130-144 Bancroft Street)
WB Group, Inc. – Capisic Meadows – 8 Lot Subdivision

To whom it may concern;

On behalf of WB Group Inc., Northeast Civil Solutions, Inc.(NCS) is pleased to submit the attached application and associated materials for Preliminary Review review by staff and the Planning Board for a proposed 7 lot residential subdivision located off of Bancroft Street. The proposed development will feature 7 new single family residential lots. The developer will construct the proposed road, stormwater facilities and associated grading for the entirety of the residential subdivision. The developer does not intend on building the individual houses.

The proposed subdivision will be located at properties identified as 130 & 144 Bancroft Street. The property is comprised of approximately 2.9 acres of land, mostly forested land (with the exception of lawn, patio and pool area of an existing single family dwelling which will be removed). The land has been fully surveyed, has been delineated for wetlands. Currently zoned Residential 3 (R-3), the proposed residential subdivision is an allowed use in the area pursuant to municipal review for subdivision and site plan.

The development will be accessed by a single paved road and feature a road, Benjamin Way, intended to be accepted as a city street. The proposed access road will feature vertical curbing on both sides with a sidewalk extending down northerly side (please see waiver request for duel sidewalks). All utilities will be extended from Bancroft Street down the proposed right-of-way (ROW) to service the proposed subdivision (please see attached ability to serve letters). A fire hydrant will be placed at the end of the proposed ROW servicing the entirety of the subdivision; meanwhile the street will be built to city standards allowing for compatible for emergency vehicle access. Stormwater from the proposed roadway will be collected and treated with the use of two stormwater Filterra units. Additional site runoff will be directed to a detention pond for peak control. The detention pond will be located near the front portion of the lot. The proposed project will also require a Tier I wetland dill permit from the DEP for 11,318 SF of wetland fill or wetland impacts.

Each of the proposed subdivision lots will provide off-street parking to service the single family residential dwellings via a paved driveway. Runoff will be directed to the proposed ponds via an open stormwater system which will be implemented throughout the development. Please see the attached Stormwater Report for further details.

WB Group, Inc. and NCS will conduct a neighborhood meeting as required for all applicable abutters to the property, at which we fully explained the proposed project to those in attendance. The impact to the surrounding residents will be minimal (there is no intention at this time for any vehicular connection to Redlon Park road), and most of the other properties in the vicinity are either previously existing residentially develop or undeveloped. Traffic counts have already been completed, and a traffic report will be included with all other submission materials for Planning Board review in the near future. The proposed development is constant with the city's master plan.

Having already met with City staff, NCS would like to meet with the Planning Board to discuss this project in somewhat greater detail and solicit comments from Board members. Ideally, we propose to meet with the Planning Board during the course of this spring/summer for preliminary and final project approval, with the intent to begin construction in the upon approval. We look forward to presenting this project to the Board.

Please contact us if you have any questions or comments. Thank you.

Sincerely,
Northeast Civil Solutions, Inc.

Michael Skolnick
Land Use Regulatory Specialist

CC: Tony Panciocco, P.E., NCS
Joshua Wagner, Owner, WB Group, Inc.

Portland, Maine — Yes. Life's good here.

Planning & Urban Development Department

LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Submit each Tab as one PDF file and bookmark the items as noted below

Please confirm by electronically checking the boxes to the left

Tab 1 – General Application Documents

Checklist	Items to be Provided
Yes ✔ NA ☐ Plan ☐	PROJECT DESCRIPTION • Cover Letter with detailed project description
Yes ✔ NA ☐ Plan ☐	COMPLETED CHECKLIST – LEVEL III APPLICATION
Yes ✔ NA ☐ Plan ☐	RIGHT, TITLE AND INTEREST • Deeds, leases, or purchase and sales agreements
Yes ✔ NA ☐ Plan ☐	EVIDENCE OF STATE OR FEDERAL APPROVALS, if applicable • Permits or letters of non-jurisdiction, if applicable
Yes ✔ NA ☐ Plan ☐	ZONING ASSESSMENT • Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☐ NA ☐ Plan ✔	EXISTING &/OR PROPOSED EASEMENTS OR COVENANTS, if applicable • Evidence of existing easements and any proposed easements
Yes ✔ NA ☐ Plan ☐	WAIVER REQUESTS • Written request for waiver describing request and reason. Waiver Table
Yes ✔ NA ☐ Plan ☐	FINANCIAL CAPABILITY • Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ✔ NA ☐ Plan ☐	TECHNICAL CAPABILITY • Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN STANDARDS AND SUBMISSION CHECKLIST

Provide assessment of compliance with standards and include supplemental documentation, as applicable.

Submit each Tab as one PDF file and bookmark the items as noted below

Tab 2 - TRANSPORTATION

Check list	Assess/Provide/Document:
Yes NA Plan ✔	**Transportation Analysis- Traffic Impact (14-526 (a) 1)** • Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts • Traffic Impact Study (Technical Manual, Section 1) if applicable
Yes NA Plan ✔	**Access and Circulation (14-526 (a) 2 a)** • Access and internal circulation, addressing ADA access • Access and egress impacts on traffic flows • Description and use of drive-up features, if applicable
Yes NA Plan ✔	**Loading and Servicing (14-526 (a) 2 b)** • Loading and servicing needs, route and travel way geometrics for deliveries • Turning templates for delivery vehicles, if applicable
Yes NA Plan ✔	**Sidewalks (14-526 (a) 2 c)** • Sidewalks and condition along street frontages and internal walkways • Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
Yes NA Plan ✔	**Public Transit (14-526 (a) 3), if applicable** • Existing available transit services • Proposed site plan design details, such as easement, pad base, and shelter
Yes NA Plan ✔	**Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c)** • Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements • Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
Yes NA Plan ✔	**Bicycle Parking (14-526 (a) 4 b)** • Address bicycle parking requirements and identify locations on-site • Construction details for bike racks (Technical Manual, Section 1)
Yes NA Plan ✔	**Snow Storage (14-526 (a) 4 d)** • Management plan for snow removal and locate snow storage areas on plan
Yes NA Plan ✔	**Traffic Demand Management (TDM) (14-526 (a) 5), if applicable** • Develop TDM with Trip Reduction Targets and Strategies

Tab 3 - ENVIRONMENTAL AND LANDSCAPE FEATURES	
Check list	Assess/Provide/Document:
Yes NA Plan ✔	**Preservation of Significant Natural Features (14-526 (b) 1), if applicable** • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
Yes NA Plan ✔	**Landscaping and Landscape Preservation (14-526 (b) 2 a)** • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
Yes NA Plan ✔	**Site Landscaping (14-526 (b) 2 b)** • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes NA Plan ✔	**Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable** • Landscaped islands within parking areas (Technical Manual, Section 4)
Yes NA Plan ✔ ✔	**Street Trees (14-526 (b) 2 b iii)** • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
Tab 4 - ENVIRONMENTAL AND STORMWATER	
Check list	Assess/Provide/Document:
Yes NA Plan ✔	**Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a)** • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

Tab 5 - PUBLIC INFRASTRUCTURE AND SAFETY	
Check list	Assess/Provide/Document:
Yes NA Plan ✔	**Consistency with City Master Plans (14-526 (c) 1)** • Identify consistency with master plans • Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes NA Plan ✔ ✔	**Public Safety and Fire Prevention (14-526 (c))** • Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) • Emergency vehicle access • Address consistency with public safety standards (Technical Manual, Section 3) • Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Yes NA Plan ✔ ✔	**Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)** • Electrical services, including providing underground services • Identify existing and proposed connections for public utilities and required public utility upgrades • Sewer line connections are required, if there is a main within 200 feet • Proposed solid waste management facilities on-site and management for the site • Written evidence of the ability to serve from utility companies, as applicable
Tab 6 - SITE DESIGN	
Check list	Assess/Provide/Document:
Yes NA Plan ✔	**Massing, Ventilations and Wind Impact (14-526 (d) 1)** • Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable • Bulk, location or height impacts on adjoining structures • Identify and locate HVAC equipment and venting away from public spaces and residential properties • Identify screening and manufacturing specifications for noise, if applicable
Yes NA Plan ✔	**Shadows (14-526 (d) 2), if applicable** • Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes NA Plan ✔	**Snow and Ice Loading (14-526 (d) 3)** • Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes NA Plan ✔	**View Corridors (14-526 (d) 4), if applicable** • Protection of designated view corridors (Portland Design Manual, Appendix 1)

Yes NA Plan ☐ ✔ ☐	**Historic Resources (14-526 (d) 5), if applicable** • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
Yes NA Plan ☐ ✔ ☐	**Exterior Lighting (14-526 (d) 6)** • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
Yes NA Plan ☐ ✔ ☐	**Noise and Vibration (14-526 (d) 7)** • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
Yes NA Plan ☐ ✔ ☐	**Signage and Wayfinding (14-526 (d) 8), if applicable** • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
Yes NA Plan ☐ ✔ ☐	**Zone Related Design Standards (14-526 (d) 5)** • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples
Tab 7 - Construction Management Plan	
Check list	
Yes NA Plan ☐ ✔ ☐	**Construction Management Plan** • Construction Management Document and Plan

Level II and Level III Site Plan Checklist

Please upload the following drawings with the listed details into e-Plan

☑ **RECENT BOUNDARY SURVEY** (stamped by Maine Licensed Surveyor)

Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

☑ **Existing Conditions**

- Approximate location of structures on abutting property
- Topography
- Locate water courses
- Delineate wetlands
- Zone lines

☑ **Proposed Site Plan**

- Ground floor area, and grade elevations for all buildings

☑ **Access, Circulation, and Parking**

- Streets and intersections adjacent to site , any proposed geometric modifications
- Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- Location and dimensions of proposed loading areas
- Existing and proposed transit infrastructure with dimensions/ engineering specifications
- Location of vehicle and bicycle parking with dimensions and engineering specifications

☑ **Site Considerations**

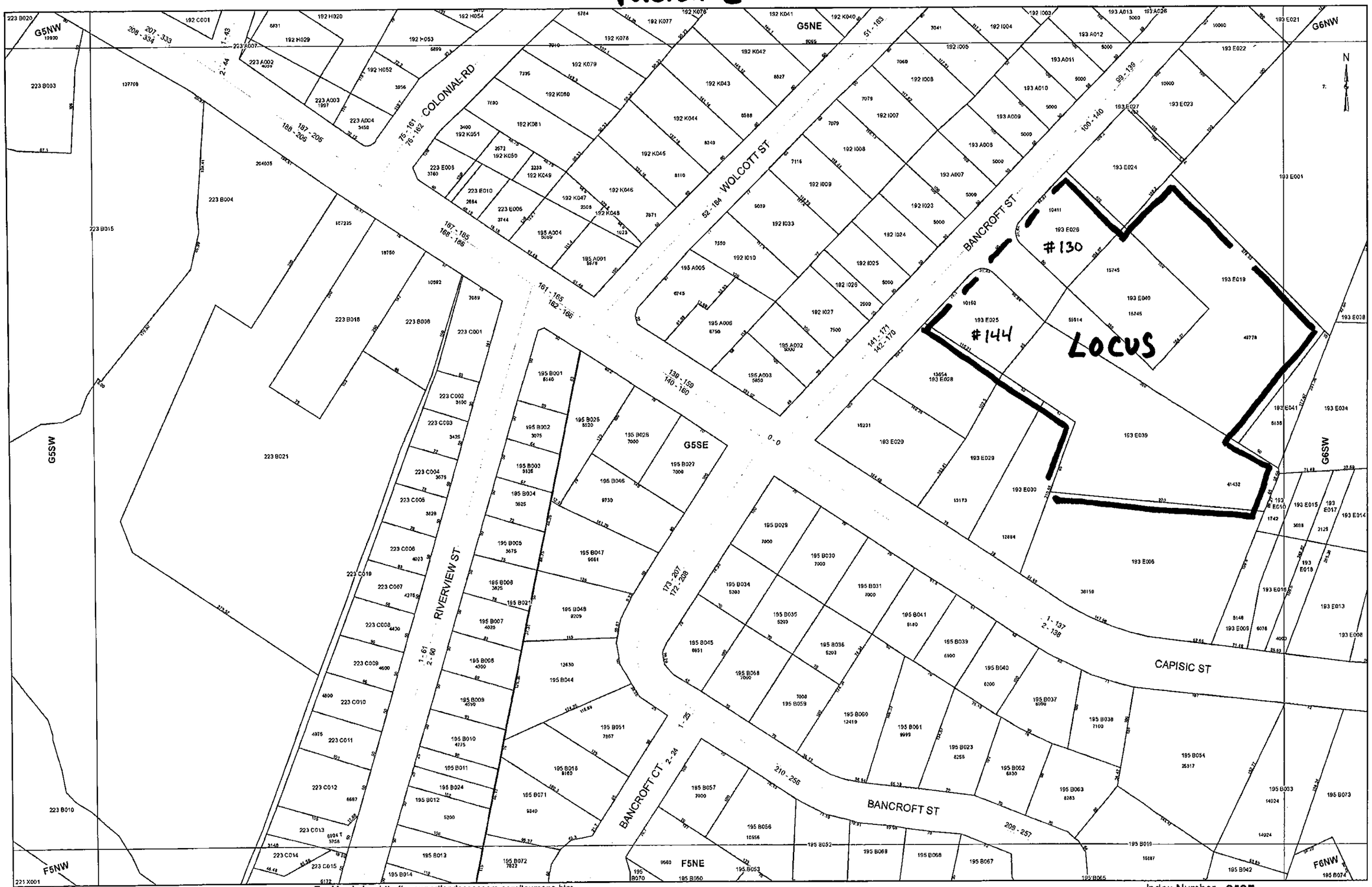
- Identify snow storage areas
- Location of fire hydrants
- Location of solid waste management facilities

☑ **UTILITY PLAN** including:

- Existing utilities on site and within public streets
- Location, sizing, and directional flows of all existing and proposed utilities
- Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- Electric utility infrastructure

☑	**GRADING and DRAINAGE PLAN** including:
	• Existing grades and drainage • Proposed grades • Proposed stormwater management meeting Technical Manual (Section 5) standards • Location and proposed alteration of a water course • Preservation or alteration of wetlands
☑	**EROSION CONTROL**
	• Must be in compliance with Technical Manual, Section 5
☐	**LANDSCAPE PLAN** including:
	• Existing vegetation to be preserved and preservation measures • Proposed landscaping and buffers • Planting schedule
☑	**RECORDING PLAT**, if applicable
	• IF SUBDIVISION: Must be in compliance with requirements of Section 14-496 (b)
☐	**ARCHITECTURAL PLANS & RENDERINGS** including:
	• Exterior building elevations, color renderings, illustrations of all sides • Location and dimensions of all existing & proposed HVAC & mechanical equipment, all proposed screening • Provide context drawings, if applicable (Design Manual, page 1) • Floor plans

PORTLAND


G5NW
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COLONIAL RD
WOLCOTT ST
BANCROFT ST
RIVERVIEW ST
BANCROFT CT
CAPISIC ST
#130
#144
LOCUS

January 15, 2018

To Whom It May Concern:

I, Josh Wagner, authorize Northeast Civil Solutions, Inc. to sign any and all applications, permit requests, and other paperwork in conjunction with obtaining final municipal and state approvals for the project located at 130 & 144 Bancroft Street in Portland, Maine.

Signature

Josh Wagner, Land Owner

Date 1/16/18

G:\NCS forms\Authorization Letter.doc

41041

PURCHASE AND SALE AGREEMENT - LAND ONLY

("days" means business days unless otherwise noted, see paragraph 20)

May 25, 2018
Offer Date

May 25, 2018 Effective Date
Effective Date is defined in Paragraph 20 of this Agreement.

1. PARTIES: This Agreement is made between Joshua Wagner ("Buyer") and Ken + Kari Doiron ("Seller").

2. DESCRIPTION: Subject to the terms and conditions hereinafter set forth, Seller agrees to sell and Buyer agrees to buy [x] all [ ] part of (if "part of" see para. 22 for explanation) the property situated in municipality of Portland, County of Cumberland, State of Maine, located at Bancroft St and described in deed(s) recorded at said County's Registry of Deeds Book(s) 29467, Page(s) 255 Less House lot

3. PURCHASE PRICE/EARNEST MONEY: For such Deed and conveyance Buyer agrees to pay the total purchase price of $ 58,000. Buyer [x] has delivered; or [ ] will deliver to the Agency within _____ days of the Effective Date, a deposit of earnest money in the amount $ 2000. Buyer agrees that an additional deposit of earnest money in the amount of $ ——— will be delivered _____.
If Buyer fails to deliver the initial or additional deposit in compliance with the above terms Seller may terminate this Agreement. This right to terminate ends once Buyer has delivered said deposit (s). The remainder of the purchase price shall be paid by wire, certified, cashier's or trust account check upon delivery of the Deed.

This Purchase and Sale Agreement is subject to the following conditions:

4. ESCROW AGENT/ACCEPTANCE: Ken + Kari Doiron ("Agency") shall hold said earnest money and act as escrow agent until closing; this offer shall be valid until May 25, 2018 (date) 5:00 [ ] AM [x] PM; and, in the event of non-acceptance, this earnest money shall be returned promptly to Buyer.

5. TITLE AND CLOSING: A deed, conveying good and merchantable title in accordance with the Standards of Title adopted by the Maine Bar Association shall be delivered to Buyer and this transaction shall be closed and Buyer shall pay the balance due and execute all necessary papers on See Addenda (closing date) or before, if agreed in writing by both parties. If Seller is unable to convey in accordance with the provisions of this paragraph, then Seller shall have a reasonable time period, not to exceed 30 calendar days, from the time Seller is notified of the defect, unless otherwise agreed to in writing by both Buyer and Seller, to remedy the title. Seller hereby agrees to make a good-faith effort to cure any title defect during such period. If, at the later of the closing date set forth above or the expiration of such reasonable time period, Seller is unable to remedy the title, Buyer may close and accept the deed with the title defect or may terminate this Agreement in which case the parties shall be relieved of any further obligations hereunder and any earnest money shall be returned to the Buyer.

6. DEED: The property shall be conveyed by a warranty deed, and shall be free and clear of all encumbrances except covenants, conditions, easements and restrictions of record which do not materially and adversely affect the continued current use of the property.

7. POSSESSION: Possession of premises shall be given to Buyer immediately at closing unless otherwise agreed in writing.

8. RISK OF LOSS: Until the closing, the risk of loss or damage to said premises by fire or otherwise, is assumed by Seller. Buyer shall have the right to view the property within 24 hours prior to closing for the purpose of determining that the premises are in substantially the same condition as on the date of this Agreement.

9. PRORATIONS: The following items, where applicable, shall be prorated as of the date of closing: rent, association fees, (other) None. Real estate taxes shall be prorated as of the date of closing (based on municipality's fiscal year). Seller is responsible for any unpaid taxes for prior years. If the amount of said taxes is not known at the time of closing, they shall be apportioned on the basis of the taxes assessed for the preceding year with a reapportionment as soon as the new tax rate and valuation can be ascertained, which latter provision shall survive closing. Buyer and Seller will each pay their transfer tax as required by State of Maine.

10. DUE DILIGENCE: Buyer is encouraged to seek information from professionals regarding any specific issue or concern. Neither Seller nor Licensee makes any warranties regarding the condition, permitted use or value of Sellers' real property. This Agreement is subject to the following contingencies, with results being satisfactory to Buyer:

Arthur Thomas Properties, 31 Silver Street Dover, NH 3820 Phone: (603)413-6175 Fax:
Thomas Toye
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CONTINGENCY	YES	NO	FULL RESOLUTION	OBTAINED BY	TO BE PAID FOR BY
1. SURVEY Purpose:	☐	☐	within _____ days	_____	_____
2. SOILS TEST Purpose:	☐	☐	within _____ days	_____	_____
3. SEPTIC SYSTEM DESIGN Purpose:	☐	☐	within _____ days	_____	_____
4. LOCAL PERMITS Purpose:	☐	☐	within _____ days	_____	_____
5. HAZARDOUS WASTE REPORTS Purpose:	☐	☐	within _____ days	_____	_____
6. UTILITIES Purpose:	☐	☐	within _____ days	_____	_____
7. WATER Purpose:	☐	☐	within _____ days	_____	_____
8. SUB-DIVISION APPROVAL Purpose:	☒	☐	within 60 days	_____	_____
9. DEP/LURC APPROVALS Purpose:	☐	☐	within _____ days	_____	_____
10. ZONING VARIANCE Purpose:	☐	☐	within _____ days	_____	_____
11. HABITAT REVIEW/ WATERFOWL Purpose:	☐	☐	within _____ days	_____	_____
12. REGISTERED FARMLAND Purpose:	☐	☐	within _____ days	_____	_____
13. MDOT DRIVEWAY/ ENTRANCE PERMIT Purpose:	☐	☐	within _____ days	_____	_____
14. DEED RESTRICTION Purpose:	☐	☐	within _____ days	_____	_____
15. TAX STATUS* Purpose:	☐	☐	within _____ days	_____	_____
16. BUILD PACKAGE Purpose:	☐	☐	within _____ days	_____	_____
17. OTHER Purpose:	☐	☐	within _____ days	_____	_____

* If the land is enrolled in the Maine Tree Growth Tax program, Seller agrees to provide Buyer with the current Forest Management and Harvest Plan within _____ days. ☐ Yes ☒ No

Further specifications regarding any of the above:

Unless otherwise specified above, all of the above will be obtained and paid for by Buyer. Seller agrees to cooperate with Buyer and shall give Buyer and Buyer's agents and consultants reasonable access to the property in order to undertake the above investigations. If the result of any investigation or other condition specified herein is unsatisfactory to Buyer, Buyer will declare the Agreement null and void by notifying Seller in writing within the specified number of days, and any earnest money shall be returned to Buyer. If the result of any investigation or other condition specified herein is unsatisfactory to Buyer, and Buyer wishes to pursue remedies other than voiding the Agreement, Buyer must do so to full resolution within the time period set forth above; otherwise this contingency is waived. If Buyer does not notify Seller that an investigation is unsatisfactory within the time period set forth above, this contingency is waived by Buyer. In the absence of inspection(s) mentioned above, Buyer is relying completely upon Buyer's own opinion as to the condition of the property.

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11. FINANCING: Buyer's obligation to close:

☒ is not subject to a financing contingency. Buyer has provided Seller with acceptable proof of the funds.

☐ is not subject to a financing contingency. Buyer shall provide proof of the funds acceptable to Seller within _____ days. If such proof is unacceptable to Seller, Seller may terminate this Agreement no later than _____ days from receipt. If proof of funds is not provided within such time period, Seller may terminate this Agreement which right shall end once such proof is received, however Seller retains the agreed upon time period to terminate if such proof is unacceptable. If Seller terminates in either case, the earnest money shall be returned to Buyer.

☐ is subject to financing as follows:

a. Buyer's obligation to close is subject to Buyer obtaining a _____ loan of _____% of the purchase price, at an interest rate not to exceed _____% and amortized over a period of _____ years. Buyer is under a good faith obligation to seek and obtain financing on these terms. If such financing is not available to Buyer as of the closing date, Buyer is not obligated to close and may terminate this Agreement in which case the earnest money shall be returned to Buyer.

b. Buyer to provide Seller with letter from lender showing that Buyer has made application for loan specified in (a) and, subject to verification of information, is qualified for the loan requested within _____ days from the Effective Date of the Agreement. If Buyer fails to provide Seller with such letter within said time period, Seller may terminate this Agreement and the earnest money shall be returned to Buyer. This right to terminate ends once Buyer's letter is received.

c. Buyer hereby authorizes, instructs and directs its lender to communicate the status of the Buyer's loan application to Seller, Seller's licensee and Buyer's licensee.

d. After (b) is met, if the lender notifies Buyer that it is unable or unwilling to provide said financing, Buyer is obligated to provide Seller with written documentation of the loan denial within two days of receipt. After notifying Seller, Buyer shall have _____ days to provide Seller with a letter from another lender showing that Buyer has made application for loan specified in (a) and, subject to verification of information, is qualified for the loan requested. If Buyer fails to provide Seller with such letter within said time period, Seller may terminate this Agreement and the earnest money shall be returned to Buyer. This right to terminate ends once Buyer's letter is received.

e. Buyer agrees to pay no more than _____ points. Seller agrees to pay up to $_____ toward Buyer's actual pre-paids, points and/or closing costs, but no more than allowable by Buyer's lender.

f. Buyer's ability to obtain financing ☐ is ☐ is not subject to the sale of another property. See addendum ☐ Yes ☐ No.

g. Buyer may choose to pay cash instead of obtaining financing. If so, Buyer shall notify Seller in writing including providing proof of funds and the Agreement shall no longer be subject to financing, and Seller's right to terminate pursuant to the provisions of this paragraph shall be void.

12. BROKERAGE DISCLOSURE: Buyer and Seller acknowledge they have been advised of the following relationships:

_____ (_____) of _____ (_____)
Licensee MLS ID Agency MLS ID

is a ☐ Seller Agent ☐ Buyer Agent ☐ Disc Dual Agent ☐ Transaction Broker

_____ (_____) of _____ (_____)
Licensee MLS ID Agency MLS ID

is a ☐ Seller Agent ☐ Buyer Agent ☐ Disc Dual Agent ☐ Transaction Broker

If this transaction involves Disclosed Dual Agency, the Buyer and Seller acknowledge the limited fiduciary duties of the agents and hereby consent to this arrangement. In addition, the Buyer and Seller acknowledge prior receipt and signing of a Disclosed Dual Agency Consent Agreement.

13. PROPERTY DISCLOSURE FORM: Buyer acknowledges receipt of Property Disclosure Form.

14. DEFAULT/RETURN OF EARNEST MONEY: Buyer's failure to fulfill any of Buyer's obligations hereunder shall constitute a default and Seller may employ all legal and equitable remedies, including without limitation, termination of this Agreement and forfeiture by Buyer of the earnest money. Seller's failure to fulfill any of Seller's obligations hereunder shall constitute a default and Buyer may employ all legal and equitable remedies, including without limitation, termination of this Agreement and return to Buyer of the earnest money. Agency acting as escrow agent has the option to require written releases from both parties prior to disbursing the earnest money to either Buyer or Seller. In the event that the Agency is made a party to any lawsuit by virtue of acting as escrow agent, Agency shall be entitled to recover reasonable attorney's fees and costs which shall be assessed as court costs in favor of the prevailing party.

15. MEDIATION: Earnest money or other disputes within the jurisdictional limit of small claims court will be handled in that forum. All other disputes or claims arising out of or relating to this Agreement or the property addressed in this Agreement (other than requests for injunctive relief) shall be submitted to mediation in accordance with generally accepted mediation practices. Buyer and Seller are bound to mediate in good faith and to each pay half of the mediation fees. If a party fails to submit a dispute or claim to mediation prior to initiating litigation (other than requests for injunctive relief), then that party will be liable for the other party's legal fees in any subsequent litigation regarding that same matter in which the party who failed to first submit the dispute or claim to mediation loses in that subsequent litigation. This clause shall survive the closing of the transaction.

16. PRIOR STATEMENTS: Any representations, statements and agreements are not valid unless contained herein. This Agreement completely expresses the obligations of the parties and may only be amended in writing, signed by both parties.

17. HEIRS/ASSIGNS: This Agreement shall extend to and be obligatory upon heirs, personal representatives, successors, and assigns of the Seller and the assigns of the Buyer.

18. COUNTERPARTS: This Agreement may be signed on any number of identical counterparts, such as a faxed copy, with the same binding effect as if the signatures were on one instrument. Original, faxed or other electronically transmitted signatures are binding.

19. NOTICE: Any notice, communication or document delivery requirements hereunder may be satisfied by providing the required notice, communication or documentation to or from the parties or their Licensee. Only withdrawals of offers and counteroffers will be effective upon communication, verbally or in writing.

20. EFFECTIVE DATE/BUSINESS DAYS: This Agreement is a binding contract when the last party signing has caused a paper or electronic copy of the fully executed agreement to be delivered to the other party which shall be the Effective Date. Licensee is authorized to fill in the Effective Date on Page 1 hereof. Except as expressly set forth to the contrary, the use of the term "days" in this

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Agreement, including all addenda made a part hereof, shall mean business days defined as excluding Saturdays, Sundays and any observed Maine State/Federal holidays. Deadlines in this Agreement, including all addenda, expressed as "within x days" shall be counted from the Effective Date, unless another starting date is expressly set forth, beginning with the first day after the Effective Date, or such other established starting date, and ending at 5:00 p.m. Eastern Time on the last day counted. Unless expressly stated to the contrary, deadlines in this Agreement, including all addenda, expressed as a specific date shall end at 5:00 p.m. Eastern Time on such date.

21. CONFIDENTIALITY: Buyer and Seller authorize the disclosure of the information herein to the real estate licensees, attorneys, lenders, appraisers, inspectors, investigators and others involved in the transaction necessary for the purpose of closing this transaction. Buyer and Seller authorize the lender and/or closing agent preparing the entire closing disclosure and/or settlement statement to release a copy of the closing disclosure and/or settlement statement to the parties and their licensees prior to, at and after the closing.

22. OTHER CONDITIONS:

23. GENERAL PROVISIONS:
    a. A copy of this Agreement is to be received by all parties and, by signature, receipt of a copy is hereby acknowledged. If not fully understood, contact an attorney. This is a Maine contract and shall be construed according to the laws of Maine.
    b. Seller acknowledges that State of Maine law requires buyers of property owned by non-resident sellers to withhold a prepayment of capital gains tax unless a waiver has been obtained by Seller from the State of Maine Revenue Services.
    c. Buyer and Seller acknowledge that under Maine law payment of property taxes is the legal responsibility of the person who owns the property on April 1, even if the property is sold before payment is due. If any part of the taxes is not paid when due, the lien will be filed in the name of the owner as of April 1 which could have a negative impact on their credit rating. Buyer and Seller shall agree at closing on their respective obligations regarding actual payment of taxes after closing. Buyer and Seller should make sure they understand their obligations agreed to at closing and what may happen if taxes are not paid as agreed.
    d. Buyer acknowledges that Maine law requires continuing interest in the property and any back up offers to be communicated by the listing agent to the Seller.
    e. Whenever this Agreement provides for earnest money to be returned or released, agency acting as escrow agent must comply with Maine Real Estate Commission rules which may require written notices or obtaining written releases from both parties.

24. ADDENDA: ☒ Yes Explain: See attached ☐ No

25. ELECTRONIC SIGNATURES: Pursuant to the Maine Uniform Electronic Transactions Act and Digital Signature Act, the parties authorize and agree to the use of electronic signatures as a method of signing/initialing this Agreement, including all addenda. The parties hereby agree that either party may sign electronically by utilizing an electronic signature service.

Buyer's Mailing address is 130 Bancroft St Portland ME 04102.

BUYER 5/25/2018 DATE BUYER DATE

Seller accepts the offer and agrees to deliver the above-described property at the price and upon the terms and conditions set forth and agrees to pay agency a commission for services as specified in the listing agreement.

Seller's Mailing address is 144 Bancroft St Portland, ME 04102.

SELLER 5/25/18 DATE SELLER 5/25/18 DATE

COUNTER-OFFER

Seller agrees to sell on the terms and conditions as detailed herein with the following changes and/or conditions:

The parties acknowledge that until signed by Buyer, Seller's signature constitutes only an offer to sell on the above terms and the offer will expire unless accepted by Buyer's signature with communication of such signature to Seller by (date) _____ (time) _____ ___ AM ___ PM.

SELLER DATE SELLER DATE

The Buyer hereby accepts the counter offer set forth above.

BUYER DATE BUYER DATE

EXTENSION:

The time for the performance of this Agreement is extended until _____ DATE.

SELLER DATE SELLER DATE

BUYER DATE BUYER DATE

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REALTOR®

EQUAL HOUSING OPPORTUNITY

Addenda

Seller grants Buyer a construction licence to change the grading on the side and rear of their house lot

Closing to take place within 10 Business Days of City Approval

House lot described book 34724 page 100

Buyer

Seller

Mike Skolnick

Subject: FW: Capisic Meadows - intent to sell to WB Group Inc.

From: Josh Wagner [mailto:joshwagner4545@yahoo.com]
Sent: Monday, April 09, 2018 7:23 AM
To: Jim Fisher
Subject: Capisic Meadows - intent to sell to WB Group Inc.

To whom it may concern,

I Joshua Wagner intend to transfer the necessary land need for a 7 lot development off Bancroft St. to WB Group Inc.

Joshua Wagner
207.831.4545

Mike Skolnick

Subject: FW: FW: Pool and Deck - Doiron

----- Forwarded Message -----
From: Doiron, Ken <kdoiron@ptc.com>
To: Josh Wagner <joshwagner4545@yahoo.com>
Sent: Sunday, April 8, 2018, 8:15:03 PM EDT
Subject: FW: Pool and Deck - Doiron

Kenneth and Kari Doiron have the intent to sell a portion of our land to WB Group Inc. defined by the attached plans created by Northeast Civil Solutions with Final Purchase and Sale Agreement defining boundary lines and grading upon City of Portland approval with no major design plan changes.

Regards,

Ken Doiron

Mobile: 1 (207) 400-6086

QUITCLAIM DEED with COVENANT (LONG FORM)

KNOW ALL BY THESE PRESENTS,

THAT WE **EDWARD C. BROOKS**, and **ROSE MARIE BROOKS**, both of Portland, Cumberland County, Maine in consideration of ONE DOLLAR and other valuable consideration paid by **KARI A. DOIRON** and **KENNETH J. DOIRON**, both of Lebanon, York County, Maine, and whose mailing address is 247 Smith Road, Lebanon ME 04027, the receipt whereof we do hereby acknowledge, do hereby REMISE, RELEASE and FOREVER QUITCLAIM unto Kari A. Doiron and Kenneth J. Doiron, as JOINT TENANTS and not as tenants-in-common, their heirs and assigns forever, the land and buildings in Portland, Cumberland County, Maine, more fully described on Exhibit A attached to this instrument.

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to Kari A. Doiron and Kenneth J. Doiron, as joint tenants and not as tenants-in-common, their heirs and assigns, to them and their use and behoof forever.

AND WE DO COVENANT with the Grantees, their heirs and assigns, that we and our heirs shall and will warrant and defend the same to Kari A. Doiron and Kenneth J. Doiron, their heirs and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under us.

IN WITNESS WHEREOF, Edward C. Brooks and Rose Marie Brooks have hereunto set their hands and seals this March 30, 2012.

SIGNED, SEALED AND DELIVERED
IN PRESENCE OF:

(Witness)

(Witness)

EDWARD C. BROOKS

ROSE MARIE BROOKS

STATE OF MAINE
CUMBERLAND, ss.

March 30, 2012

Then personally appeared Edward C. Brooks and Rose Marie Brooks acknowledged the foregoing instrument to be their free act and deed.

Before me:

Notary Public/Attorney at Law

NOTARY PRINT NAME: Carly Smith

CARLY R. SMITH
ATTORNEY AT LAW, STATE OF MAINE
AUTHORIZED TO TAKE ACKNOWLEDGEMENTS
PURSUANT TO 4 MRSA SEC 1056

EXHIBIT A

Property Location: 144 Bancroft Street, Portland, Cumberland County, Maine

Municipal Assessor's Map 193 Block E Lot 39

A certain lot or parcel of land with any improvements thereon, located in Portland, Cumberland County, Maine, adjacent to the parcel first above described and being more particularly bounded and described as follows:

Beginning at an iron pin found at the southeasterly corner of land now or formerly owned by Edward C. Brooks and Rose M. Brooks (formerly premises owned by Richard P. Masters et ux.; reference is made to deed recorded at Book 3855, Page 86 of the Cumberland County Registry of Deeds);

Thence in a southeasterly direction along land now or formerly of Stuart B. Herrick, Jr., a distance of 350 feet, more or less, to an iron pin found at the southerly corner of Parcel 3 as shown on Plan of Property made for Stuart B. Herrick. Jr., Bancroft Street, Portland, Maine dated July 31, 1986 drawn by R. P. Titcomb Associates, Inc.;

Thence South 38° 44' 24" West a distance of 65.00 feet to a point and land now or formerly of Vincent L. Devlin (Book 3725, Page 18):

Thence North 67° 44' 05" West along land now or formerly of said Devlin a distance of 272.00 feel to a point and land now or formerly of James T. King, et ux. (Book 6437, Page 38);

Thence North 37° 54' 38" East along land now or formerly of said King a distance of 65.00 feet to an iron pin found;

Thence North 37° 54' 36" East along land now or formerly of said King a distance of 35.14 feet to an iron pin found;

Thence North 39° 49' 28" West a distance of 110.00 feet to the southwesterly corner of said land now or formerly of Edward C. Brooks and Rose M. Brooks;

Thence North 56° 33' 16" East along the southerly side of said Brooks land a distance of 84.47 feet to the point of beginning.

Meaning and intending to convey, and hereby conveying, the same premises described in the Quitclaim Deed without Covenant of Stuart B. Herrick, Jr. to Edward C. Brooks and Rose Marie Brooks, dated November 23, 1997, and recorded in the Cumberland County Registry of Deeds, Book 13465 Page 155.

Received
Recorded Register of Deeds
Apr 02,2012 09:12:56A
Cumberland County
Pamela E. Lovley

MAINE REAL ESTATE TAX PAID

DEED OF SALE BY PERSONAL REPRESENTATIVE

KNOW ALL MEN BY THESE PRESENTS

THAT, **DANIEL W. BOUTIN** of Portland, County of Cumberland, State of Maine, duly appointed and acting personal representative of the Estate of Stuart B. Herrick, Jr., deceased (testate), as shown by the probate records of the County of Cumberland, Maine, Docket No. 2008-0252, by the power conferred by the Probate Code, and every other power, for consideration paid, grants to **JOSHUA WAGNER** of Portland, County of Cumberland, State of Maine, whose mailing address is 130 Bancroft Street, Portland, Maine 04102, the real property in Portland, County of Cumberland, State of Maine, described on Exhibit A attached hereto.

WITNESS my hand and sale this 23rd day of August, 2010.

Signed, Sealed and Delivered
in presence of

Mary A. Kiene

Estate of Stuart B Herrick, Jr

Daniel W. Boutin
Personal Representative

STATE OF MAINE
CUMBERLAND, SS.

August 23, 2010

Then personally appeared the above-named Daniel W. Boutin in his said capacity and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Mary A. Kiene
Notary Public/~~Attorney-at-Law~~
MARY A KIENE

EXHIBIT A

A certain lot or parcel of land located on the southeasterly side of Bancroft Street in the City of Portland, County of Cumberland, and State of Maine; said lot being bounded and described as follows:

Beginning at a point located at the southerly corner of land now or formerly of Thomas R. Lussier and Melody M. Lussier as described in a deed recorded in the Cumberland County Registry of Deeds in Book 13795, Page 93. Thence:

1) N 60° 18' 30" E by said land of Lussier a distance of Eighty-Eight and 83/100 (88.83) feet to a point located at the westerly corner of land now or formerly of Chabad Lubavitch of Maine, Inc. as described in a deed recorded in said Registry in Book 21417, Page 198.

2) S 28° 05' 18" E by said land of Chabad Lubavitch of Maine , Inc. a distance of Two Hundred Eighty-Six and 03/100 (286.03) feet to a point located on the northwesterly sideline of land now or formerly of Richard Marino as described in a deed recorded in said Registry in Book 22771, Page 251.

3) S 38° 44' 24" W by said land of Marino a distance of One Hundred Seventy-Seven and 67/100 (177.67) feet to a 5/8" reinforcing rod with identification cap number 2271 set at the easterly corner of land now or formerly of Edward C. Brooks and Rose Marie Brooks as described in a deed recorded in said Registry in Book 13465, Page 155.

4) N 41° 20' 13" W by said land of Brooks a distance of Three Hundred Forty-Nine and 59/100 (349.59) feet to a point located at the easterly corner of other land of said Brooks as described in a deed recorded in said Registry in Book 6741, Page 39.

5) N 29° 41' 30" W by said other land of Brooks a distance of Eighty-Eight and 84/100 (88.84) feet to a 5/8" reinforcing rod with identification cap number 2271 set at a point of curvature.

6) Northwesterly, westerly and southwesterly by said land of Brooks along a tangential curve to the left an arc distance of Thirty-One and 42/100 (31.42) feet to a 5/8" reinforcing rod with identification cap number 2271 set on the southeasterly sideline of Bancroft Street; said curve having a radius of Twenty (20.00) feet.

7) N 60° 18' 30" E by said Bancroft Street a distance of Ninety and 00/100 (90.00) feet to a rail road spike set on the northwesterly sideline of land now or formerly of Dianne Herrick as described in a deed recorded in said Registry in Book 4560, Page 246. Said land being shown as Parcel 1 on a plan entitled "Estate of Stuart B. Herrick, Jr." by Titcomb Associates dated August 13, 2008 and revised February 25, 2009.

8) Southwesterly, southerly and southeasterly, by said land of Herrick, along a non-tangential curve to the left a distance of Thirty-One and 42/100 (31.42) feet to a 5/8" reinforcing rod with identification cap number 2271 set; said curve having a radius of Twenty and 00/100 (20.00) feet and a chord bearing S 15° 18' 30" W over a distance of Twenty-Eight and 28/100 (28.28) feet.

9) S 29° 41' 30" E by said land of Herrick and by other land of said Herrick as described in a deed recorded in said Registry in Book 6305, Page 307, being shown as Parcel 2 on said plan, a distance of Two Hundred Thirty and 00/100 (230.00) feet to a 5/8" reinforcing rod with identification cap number 2271 set.

10) N 60° 18' 30" E by said land of Herrick a distance of One Hundred Four and 97/100 (104.97) feet to a 5/8" reinforcing rod with identification cap number 2271 set.

11) N 29° 41' 30" W by said land of Herrick a distance of One Hundred Fifty and 00/100 (150.00) feet to the point of beginning.

Said parcel contains 55, 914 square feet (1.28 acres) and being a portion of land now or formerly of the heirs of Stuart B. Herrick, Jr. as described in a deed recorded in said Registry in Book 6258, Page 53.

Meaning and intending to convey Parcel 3 as described in Plan of Property of Bancroft Street, said plan dated 8/13/2008 and prepared by Titcomb Associates, and recorded on 7/14/2010 in Plan Book 210, Page 220 of the Cumberland County Registry of Deeds. Said parcel being a portion of the land described in a deed from Robert J. Cheney to Stuart B. Herrick, Jr., dated August 24, 1983 and recorded in Book 6258, Page 53 of the Cumberland County Registry of Deeds. Reference is also made to a corrective deed from Cheney Realty Co. to Stuart B. Herrick, Jr., dated November 18, 1986 and recorded in Book 7509, Page 292 of said registry of deeds. Stuart B. Herrick, Jr. died on February 7, 2008. Daniel W. Boutin, Esq. was appointed as the Personal Representative of the Estate of Stuart B. Herrick., Jr. by the Cumberland County Register of Probate on March 7, 2008.

Also conveying another strip of land as shown on the City of Portland's Assessor's Map as Lot 193-E-27.

Received
Recorded Register of Deeds
Aug 27,2010 11:45:03A
Cumberland County
Pamela E. Lovley

Benj. F. Packard

Bath Savings Institution

Since 1852

April 11, 2018

City of Portland
Planning Division
389 Congress Street
Portland, ME 04101

Re: WB Group

To whom it may concern:

Bath Savings is aware of the Wagner Subdivision that WB Group is proposing and the cost infrastructure cost of approximately $270,000. Based on Joshua Wagner and WB Group's existing deposit relationship with Bath Savings, I can verify Joshua Wagner and WB Group have sufficient funds available at this time and the financial capacity to complete the proposed project.

Please let me know if you have any questions.

Sincerely,

Brian C. Desjardins
Vice President/Commercial Lender

105 Front Street, PO Box 548, Bath, Maine 04530
Tel. 207-442-7711 Fax 207-442-9137
1-800-447-4559
Member FDIC

List of Consultants

Northeast Civil Solutions, Inc. – Engineering, Surveying and Land Planning
381 Payne Road
Scarborough, ME 04074

Longview Partners, LLC – Wetland Delineation
6 Second Street
Buxton, Maine 04093

Traffic Solutions – Traffic Analysis
235 Bancroft Street
Portland, ME 04102

Traffic Solutions
William J. Bray, P.E.
235 Bancroft Street
Portland, ME 04102
(207) 774-3603
(207) 400-6890 mobile
trafficsolutions@maine.rr.com

April 2, 2018

Traffic Assessment

For Proposed

Bancroft Street Subdivision

Portland, Maine

INTRODUCTION

Josh Wagner is proposing to subdivide a 2.93-acre parcel of property located at 130/144 Bancroft Street creating a total of seven single-family house lots. Access to the property is provided with construction of a "*new*" dead-end street intersecting Bancroft Street adjacent to the existing Wagner home. The proposed subdivision street will be constructed to City standards and, with completion, the City will be petitioned for acceptance of the street.

This document determines daily and peak hour trip generation of the proposed project for both peak commuter time periods, examines current roadway safety trends in the general vicinity of the proposed project, and reviews vehicle sight distance.

SITE TRAFFIC

Site Trip Generation: Daily and peak hour trip generation was determined for the proposed project based upon trip tables presented in the ninth edition of the Institute of Transportation Engineers (ITE) "**TRIP GENERATION**" handbook. The ITE publication provides numerous land use categories and the average volume of trips generated by each category.

The following trip rate was used to calculate trip generation for the proposed project:

Land Use #210 – Single-Family Detached Housing

Weekday	= 9.52 trips per dwelling unit
AM Peak Hour	= 0.75 trips per dwelling unit
PM Peak Hour	= 1.00 trips per dwelling unit

Accordingly, the proposed 7 single-family homes can be expected to generate a total of 67 trips during a typical weekday; 5 trips in the morning peak hour and 7 trips in the evening peak hour.

Site Trip Distribution: The Institute of Transportation Engineers handbook also provides the following directional distribution rates for a single-family house lot:

AM Peak Hour	= 25% enter site and 75% exit site
PM Peak Hour	= 63% enter site and 37% exit site

Based upon the noted directional distribution patterns, 1 trip during the morning peak hour and 4 trips in the evening peak hour will enter the site and the remaining trips (4 AM trip and 3 PM trips) will exit.

EXISTING SAFETY CONDITIONS

The Maine Department of Transportation's (MaineDOT) Accident Records Section provided the latest three-year (2014 through 2016) crash data for the 0.29 mile section of Bancroft Street between Capisic Street and Rockland Avenue.

2014 -2016 Traffic Accident Summary

Location	Total Crashes	Critical Rate Factor
1. Capisic Street @ Bancroft Street	2	0.60
2. Bancroft Street btw. Capisic Street and Rockland Avenue	1	0.54

The MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents***
- ***A Critical Rate Factor greater than 1.00***

As the data presented in the table shows, the incidence of traffic crashes is very low; well below MaineDOT's threshold criteria for identification of a high crash location.

SIGHT DISTANCE

The Maine Department of Transportation's Highway Entrance and Driveway Rules require the following sight distances for a non-mobility roadway:

Sight Distance Standards

Speed Limit	Sight Distance
25 mph	200 feet
30	250
35	305
40	360
45	425
50	495
55	570

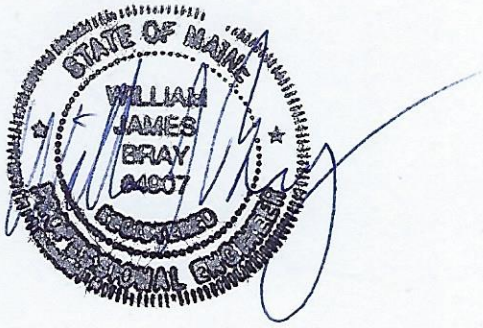
Bancroft Street is currently posted with a regulatory speed limit of 25 mph, which requires an unobstructed sightline of 200 feet. Field measurements determined for both directions of travel exceed 350-feet, a distance well in excess of the required design standards.

CONCLUSIONS

- The residential subdivision project can be expected to generate **67** daily trips; five (**5**) trips in the morning peak hour and **7** trips during the afternoon peak commuter hour.

- The Maine Department of Transportation's most recent three-year (2014 to 2016) accident safety audit completed for the section of Bancroft Street between Capisic Street and Rockland Avenue shows a total of 3 crashes have occurred over the 0.29-mile section of Bancroft Street.

- Vehicle sightlines measured in both directions from the proposed subdivision road onto Bancroft Street meet and exceed, by a considerable margin, the non-mobility highway sight distance standard for a posted speed limit of 25mph.



DEFAULT TITLE FROM MAP DOCUMENT

The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

0.08 Miles

1 inch = 0.06 miles

Date: 3/26/2018
Time: 9:38:48 AM

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

Bancroft St in Portland

REPORT PARAMETERS

Year 2014, Start Month 1 through Year 2016 End Month: 12

Route: **0560033**	Start Node: **12971**	Start Offset: **0**	☐ **Exclude First Node**
	End Node: **12972**	End Offset: **0**	☐ **Exclude Last Node**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

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
12971	0560033 - 0.16	Int of BANCROFT ST, CAPISIC ST	2	2	0	0	0	1	1	50.0	2.713	0.25	0.42	0.00
												Statewide Crash Rate:	0.14	
12972	0560033 - 0.45	0503385 POR,BANCROFT ST,ROCKLAND AVE.	2	0	0	0	0	0	0	0.0	0.141	0.00	0.44	0.00
												Statewide Crash Rate:	0.14	
Study Years: 3.00		NODE TOTALS:		2	0	0	0	1	1	50.0	2.854	0.23	0.41	0.57

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

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
12971	12972	187581	0 - 0.29	0560033 - 0.16	0.29	2	1	0	0	0	0	1	0.0	0.00042	787.28	1454.15	0.00
Int of BANCROFT ST, CAPISIC ST				RD INV 05 60033											Statewide Crash Rate: 400.79		
Study Years: 3.00				**Section Totals:**	0.29		1	0	0	0	0	1	0.0	0.00042	787.28	1454.12	0.54
				Grand Totals:	0.29		3	0	0	0	1	2	33.3	0.00042	2361.83	1715.94	1.38

Wetland Summary Report

Prepared for

Northeast Civil Solutions

130 Bancroft Street

Portland, Maine

January, 2018

6 Second Street
Buxton, Maine
207-693-8799

WETLAND SUMMARY

prepared for Northeast Civil Solutions
130 Bancroft Street
Portland, Maine

Longview Partners, LLC was contracted in late fall of 2016 to identify and flag wetlands on the subject property. Alpha-numeric flags were placed on-site, generally at intervals of 30'-50' along wetlands identified, for location by survey onto the base plan by Northeast Civil Solutions.

Wetlands were identified using the 'three-parameter' approach outlined in the U.S. Army Corps of Engineers, Wetland Delineation Manual Version 1987 (with Regional Supplements). Criteria must be met for all three parameters of hydrophytic vegetation, hydric soils, and hydrology in one location in order for an area to be included as wetlands.

The majority of the wetlands on-site consist of forested, freshwater wetlands that occur in narrow, "fingered' swales within the gently rolling landscape. These enter the subject property from the abutting properties to the southeast and east, and contain areas of runoff that concentrate at the lowest elevations of the swales. Lowest portions of the wetland swales then drain into the ditchline system created at the rear of the existing single family dwelling, lawn and swimming pool that pre-exists the redevelopment of the site.

No vernal pool habitat was observed on the project site, and Maine Dept. of Environmental Protection (MDEP) staff visited the site and found no streams within the property. (see Field Determination Form by Audie Arbo, 8/23/16).

Per MDEP, Natural Resources Protection Act standards, no setbacks are generally required the wetlands on the subject property.

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RESOURCES

8/23/2016

CONTACT ID 11294

FIELD DETERMINATION FORM

CONTACT

PETER BLAKE
281 VERANDA ST
PORTLAND, ME 04103
2014001450

PROPERTY OWNER

JOHN WAGNER
130 BANCROFT STREET
PORTLAND, ME 04102

STAFF ARBO, AUDIE LEE

DIRECTIONS

Read St to Stevens Ave to Brighton to Bancroft

SITE TOWN PORTLAND
MAP **LOT**

MEMO

On August 23, 2016, I met with Peter Blake at 130 Bancroft Street in Portland. I was asked to inspect the property for protected natural resources and indicate what permits may be required for a development proposal on the site. The landowner is looking to develop the 13-acre parcel with multiple lots. The property contains freshwater wetlands as defined by the Natural Resources Protection Act (NRPA), 38 M.R.S. §480-B(4). Up to 4,300 square feet of the wetland, in total, may be altered on the property without obtaining a permit from the Department, pursuant to NRPA, 38 M.R.S. §480-Q(17). All wetland impact on the property since September 29th, 1995 is counted towards the 4,300 square foot total. Any alteration above 4,300 square feet will require a Tier Permit for wetland alteration from the Department. The application materials can be found at the following link: http://www.maine.gov/dep/land/nrpa/index.html.

As discussed on site, a Tier permit may be required for the proposed development. A Tier 1 permit would be required for proposed wetland alteration up to 14,999 square feet. A Tier 2 permit would be required for wetland alteration from 15,000 to 43,560 square feet. A Tier 3 permit is required for alterations above 43,560 square feet. The applicant must demonstrate project need and purpose and evidence of avoidance and minimization of wetland impacts in the design proposal.

I recommend you hire a wetland delineator or other qualified professional to perform a wetland survey and to provide a wetland boundary map. I have determined that there are no streams on the property next to the existing lawn area.

Erosion control devices must be installed and maintained on the project site during any soil disturbance activity. A Stormwater Management Law PBR or Maine Construction General Permit "NOI" and "NOT" must be filed with the Department if more than 1 acre of area is going to be disturbed on the project site at any given time during construction.

NAME:

RECEIVED 8/16/2016 **SITE VISIT** 8/23/2016 **COMPLETED** 8/23/2016

Mike Skolnick

From: James Logan <longviewpartners213@gmail.com>
Sent: Friday, March 30, 2018 7:55 AM
To: Mike Skolnick
Subject: Re: 130-144 Bancroft - 7 Lot Subdivision

Hello Mike,

The wetlands, as represented on the plan entitled "Grading and Drainage Plan" prepared by Northeast Civil Solutions, are depicted as I mapped them in the field. Feel free to call me at 207-693-8799 for more information.

Best,

Jim

On Thu, Mar 29, 2018 at 1:45 PM, Mike Skolnick <mike.skolnick@northeastcivilsolutions.com> wrote:

Jim,

Can you please take a look at the attached plan and reply with a quick response indicating that the wetlands are shown as you mapped for DEP. They need us to include this within our submission package for Tier 1 permitting.

Please let us know if there is any further information you may need.

Michael Skolnick

Land Use Regulatory Specialist

(p) 207.883.1000
(f) 207.883.1001

Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

A DBE Certified Company

SURVEYING ⊙ ENGINEERING ⊙ LAND PLANNING

www.northeastcivilsolutions.com

--

James Logan, CSS/LSE
Longview Partners, LLC
6 Second Street ***Buxton, ME 04093***
207-693-8799

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

JOSH WAGNER	) NATURAL RESOURCES PROTECTION ACT
Portland, Cumberland County	) FRESHWATER WETLAND ALTERATION
BANCROFT SUBDIVISION AND ROAD	) WATER QUALITY CERTIFICATION
L-27901-TC-A-N (approval)	) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to fill 10,741 square feet of forested freshwater wetlands to construct an eight-lot residential subdivision that will include an access road, driveways, and a detention pond for stormwater as shown on a set of plans, the first of which is titled "Wetland Impacts," prepared by Northeast Civil Solutions, and dated May 3, 2018. The applicant has avoided and minimized wetland impacts to the greatest extent practicable by proposing 2H:1V fill side slopes within wetland areas, crossing wetland areas at the narrowest locations and by installing no less than four culverts under driveways and the access road to maintain wetland hydrological connectivity. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site. The Stormwater Management Law application required for this project will be reviewed under municipal review authority by the City of Portland. The proposed project is located off Bancroft Street in City of Portland.

Permit for:	X	Tier 1
DEP Decision:	X	Approved [ ] Denied (see attached letter)
CORPS Action:	X	The Corps has been notified of your application. The following are subject to Federal screening: (1) projects with previously authorized or unauthorized work, in combination with a Tier 1 permit for a single and complete project, which total more than 15,000 square feet of altered area; (2) projects with multiple state permits and/or state exemptions which apply to a single and complete project that total more than 15, 000 square feet of altered area; and (3) projects that may impact a vernal pool, as determined by the State of Maine or the Corps. If your activity is listed above, *Corps approval is required for your project*. For information regarding the status of your application contact the Corps' Maine Project Office at (207) 623-8367.

Standard Conditions:

1) If construction or operation of the activity is not begun within four (4) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.

4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 28TH DAY OF JUNE, 2018.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
For: Paul Mercer, Commissioner

Filed
JUN 29 2018
State of Maine
Board of Environmental Protection

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

JH/L27901AN/ATS#83116

Natural Resources Protection Act (NRPA)
Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.

B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.

D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.

E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.

G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.

H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION, AUGUSTA, MAINE 04333

Erosion Control for Homeowners

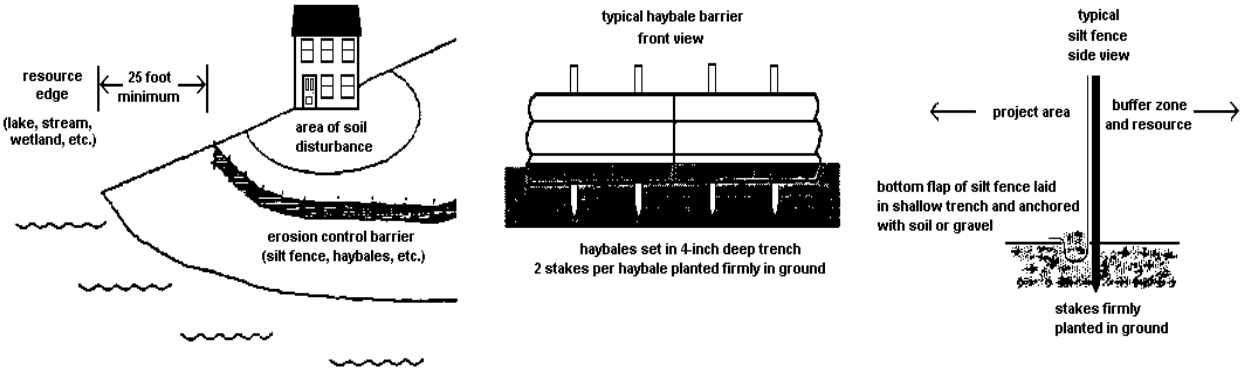
Before Construction

1. If you have hired a contractor, make sure you discuss your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is, and where it is located. Most people can identify the edge of a lake or river. However, the edges of wetlands are often not so obvious. Your contractor may be the person actually pushing dirt around, but you are both responsible for complying with the permit.

2. Call around to find where erosion control materials are available. Chances are your contractor has these materials already on hand. You probably will need silt fence, hay bales, wooden stakes, grass seed (or conservation mix), and perhaps filter fabric. Places to check for these items include farm & feed supply stores, garden & lawn suppliers, and landscaping companies. It is not always easy to find hay or straw during late winter and early spring. It also may be more expensive during those times of year. Plan ahead -- buy a supply early and keep it under a tarp.

3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the soil-disturbance activity.

4. If a contractor is installing the erosion control barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour", meaning at the same level or elevation across the land slope, whenever possible. This keeps stormwater from flowing to the lowest point along the barrier where it can build up and overflow or destroy the barrier.



During Construction

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops hitting the bare ground that makes the soil begin to move downslope with the runoff water, and cause erosion. More than 90% of erosion is prevented by keeping the soil covered.

2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. You or your contractor then need to figure out what can be done to prevent more soil from getting past the barrier.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

After Construction

1. After your project is finished, seed the area. Note that all ground covers are not equal. For example, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high-maintenance areas. But this same seed mix is a poor selection for stabilizing a road shoulder or a cut bank that you don't intend to mow. Your contractor may have experience with different seed mixes, or you might contact a seed supplier for advice.

2. Do not spread grass seed after September 15. There is the likelihood that germinating seedlings could be killed by a frost before they have a chance to become established. Instead, mulch the area with a thick layer of hay or straw. In the spring, rake off the mulch and then seed the area. Don't forget to mulch again to hold in moisture and prevent the seed from washing away or being eaten by birds or other animals.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

Why Control Erosion?

To Protect Water Quality

When soil erodes into protected resources such as streams, rivers, wetlands, and lakes, it has many bad effects. Eroding soil particles carry phosphorus to the water. An excess of phosphorus can lead to explosions of algae growth in lakes and ponds called blooms. The water will look green and can have green slime in it. If you are near a lake or pond, this is not pleasant for swimming, and when the soil settles out on the bottom, it smothers fish eggs and small animals eaten by fish. There many other effects as well, which are all bad.

To Protect the Soil

It has taken thousands of years for our soil to develop. It usefulness is evident all around us, from sustaining forests and growing our garden vegetables, to even treating our septic wastewater! We cannot afford to waste this valuable resource.

To Save Money ($$)

Replacing topsoil or gravel washed off your property can be expensive. You end up paying twice because State and local governments wind up spending your tax dollars to dig out ditches and storm drains that have become choked with sediment from soil erosion.

DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: March 2012 **Contact: (207) 287-2811**

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's ("DEP") Commissioner: (1) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This INFORMATION SHEET, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

HOW LONG YOU HAVE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status*. The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions or conditions objected to or believed to be in error*. Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge*. If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested*. The Board will limit its consideration to those arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer questions regarding applicable requirements.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed the license normally remains in effect pending the processing of the appeal. A license holder may proceed with a project pending the outcome of an appeal but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, including the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, a license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court, see 38 M.R.S.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & M.R. Civ. P 80C. A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452 or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY

JOSH WAGNER
130 BANCROFT STREET
PORTLAND, MAINE 04101

CORPS PERMIT # NAE-2018-01383
CORPS GP ID# 18-418
STATE ID# L-27901-TC-A-N

DESCRIPTION OF WORK:
Fill approximately 10,741 s.f. (0.25 ac.) of freshwater wetlands off 130 & 144 Bancroft Street at Portland, Maine (Cumberland County) in order to construct an access road and associated infrastructure for a seven-lot subdivision. This work is shown on the attached plans entitled "JOSH WAGNER, BANCROFT SUBDIVISION" in seven sheets dated "5/1/18" and "5/3/18" respectively.

LAT/LONG COORDINATES: 43.663543° N -70.302686° W **USGS QUAD:** PORTLAND WEST, ME

I. CORPS DETERMINATION:
Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. **Your work is therefore authorized by the U.S. Army Corps of Engineers under the enclosed Federal Permit, the Maine General Permit (GP).** Accordingly, we do not plan to take any further action on this project.

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 38 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. **This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.**

II. STATE ACTIONS: PENDING [X], ISSUED [ ], DENIED [ ] DATE_____

APPLICATION TYPE: PBR:__, TIER 1: X, TIER 2 :__, TIER 3:__, LURC: __ DMR LEASE: __ NA: __

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: 6/29/2018 LEVEL OF REVIEW: CATEGORY 1:__ CATEGORY 2: X

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10__, 404 X 10/404__, 103__

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA NO, USF&WS NO, NMFS NO

If you have any questions on this matter, please contact my staff at 978-318-8676 at our Augusta, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

COLIN M. GREENAN
PROJECT MANAGER
MAINE PROJECT OFFICE

for Jay L Clement 8/2/18
FRANK J. DEL GIUDICE DATE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION

US Army Corps
of Engineers®
New England District

PLEASE NOTE THE FOLLOWING ADDITIONAL CONDITIONS FOR DEPARTMENT OF THE ARMY GENERAL PERMIT NO. NAE-2018-01383

1. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.

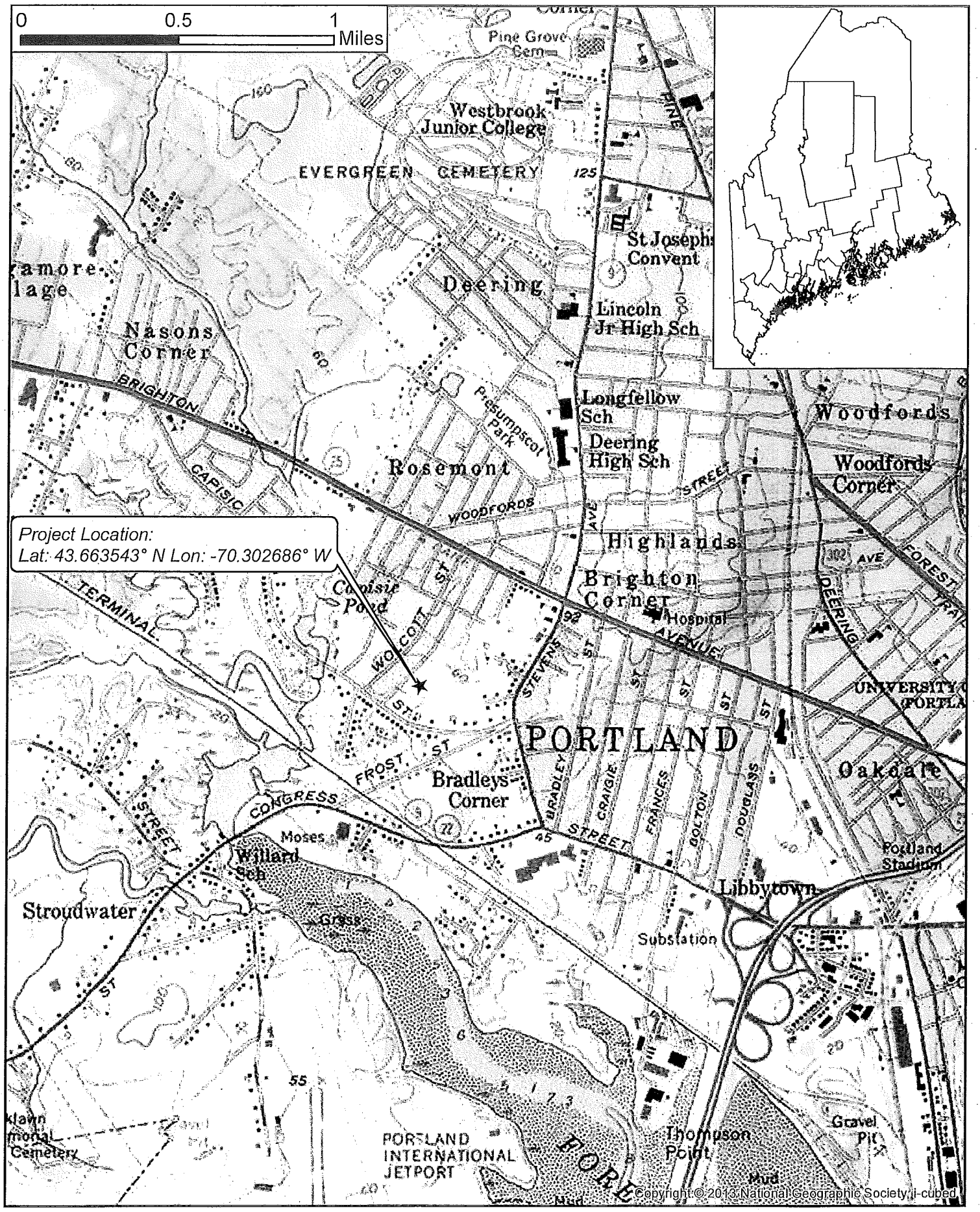
2. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must **complete and return the enclosed Work Start Notification Form**(s) to this office at least two weeks before the anticipated starting date. You must **complete and return the enclosed Compliance Certification Form** within one month following the completion of the authorized work and any required mitigation (but not mitigation monitoring, which requires separate submittals).

3. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices shall be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

4. All exposed soils resulting from the construction shall be promptly seeded and mulched in order to achieve vegetative stabilization.

5. The 36-in. dia. wetland crossing culverts shall be embedded at least 6 in. with natural bottoms for hydraulic and ecological connectivity. If future inspections discover wetland damage likely due to lack of hydraulic connectivity, the Permittee shall take necessary measures to correct this deficiency.

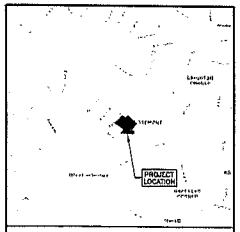
6. No tree cutting shall occur between June 1st and July 31st of any year in order to minimize potential impacts to federally listed northern long eared bats.



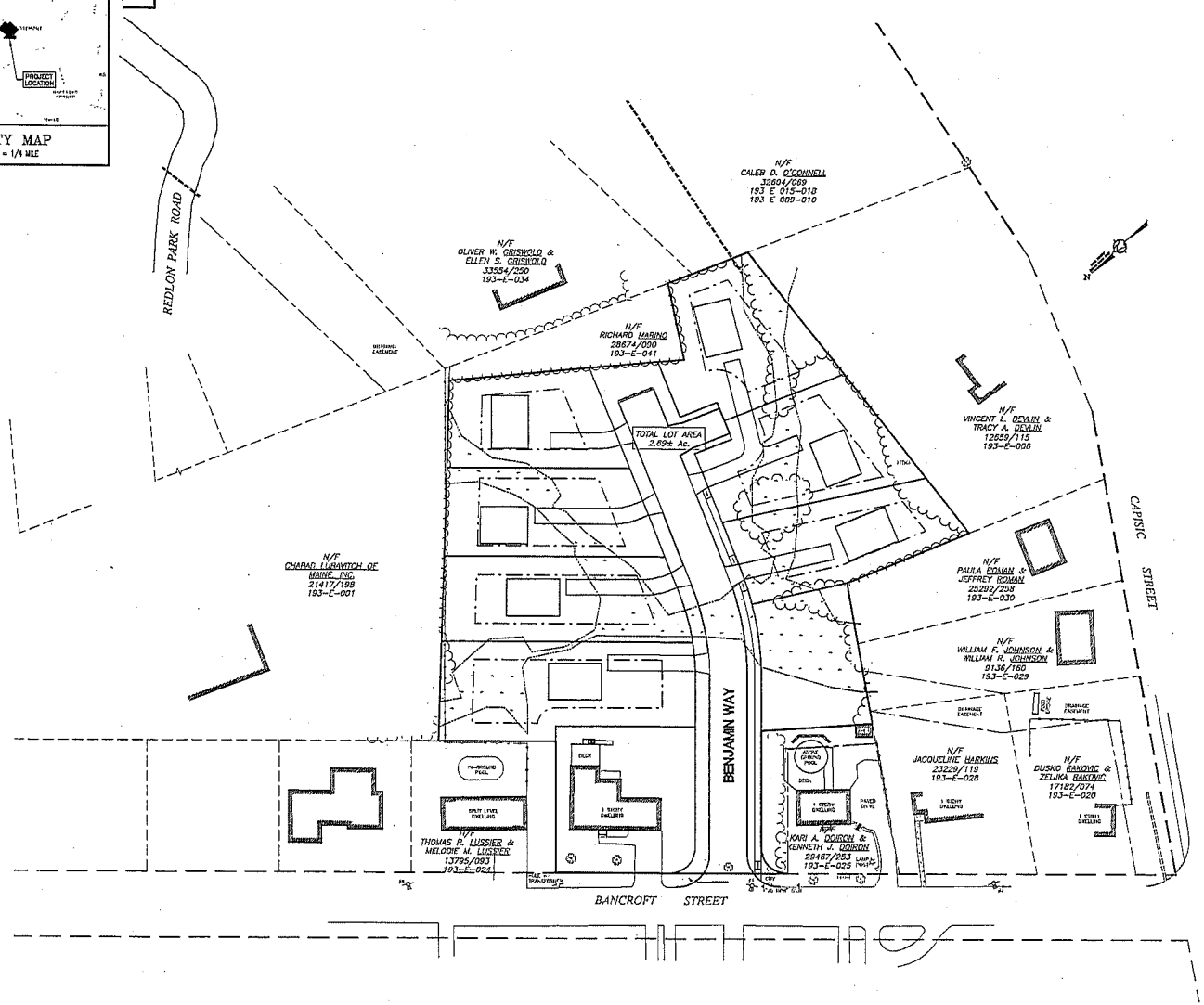
Josh Wagner, 130 & 144 Bancroft Street
Portland, Maine
USGS 7.5 QUAD: Portland West, ME

CORPS PERMIT NO. NAE-2018-01383

PROPOSED CAPISIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE



VICINITY MAP
SCALE: 1" = 1/4 MILE



SHEET INDEX

1. COVER/INDEX/VICINITY MAP
2. BOUNDARY & TOPOGRAPHIC SURVEY
3. SUBDIVISION PLAN
4. PLAN & PROFILE
5. GRADING & DRAINAGE PLAN
6. UTILITY PLAN
7. EROSION & SEDIMENTATION CONTROL PLAN
8. EROSION & SEDIMENTATION CONTROL NOTES AND DETAILS
9. CONSTRUCTION DETAILS – SHEET 1
10. CONSTRUCTION DETAILS – SHEET 2
11. CONSTRUCTION DETAILS – SHEET 3
12. CONSTRUCTION DETAILS – SHEET 4
13. CONSTRUCTION DETAILS – SHEET 5
14. CONSTRUCTION DETAILS – SHEET 6

PRE-DEVELOPMENT DRAINAGE AREA PLAN

POST-DEVELOPMENT DRAINAGE AREA PLAN

ABUTTERS

ASSESSOR'S MAP	PARCEL NUMBER	OWNER'S NAME
193-C	1	CHABAD LUBAVITCH OF MAINE, INC. 101 CAPISIC STREET, PORTLAND, ME 04102 BOOK 21417, PAGE 195
193-E	34	OLIVER W. GRISWOLD & ELLEN S. GRISWOLD 38 REDLON PARK ROAD, PORTLAND, ME 04102 BOOK 33554, PAGE 250
193-E	41	RICHARD MARINO 38 REDLON PARK ROAD, PORTLAND, ME 04102 BOOK 28674, PAGE 90
193-E	15 – 18 9 & 10	CALEB D. O'DONNEL BOOK 32604, PAGE 69
193-E	6	VINCENT L. DEVLIN 99 CAPISIC STREET, PORTLAND, ME 04102 BOOK 12659, PAGE 115
193-E	30	PAULA ROMAN & JEFFERY ROMAN 60 WOODVALE STREET, PORTLAND, ME 04102 BOOK 25299, PAGE 258
193-E	29	WILLIAM R. JOHNSON & WILLIAM F. JOHNSON 119 CAPISIC STREET, PORTLAND, ME 04102 BOOK 9136, PAGE 160
193-E	28	JACQUELINE HARKINS 154 BANCROFT STREET, PORTLAND, ME 04102 BOOK 23329, PAGE 116
193-E	20	DUSKO RAKOVIC & ZELIKA RAKOVIC 164 BANCROFT STREET, PORTLAND, ME 04102 BOOK 17182, PAGE 74
193-E	24	THOMAS R. LUSSIER & MELODY M. LUSSIER 126 BANCROFT STREET, PORTLAND, ME 04102 BOOK 13795, PAGE 93

THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR RECORDING

Revision	By	Date	Change
1	SMA	5/4/18	SUBMITTED FOR MDEP TIER 1 REVIEW

PROJECT NUMBER: 41041 | ACAD FILE: 41041-COVER.DWG | SCALE: 1" = 40' | DATE: MAY 1, 2018

DRAWING STATUS
- ☐ SITE PLAN REVIEW
- ☒ DEP REVIEW
- ☐ PLANNING BOARD
- ☐ SKETCH PLAN
- ☐ FOR CONSTRUCTION

5-4-18

ANTHONY P. PANDOLFO JR. No. 10941 — 5-4-18

SHEET 1 OF 14

Drawing Name: COVER/INDEX/VICINITY PLAN

Project Name: PROPOSED CAPISIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102

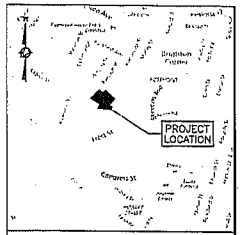
Owner/Applicant: WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102

SURVEYING • ENGINEERING • LAND PLANNING
Northeast Civil Solutions
INCORPORATED
351 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail / website info@northeastcivilsolutions.com www.northeastcivilsolutions.com

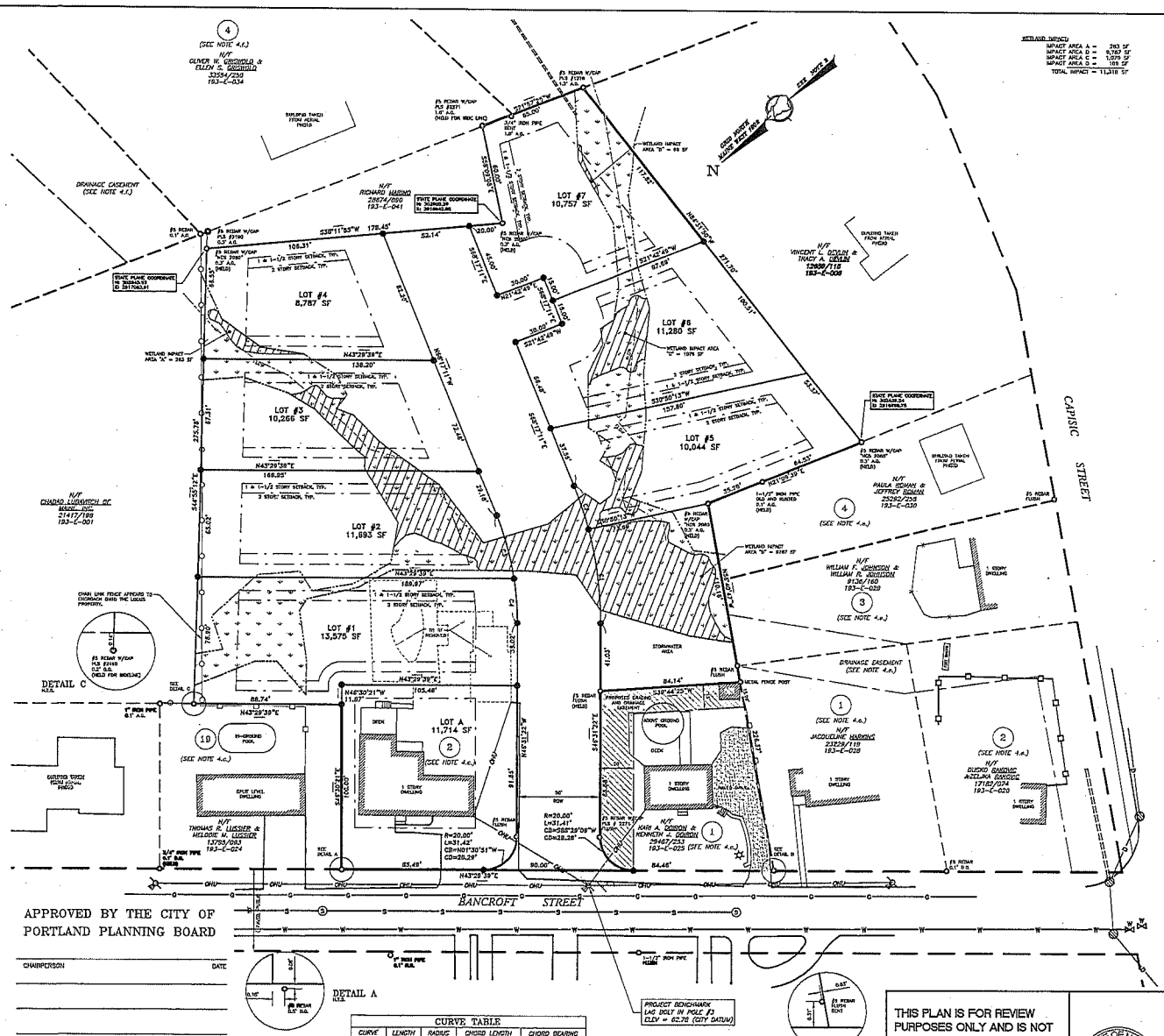
0 10' 20' 40'

E:\LAND PROJECTS\2018\41041-CAPISIC MEADOWS\DWG\41041-COVER.DWG

JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 1 of 7 (rev'd 5/1/18)



VICINITY MAP
N.T.S.



SUBDIVISION NOTES

S-1. DEVELOPER:

S-2. SURVEYING / ENGINEERING:
NORTHEAST CIVIL SOLUTIONS, INC.
381 PAYNE ROAD
SCARBOROUGH, MAINE 04074

S-3. WETLAND DELINEATION:
LONGVIEW PARTNERS, LLC
8 SECOND STREET
GORHAM, MAINE 04093

S-4. THE SUBJECT PARCEL IS LOCATED IN B-3 ZONE. PORTIONS OF BULK & SPACE REQUIREMENTS ARE AS FOLLOWS:
MINIMUM LOT AREA = 6,500 S.F.
MINIMUM LOT FRONTAGE = 50'
FRONT SETBACK = 25'
REAR SETBACK = 25'
SIDE SETBACK = 8' MINIMUM
1 & 1-1/2 STORY = 8'
2 STORY = 14'
3 STORY = 18'

S-5. ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM. SEE PLAN FOR TBM DESCRIPTION.

APPROVED BY THE CITY OF PORTLAND PLANNING BOARD

CHAIRPERSON DATE

CURVE TABLE				
CURVE	LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING
C1	87.65'	225.00'	87.15'	S57°49'57"E
C2	28.09'	225.00'	28.07'	S64°54'47"E
C3	38.39'	175.00'	38.30'	N41°50'20"W
C4	27.09'	175.00'	27.06'	N52°57'25"W

THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR RECORDING

STATE OF MAINE
TROY H. McDONALD
#2030
PROFESSIONAL LAND SURVEYOR
5/10/2018

LEGEND

- #5 REBAR WITH PLASTIC CAP (PROPOSED)
- SET GRANITE MONUMENT WITH PLASTIC CAP (PROPOSED)
  (PROPOSED MONUMENTATION SHOWN ON THIS SURVEY PLAT MAY OR MAY NOT BE SET BY NCS, INC. AND IF SO WILL BE DONE UPON CLIENT AUTHORIZATION.)
- FOUND IRON (SIZE & TYPE AS NOTED)
- UTILITY POLE (NUMBER AS NOTED)
- GUY WIRE ANCHOR
- TREE LINE (APPROXIMATE)
- BOUNDARY LINE
- EASEMENT LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- ABUTTER LINE
- BUILDING SETBACK
- OVERHEAD UTILITY
- N/F 1234/567 12-34 — NOW OR FORMERLY OWNED BY DEED BOOK AND PAGE (COORD) TAX MAP-LOT
- PARENTHESIS DENOTE RECORD DATA

BOUNDARY NOTES

1. RECORD OWNERS OF THE PARCELS SURVEYED ARE DESCRIBED IN THE FOLLOWING DEEDS RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS:
   a. FROM EDWARD C. BROOKS & ROSE MARIE BROOKS TO KARI A. DOIRON & KENNETH J. DOIRON, DATED MARCH 30, 2012 AND RECORDED IN DEED BOOK 29467, PAGE 255 (PARCEL 193-E-039).
   b. FROM DIANE E. HERRICK TO PAUL WAGNER, DATED MARCH 23, 2010 AND RECORDED IN DEED BOOK 27668, PAGE 230 (PARCEL 193-E-026 & 040).
   c. FROM THE ESTATE OF STUART HERRICK, JR. TO JOSHUA WAGNER, DATED AUGUST 23, 2010 AND RECORDED IN DEED BOOK 28027, PAGE 268 (PARCEL 193-E-019).
2. THE PARCELS SURVEYED ARE IDENTIFIED ON THE CITY/TOWN OF PORTLAND TAX ASSESSOR'S MAP 193, BLOCK E, PARCELS 19, 26, 39 & 40.
3. THE BEARINGS SHOWN ON THIS PLAN ARE BASED ON MAINE STATE COORDINATE SYSTEM, WEST ZONE, 1801, GRID NORTH.
4. REFERENCE IS MADE TO THE FOLLOWING PLANS:
   a. "PLAN OF PROPERTY, 130 BANCROFT STREET, PORTLAND, MAINE", BY TITCOMB ASSOCIATES, DATED 8/30/2006, RECORDED IN PLAN BOOK 210, PAGE 228.
   b. "PLAN OF PROPERTY, 130 BANCROFT STREET, PORTLAND, MAINE", BY TITCOMB ASSOCIATES, DATED 8/13/2008, RECORDED IN PLAN BOOK 208, PAGE 370.
   c. "PLAN OF EMERSON WOODS, PORTLAND, MAINE", BY ROBERT P. TITCOMB, DATED 4/25/1973, RECORDED IN PLAN BOOK 94, PAGE 15.
   d. "PLAN OF EMERSON WOODS, PORTLAND, MAINE", BY ROBERT P. TITCOMB, DATED 12/20/1972, RECORDED IN PLAN BOOK 93, PAGE 42.
   e. "PLAN OF PROPERTY IN PORTLAND, MAINE MADE FOR CHARLOTTE L.F. CHENEY, BY H.L. & E.C. JORDAN, DATED 10/05/1078, RECORDED IN PLAN BOOK 125, PAGE 8.
   f. "1ST AMENDED SUBDIVISION PLAN OF REDLON PARK SUBDIVISION", BY SEBAGO TECHNICS, DATED 4/11/2016, RECORDED IN PLAN BOOK 216, PAGE 139.
   g. "PLANNED RESIDENTIAL UNIT DEVELOPMENT PLAN AND SUBDIVISION PLAN, REDLON PARK, REDLON ROAD, PORTLAND, MAINE" BY PINKHAM & GREEN, DATED 2/27/1987, RECORDED IN PLAN BOOK 187, PAGE 493.
   h. "RIGHT-OF-WAY MAP, STATE HIGHWAY NO. 17, FEDERAL AID PROJECT NO. M-0614(2)", BY STATE OF MAINE DEPARTMENT OF TRANSPORTATION, DATED 4/1968, D.O.T. FILE NO. 3-364.
   i. MULTIPLE STREET LINE RECORDS PROVIDED BY THE CITY OF PORTLAND PUBLIC WORKS.
   k. PLAN OF BRIGHTON, PORTLAND, MAINE MADE FOR GEORGE T. EDWARDS, BY CLIFFORD C. LEGROW, DATED AUGUST, 1902, RECORDED IN PLAN BOOK 11, PAGE 109.
5. THE WIDTH OF BANCROFT STREET IS 50' BASED ON CITY OF PORTLAND STREET LINE RECORDS. THE LAYOUT OF THE RIGHT-OF-WAY LIMITS IS BASED ON SAID STREET LINE SHEETS AND MONUMENTATION FOUND.
6. ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM CALCULATED BY RTK (NAVD 1988 DATUM) AND ADDING 0.5' (DIFFERENCE BETWEEN NAVD 1988 AND NGVD 1929 IN PORTLAND) TO GET TO CITY DATUM. SEE PLAN FOR TBM DESCRIPTION.
7. THE UTILITIES SHOWN ON THIS PLAN WERE FROM FIELD OBSERVATION ONLY. THERE MAY BE OTHER UTILITIES EXISTING THAT ARE NOT SHOWN. CONTACT DIG-SAFE (888)DIG-SAFE PRIOR TO ANY EXCAVAT ON WORK.
8. WETLANDS SHOWN WERE DELINEATED BY LONGVIEW PARTNERS, LLC, JANUARY, 2017 AND FIELD LOCATED BY NCS. MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION PROVIDED A FIELD DETERMINATION THAT NO STREAMS EXIST ON THE SITE.

Revised	By:	Date:	Change

PROJECT: 41041	DRAWING NAME: 41041 Subdivision.dwg	
ISSUED: MAY 1, 2018	SCALE: 1"=30' FB # 420	DRAWN BY: JAP
FIELDED BY: JAP / MAC	FIELD DATE: 1/10/2017	CHECKED BY: TFM

Drawing Name and Location:
SUBDIVISION PLAN
130 & 144 BANCROFT STREET, PORTLAND, MAINE

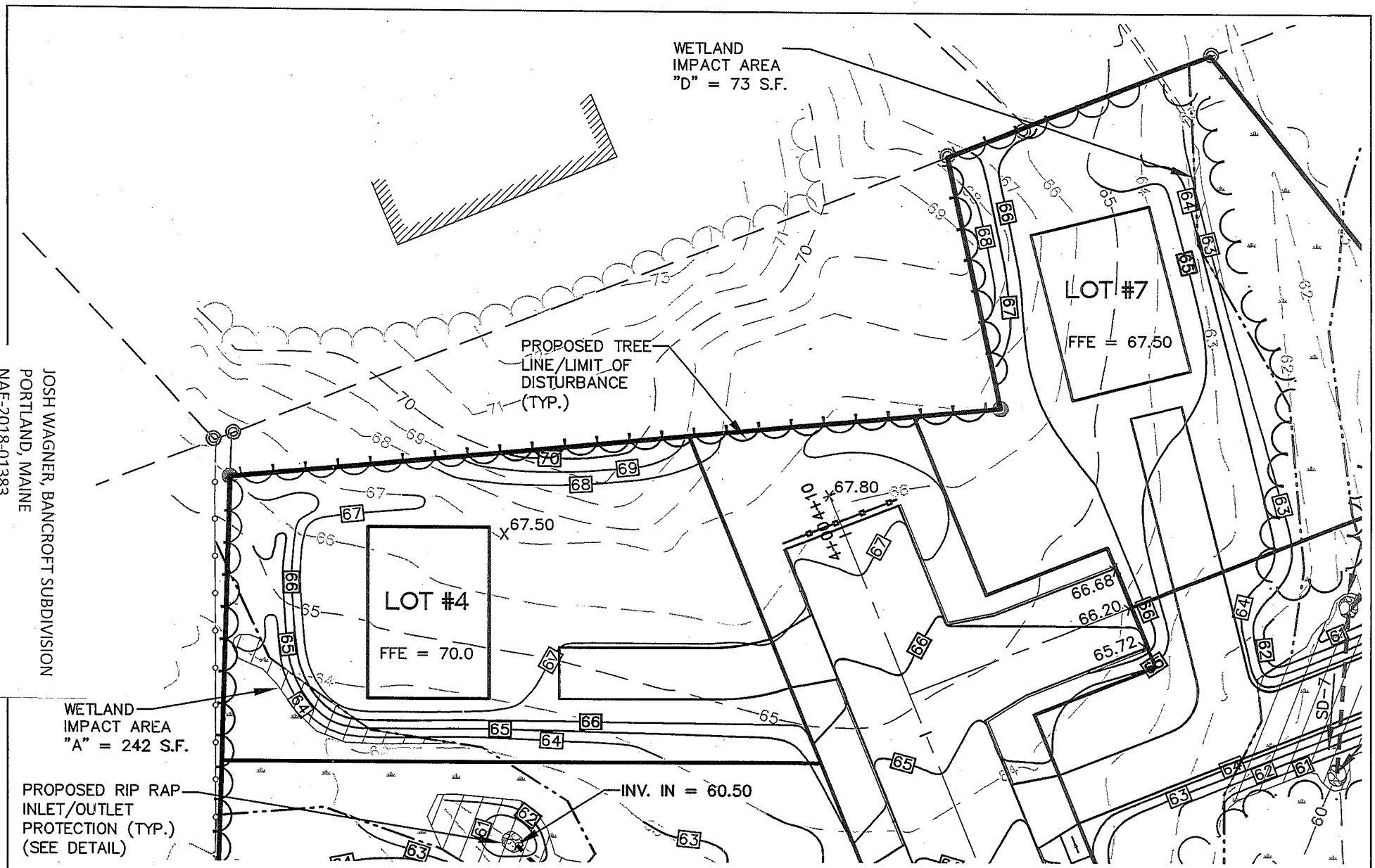
Owner:
JOSHUA WAGNER (193-E-019)
130 BANCROFT STREET, PORTLAND, MAINE 04102
PAUL WAGNER (193-E-026 & 040)
66 WILCOTT STREET, PORTLAND, MAINE 04102
KARI DOIRON & KENNETH J. DOIRON (193-E-039)
144 BANCROFT STREET, PORTLAND, MAINE 04102

Prepared For:
JOSH WAGNER

SURVEYING • ENGINEERING • LAND PLANNING
Northeast Civil Solutions
INCORPORATED
381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1500 fax 207.883.1501 e-mail / website info@northeastcivilsolutions.com
800.552.2227 www.northeastcivilsolutions.com

8 30' 60' 120'

JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 2 of 7 (rev'd 5/1/18)



JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 3 of 7 (rev'd 5/3/18)

WETLAND IMPACT:

IMPACT AREA "A" = 242 SF
IMPACT AREA "D" = 73 SF

HORIZONTAL SCALE 1" = 30'

0 30' 60' 120'

E:\LAND PROJECT\41000\41041 WAGNER PORTLAND\PLANSET\41041 WETLAND IMPACTS.DWG

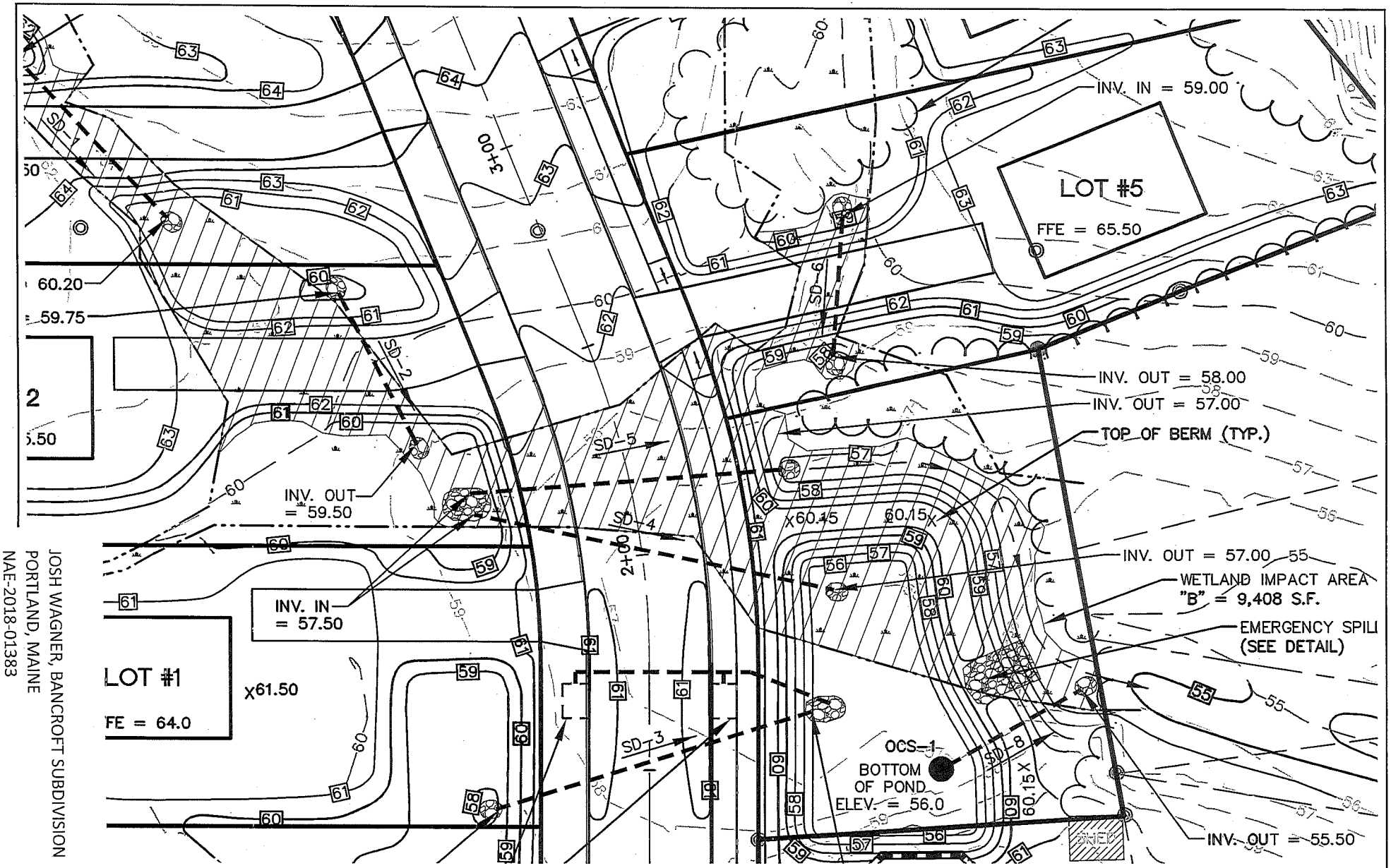
Drawing Name: WETLAND IMPACTS

Project Name and Location: 130-144 BANCROFT STREET
PORTLAND, MAINE 04103

DATE: MAY 3, 2018

SHEET: 1 OF 3

SURVEYING ENGINEERING LAND PLANNING
Northeast Civil Solutions
INCORPORATED
381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail info@northeastcivilsolutions.com



JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 4 of 7 (rev'd 5/3/18)

WETLAND IMPACT:

IMPACT AREA "B" = 9,408 SF

HORIZONTAL SCALE 1" = 30'

0 30' 60' 120'

E:\LAND PROJECT\41000\41041 WAGNER PORTLAND\PLANSET\41041 WETLAND IMPACTS.DWG

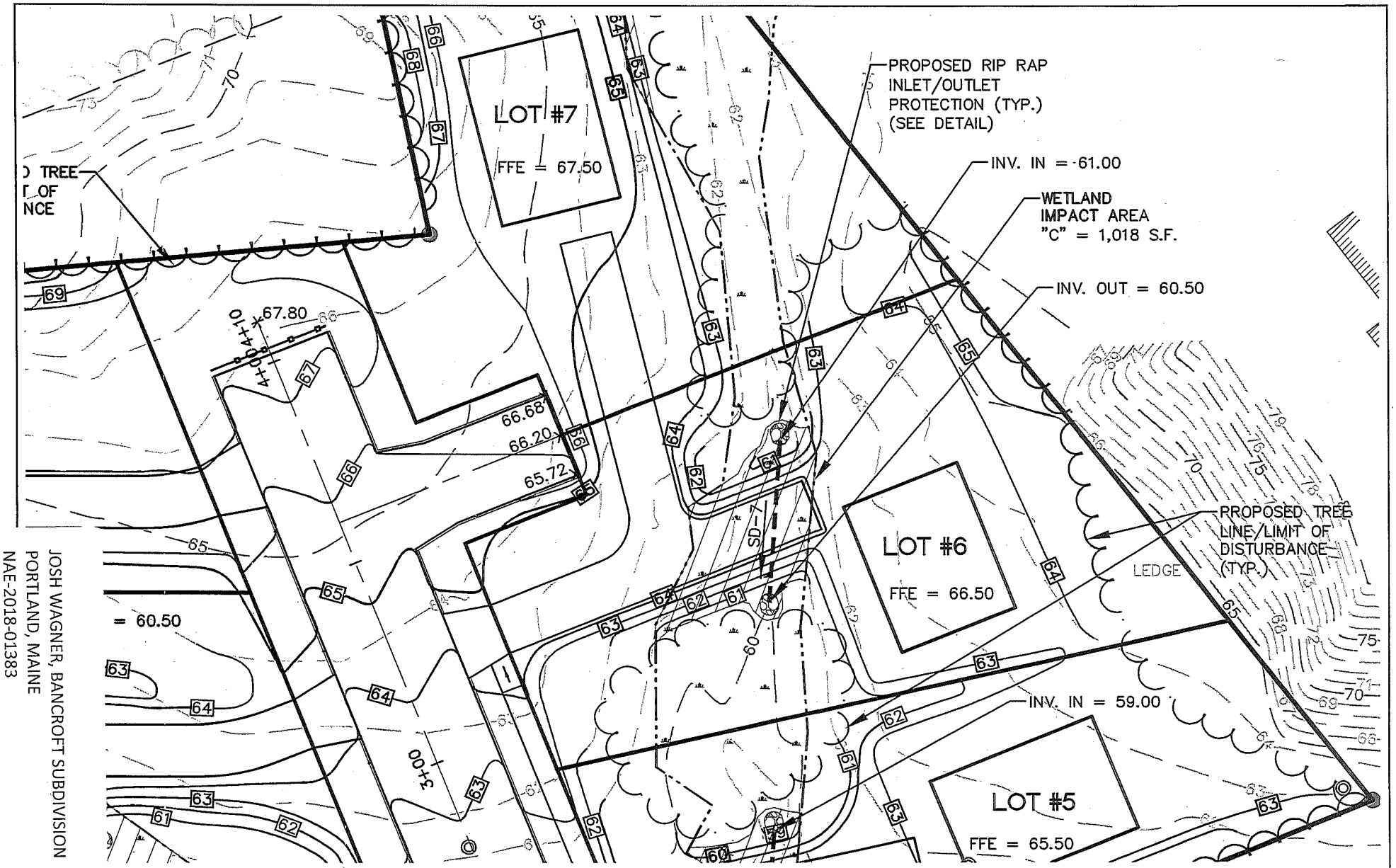
Drawing Name: WETLAND IMPACTS

Project Name and Location: 130-144 BANCROFT STREET
PORTLAND, MAINE 04103

DATE: MAY 3, 2018

SHEET: 2 OF 3

SURVEYING ENGINEERING LAND PLANNING
Northeast Civil Solutions
INCORPORATED
381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail info@northeastcivilsolutions.com



JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 5 of 7 (rev'd 5/3/18)

WETLAND IMPACT:

IMPACT AREA "C" = 1,018 SF

HORIZONTAL SCALE 1" = 30'

0 30' 60' 120'

E:\LAND PROJECT\41000\41041 WAGNER PORTLAND\PLANSET\41041 WETLAND IMPACTS.DWG

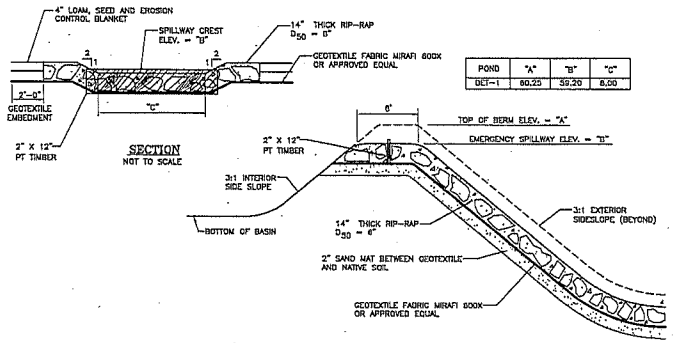
Drawing Name: WETLAND IMPACTS

Project Name and Location: 130-144 BANCROFT STREET
PORTLAND, MAINE 04103

DATE: MAY 3, 2018

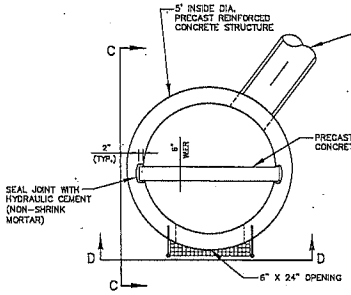
SHEET: 3 OF 3

SURVEYING ENGINEERING LAND PLANNING
Northeast Civil Solutions
INCORPORATED
381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail info@northeastcivilsolutions.com

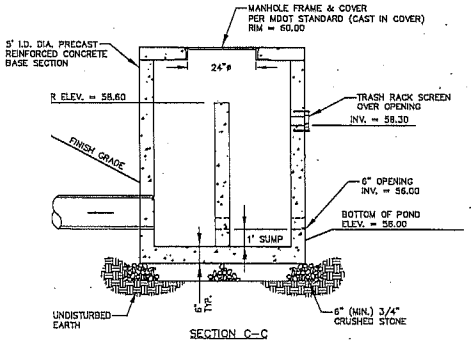


POND	"A"	"B"	"C"
DET-1	60.25	59.20	6.00

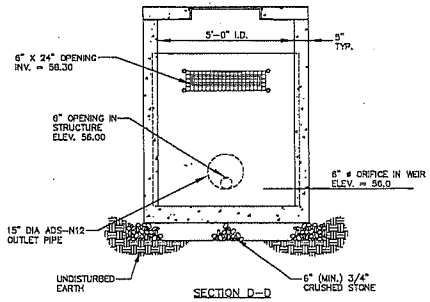
CROSS SECTION OF EMERGENCY SPILLWAY
NOT TO SCALE



PLAN VIEW

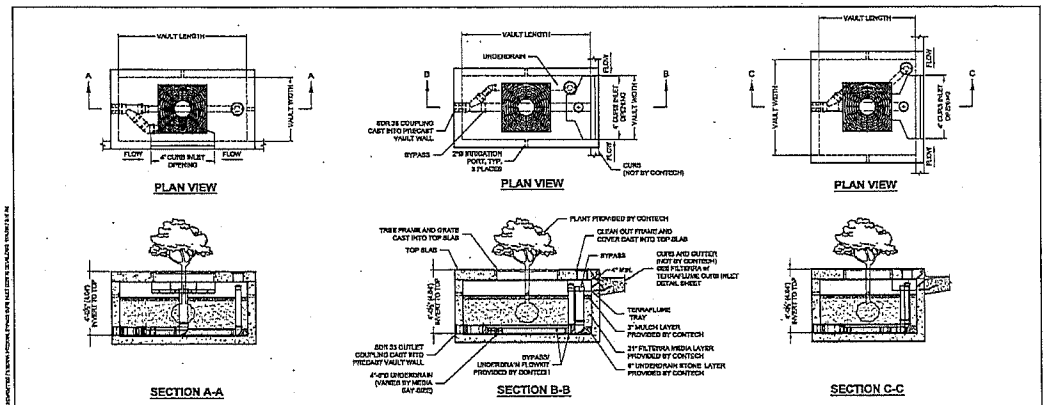


SECTION C-C



SECTION D-D

ST CONCRETE OUTLET CONTROL STUCTURE (OCS-1)
N.T.S.



FTIBC LONG SIDE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (L x W)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC0604	N/A CA	6 x 4	6 x 4	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC0604	CA ONLY	6.5 x 4	6.5 x 4	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC0707HS	MID-ATL ONLY	7.83 x 4.5	7.83 x 4.5	8" SDR 35	1.89	4" SDR 35	(1) 3' x 2'
FTIBC0804	N/A MID-ATL	8 x 4	8 x 4	8" SDR 35	1.89	4" SDR 35	(1) 3' x 2'
FTIBC0808	ALL	8 x 8	8 x 8	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC1006	ALL	10 x 6	10 x 6	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC1208	ALL	12 x 8	12 x 8	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC1307	ALL	13 x 7	13 x 7	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

N/A = NOT AVAILABLE

FTIBC SHORT SIDE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (W x L)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC4608	N/A CA	4 x 6	4 x 6	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC4065	CA ONLY	4 x 6.5	4 x 6.5	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC4806	N/A MID-ATL ONLY	4 x 8	4 x 8	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC4807S	MID-ATL ONLY	4.5 x 7.83	4.5 x 7.83	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'
FTIBC8808	ALL	8 x 8	8 x 8	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC8810	ALL	8 x 10	8 x 10	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC8812	ALL	8 x 12	8 x 12	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC7813	ALL	7 x 13	7 x 13	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

N/A = NOT AVAILABLE

FTIBC SQUARE CURB INLET

DESIGNATION	AVAIL-ABILITY	MEDIA BAY SIZE	VAULT SIZE (L x W)	MAX. OUTLET/ BYPASS PIPE DIA.	MAX. BYPASS FLOW (CFS)	UNDER-DRAIN PIPE DIA. (PERF)	TREE GRATE QTY. & SIZE
FTIBC4404	ALL	4 x 4	4'-0"	8" SDR 35	1.42	4" SDR 35	(1) 2' x 2'
FTIBC6060	ALL	6 x 6	6'-0"	8" SDR 35	1.89	4" SDR 35	(1) 2' x 2'

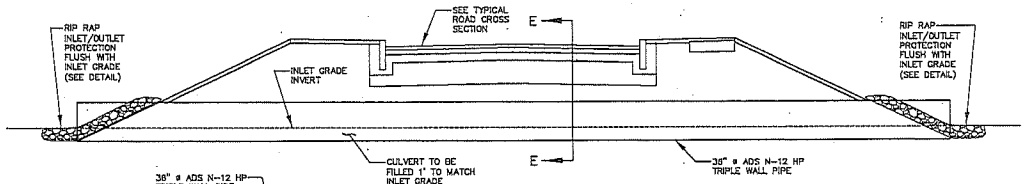
N/A = NOT AVAILABLE

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING ON VAULT SIZE.

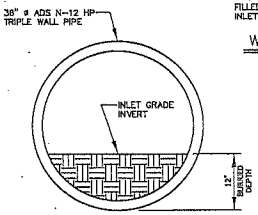
filterra

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
513-645-7000 513-645-7993 513-645-7993 FAX

FILTERRA INTERNAL BYPASS CURB (FTIBC) CONFIGURATION DETAIL



WETLAND CROSSING CULVERT
N.T.S.



SECTION E-E
N.T.S.

THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR RECORDING

Revision	By	Date	Change
2	SMA	3/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR MDEP TIER 1 REVIEW

PROJECT NUMBER: 41041 | ACAD FILE: 41041-DETAILS.DWG | SCALE: AS NOTED | DATE: MAY 1, 2018

Drawing Name: CONSTRUCTION DETAILS – SHEET 1

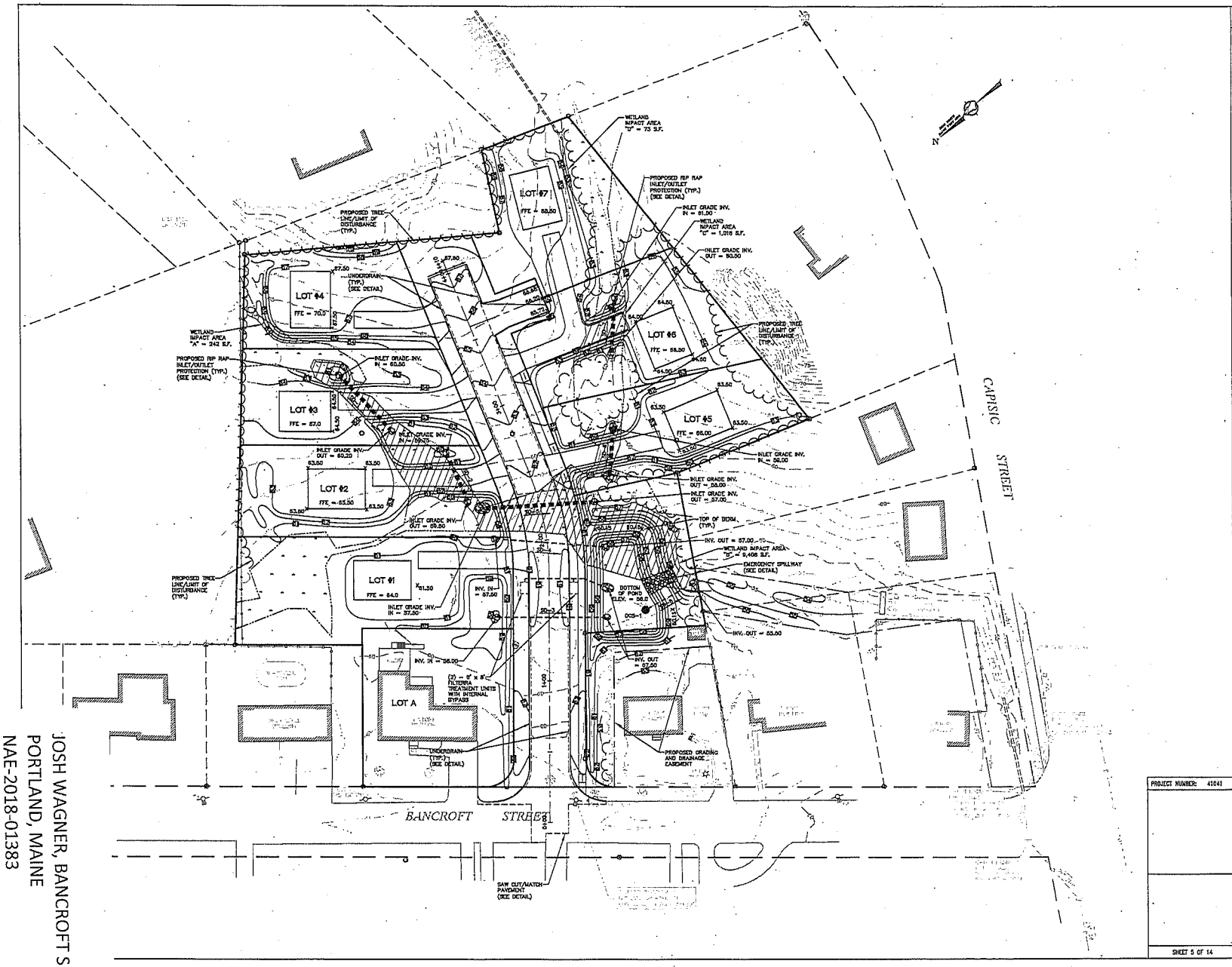
Project Name and Location: PROPOSED CAPISIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102

Prepared For: WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102

SURVEYING • ENGINEERING • LAND PLANNING
Northeast Civil Solutions INCORPORATED
381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail / website info@ne-civilsolutions.com www.ne-civilsolutions.com

SHEET 9 OF 14

JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 6 of 7 (rev'd 5/1/18)



LEGEND

- BOUNDARY LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- ABUTTER
- EXISTING EASEMENT
- BUILDING SETBACK
- EXISTING UTILITY POLE
- EXISTING OVERHEAD UTILITY
- EXISTING HYDRANT
- EXISTING HYDRANT
- EXISTING WATER LINE
- EXISTING SEWER MANHOLE
- EXISTING WATER LINE
- EXISTING TREE
- EXISTING TREE LINE
- WETLAND
- EXISTING CONTOUR
- PROPOSED TREE LINE
- PROPOSED DRAIN LINE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED GRADING & DRAINAGE EASEMENT
- WETLAND IMPACT
- PROPOSED CONTOUR

NOTES

1. WETLAND IMPACT:
   IMPACT AREA A = 242 SF
   IMPACT AREA B = 9,408 SF
   IMPACT AREA C = 1,012 SF
   IMPACT AREA D = 73 SF
   TOTAL IMPACT = 10,741 SF
2. ALL PROPOSED HOUSES THAT HAVE BASEMENTS SHOULD INCLUDE PROVISIONS FOR A SUMP PUMP, AND SUMP PUMP DISCHARGE WITH BACK-FLOW PREVENTION.

PIPE SCHEDULE

PIPE	PIPE DIAMETER	PIPE LENGTH	PIPE SLOPE (FT/FT)	TYPE
SD-1	36"	51'	0.0059	ADS N-12 HP TRIPLE WALL PIPE
SD-2	36"	43'	0.0058	ADS N-12 HP TRIPLE WALL PIPE
SD-3	15"	60'	0.0063	ADS N-12 HP TRIPLE WALL PIPE
SD-4	18"	85'	0.006	ADS N-12 HP TRIPLE WALL PIPE
SD-5	36"	72'	0.007	ADS N-12 HP TRIPLE WALL PIPE
SD-6	36"	32'	0.031	ADS N-12 HP TRIPLE WALL PIPE
SD-7	36"	38'	0.013	ADS N-12 HP TRIPLE WALL PIPE
SD-8	12"	35'	0.014	ADS N-12 HP TRIPLE WALL PIPE

THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR RECORDING

Revision	By	Date	Change
2	SNA	3/01/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SNA	3/4/18	SUBMITTED FOR MDEP TIER 1 REVIEW

PROJECT NUMBER: 41041 | ACAD FILE: 41041-GRADING.DWG | SCALE: 1" = 30' | DATE: MAY 1, 2018

Drawing Name: GRADING & DRAINAGE PLAN

Project Name: PROPOSED CAPISIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102

Owner/Applicant: WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102

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Northeast Civil Solutions
INCORPORATED
301 PAYNE ROAD, SCARBOROUGH, MAINE 04074
tel 207.883.1000 fax 207.883.1001 e-mail / website info@northeastcivilsolutions.com www.northeastcivilsolutions.com

SHEET 5 OF 14

E:\CAD PROJECTS\2041\41041-PORTLAND\CIVIL\41-GRADING.DWG

JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 7 of 7 (rev'd 5/1/18)

US Army Corps of Engineers®
New England District

GENERAL PERMIT
WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

MAIL TO: Colin M. Greenan
U.S. Army Corps of Engineers, New England District
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, Maine 04330

A Corps of Engineers Permit (NAE-2018-01383) was issued to Josh Wagner. The permit authorized the permittee(s) to fill approximately 10,741 s.f. (0.25 ac.) of freshwater wetlands off 130 & 144 Bancroft Street at Portland, Maine (Cumberland County) in order to construct an access road and associated infrastructure for a seven-lot subdivision.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

_____

_____

Business Address: _____

_____

_____

Telephone: ( ) _____ ( ) _____

Proposed Work Dates: Start: _____

Finish: _____

PERMITTEE'S SIGNATURE: _____ DATE: _____

PRINTED NAME: _____ TITLE: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: GREENAN Submittals Required: No

Inspection Recommendation: random MEGP compliance

US Army Corps of Engineers®
New England District

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Corps of Engineers Permit No: NAE-2018-01383

Name of Permittee: Josh Wagner

Permit Issuance Date: _____

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

```
*********************************************************************
* MAIL TO: U.S. Army Corps of Engineers, New England District       *
*          Policy & Technical Support Branch                        *
*          Regulatory Division                                      *
*          696 Virginia Road                                        *
*          Concord, Massachusetts 01742-2751                        *
*********************************************************************
```

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

_____ Signature of Permittee

_____ Date

_____ Printed Name

_____ Date of Work Completion

( ) _____ Telephone Number

( ) _____ Telephone Number

CAPISIC MEADOWS SUBDIVISION
BANCROFT STREET
PORTLAND, MAINE

STORMWATER MANAGEMENT REPORT
REV. 1
SEPTEMBER 2018

Prepared for:

WB Group, Inc.
130 Bancroft Street
Portland, ME 04101

STATE OF MAINE
ANTHONY P. PANCIOCCO JR.
No. 10941
LICENSED
PROFESSIONAL ENGINEER

9-6-18

Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

Project # 41041

TABLE OF CONTENTS

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1 PROJECT DESCRIPTION 2
2 STORMWATER NARRATIVE 2
2.1 Site Location 2
2.2 Receiving Waters 2
2.3 Historic Flooding 3
2.4 Methodology and Modeling Assumptions 3
2.5 Soils 3
2.6 Permitting Requirements 4
2.7 Proposed BMPs 5
2.8 Project Impacts 5
3 STORMWATER QUANTITY ANALYSIS 5
3.1 Pre-Development Conditions 5
3.2 Post- Development Conditions 6
3.3 Stormwater Quantity Summary 6
4 STORMWATER QUALITY ANALYSIS 6
5 CONCLUSIONS 7

APPENDICES

Appendix A HydroCAD Output: Pre-Development
Appendix B HydroCAD Output: Post-Development
Appendix C Stormwater Quality Calculations
Appendix D Filterra Sizing Calculations
Appendix E Fema Firm Map
Appendix F Capisic Brook Watershed Map

1) PROJECT DESCRIPTION

This Stormwater Management Report has been prepared for WB Group, Inc., to present the stormwater runoff results for a proposed 8 lot residential subdivision located off Bancroft Street in Portland. The properties are identified on the City of Portland Tax Assessor's Map 193, Block E, parcels 19, 25, 26, 39 & 40. The property occupies approximately 2.69 acres.

The site generally drains in a southwesterly direction to a drainage easement at the southerly edge of the property. Runoff is conveyed around residential properties to an open ended culvert inlet at the corner of Bancroft Street and Capisic Street. At this point runoff enters the drainage infrastructure in Capisic Street and is conveyed westerly down Capisic Street to a discharge point at Capisic Pond. Capisic Pond is tributary to the Fore River

There is a large offsite watershed to the east, which includes a portion of Redlon Park Subdivision that directs runoff onto the project property. The offsite runoff is conveyed across the subject property through drainage ways to the culvert inlet at the intersection of Capisic and Bancroft Streets.

The development of this site will require Maine Department of Environmental Protection (MDEP) Tier I wetland fill permit, for wetland fills in the amount of 10,741 S.F. Approved MDEP and Army Corps wetland fill permits are attached with this submission. Though this project is tributary to Capisic Pond it is not located in the Capisic Brook Watershed, as such this project is not located in an Urban Impaired Stream Watershed. See attached Capisic Brook Watershed Management Plan map with our project identified.

The development of the site will result in the following:

Proposed new impervious area (on previously vegetated surface)	= 0.65 acres
Proposed disturbed area	= 2.27 acres

2) STORMWATER NARRATIVE

2.1 SITE LOCATION

The project site is located at 130 Bancroft Street in Portland. The project has frontage on Bancroft Street and a new road access will be provided from Bancroft Street. The property is currently mostly lawn area, and woodlands.

2.2 RECEIVING WATERS

Runoff from the project drains southwesterly across the property to an open culvert inlet. Runoff is then conveyed within the drainage infrastructure in Capisic Street to Capisic Pond. Capisic Pond is tributary to the Fore River.

2.3 Historic Flooding

The project site is not located with a floodplain as indicated on the Flood Insurance Rate Maps for the City of Portland Maine, Panel 12 of 17, Community panel number 230051 0012 C dated December 8, 1998 and Panel 13 of 17, Community panel number 230051 0013 B dated July 17, 1986.

2.4 Methodology and Modeling Assumptions

Runoff and routing calculations have been performed for the watershed areas affected by the proposed development. Times of concentration and runoff curve number calculations Service (NRCS) Technical Release 55, (TR-55). Time of concentration calculations have been amended where the values given by the TR-55 method is less than six minutes. In these cases a standard minimum value of six minutes has been used to keep this parameter within the acceptable working range of the model. Each Tc path and corresponding length and slope is identified in the pre and post development drainage area plan. The TR-20 based HydroCAD (version 10.0) modeling software has been utilized to perform the complex runoff and routing calculations.

Design rainfall has been modeled using the SCS Type III hydrograph for 24-hour duration storm events. The rainfall depth for each return period is taken from the Stormwater Management for Maine: Best Management Practices, Appendix H. The rainfall depth values utilized in the stormwater model are indicated in the table below.

24-Hour Rainfall Depths for Cumberland County			
Stormwater Management for Maine: Best Management Practices Appendix H			
Frequency	2-Year	10-Year	25-Year
Rainfall Depth	3.1	4.6	5.8

2.5 Soils

Soil types in the area of the project were identified using the NRCS Web Soil Survey. The curve numbers (CN) utilized in this analysis relate to the ground cover that was observed on the site. Soils identified on the site (or within close proximity) are identified in the Table below. These soil boundaries have been identified on the Pre and Post Development Watershed Maps. Additionally, onsite wetland areas were modeled as Hydrologic Soil group D soils.

Soil Types	Symbol	HSG
Belgrade very fine sandy loam, 0%-8% slopes	BgB	B
Hollis fine sandy loam, 3%-8% slopes	HrB	D

Walpole fine sandy loam	Wa	A/D
Windsor loamy sand, 0%-8% slopes	WmB	A

2.6 PERMITTING REQUIREMENTS

The City of Portland Technical Manual Section 5 Stormwater Management Plans for New Development states that, "Except as provided in below, the following development proposals shall submit a stormwater management plan pursuant to the regulations of Maine DEP Chapter 500 Stormwater Management Rules, including General and Flooding standards": Since this project is a subdivision that will create more than 1,000 square feet of new impervious area and will create more than 10,000 square feet of new non-impervious developed area it will be required to provide a Stormwater Management plan.

As this project will not create one or more acres of new impervious surface area, review by the MDEP under the Stormwater Management Law, Stormwater Permit is not required. As such the project will be required to meet the MDEP's (Chapter 500 Stormwater Management Rules).

The project has received a Tier I NRPA wetland fill permit for wetland impacts in the amount of 10,741 square feet.

Basic Standards: The basic standards require that grading and other construction activities on the site do not impede or otherwise alter drainage ways to create an unreasonable adverse impact on a protected natural resource. The basic standards will be met by the implementation of an Erosion and Sedimentation Control Plan addressing erosion and sediment during construction and post-construction stabilization of the site.

The Erosion and Sedimentation Control Plan was developed following Best Management Practice (BMP) guidelines and has been placed directly on the design plans for reference during construction.

General Standards: The general standards consist of Best Management Practice (BMP) standards. The BMP standards require a project's stormwater management system to include treatment measures that will mitigate the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This must be achieved by using one or more MDEP approved methods to control runoff from no less than 95% of the proposed impervious area and no less than 80% of the proposed developed area associated with a project.

The project will meet the linear portion requirement of MDEP Chapter 500 which states," For a linear portion of a project, treatment may be reduced to no less than 75% of the linear portion's impervious area and no less than 50% of the linear portion's developed area".

As this project will not create one acre or more of new impervious surface area, it will not be subject to MDEP Stormwater Permit Review. The project will be required to meet the Chapter 500 General and Flooding Standards per City of Portland Technical manual.

Flooding Standard: MDEP requires that projects which create 3 acres or more of impervious area and 20 acres or more of developed area or otherwise require review pursuant to the Site Location of Development Law must control the peak flow of runoff from the site to pre-development rates during the 2-year, 10-year and 25-year, 24-hour storms. As this project does not meet the above criteria, the Flooding Standard does not apply for MDEP approvals.

As part of the City of Portland's Technical manual the project will be required to meet the Flooding Standard.

2.7 PROPOSED BMPS

Two Filterra treatment units have been proposed at the low point of the proposed roadway to treat runoff from new roadway surface. The units will have an internal bypass to divert larger storms to an adjacent detention basin for flooding control. The Filterras have been sized in accordance with MDEP Chapter 500 rules.

The owner of the property is not intending to build the houses on this project and as such is not required to provide water quality treatment for the lot impervious areas. The lot impervious areas were included in the modeling to properly model runoff from the site.

2.8 PROJECT IMPACTS

The development of this project will result in the creation of approximately 0.65 acres of new impervious surface area and 2.27 acres of disturbed area.

3) STORMWATER QUANTITY ANALYSIS

3.1 PRE-DEVELOPMENT CONDITIONS

Under pre-development conditions the site is modeled with five Subcatchment areas (See Plan Set for Pre-Development Drainage Area Plan) three onsite Subcatchment areas and two offsite Subcatchment areas. The offsite areas direct offsite runoff onto the project property. The onsite and offsite Subcatchment areas drain to four points of analysis, Study Point 1, Study Point 2, Study Point 3 and Study Point 4 . The analysis encompasses approximately 13.78 acres of land area.

3.2 POST- DEVELOPMENT CONDITIONS

Under the post-development condition the site area is further divided into 8 subcatchment areas to allow for the effects of localized storage to be calculated. The runoff from the subcatchment areas drains to the same four points of analysis, Study Point 1, Study Point 2, Study Point 3 and Study Point 4. The analysis encompasses approximately 13.78 acres of drainage area. As such, a direct comparison can be made of the pre-development and post-development runoff values at each Study Point.

The watershed areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development and grading. The Table below summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

3.3 STORMWATER QUANTITY SUMMARY

Stormwater Runoff Summary Table Pre-Development vs. Post-Development										
Study Point	**Total Watershed Area (Ac)**		**Avg. Weighted Curve No. (Cn)**		**Peak Rates of Runoff (cfs)**					
					2-Year		**10-Year**		**25-Year**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
SP-1	1.98	2.02	80	80	6.0	**2.6**	11.7	**6.5**	16.4	**10.1**
SP-2	2.99	2.95	64	72	6.7	**6.3**	15.0	**13.7**	22.9	**21.9**
SP-3	4.95	4.95	81	81	4.7	**4.7**	9.0	**9.0**	12.6	**12.6**
SP-4	3.86	3.86	55	55	0.2	**0.2**	1.6	**1.6**	3.3	**3.3**

4) STORMWATER QUALITY ANALYSIS

Water quality treatment is provided for runoff from the majority of the new Roadway areas associated with the project. Two proposed Filterra units provide treatment for 85% of the new roadway impervious area and 85% of the new roadway developed area. The proposed treatment meets the Chapter 500 treatment requirements for the project site.

5) CONCLUSIONS

The runoff and routing calculations demonstrate that the development will result in a decrease in the peak rate of runoff at Study Points SP-1 and Study Point SP-2 during the 2-year, 10-year and 25-year storm events.

Study Point SP-3 and Study Point, SP-4 remain unchanged from the pre to post development condition.

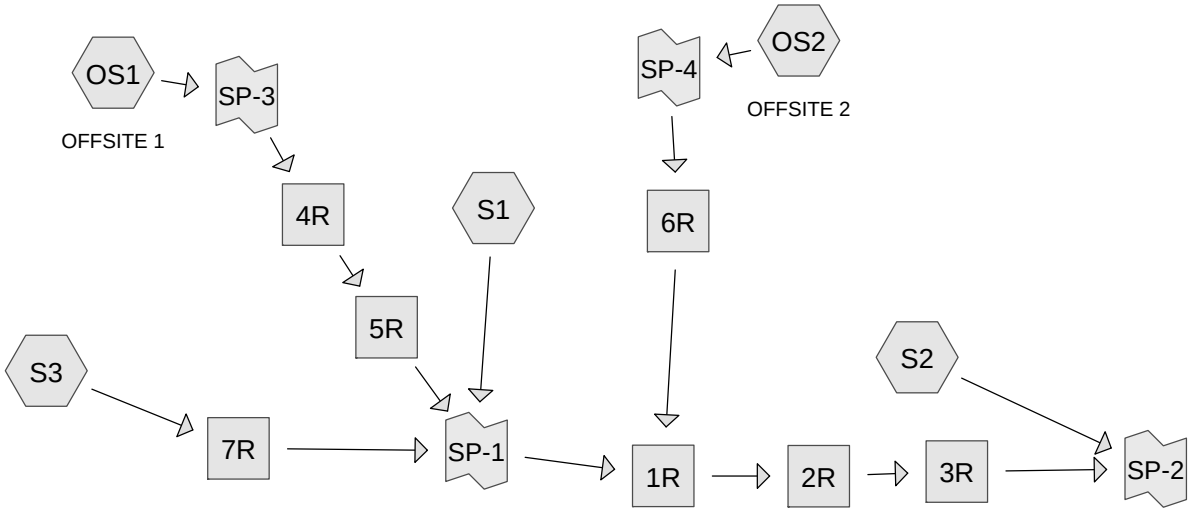
Stormwater runoff from this site will be treated to meet the MDEP Basic and General Standards for stormwater quality treatment for the project site. The project will provide treatment for 85% of the new roadway impervious areas and 85% of the new roadways developed area, meeting Chapter 500 Stormwater requirements.

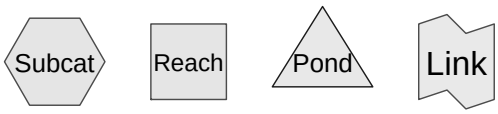
The proposed project is designed to fit the topography and natural features of the site to the maximum extent practical. Stormwater runoff from the development will be captured, detained and treated in a series of BMPs and discharged to the same locations as the pre-development conditions.

An Erosion and Sedimentation Control Plan will be implemented to address erosion and sediment control during construction and the post-construction stabilization of the site. These construction requirements have been developed following BMP guidelines and have been place directly on the design plans for construction reference.

APPENDIX A

PRE-DEVELOPMENT HYDROCAD OUTPUT





Routing Diagram for 41041 PRE
Prepared by Microsoft, Printed 9/4/2018
HydroCAD® 10.00-20 s/n 02173 © 2017 HydroCAD Software Solutions LLC

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 1.4 cfs @ 12.20 hrs, Volume= 0.133 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 0.9 cfs @ 12.32 hrs, Volume= 0.128 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.108	98	Exposed Ledge, HSG A
	0.092	98	Paved parking, HSG D
	0.297	39	>75% Grass cover, Good, HSG A
	0.508	80	>75% Grass cover, Good, HSG D
	0.693	30	Woods, Good, HSG A
	1.295	77	Woods, Good, HSG D
	2.993	64	Weighted Average
	2.793		93.32% Pervious Area
	0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=7.00' D=0.25' Z= 10.0 '/' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, E-F** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 0.9 cfs @ 12.22 hrs, Volume= 0.083 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
Inflow = 6.0 cfs @ 12.44 hrs, Volume= 0.862 af
Outflow = 6.0 cfs @ 12.47 hrs, Volume= 0.862 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.52 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 3.2 min

Peak Storage= 388 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
Inflow = 6.0 cfs @ 12.47 hrs, Volume= 0.862 af
Outflow = 6.0 cfs @ 12.51 hrs, Volume= 0.862 af, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.74 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 3.5 min

Peak Storage= 447 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
Inflow = 6.0 cfs @ 12.51 hrs, Volume= 0.862 af
Outflow = 6.0 cfs @ 12.53 hrs, Volume= 0.862 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 2.1 min

Peak Storage= 262 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Outflow = 4.6 cfs @ 12.45 hrs, Volume= 0.574 af, Atten= 1%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 5.2 min

Peak Storage= 488 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Reach 5R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.6 cfs @ 12.45 hrs, Volume= 0.574 af
Outflow = 4.6 cfs @ 12.49 hrs, Volume= 0.574 af, Atten= 1%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.55 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 4.2 min

Peak Storage= 368 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

‡

Summary for Reach 6R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Outflow = 0.2 cfs @ 12.88 hrs, Volume= 0.071 af, Atten= 5%, Lag= 13.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 13.4 min

Peak Storage= 106 cf @ 12.76 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

‡

Summary for Reach 7R:

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-YR event
Inflow = 0.9 cfs @ 12.22 hrs, Volume= 0.083 af
Outflow = 0.8 cfs @ 12.27 hrs, Volume= 0.083 af, Atten= 2%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.99 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 5.5 min

Peak Storage= 87 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

‡

Summary for Link SP-1:

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 1.37" for 2-YR event
Inflow = 6.0 cfs @ 12.44 hrs, Volume= 0.790 af
Primary = 6.0 cfs @ 12.44 hrs, Volume= 0.790 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 0.86" for 2-YR event
Inflow = 6.7 cfs @ 12.51 hrs, Volume= 0.990 af
Primary = 6.7 cfs @ 12.51 hrs, Volume= 0.990 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Primary = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Primary = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 2.7 cfs @ 12.20 hrs, Volume= 0.252 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 3.0 cfs @ 12.27 hrs, Volume= 0.331 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.108	98	Exposed Ledge, HSG A
	0.092	98	Paved parking, HSG D
	0.297	39	>75% Grass cover, Good, HSG A
	0.508	80	>75% Grass cover, Good, HSG D
	0.693	30	Woods, Good, HSG A
	1.295	77	Woods, Good, HSG D
	2.993	64	Weighted Average
	2.793		93.32% Pervious Area
	0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=7.00' D=0.25' Z= 10.0 '/' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, E-F** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 1.7 cfs @ 12.21 hrs, Volume= 0.165 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
Inflow = 12.9 cfs @ 12.43 hrs, Volume= 1.758 af
Outflow = 12.9 cfs @ 12.46 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 2.6 min

Peak Storage= 634 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
Inflow = 12.9 cfs @ 12.46 hrs, Volume= 1.758 af
Outflow = 12.8 cfs @ 12.49 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.47 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 2.9 min

Peak Storage= 756 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
Inflow = 12.8 cfs @ 12.49 hrs, Volume= 1.758 af
Outflow = 12.8 cfs @ 12.50 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.99 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 1.7 min

Peak Storage= 442 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Outflow = 8.9 cfs @ 12.43 hrs, Volume= 1.087 af, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 4.4 min

Peak Storage= 770 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Reach 5R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 8.9 cfs @ 12.43 hrs, Volume= 1.087 af
Outflow = 8.9 cfs @ 12.46 hrs, Volume= 1.087 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 3.5 min

Peak Storage= 548 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

‡

Summary for Reach 6R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Outflow = 1.6 cfs @ 12.57 hrs, Volume= 0.254 af, Atten= 1%, Lag= 6.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.31 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 9.1 min

Peak Storage= 345 cf @ 12.51 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

‡

Summary for Reach 7R:

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-YR event
Inflow = 1.7 cfs @ 12.21 hrs, Volume= 0.165 af
Outflow = 1.7 cfs @ 12.25 hrs, Volume= 0.165 af, Atten= 2%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 4.5 min

Peak Storage= 136 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

‡

Summary for Link SP-1:

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 2.60" for 10-YR event
Inflow = 11.7 cfs @ 12.40 hrs, Volume= 1.504 af
Primary = 11.7 cfs @ 12.40 hrs, Volume= 1.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 1.82" for 10-YR event
Inflow = 15.0 cfs @ 12.47 hrs, Volume= 2.089 af
Primary = 15.0 cfs @ 12.47 hrs, Volume= 2.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Primary = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Primary = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 3.8 cfs @ 12.20 hrs, Volume= 0.354 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	**Trap/Vee/Rect Channel Flow, D-E** Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 5.1 cfs @ 12.26 hrs, Volume= 0.529 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.108	98	Exposed Ledge, HSG A
	0.092	98	Paved parking, HSG D
	0.297	39	>75% Grass cover, Good, HSG A
	0.508	80	>75% Grass cover, Good, HSG D
	0.693	30	Woods, Good, HSG A
	1.295	77	Woods, Good, HSG D
	2.993	64	Weighted Average
	2.793		93.32% Pervious Area
	0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=7.00' D=0.25' Z= 10.0 '/' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		**Shallow Concentrated Flow, D-E** Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, E-F** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 2.5 cfs @ 12.21 hrs, Volume= 0.236 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
Inflow = 19.4 cfs @ 12.42 hrs, Volume= 2.570 af
Outflow = 19.4 cfs @ 12.44 hrs, Volume= 2.570 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.29 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 2.3 min

Peak Storage= 829 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
Inflow = 19.4 cfs @ 12.44 hrs, Volume= 2.570 af
Outflow = 19.3 cfs @ 12.46 hrs, Volume= 2.570 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.92 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 2.6 min

Peak Storage= 1,006 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
Inflow = 19.3 cfs @ 12.46 hrs, Volume= 2.570 af
Outflow = 19.2 cfs @ 12.48 hrs, Volume= 2.570 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.38 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 1.6 min

Peak Storage= 588 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Outflow = 12.5 cfs @ 12.42 hrs, Volume= 1.527 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.05 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 4.0 min

Peak Storage= 978 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Reach 5R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.5 cfs @ 12.42 hrs, Volume= 1.527 af
Outflow = 12.4 cfs @ 12.44 hrs, Volume= 1.527 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.27 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 3.2 min

Peak Storage= 674 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

‡

Summary for Reach 6R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Outflow = 3.3 cfs @ 12.51 hrs, Volume= 0.452 af, Atten= 1%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.71 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 7.7 min

Peak Storage= 544 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

‡

Summary for Reach 7R:

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-YR event
Inflow = 2.5 cfs @ 12.21 hrs, Volume= 0.236 af
Outflow = 2.4 cfs @ 12.25 hrs, Volume= 0.236 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.47 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 4.1 min

Peak Storage= 171 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

‡

Summary for Link SP-1:

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 3.67" for 25-YR event
Inflow = 16.4 cfs @ 12.39 hrs, Volume= 2.118 af
Primary = 16.4 cfs @ 12.39 hrs, Volume= 2.118 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 2.70" for 25-YR event
Inflow = 22.9 cfs @ 12.44 hrs, Volume= 3.099 af
Primary = 22.9 cfs @ 12.44 hrs, Volume= 3.099 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Primary = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

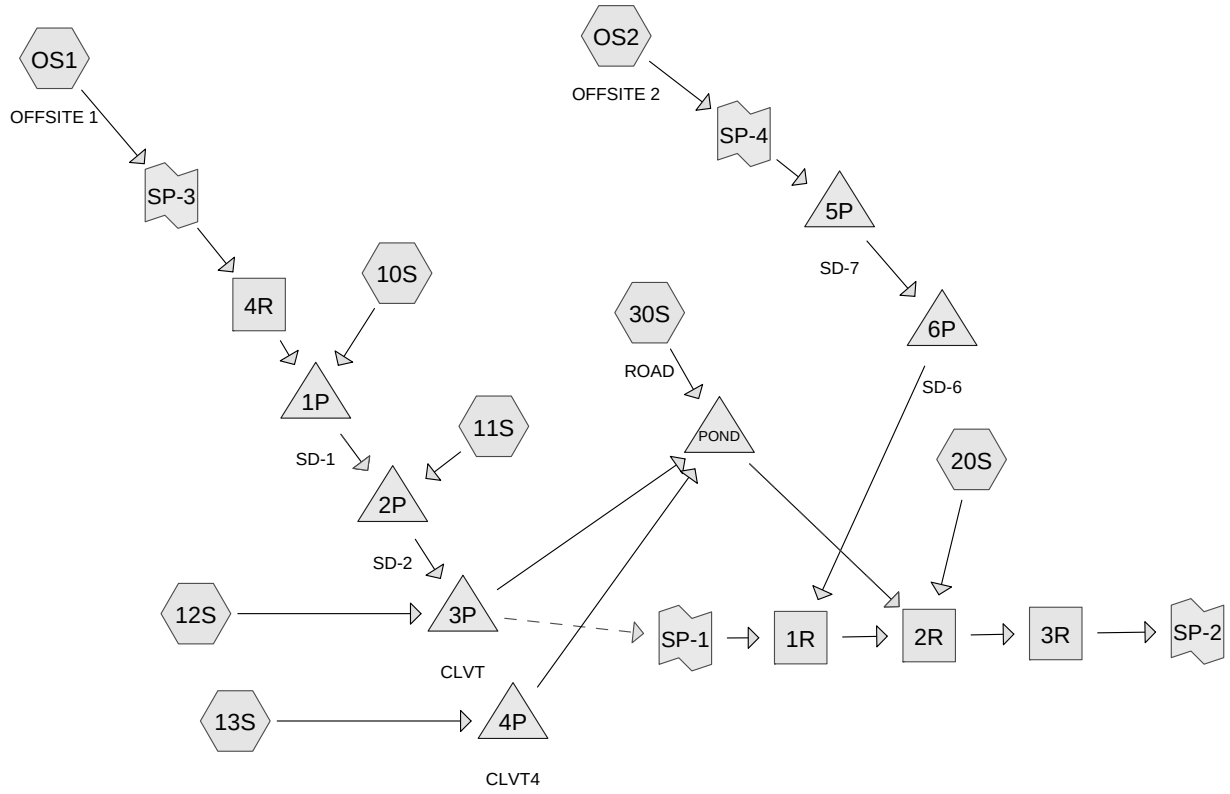
Summary for Link SP-4:

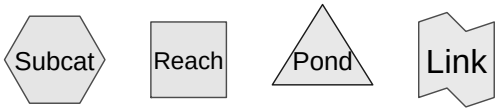
Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Primary = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX B

POST DEVELOPMENT HYDROCAD OUTPUT





Routing Diagram for 41041 POST
Prepared by Microsoft, Printed 9/4/2018
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Summary for Subcatchment 10S:

Runoff = 1.0 cfs @ 12.10 hrs, Volume= 0.073 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

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

Summary for Subcatchment 11S:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

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

Summary for Subcatchment 12S:

Runoff = 1.1 cfs @ 12.22 hrs, Volume= 0.106 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 0.4 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (sf)	CN	Description
	484	98	Paved parking, HSG A
*	2,166	98	Existing Impervious, HSG D
	1,873	39	>75% Grass cover, Good, HSG A
	7,761	80	>75% Grass cover, Good, HSG D
	12,284	78	Weighted Average
	9,634		78.43% Pervious Area
	2,650		21.57% Impervious Area

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

Summary for Subcatchment 20S:

Runoff = 1.2 cfs @ 12.27 hrs, Volume= 0.139 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	**Pipe Channel, C-D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	**Pipe Channel, E-F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, G-H** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, H-I** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.079 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

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

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.582	98	Existing Impervious, HSG D
	1.923	30	Woods, Good, HSG A
	0.969	77	Woods, Good, HSG D
	0.231	39	>75% Grass cover, Good, HSG A
	0.157	80	>75% Grass cover, Good, HSG D
	3.862	55	Weighted Average
	3.280		84.93% Pervious Area
	0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.54" for 2-YR event
Inflow = 2.6 cfs @ 12.55 hrs, Volume= 0.172 af
Outflow = 2.6 cfs @ 12.57 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.11 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 5.8 min

Peak Storage= 228 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
Inflow = 6.3 cfs @ 12.55 hrs, Volume= 1.047 af
Outflow = 6.3 cfs @ 12.56 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 4.7 min

Peak Storage= 463 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
Inflow = 6.3 cfs @ 12.56 hrs, Volume= 1.047 af
Outflow = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.39 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 3.1 min

Peak Storage= 272 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Outflow = 4.7 cfs @ 12.42 hrs, Volume= 0.574 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 5.2 min

Peak Storage= 488 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Pond 1P: SD-1

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 5.0 cfs @ 12.40 hrs, Volume= 0.647 af
Outflow = 5.0 cfs @ 12.42 hrs, Volume= 0.644 af, Atten= 0%, Lag= 1.0 min
Primary = 5.0 cfs @ 12.42 hrs, Volume= 0.644 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.27' @ 12.42 hrs Surf.Area= 626 sf Storage= 339 cf
Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 4.7 min calculated for 0.644 af (99% of inflow)
Center-of-Mass det. time= 2.0 min (863.8 - 861.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	**36.0" Round Culvert w/ 12.0" inside fill** L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.0 cfs @ 12.42 hrs HW=62.26' TW=61.51' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.0 cfs @ 2.21 fps)

Summary for Pond 2P: SD-2

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 5.1 cfs @ 12.42 hrs, Volume= 0.665 af
Outflow = 5.0 cfs @ 12.47 hrs, Volume= 0.654 af, Atten= 2%, Lag= 2.9 min
Primary = 5.0 cfs @ 12.47 hrs, Volume= 0.654 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 61.52' @ 12.47 hrs Surf.Area= 1,651 sf Storage= 1,599 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 18.9 min calculated for 0.653 af (98% of inflow)
Center-of-Mass det. time= 9.3 min (871.9 - 862.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**36.0" Round Culvert w/ 12.0" inside fill** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.0 cfs @ 12.47 hrs HW=61.52' TW=58.95' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.0 cfs @ 2.21 fps)

Summary for Pond 3P: CLVT

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 1.36" for 2-YR event
Inflow = 5.7 cfs @ 12.44 hrs, Volume= 0.760 af
Outflow = 5.5 cfs @ 12.46 hrs, Volume= 0.760 af, Atten= 3%, Lag= 1.0 min
Primary = 4.3 cfs @ 12.28 hrs, Volume= 0.630 af
Secondary = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 58.99' @ 12.55 hrs Surf.Area= 591 sf Storage= 163 cf
Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.2 min (869.4 - 869.3)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	**18.0" Round Culvert SD-4** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	**36.0" Round Culvert SD-5 w/ 12.0" inside fill** L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.6 cfs @ 12.28 hrs HW=58.69' TW=58.19' (Dynamic Tailwater)
└─**1=Culvert SD-4** (Outlet Controls 3.6 cfs @ 3.25 fps)

Secondary OutFlow Max=2.6 cfs @ 12.55 hrs HW=58.99' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert SD-5** (Inlet Controls 2.6 cfs @ 1.77 fps)

Summary for Pond 4P: CLVT4

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 1.20" for 2-YR event
Inflow = 0.4 cfs @ 12.10 hrs, Volume= 0.028 af
Outflow = 0.3 cfs @ 12.15 hrs, Volume= 0.028 af, Atten= 12%, Lag= 3.0 min
Primary = 0.3 cfs @ 12.15 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 58.62' @ 13.19 hrs Surf.Area= 808 sf Storage= 265 cf
Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 20.3 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 20.3 min (871.2 - 850.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.3 cfs @ 12.15 hrs HW=58.30' TW=57.49' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.3 cfs @ 1.47 fps)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Outflow = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af, Atten= 49%, Lag= 67.4 min
Primary = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.07' @ 13.78 hrs Surf.Area= 1,347 sf Storage= 739 cf
Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 156.5 min calculated for 0.056 af (79% of inflow)
Center-of-Mass det. time= 70.6 min (1,051.9 - 981.3)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=0.1 cfs @ 13.78 hrs HW=62.07' TW=59.48' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.1 cfs @ 0.67 fps)

Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.18" for 2-YR event
Inflow = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af
Outflow = 0.1 cfs @ 15.42 hrs, Volume= 0.042 af, Atten= 24%, Lag= 98.5 min
Primary = 0.1 cfs @ 15.42 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 60.05' @ 15.42 hrs Surf.Area= 1,198 sf Storage= 693 cf
Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 179.1 min calculated for 0.042 af (74% of inflow)
Center-of-Mass det. time= 84.0 min (1,135.9 - 1,051.9)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=0.1 cfs @ 15.42 hrs HW=60.05' TW=57.01' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.1 cfs @ 0.62 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 1.16" for 2-YR event
Inflow = 5.0 cfs @ 12.24 hrs, Volume= 0.737 af
Outflow = 3.0 cfs @ 12.56 hrs, Volume= 0.737 af, Atten= 41%, Lag= 18.8 min
Primary = 3.0 cfs @ 12.56 hrs, Volume= 0.737 af
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 58.83' @ 12.56 hrs Surf.Area= 3,024 sf Storage= 6,959 cf

Plug-Flow detention time= 53.3 min calculated for 0.737 af (100% of inflow)
Center-of-Mass det. time= 52.5 min (937.4 - 884.9)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	58.60'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=3.0 cfs @ 12.56 hrs HW=58.83' TW=56.22' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.0 cfs of 6.9 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.5 cfs @ 7.74 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 1.5 cfs @ 1.58 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link SP-1:

Inflow = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af
Primary = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
Inflow = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af
Primary = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Primary = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Primary = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 10S:

Runoff = 1.9 cfs @ 12.09 hrs, Volume= 0.139 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

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

Summary for Subcatchment 11S:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

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

Summary for Subcatchment 12S:

Runoff = 2.1 cfs @ 12.21 hrs, Volume= 0.203 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (sf)	CN	Description
	484	98	Paved parking, HSG A
*	2,166	98	Existing Impervious, HSG D
	1,873	39	>75% Grass cover, Good, HSG A
	7,761	80	>75% Grass cover, Good, HSG D
	12,284	78	Weighted Average
	9,634		78.43% Pervious Area
	2,650		21.57% Impervious Area

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

Summary for Subcatchment 20S:

Runoff = 3.1 cfs @ 12.25 hrs, Volume= 0.320 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	**Pipe Channel, C-D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	**Pipe Channel, E-F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, G-H** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, H-I** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 0.148 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

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

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E**
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.582	98	Existing Impervious, HSG D
	1.923	30	Woods, Good, HSG A
	0.969	77	Woods, Good, HSG D
	0.231	39	>75% Grass cover, Good, HSG A
	0.157	80	>75% Grass cover, Good, HSG D
	3.862	55	Weighted Average
	3.280		84.93% Pervious Area
	0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 2.06" for 10-YR event
Inflow = 6.5 cfs @ 12.45 hrs, Volume= 0.664 af
Outflow = 6.5 cfs @ 12.47 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.56 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 4.1 min

Peak Storage= 408 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 13.7 cfs @ 12.41 hrs, Volume= 2.201 af
Outflow = 13.7 cfs @ 12.42 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 4.0 min

Peak Storage= 787 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 13.7 cfs @ 12.42 hrs, Volume= 2.201 af
Outflow = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.05 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 2.6 min

Peak Storage= 462 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Outflow = 8.9 cfs @ 12.40 hrs, Volume= 1.087 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 4.4 min

Peak Storage= 770 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Pond 1P: SD-1

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.6 cfs @ 12.39 hrs, Volume= 1.226 af
Outflow = 9.5 cfs @ 12.42 hrs, Volume= 1.223 af, Atten= 1%, Lag= 1.8 min
Primary = 9.5 cfs @ 12.42 hrs, Volume= 1.223 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.71' @ 12.43 hrs Surf.Area= 1,289 sf Storage= 766 cf
Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 3.5 min calculated for 1.223 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (844.4 - 842.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	**36.0" Round Culvert w/ 12.0" inside fill** L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=9.4 cfs @ 12.42 hrs HW=62.71' TW=61.92' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 9.4 cfs @ 2.66 fps)

Summary for Pond 2P: SD-2

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 2.64" for 10-YR event
Inflow = 9.6 cfs @ 12.41 hrs, Volume= 1.261 af
Outflow = 9.5 cfs @ 12.46 hrs, Volume= 1.250 af, Atten= 1%, Lag= 2.6 min
Primary = 9.5 cfs @ 12.46 hrs, Volume= 1.250 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 61.93' @ 12.46 hrs Surf.Area= 1,819 sf Storage= 2,313 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 12.7 min calculated for 1.248 af (99% of inflow)
Center-of-Mass det. time= 7.4 min (850.8 - 843.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**36.0" Round Culvert w/ 12.0" inside fill** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=9.5 cfs @ 12.46 hrs HW=61.93' TW=59.41' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 9.5 cfs @ 2.77 fps)

Summary for Pond 3P: CLVT

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 2.61" for 10-YR event
Inflow = 10.8 cfs @ 12.43 hrs, Volume= 1.453 af
Outflow = 10.8 cfs @ 12.45 hrs, Volume= 1.453 af, Atten= 0%, Lag= 1.2 min
Primary = 4.4 cfs @ 12.10 hrs, Volume= 1.013 af
Secondary = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 59.41' @ 12.45 hrs Surf.Area= 1,118 sf Storage= 519 cf
Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= 0.4 min calculated for 1.451 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (848.8 - 848.5)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	**18.0" Round Culvert SD-4** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	**36.0" Round Culvert SD-5 w/ 12.0" inside fill** L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=2.8 cfs @ 12.10 hrs HW=58.87' TW=58.66' (Dynamic Tailwater)
└─**1=Culvert SD-4** (Outlet Controls 2.8 cfs @ 2.16 fps)

Secondary OutFlow Max=6.5 cfs @ 12.45 hrs HW=59.41' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert SD-5** (Inlet Controls 6.5 cfs @ 2.42 fps)

Summary for Pond 4P: CLVT4

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 2.38" for 10-YR event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.4 cfs @ 12.07 hrs, Volume= 0.056 af, Atten= 45%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.07 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.01' @ 12.52 hrs Surf.Area= 1,295 sf Storage= 673 cf
Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 29.5 min calculated for 0.056 af (100% of inflow)
Center-of-Mass det. time= 28.8 min (859.7 - 830.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 12.07 hrs HW=58.42' TW=58.47' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.0 cfs)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Outflow = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af, Atten= 9%, Lag= 8.1 min
Primary = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.34' @ 12.61 hrs Surf.Area= 2,000 sf Storage= 1,200 cf
Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 51.1 min calculated for 0.239 af (94% of inflow)
Center-of-Mass det. time= 20.6 min (940.7 - 920.1)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=1.5 cfs @ 12.61 hrs HW=62.34' TW=60.22' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.5 cfs @ 1.48 fps)

Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.74" for 10-YR event
Inflow = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af
Outflow = 1.3 cfs @ 12.76 hrs, Volume= 0.224 af, Atten= 11%, Lag= 9.2 min
Primary = 1.3 cfs @ 12.76 hrs, Volume= 0.224 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 60.32' @ 12.76 hrs Surf.Area= 1,643 sf Storage= 1,064 cf
Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 51.6 min calculated for 0.224 af (94% of inflow)
Center-of-Mass det. time= 20.6 min (961.3 - 940.7)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=1.3 cfs @ 12.76 hrs HW=60.32' TW=57.17' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.3 cfs @ 1.42 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 6.9 cfs @ 12.09 hrs, Volume= 1.217 af
Outflow = 4.9 cfs @ 12.48 hrs, Volume= 1.217 af, Atten= 29%, Lag= 23.2 min
Primary = 4.9 cfs @ 12.48 hrs, Volume= 1.217 af
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.01' @ 12.48 hrs Surf.Area= 3,096 sf Storage= 7,490 cf

Plug-Flow detention time= 48.2 min calculated for 1.217 af (100% of inflow)
Center-of-Mass det. time= 47.6 min (924.3 - 876.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	58.60'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=4.9 cfs @ 12.48 hrs HW=59.01' TW=56.34' (Dynamic Tailwater)
└─**1=Culvert** (Passes 4.9 cfs of 7.2 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.5 cfs @ 7.87 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 3.3 cfs @ 2.09 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link SP-1:

Inflow = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af
Primary = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af
Primary = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Primary = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Primary = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 10S:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 0.195 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

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

Summary for Subcatchment 11S:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.052 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

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

Summary for Subcatchment 12S:

Runoff = 3.0 cfs @ 12.21 hrs, Volume= 0.288 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		**Shallow Concentrated Flow, C-D** Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
	484	98	Paved parking, HSG A
*	2,166	98	Existing Impervious, HSG D
	1,873	39	>75% Grass cover, Good, HSG A
	7,761	80	>75% Grass cover, Good, HSG D
	12,284	78	Weighted Average
	9,634		78.43% Pervious Area
	2,650		21.57% Impervious Area

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

Summary for Subcatchment 20S:

Runoff = 4.9 cfs @ 12.24 hrs, Volume= 0.490 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		**Shallow Concentrated Flow, B-C** Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	**Pipe Channel, C-D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	**Pipe Channel, E-F** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	**Trap/Vee/Rect Channel Flow, F-G** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	**Trap/Vee/Rect Channel Flow, G-H** Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	**Trap/Vee/Rect Channel Flow, H-I** Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 2.8 cfs @ 12.09 hrs, Volume= 0.207 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

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

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		**Shallow Concentrated Flow, C-D**
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		**Shallow Concentrated Flow, D-E**
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.582	98	Existing Impervious, HSG D
	1.923	30	Woods, Good, HSG A
	0.969	77	Woods, Good, HSG D
	0.231	39	>75% Grass cover, Good, HSG A
	0.157	80	>75% Grass cover, Good, HSG D
	3.862	55	Weighted Average
	3.280		84.93% Pervious Area
	0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 3.64" for 25-YR event
Inflow = 12.4 cfs @ 12.49 hrs, Volume= 1.172 af
Outflow = 12.3 cfs @ 12.50 hrs, Volume= 1.172 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.96 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 3.5 min

Peak Storage= 616 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 10.0 '/' Top Width= 40.00'
Length= 98.0' Slope= 0.0102 '/'
Inlet Invert= 57.00', Outlet Invert= 56.00'

‡

Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
Inflow = 21.9 cfs @ 12.46 hrs, Volume= 3.246 af
Outflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 3.7 min

Peak Storage= 1,098 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 3R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
Inflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af
Outflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 2.4 min

Peak Storage= 643 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

‡

Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Outflow = 12.5 cfs @ 12.39 hrs, Volume= 1.527 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.05 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 4.0 min

Peak Storage= 978 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

‡

Summary for Pond 1P: SD-1

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 13.5 cfs @ 12.38 hrs, Volume= 1.722 af
Outflow = 13.3 cfs @ 12.41 hrs, Volume= 1.719 af, Atten= 1%, Lag= 1.6 min
Primary = 13.3 cfs @ 12.41 hrs, Volume= 1.719 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 63.09' @ 12.44 hrs Surf.Area= 1,937 sf Storage= 1,366 cf
Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 2.7 min calculated for 1.718 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (834.4 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	**36.0" Round Culvert w/ 12.0" inside fill** L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=12.7 cfs @ 12.41 hrs HW=63.08' TW=62.28' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 12.7 cfs @ 2.89 fps)

Summary for Pond 2P: SD-2

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 3.71" for 25-YR event
Inflow = 13.5 cfs @ 12.41 hrs, Volume= 1.771 af
Outflow = 14.1 cfs @ 12.40 hrs, Volume= 1.760 af, Atten= 0%, Lag= 0.0 min
Primary = 14.1 cfs @ 12.40 hrs, Volume= 1.760 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.30' @ 12.40 hrs Surf.Area= 1,848 sf Storage= 2,443 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 10.3 min calculated for 1.758 af (99% of inflow)
Center-of-Mass det. time= 6.5 min (840.0 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**36.0" Round Culvert w/ 12.0" inside fill** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=14.0 cfs @ 12.40 hrs HW=62.29' TW=59.72' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 14.0 cfs @ 3.23 fps)

Summary for Pond 3P: CLVT

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 3.67" for 25-YR event
Inflow = 16.1 cfs @ 12.40 hrs, Volume= 2.048 af
Outflow = 15.2 cfs @ 12.42 hrs, Volume= 2.048 af, Atten= 5%, Lag= 1.1 min
Primary = 5.2 cfs @ 12.42 hrs, Volume= 1.298 af
Secondary = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 59.73' @ 12.42 hrs Surf.Area= 1,515 sf Storage= 932 cf
Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.5 min (838.2 - 837.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	**18.0" Round Culvert SD-4** L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	**36.0" Round Culvert SD-5 w/ 12.0" inside fill** L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.2 cfs @ 12.42 hrs HW=59.72' TW=59.13' (Dynamic Tailwater)
└─**1=Culvert SD-4** (Inlet Controls 5.2 cfs @ 2.92 fps)

Secondary OutFlow Max=10.0 cfs @ 12.42 hrs HW=59.72' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert SD-5** (Inlet Controls 10.0 cfs @ 2.83 fps)

Summary for Pond 4P: CLVT4

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 3.40" for 25-YR event
Inflow = 1.1 cfs @ 12.09 hrs, Volume= 0.080 af
Outflow = 0.5 cfs @ 12.28 hrs, Volume= 0.080 af, Atten= 54%, Lag= 11.5 min
Primary = 0.5 cfs @ 12.28 hrs, Volume= 0.080 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.14' @ 12.42 hrs Surf.Area= 1,527 sf Storage= 853 cf
Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 30.4 min calculated for 0.080 af (100% of inflow)
Center-of-Mass det. time= 29.7 min (850.3 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	**15.0" Round Culvert** L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.4 cfs @ 12.28 hrs HW=59.13' TW=59.12' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.4 cfs @ 0.40 fps)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Outflow = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af, Atten= 5%, Lag= 5.7 min
Primary = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.56' @ 12.52 hrs Surf.Area= 2,523 sf Storage= 1,699 cf
Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 31.3 min calculated for 0.436 af (97% of inflow)
Center-of-Mass det. time= 13.6 min (912.4 - 898.8)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.1 cfs @ 12.52 hrs HW=62.56' TW=60.52' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 3.1 cfs @ 1.89 fps)

Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.36" for 25-YR event
Inflow = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af
Outflow = 3.0 cfs @ 12.61 hrs, Volume= 0.422 af, Atten= 4%, Lag= 5.5 min
Primary = 3.0 cfs @ 12.61 hrs, Volume= 0.422 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 60.55' @ 12.61 hrs Surf.Area= 2,035 sf Storage= 1,488 cf
Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 31.3 min calculated for 0.422 af (97% of inflow)
Center-of-Mass det. time= 12.8 min (925.2 - 912.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	**36.0" Round Culvert w/ 12.0" inside fill** L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.0 cfs @ 12.61 hrs HW=60.55' TW=57.26' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.0 cfs @ 1.86 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 2.49" for 25-YR event
Inflow = 6.7 cfs @ 12.31 hrs, Volume= 1.585 af
Outflow = 6.5 cfs @ 12.37 hrs, Volume= 1.584 af, Atten= 2%, Lag= 3.4 min
Primary = 6.5 cfs @ 12.37 hrs, Volume= 1.584 af
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.13' @ 12.37 hrs Surf.Area= 3,184 sf Storage= 7,883 cf

Plug-Flow detention time= 45.1 min calculated for 1.582 af (100% of inflow)
Center-of-Mass det. time= 45.3 min (914.6 - 869.3)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	**15.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	**8.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	58.60'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=6.5 cfs @ 12.37 hrs HW=59.13' TW=56.42' (Dynamic Tailwater)
└─**1=Culvert** (Passes 6.5 cfs of 7.4 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.6 cfs @ 7.92 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 5.0 cfs @ 2.39 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link SP-1:

Inflow = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af
Primary = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
Inflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af
Primary = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Primary = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Primary = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX C

STORMWATER QUALITY CALCULATIONS

Capisic Meadows
Project No. 41041

TABLE 1
MDEP WATER QUALITY VOLUME CALCULATIONS
ROADWAY IMPERVIOUS AREA / DEVELOPED AREA SUMMARY

Subcatchment ID	Description	Lot Impervious	Lot Undisturbed	Lot Developed	Start Station	End Station	Row Length (ft)	ROW Width (ft)	Road Paved Width (ft)	Walk Width (ft)	Esplande Width (ft)	ROW Impervious (ft)	ROW Landscaped (ft)	New Imp Area (s.f.)	Subtotals	New Developed Area	Subtotals
	STA 0+00 - 0+62.78				0	62.78	62.78	50	28	5	17	2072	1067	2072		3139	
	STA 0+62.78 - 4+02				62.78	402	339.22	50	28	5	17	11194	5767	11194		16961	
	Hammerhead											900	0	900		900	
														Subtotal	14166	Subtotal	21000

Total New Impervious Area =	14,166
Min Treatment Area (75%) =	10,625

Total New Developed Area =	21,000
Min Treatment Area (50%) =	10,500

TABLE 2
CAPISIC MEADOWS
IMPERVIOUS AREA / DEVELOPED AREA
ROADWAY TREATMENT SUMMARY

Description	Lot Impervious	Lot Developed	ROW Impervious (ft)	ROW Landscaped (ft)	New imp area (S.F.)	Landscaped AREA (acre)	Receives Treatment (Yes/No)	IMP AREA TREATED	DEVELOPED AREA TREATED
STA 0+00 - 0+62.78			2071.74	1067.26	2072	1067	N	0	0
STA 0+62.78 - 4+02			11194.26	5766.74	11194	5767	YES	11194	16961
Hammerhead			900	0	900	0	YES	900	900
					14166	**6834**		**12094**	**17861**

TOTAL NEW IMPERVIOUS AREA	**14166**
TOTAL NEW IMPERVIOUS AREA REQUIRING TREATMENT	**10,625**
TOTAL NEW IMPERVIOUS ARE RECEIVING TREATMENT	**12094**
% OF NEW IMPERVIOUS AREA RECEIVING TREATMENT	**85%**

TOTAL NEW DEVELOPED AREA	**21000**
TOTAL NEW DEVELOPED AREA REQUIRING TREATMENT	**10,500**
TOTAL NEW DEVELOPED AREA RECEIVING TREATMENT	**17861**
% OF NEW DEVELOPED AREA RECEIVING TREATMENT	**85%**

APPENDIX D

Filterra Sizing Calculations

Contech Engineered Solutions LLC
7037 Ridge Road, Suite 350
Hanover, MD 21076
Phone: (866) 740-3318
Fax: (866) 376-8511
www.ContechES.com

Tony Panciocco
Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

April 25th, 2018

RE: Capisic Meadows Subdivision (Contech Reference No. 589,880)
Review of Filterra Design

Dear Mr. Panciocco:

The purpose of this letter is to document Contech Engineered Solutions' review of the plans and the proposed application of Filterra water quality units for the Capisic Meadows Subdivision project in Scarborough, ME.

Contech Engineered Solutions (Contech) has reviewed the Filterra design for this project. We believe the FTIBC Filterra configuration with internal bypass is an appropriate water quality solution for this site. The Filterra systems are approved for use by MEDEP as an alternate to the General Standards of the Stormwater Rules (Chapter 500) if designed, installed, and maintained in accordance with the provisions noted in the February 2, 2017 approval letter from the MEDEP.

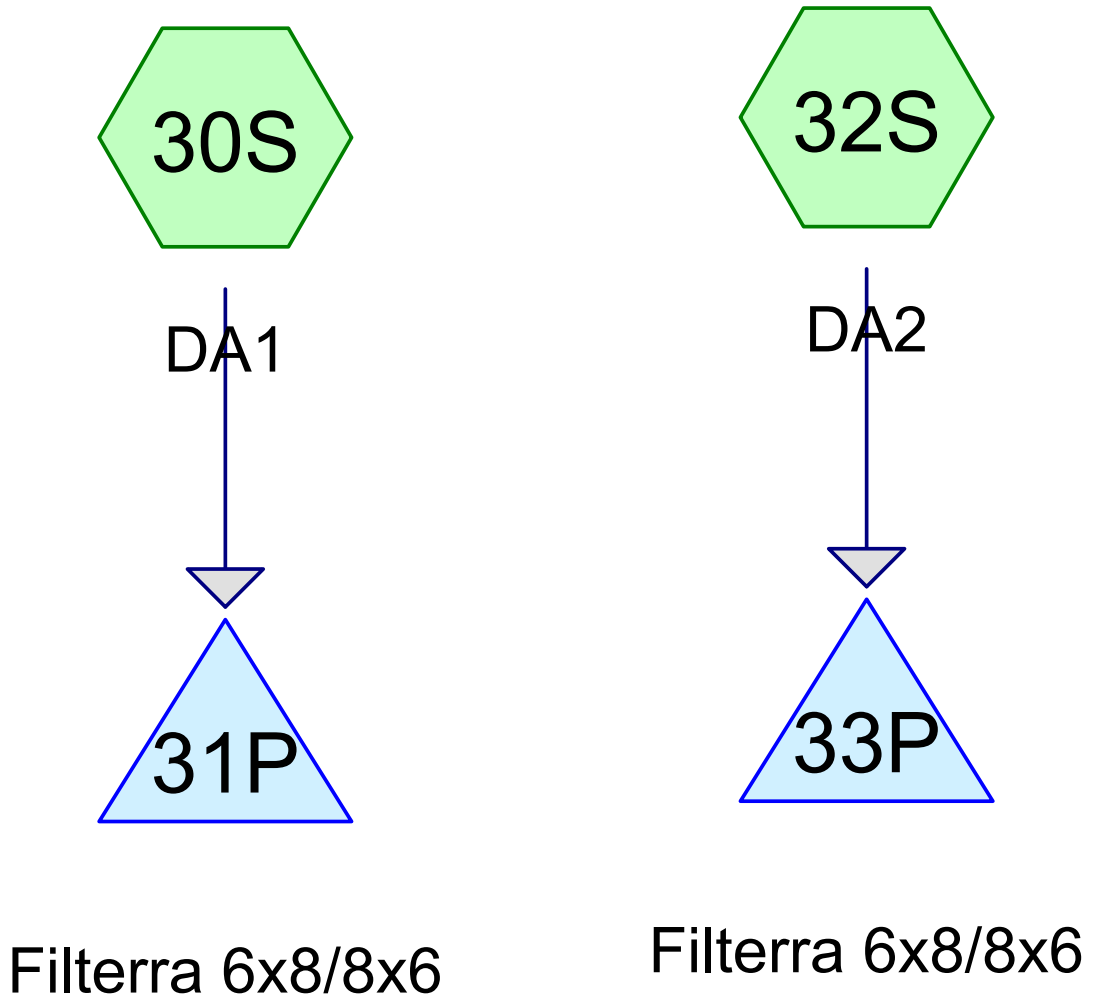
The engineer of record reports treatment drainage areas of 0.186 acres impervious and 0.156 acres landscaped, for each of two Filterra units. The two Filterra were designed in accordance with the sizing design guidelines to treat the runoff from the 0.95" storm over the entire contributing drainage area, including all pervious areas, prior to bypass. In order to adequately treat the generated run-off directed to each system, Contech recommends 6'x8' Filterra. The attached HydroCAD report is provided to support this size recommendation. The modeled peak elevation in the Filterra shows that at the approved 140"/hr hydraulic loading rate, the ponding in the Filterra will remain below the inside of the top slab (elevation 60.33' in the model) and be fully treated before bypass. The 25-year peak storm event was also modelled, and the HydroCAD report demonstrates that each of the Filterra's bypass capacities are suitable to convey the peak flow safely and keep the water surface elevation below the bottom of the system's top slab.

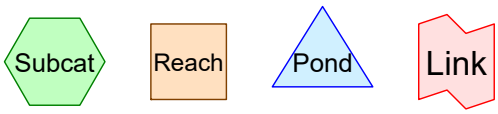
The configuration of the Filterra is acceptable. The system appears to be constructible and is located in order to facilitate maintenance activities. Our systems require periodic maintenance to continue operating properly. Given typical runoff pollutant loading rates, Contech recommends maintenance inspections on an annual basis. Based on the location of the system, we anticipate replacement of the mulch layer every 12 months for the system to continue to remove pollutants. Contech will be responsible for the first year of maintenance as included in the purchase of the Filterra unit; subsequent years of maintenance shall be performed by a third party at the owner's expense.

This system is expected to operate in accordance with Contech's design intent. Please feel free to contact me if you have any questions or concerns.

Sincerely,

Nicholas T. Busque
Stormwater Design Engineer
Contech Engineered Solutions, LLC.
(410) 609-6140
nbusque@conteches.com





Routing Diagram for Filterra - 140inhr ME - Rainfall Type III Sizing - Fina
Prepared by Contech Engineered Solutions LLC, Printed 4/25/2018
HydroCAD® 10.00-20 s/n 02512 © 2017 HydroCAD Software Solutions LLC

Summary for Subcatchment 30S: DA1

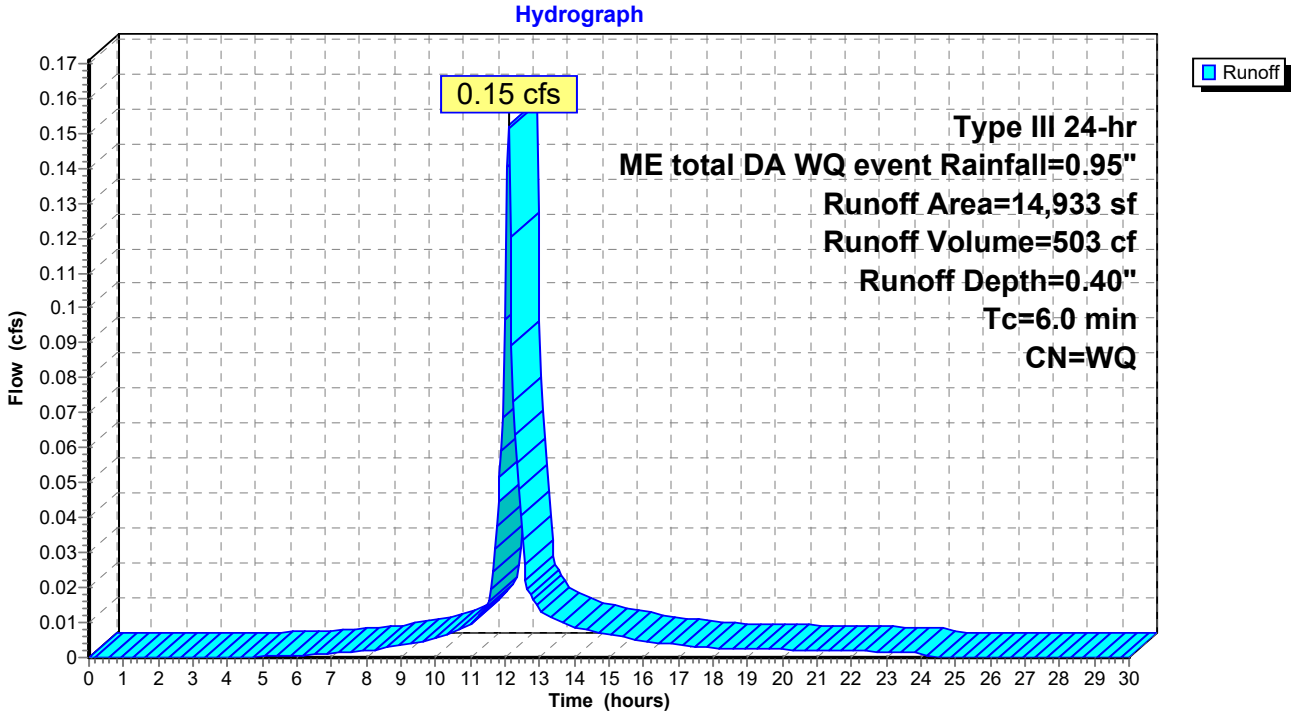
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr ME total DA WQ event Rainfall=0.95"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

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

Subcatchment 30S: DA1



Hydrograph for Subcatchment 30S: DA1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00
1.00	0.01	0.00	0.00
1.50	0.01	0.00	0.00
2.00	0.02	0.00	0.00
2.50	0.02	0.00	0.00
3.00	0.03	0.00	0.00
3.50	0.03	0.00	0.00
4.00	0.04	0.00	0.00
4.50	0.05	0.00	0.00
5.00	0.05	0.00	0.00
5.50	0.06	0.00	0.00
6.00	0.07	0.00	0.00
6.50	0.08	0.00	0.00
7.00	0.09	0.00	0.00
7.50	0.10	0.00	0.00
8.00	0.11	0.00	0.00
8.50	0.12	0.00	0.00
9.00	0.14	0.00	0.00
9.50	0.16	0.00	0.00
10.00	0.18	0.00	0.01
10.50	0.21	0.00	0.01
11.00	0.24	0.00	0.01
11.50	0.28	0.00	0.02
12.00	0.47	0.01	**0.10**
12.50	0.67	0.05	**0.03**
13.00	0.71	0.06	0.01
13.50	0.74	0.07	0.01
14.00	0.77	0.08	0.01
14.50	0.79	0.09	0.01
15.00	0.81	0.09	0.01
15.50	0.83	0.10	0.01
16.00	0.84	0.11	0.00
16.50	0.85	0.11	0.00
17.00	0.86	0.11	0.00
17.50	0.87	0.12	0.00
18.00	0.88	0.12	0.00
18.50	0.89	0.12	0.00
19.00	0.90	0.13	0.00
19.50	0.90	0.13	0.00
20.00	0.91	0.13	0.00
20.50	0.92	0.14	0.00
21.00	0.92	0.14	0.00
21.50	0.93	0.14	0.00
22.00	0.93	0.14	0.00
22.50	0.94	0.15	0.00
23.00	0.94	0.15	0.00
23.50	0.95	0.15	0.00
24.00	**0.95**	**0.15**	0.00
24.50	0.95	0.15	0.00
25.00	0.95	0.15	0.00
25.50	0.95	0.15	0.00
26.00	0.95	0.15	0.00
26.50	0.95	0.15	0.00
27.00	0.95	0.15	0.00
27.50	0.95	0.15	0.00
28.00	0.95	0.15	0.00
28.50	0.95	0.15	0.00
29.00	0.95	0.15	0.00
29.50	0.95	0.15	0.00
30.00	0.95	0.15	0.00

Summary for Pond 31P: Filterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 0.40" for ME total DA WQ event event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 59.13' @ 12.09 hrs Surf.Area= 48 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 503 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (790.0 - 789.9)

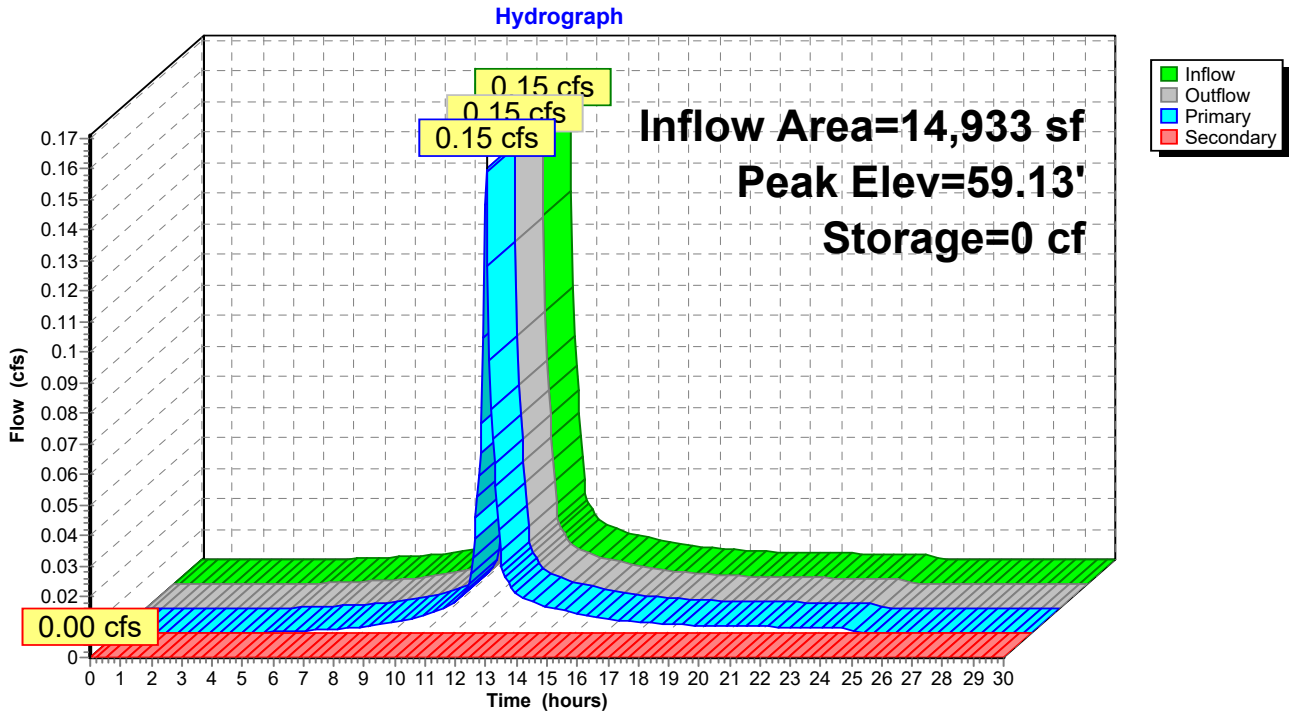
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	**8.00'W x 6.00'L x 1.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	**140.000 in/hr Exfiltration over Surface area**
#2	Secondary	59.54'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=59.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.12' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 31P: Filterra 6x8/8x6



Hydrograph for Pond 31P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	**0.00**
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.00	0	59.12	0.00	0.00	0.00
4.00	0.00	0	59.12	0.00	0.00	0.00
5.00	0.00	0	59.12	0.00	0.00	0.00
6.00	0.00	0	59.12	0.00	0.00	0.00
7.00	0.00	0	59.12	0.00	0.00	0.00
8.00	0.00	0	59.12	0.00	0.00	0.00
9.00	0.00	0	59.12	0.00	0.00	0.00
10.00	0.01	0	59.12	0.01	0.01	0.00
11.00	0.01	0	59.12	0.01	0.01	0.00
12.00	**0.10**	**0**	**59.13**	**0.10**	**0.10**	0.00
13.00	**0.01**	**0**	**59.12**	**0.01**	**0.01**	0.00
14.00	0.01	0	59.12	0.01	0.01	0.00
15.00	0.01	0	59.12	0.01	0.01	0.00
16.00	0.00	0	59.12	0.00	0.00	0.00
17.00	0.00	0	59.12	0.00	0.00	0.00
18.00	0.00	0	59.12	0.00	0.00	0.00
19.00	0.00	0	59.12	0.00	0.00	0.00
20.00	0.00	0	59.12	0.00	0.00	0.00
21.00	0.00	0	59.12	0.00	0.00	0.00
22.00	0.00	0	59.12	0.00	0.00	0.00
23.00	0.00	0	59.12	0.00	0.00	0.00
24.00	0.00	0	59.12	0.00	0.00	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 30S: DA1

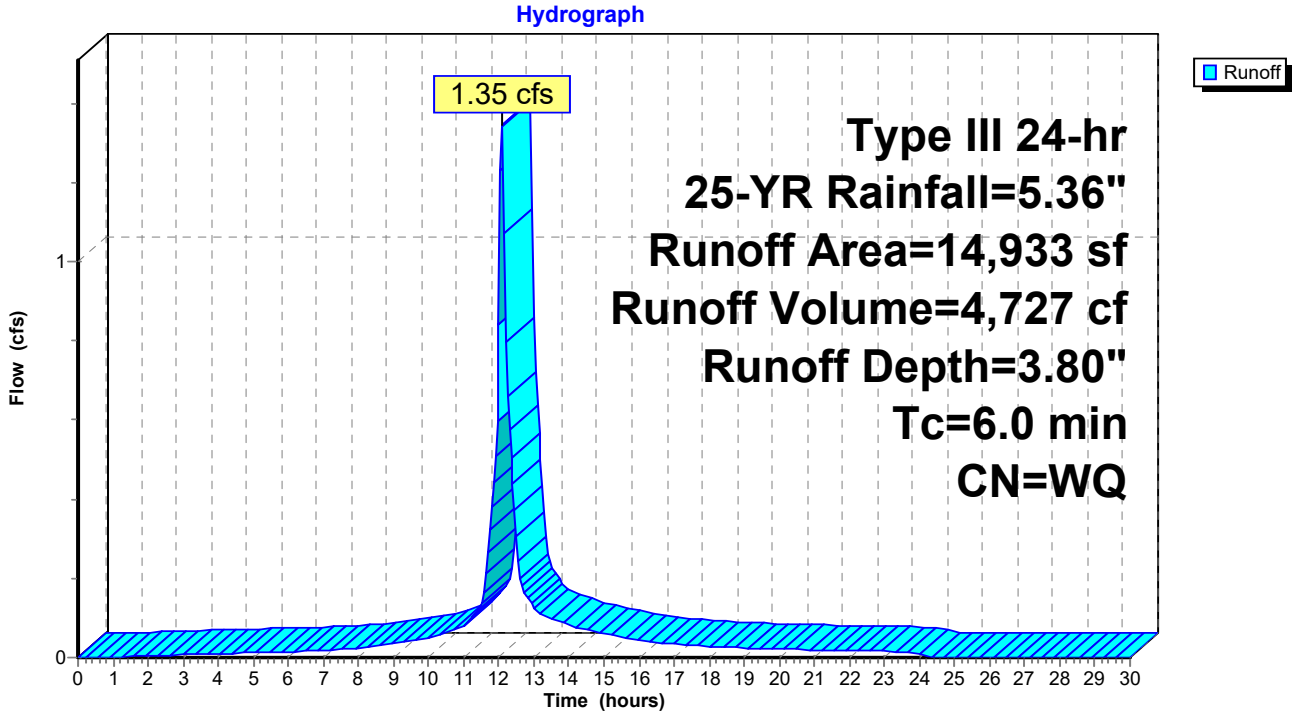
Runoff = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.36"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

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

Subcatchment 30S: DA1



Hydrograph for Subcatchment 30S: DA1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.01
3.00	0.16	0.00	0.01
3.50	0.20	0.00	0.01
4.00	0.23	0.00	0.01
4.50	0.27	0.00	0.01
5.00	0.30	0.00	0.01
5.50	0.34	0.00	0.01
6.00	0.39	0.00	0.01
6.50	0.43	0.00	0.02
7.00	0.49	0.01	0.02
7.50	0.54	0.02	0.02
8.00	0.61	0.03	0.02
8.50	0.69	0.05	0.03
9.00	0.78	0.08	0.03
9.50	0.89	0.13	0.04
10.00	1.01	0.18	0.05
10.50	1.16	0.25	0.06
11.00	1.34	0.35	0.08
11.50	1.60	0.51	0.13
12.00	2.68	1.32	**0.84**
12.50	3.76	2.25	**0.31**
13.00	4.02	2.48	0.13
13.50	4.20	2.64	0.10
14.00	4.35	2.77	0.08
14.50	4.47	2.88	0.07
15.00	4.58	2.98	0.06
15.50	4.67	3.07	0.05
16.00	4.75	3.14	0.04
16.50	4.82	3.20	0.04
17.00	4.87	3.25	0.03
17.50	4.93	3.30	0.03
18.00	4.97	3.34	0.03
18.50	5.02	3.38	0.02
19.00	5.06	3.42	0.02
19.50	5.09	3.45	0.02
20.00	5.13	3.49	0.02
20.50	5.16	3.52	0.02
21.00	5.20	3.55	0.02
21.50	5.23	3.58	0.02
22.00	5.26	3.61	0.02
22.50	5.28	3.63	0.02
23.00	5.31	3.66	0.02
23.50	5.34	3.68	0.02
24.00	**5.36**	**3.70**	0.01
24.50	5.36	3.70	0.00
25.00	5.36	3.70	0.00
25.50	5.36	3.70	0.00
26.00	5.36	3.70	0.00
26.50	5.36	3.70	0.00
27.00	5.36	3.70	0.00
27.50	5.36	3.70	0.00
28.00	5.36	3.70	0.00
28.50	5.36	3.70	0.00
29.00	5.36	3.70	0.00
29.50	5.36	3.70	0.00
30.00	5.36	3.70	0.00

Summary for Pond 31P: Filterra 6x8/8x6

Inflow Area =	14,933 sf,	54.35% Impervious,	Inflow Depth =	3.80"	for 25-YR event
Inflow =	1.35 cfs @	12.09 hrs,	Volume=	4,727 cf	
Outflow =	1.34 cfs @	12.09 hrs,	Volume=	4,696 cf,	Atten= 1%, Lag= 0.0 min
Primary =	0.16 cfs @	11.60 hrs,	Volume=	3,243 cf	
Secondary =	1.18 cfs @	12.09 hrs,	Volume=	1,453 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 59.81' @ 12.09 hrs Surf.Area= 48 sf Storage= 33 cf

Plug-Flow detention time= 4.8 min calculated for 4,688 cf (99% of inflow)
Center-of-Mass det. time= 0.5 min (774.0 - 773.5)

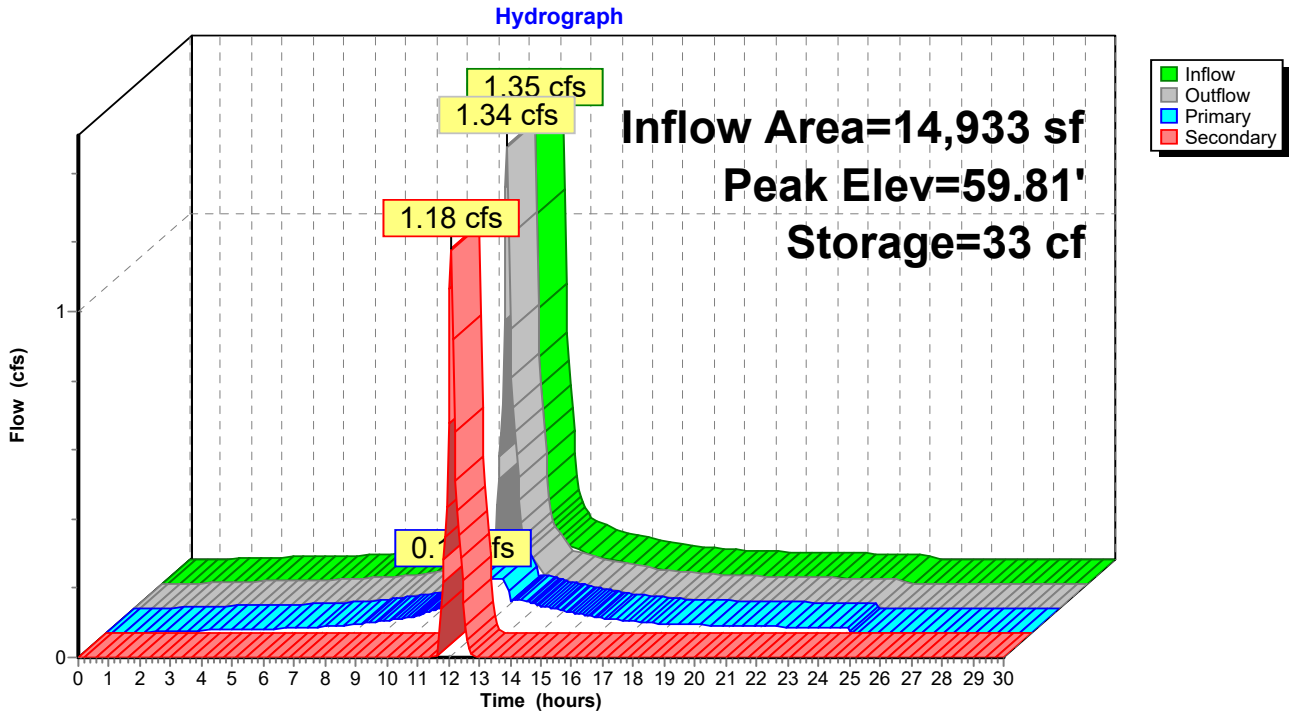
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	**8.00'W x 6.00'L x 1.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	**140.000 in/hr Exfiltration over Surface area**
#2	Secondary	59.54'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 11.60 hrs HW=59.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=1.15 cfs @ 12.09 hrs HW=59.80' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 1.15 cfs @ 1.68 fps)

Pond 31P: Filterra 6x8/8x6



Hydrograph for Pond 31P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.01	0	59.12	0.01	0.01	0.00
4.00	0.01	0	59.12	0.01	0.01	0.00
5.00	0.01	0	59.12	0.01	0.01	0.00
6.00	0.01	0	59.12	0.01	0.01	0.00
7.00	0.02	0	59.12	0.02	0.02	0.00
8.00	0.02	0	59.12	0.02	0.02	0.00
9.00	0.03	0	59.12	0.03	0.03	0.00
10.00	0.05	0	59.12	0.05	0.05	0.00
11.00	0.08	0	59.13	0.08	**0.08**	0.00
12.00	**0.84**	**29**	**59.72**	**0.83**	**0.16**	**0.68**
13.00	**0.13**	**9**	**59.31**	**0.16**	0.16	**0.00**
14.00	0.08	0	59.13	0.08	0.08	0.00
15.00	0.06	0	59.12	0.06	0.06	0.00
16.00	0.04	0	59.12	0.04	0.04	0.00
17.00	0.03	0	59.12	0.03	0.03	0.00
18.00	0.03	0	59.12	0.03	0.03	0.00
19.00	0.02	0	59.12	0.02	0.02	0.00
20.00	0.02	0	59.12	0.02	0.02	0.00
21.00	0.02	0	59.12	0.02	0.02	0.00
22.00	0.02	0	59.12	0.02	0.02	0.00
23.00	0.02	0	59.12	0.02	0.02	0.00
24.00	0.01	0	59.12	0.01	0.01	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 32S: DA2

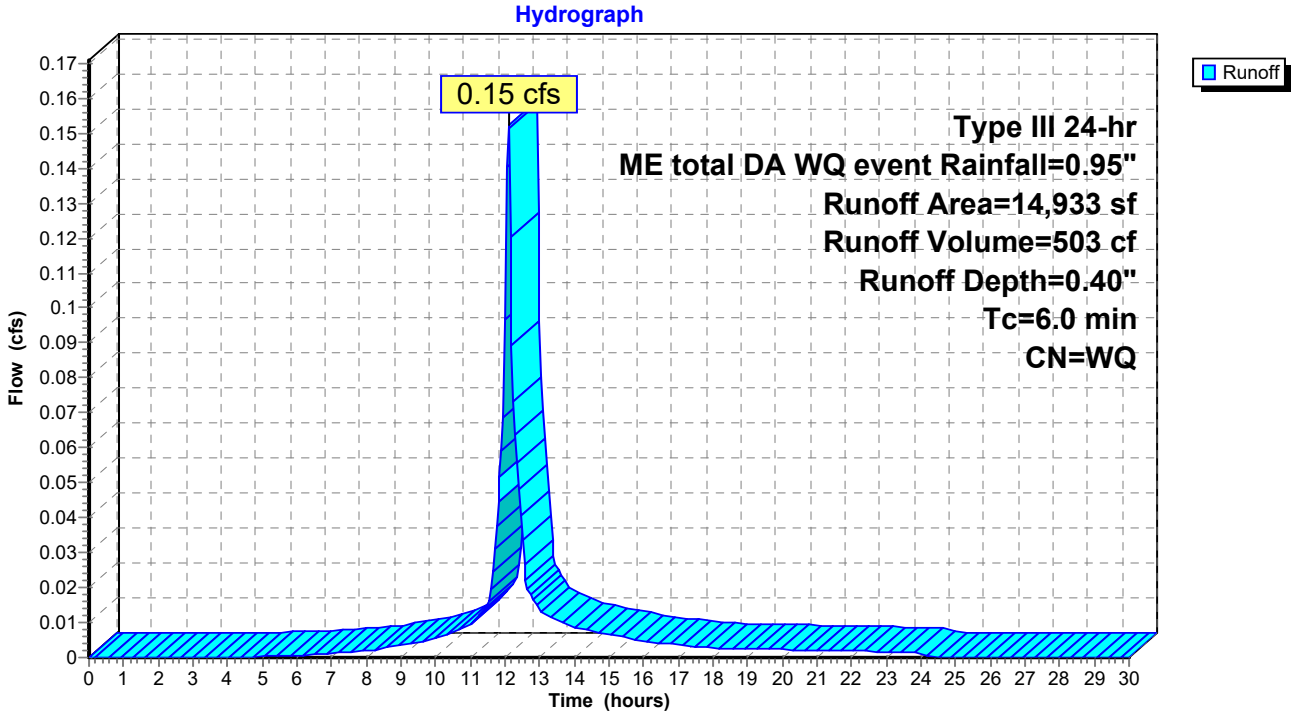
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr ME total DA WQ event Rainfall=0.95"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

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

Subcatchment 32S: DA2



Hydrograph for Subcatchment 32S: DA2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.00	0.00	0.00
1.00	0.01	0.00	0.00
1.50	0.01	0.00	0.00
2.00	0.02	0.00	0.00
2.50	0.02	0.00	0.00
3.00	0.03	0.00	0.00
3.50	0.03	0.00	0.00
4.00	0.04	0.00	0.00
4.50	0.05	0.00	0.00
5.00	0.05	0.00	0.00
5.50	0.06	0.00	0.00
6.00	0.07	0.00	0.00
6.50	0.08	0.00	0.00
7.00	0.09	0.00	0.00
7.50	0.10	0.00	0.00
8.00	0.11	0.00	0.00
8.50	0.12	0.00	0.00
9.00	0.14	0.00	0.00
9.50	0.16	0.00	0.00
10.00	0.18	0.00	0.01
10.50	0.21	0.00	0.01
11.00	0.24	0.00	0.01
11.50	0.28	0.00	0.02
12.00	0.47	0.01	**0.10**
12.50	0.67	0.05	**0.03**
13.00	0.71	0.06	0.01
13.50	0.74	0.07	0.01
14.00	0.77	0.08	0.01
14.50	0.79	0.09	0.01
15.00	0.81	0.09	0.01
15.50	0.83	0.10	0.01
16.00	0.84	0.11	0.00
16.50	0.85	0.11	0.00
17.00	0.86	0.11	0.00
17.50	0.87	0.12	0.00
18.00	0.88	0.12	0.00
18.50	0.89	0.12	0.00
19.00	0.90	0.13	0.00
19.50	0.90	0.13	0.00
20.00	0.91	0.13	0.00
20.50	0.92	0.14	0.00
21.00	0.92	0.14	0.00
21.50	0.93	0.14	0.00
22.00	0.93	0.14	0.00
22.50	0.94	0.15	0.00
23.00	0.94	0.15	0.00
23.50	0.95	0.15	0.00
24.00	**0.95**	**0.15**	0.00
24.50	0.95	0.15	0.00
25.00	0.95	0.15	0.00
25.50	0.95	0.15	0.00
26.00	0.95	0.15	0.00
26.50	0.95	0.15	0.00
27.00	0.95	0.15	0.00
27.50	0.95	0.15	0.00
28.00	0.95	0.15	0.00
28.50	0.95	0.15	0.00
29.00	0.95	0.15	0.00
29.50	0.95	0.15	0.00
30.00	0.95	0.15	0.00

Summary for Pond 33P: Filterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 0.40" for ME total DA WQ event event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 59.13' @ 12.09 hrs Surf.Area= 48 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 503 cf (100% of inflow)
Center-of-Mass det. time= 0.0 min (790.0 - 789.9)

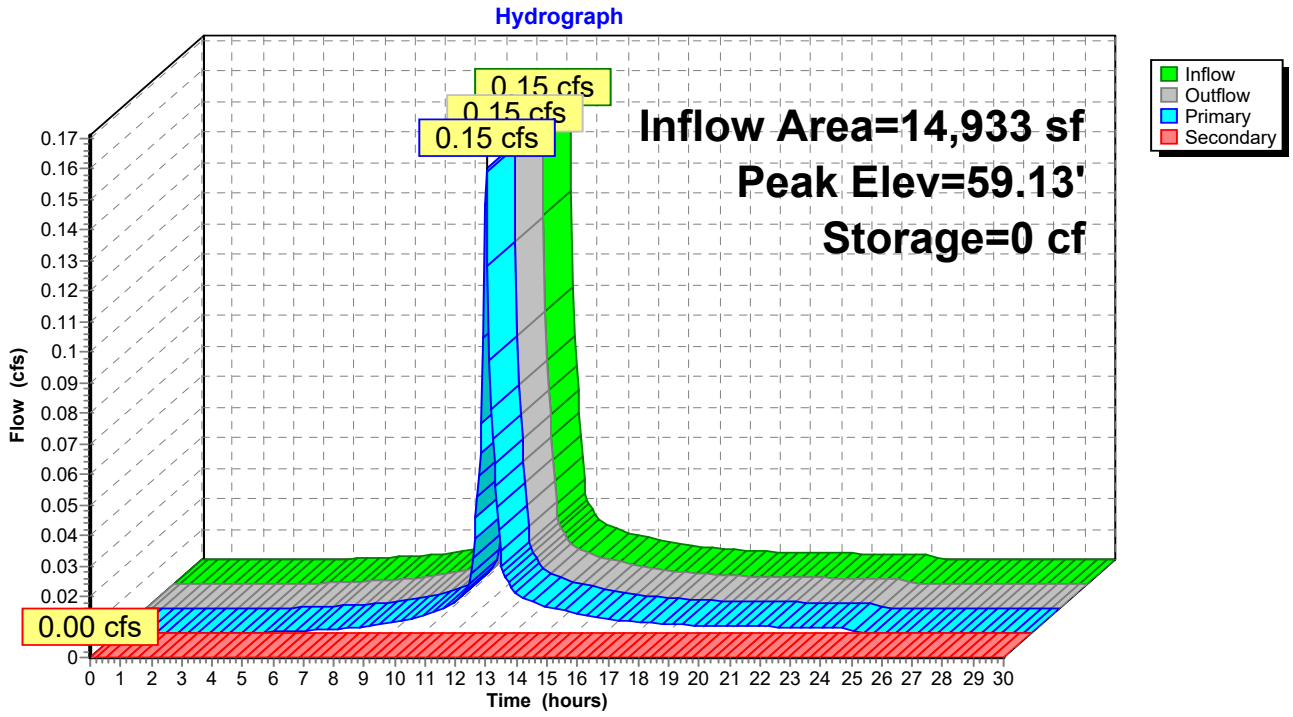
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	**8.00'W x 6.00'L x 1.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	**140.000 in/hr Exfiltration over Surface area**
#2	Secondary	59.54'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=59.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.12' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 33P: Filterra 6x8/8x6



Hydrograph for Pond 33P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	**0.00**
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.00	0	59.12	0.00	0.00	0.00
4.00	0.00	0	59.12	0.00	0.00	0.00
5.00	0.00	0	59.12	0.00	0.00	0.00
6.00	0.00	0	59.12	0.00	0.00	0.00
7.00	0.00	0	59.12	0.00	0.00	0.00
8.00	0.00	0	59.12	0.00	0.00	0.00
9.00	0.00	0	59.12	0.00	0.00	0.00
10.00	0.01	0	59.12	0.01	0.01	0.00
11.00	0.01	0	59.12	0.01	0.01	0.00
12.00	**0.10**	**0**	**59.13**	**0.10**	**0.10**	0.00
13.00	**0.01**	**0**	**59.12**	**0.01**	**0.01**	0.00
14.00	0.01	0	59.12	0.01	0.01	0.00
15.00	0.01	0	59.12	0.01	0.01	0.00
16.00	0.00	0	59.12	0.00	0.00	0.00
17.00	0.00	0	59.12	0.00	0.00	0.00
18.00	0.00	0	59.12	0.00	0.00	0.00
19.00	0.00	0	59.12	0.00	0.00	0.00
20.00	0.00	0	59.12	0.00	0.00	0.00
21.00	0.00	0	59.12	0.00	0.00	0.00
22.00	0.00	0	59.12	0.00	0.00	0.00
23.00	0.00	0	59.12	0.00	0.00	0.00
24.00	0.00	0	59.12	0.00	0.00	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 32S: DA2

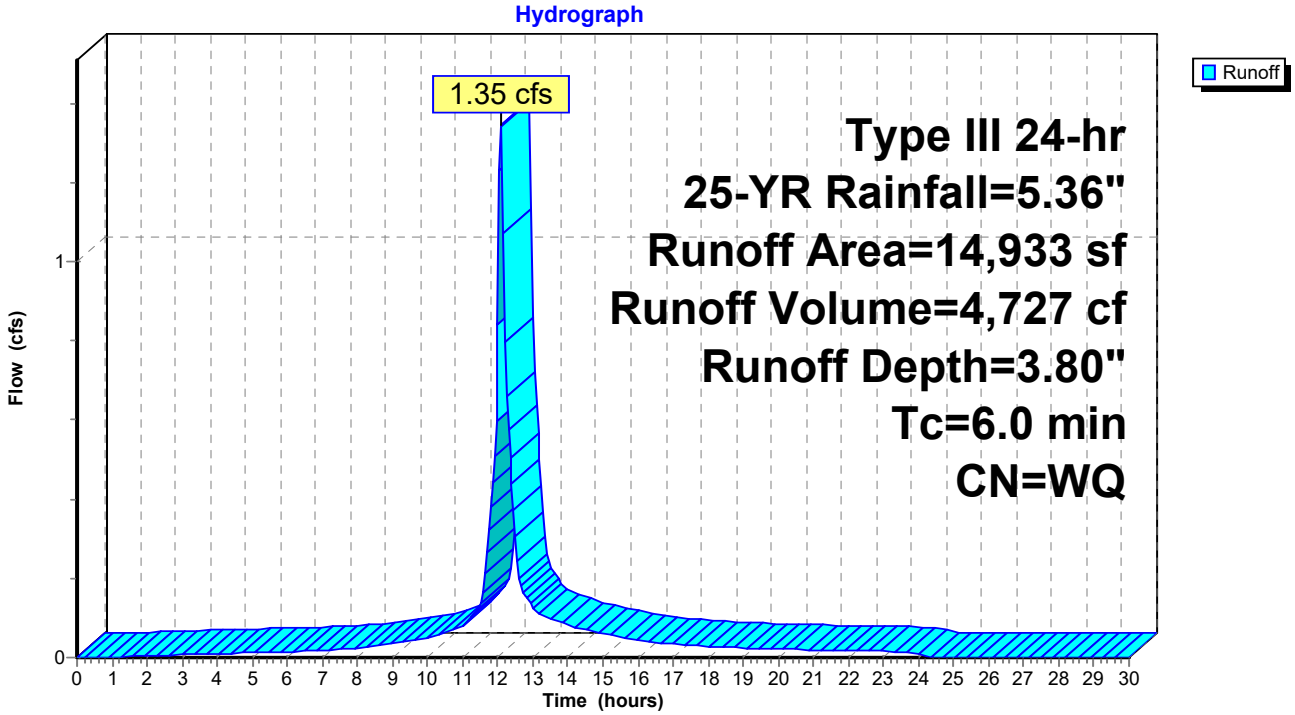
Runoff = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.36"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

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

Subcatchment 32S: DA2



Hydrograph for Subcatchment 32S: DA2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.01
3.00	0.16	0.00	0.01
3.50	0.20	0.00	0.01
4.00	0.23	0.00	0.01
4.50	0.27	0.00	0.01
5.00	0.30	0.00	0.01
5.50	0.34	0.00	0.01
6.00	0.39	0.00	0.01
6.50	0.43	0.00	0.02
7.00	0.49	0.01	0.02
7.50	0.54	0.02	0.02
8.00	0.61	0.03	0.02
8.50	0.69	0.05	0.03
9.00	0.78	0.08	0.03
9.50	0.89	0.13	0.04
10.00	1.01	0.18	0.05
10.50	1.16	0.25	0.06
11.00	1.34	0.35	0.08
11.50	1.60	0.51	0.13
12.00	2.68	1.32	**0.84**
12.50	3.76	2.25	**0.31**
13.00	4.02	2.48	0.13
13.50	4.20	2.64	0.10
14.00	4.35	2.77	0.08
14.50	4.47	2.88	0.07
15.00	4.58	2.98	0.06
15.50	4.67	3.07	0.05
16.00	4.75	3.14	0.04
16.50	4.82	3.20	0.04
17.00	4.87	3.25	0.03
17.50	4.93	3.30	0.03
18.00	4.97	3.34	0.03
18.50	5.02	3.38	0.02
19.00	5.06	3.42	0.02
19.50	5.09	3.45	0.02
20.00	5.13	3.49	0.02
20.50	5.16	3.52	0.02
21.00	5.20	3.55	0.02
21.50	5.23	3.58	0.02
22.00	5.26	3.61	0.02
22.50	5.28	3.63	0.02
23.00	5.31	3.66	0.02
23.50	5.34	3.68	0.02
24.00	**5.36**	**3.70**	0.01
24.50	5.36	3.70	0.00
25.00	5.36	3.70	0.00
25.50	5.36	3.70	0.00
26.00	5.36	3.70	0.00
26.50	5.36	3.70	0.00
27.00	5.36	3.70	0.00
27.50	5.36	3.70	0.00
28.00	5.36	3.70	0.00
28.50	5.36	3.70	0.00
29.00	5.36	3.70	0.00
29.50	5.36	3.70	0.00
30.00	5.36	3.70	0.00

Summary for Pond 33P: Filterra 6x8/8x6

Inflow Area =	14,933 sf,	54.35% Impervious,	Inflow Depth =	3.80"	for 25-YR event
Inflow =	1.35 cfs @	12.09 hrs,	Volume=	4,727 cf	
Outflow =	1.34 cfs @	12.09 hrs,	Volume=	4,696 cf,	Atten= 1%, Lag= 0.0 min
Primary =	0.16 cfs @	11.60 hrs,	Volume=	3,243 cf	
Secondary =	1.18 cfs @	12.09 hrs,	Volume=	1,453 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 59.81' @ 12.09 hrs Surf.Area= 48 sf Storage= 33 cf

Plug-Flow detention time= 4.8 min calculated for 4,688 cf (99% of inflow)
Center-of-Mass det. time= 0.5 min (774.0 - 773.5)

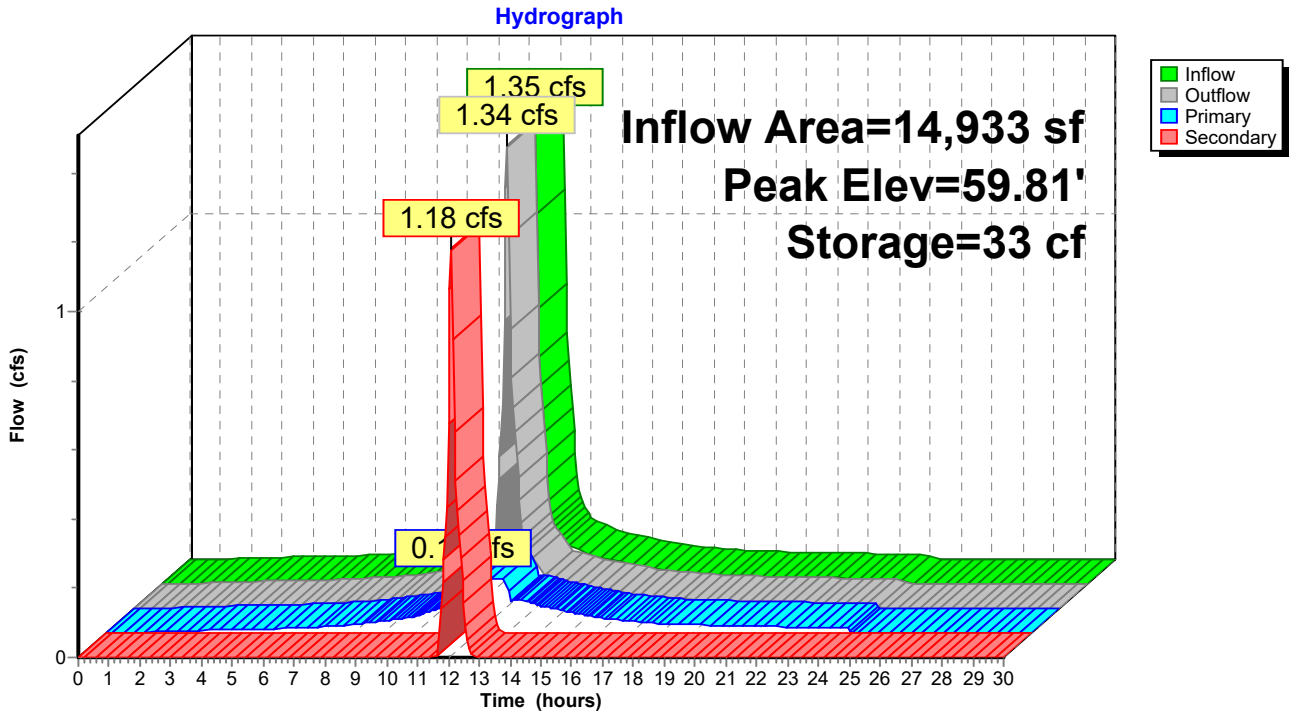
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	**8.00'W x 6.00'L x 1.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	**140.000 in/hr Exfiltration over Surface area**
#2	Secondary	59.54'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 11.60 hrs HW=59.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=1.15 cfs @ 12.09 hrs HW=59.80' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 1.15 cfs @ 1.68 fps)

Pond 33P: Filterra 6x8/8x6

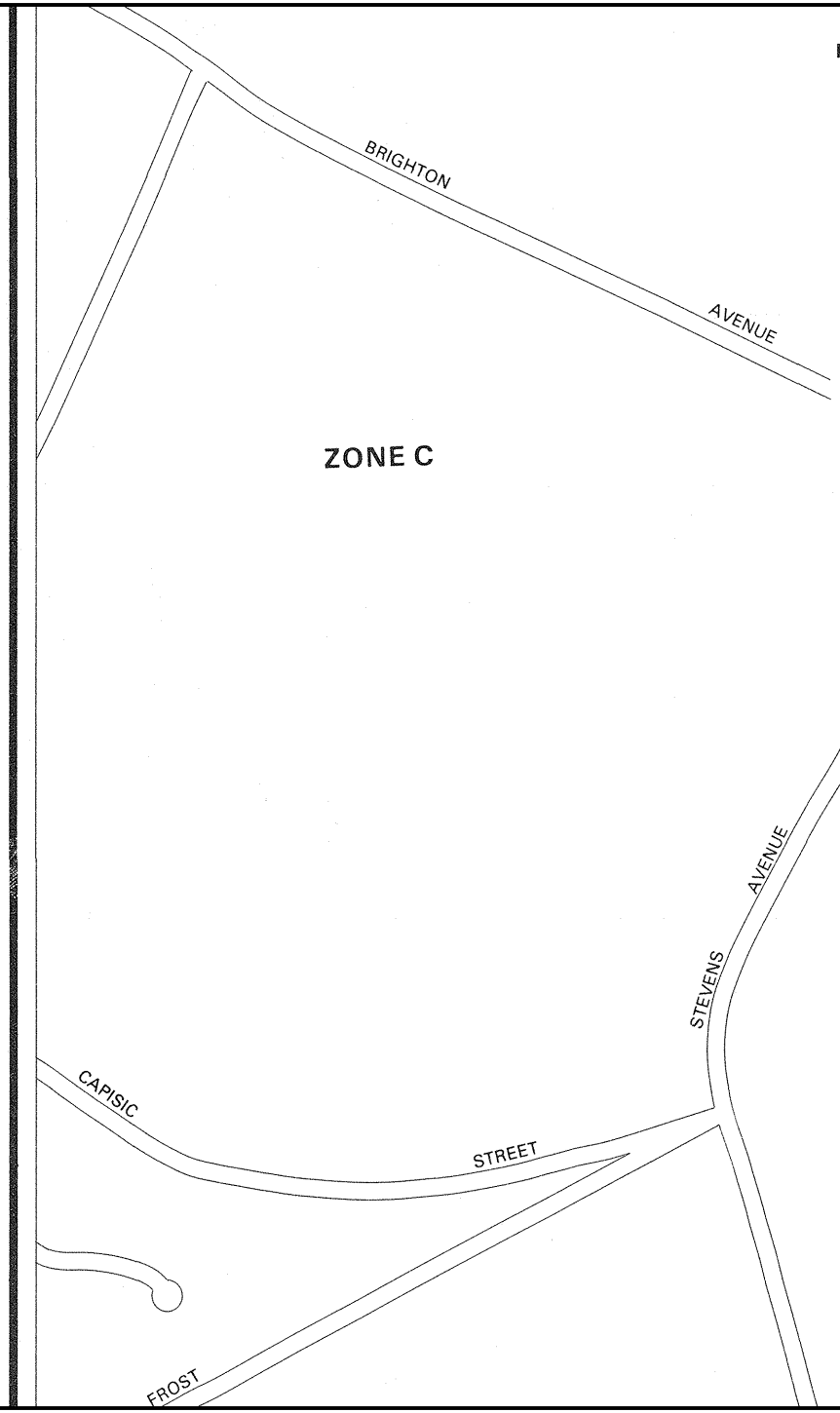


Hydrograph for Pond 33P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.01	0	59.12	0.01	0.01	0.00
4.00	0.01	0	59.12	0.01	0.01	0.00
5.00	0.01	0	59.12	0.01	0.01	0.00
6.00	0.01	0	59.12	0.01	0.01	0.00
7.00	0.02	0	59.12	0.02	0.02	0.00
8.00	0.02	0	59.12	0.02	0.02	0.00
9.00	0.03	0	59.12	0.03	0.03	0.00
10.00	0.05	0	59.12	0.05	0.05	0.00
11.00	0.08	0	59.13	0.08	**0.08**	0.00
12.00	**0.84**	**29**	**59.72**	**0.83**	**0.16**	**0.68**
13.00	**0.13**	**9**	**59.31**	**0.16**	0.16	**0.00**
14.00	0.08	0	59.13	0.08	0.08	0.00
15.00	0.06	0	59.12	0.06	0.06	0.00
16.00	0.04	0	59.12	0.04	0.04	0.00
17.00	0.03	0	59.12	0.03	0.03	0.00
18.00	0.03	0	59.12	0.03	0.03	0.00
19.00	0.02	0	59.12	0.02	0.02	0.00
20.00	0.02	0	59.12	0.02	0.02	0.00
21.00	0.02	0	59.12	0.02	0.02	0.00
22.00	0.02	0	59.12	0.02	0.02	0.00
23.00	0.02	0	59.12	0.02	0.02	0.00
24.00	0.01	0	59.12	0.01	0.01	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

APPENDIX E

Fema Firm Map



REFERENCE MARK	ELEVATION IN FT. (NGV
RM 28	56.00
RM 29	35.25
RM 30	25.36
RM 31	11.88
RM 32	9.89
RM 33	36.80
RM 34	22.81
RM 35	12.83
RM 36	28.34
RM 37	22.23
RM 38	15.56

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND, MAINE
CUMBERLAND COUNTY

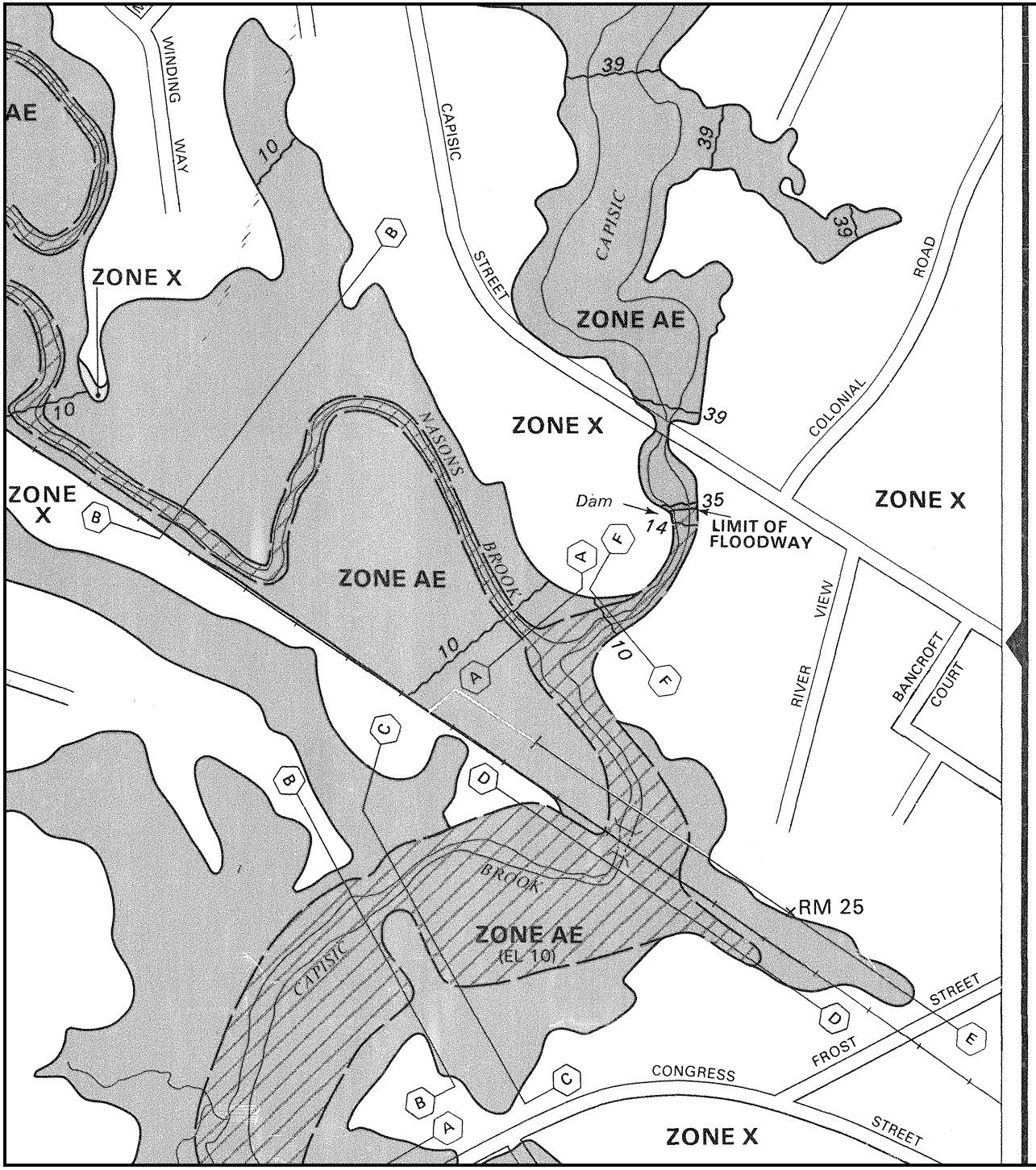
PANEL 13 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0013 B

EFFECTIVE DATE:
JULY 17, 1986

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



insurance agent or call the National Flood Insurance Pro

APPROXIMATE SCALE

400 0

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND,
MAINE
CUMBERLAND COUNTY

PANEL 12 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0012 C

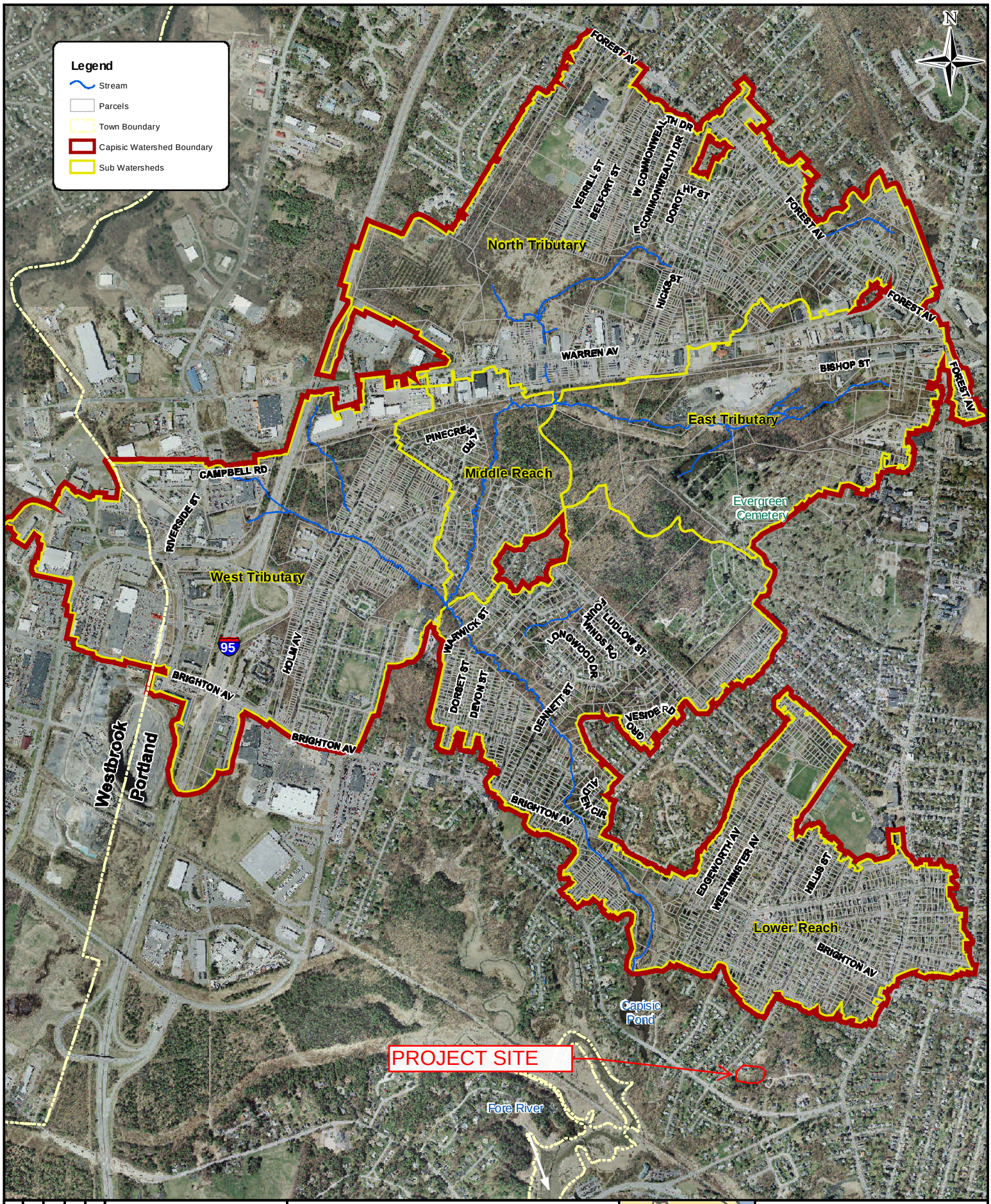
MAP REVISED:
DECEMBER 8, 1998

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX F

Capisic Brook Watershed Map



Scale: 1" = 1500'	Aerial Site Location	City of Portland - Capisic Brook Watershed Management Plan	Windham, Falmouth, Westbrook, Portland, Long Island, Gorham, South Portland, Scarborough, Cape Elizabeth
Job # 203939	Figure 1	Sources: City of Portland, Maine Office of GIS, DEP, WC	
Date: Oct 2010		Doc: SiteLocation_Aerials.mxd	
Checked By: ZH			
Drawn By: ADF/JS			

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INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Capisic Meadows Subdivision
Bancroft Street
Portland, Maine

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in this inspection and maintenance plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP). This is in compliance with the City of Portland Code of Ordinances, Chapter 32 Section 38 of the Post-construction stormwater management plan.

Inspections: The owner or operator of a BMP shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post construction stormwater management plan.

Maintenance and repair: If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the department of public works ("DPW") in the annual report.

Annual report: The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification to DPW in a form provided by DPW, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance

or repair, including the record of the deficiency and corrective action(s) taken.

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. 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, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations 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 the appropriate regulatory agency 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.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

   A. Sediment Barriers:

   - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
   - If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
   - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
   - Filter berms shall be reshaped as needed.

- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Stone Check Dams:

- Inspect the center of the dam to make sure it is lower than the edges. Erosion caused by high flows around the edges of the dam must be corrected.
- Sediment accumulation shall be removed prior to reaching half of the original design height.
- Areas beneath stone check dams must be seeded and mulched upon removal.

E. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

F. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.

- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

G. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. 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.

C. Fugitive sediment and dust: Actions must be taken to insure 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.

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

E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

After Construction

1. **Inspection:** After construction, it is the responsibility of the owner or Homeowner's Association to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.

2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.

A. Vegetated Areas:

- 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.

B. Ditches, Swales, and Other Open Channels:

- Inspect ditches, swales and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
- Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
- Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
- If the ditch has a riprap lining, replace riprap in areas where any

underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

C. Culverts:

- Inspect culverts in the spring, in the 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.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

D. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of 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).

E. Winter Sanding:

- 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 or other acceptable method.

F. Detention Pond

- The inlet and outlet of the basin should be checked periodically to ensure that flow structures are not blocked by debris. Inspections should be conducted monthly during wet weather conditions (March to November). Flow structures should be easily accessible for inspection and the removal of debris blockage during storm conditions.
- Embankments should be maintained to preserve their integrity as impoundment structures, including: mowing, control of woody vegetation, rodent, and outlet maintenance and repair. Basins should be mowed no more than twice a year during the growing season to maintain maximum grass heights less than 12 inches. All accumulated trash and debris should be removed.
- Sediment should be removed from the pretreatment structure at least annually and from the basin when necessary.

G. Filterra Units

- See attached documents for inspection and maintenance requirements.

1. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained. 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 controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations 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 the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.

2. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a 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.

Attachment 1
Capisic Meadows
BMP MAINTENANCE LOG

PAGE____

BMP STRUCTURE	INSPECTOR (NAME)	WORK PERFORMED	DATE PERFORMED	COMMENTS
Filterra Units				
Catchbasin				
Vegetated Areas				
Sweep Roadway				
Grassed Swales				
Rip Rap				
Culverts				
Detention Pond				
Other				
Additional Comments:				

Operation & Maintenance (OM) Manual v01

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Table of Contents

Overview

- Filterra General Description
- Filterra Schematic
- Basic Operations
- Design

Maintenance

- Maintenance Overview
  - » Why Maintain?
  - » When to Maintain?
- Exclusion of Services
- Maintenance Visit Summary
- Maintenance Tools, Safety Equipment and Supplies
- Maintenance Visit Procedure
- Maintenance Checklist

Resources

- *Example Filterra Project Maintenance Report Sheet*
- *Example Filterra Structure Maintenance Report Sheet*
- Filterra Warranty
- *Drawing FTST-2: Filterra Standard Configuration Detail*
- *Drawing FTNL-3: Filterra Narrow Length Configuration Detail*
- *Drawing FTNW-3: Filterra Narrow Width Configuration Detail*

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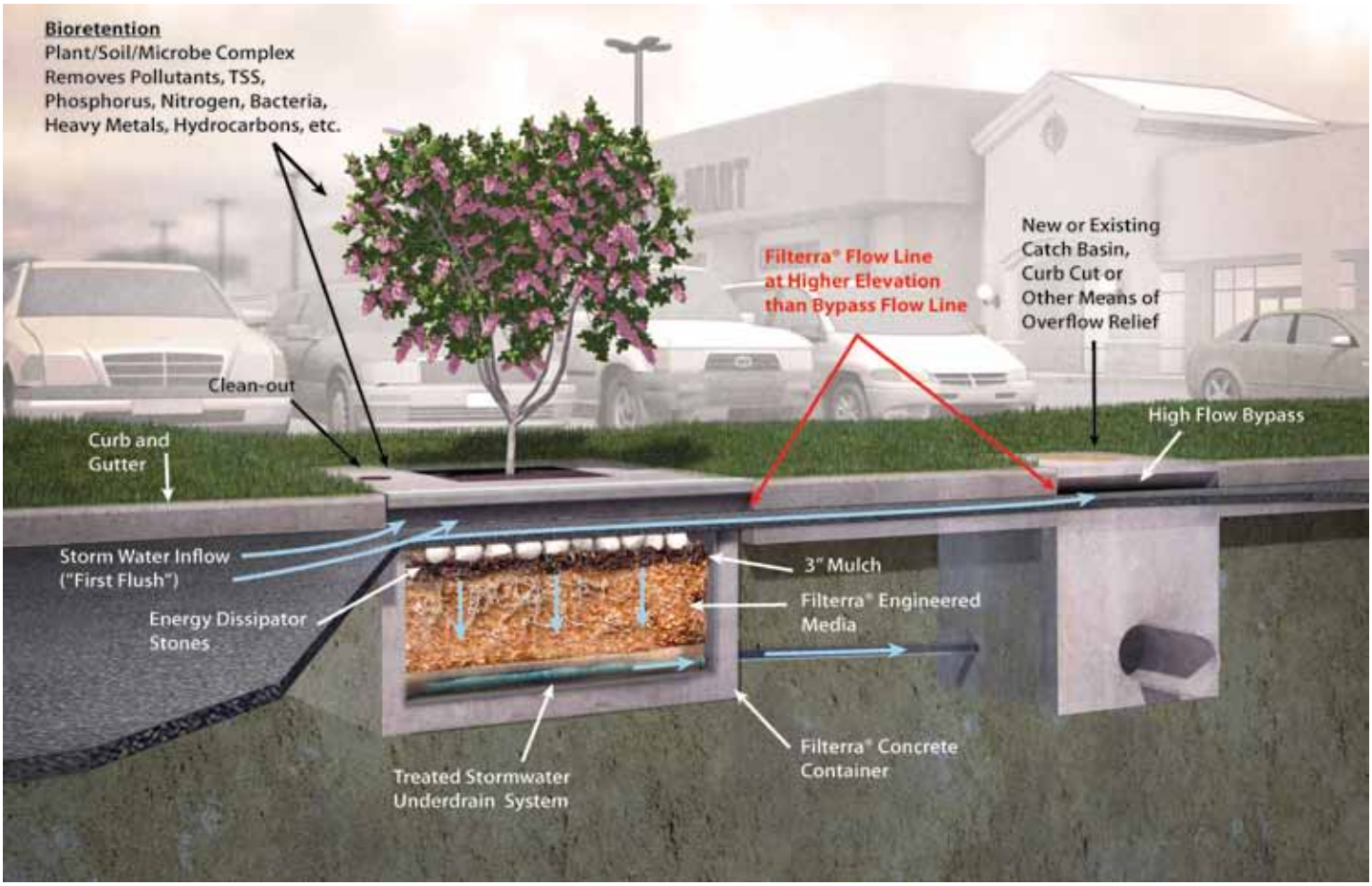
General Description

The following general specifications describe the general operations and maintenance requirements for the Contech Engineered Solutions LLC stormwater bioretention filtration system, the Filterra. The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, pre-constructed drop-in place unit designed for applications in the urban landscape to treat contaminated runoff.



Stormwater flows through a specially designed filter media mixture contained in a landscaped concrete container. The mixture immobilizes pollutants which are then decomposed, volatilized and incorporated into the biomass of the Filterra system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra to a downstream inlet or outfall. Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra Stormwater systems by following instructions in this manual.

Basic Operations

Filterra is a bioretention system in a concrete box. Contaminated stormwater runoff enters the filter box through the curb inlet spreading over the 3-inch layer of mulch on the surface of the filter media. As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the soil media where the finer particles are removed and other chemical reactions take place to immobilize and capture pollutants in the soil media. The cleansed water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are in the soil, the bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

Design and Installation

Each project presents different scopes for the use of Filterra systems. To ensure the safe and specified function of the stormwater BMP, Contech reviews each application before supply. Information and help may be provided to the design engineer during the planning process. Correct Filterra box sizing (by rainfall region) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra units as shown in approved plans. A comprehensive installation manual is available at www.conteches.com.

Maintenance

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement.

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the expected lifespan of your Filterra media.
- Avoid more costly media replacement.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the Filterra is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed.

Activation cannot be carried out until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra (where the cleaned runoff drains to, such as drop inlet) and block off the throat of the Filterra. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation and pruning or replacement as necessary
6. Clean area around Filterra
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each unit size. Mulch should be a double shredded, hardwood variety; do not use colored or dyed mulch. Some visits may require additional Filterra engineered soil media available from the Supplier.

Box Length	Box Width	Filter Surface Area (ft^2)	Volume at 3" (ft^3)	# of 2 ft^3 Mulch Bags
4	4	4	4	2
6	4	6	6	3
8	4	8	8	4
6	6	9	9	5
8	6	12	12	6
10	6	15	15	8
12	6	18	18	9
13	7	23	23	12

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.

1. Inspection of Filterra and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes | no
Damage to Box Structure	yes | no
Damage to Grate	yes | no
Is Bypass Clear	yes | no

If yes answered to any of these observations, record with close-up photograph (numbered).

2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes | no
Cups/ Bags	yes | no
Leaves	yes | no
# of Buckets Removed	_____

3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra media (not top soil or other) to recharge to a 9" distance

Record on Maintenance Report the following:

Distance of Bottom of Top Slab (inches)	_____
# of Buckets of Media Added	_____

4. Mulch replacement

- Please see mulch specifications.
- Add double shredded mulch evenly across the entire unit to a depth of 3″.
- Ensure correct repositioning of erosion control stones by the Filterra inlet to allow for entry of trash during a storm event.
- Replace Filterra grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.

5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	(Feet)
Width at Widest Point	(feet)
Health	alive | dead
Damage to Plant	yes | no
Plant Replaced	yes | no

6. Clean area around Filterra

- Clean area around unit and remove all refuse to be disposed of appropriately.

7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.
Maintenance is ideally to be performed twice annually.				

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ENGINEERED SOLUTIONS

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Revised 3/2/2016

IBERDROLA USA

3/13/2018

Joshua Wagner
130 Bancroft St
Portland, Maine 04102

Sent via email

RE: Request for Letter of Ability to Serve for 130-144 Bancroft Street, Portland

Dear Mr. Wagner:

Thank you for contacting Central Maine Power Company (CMP) to inquire about the property located on Bancroft Street in Portland. The purpose of this communication is to acknowledge receipt of your March 8, 2018 email requesting ability to serve for the site referenced above.

Currently, CMP has the ability to serve this site with single phase. If you require polyphase service, a line extension will have to be completed. Also, as much lead time as you can reasonably provide to CMP before the project breaks ground is always very much appreciated.

New Service Milestones

- Call 1-800-565-3181 to establish a new account and an SAP work order. Please provide both of these to me.
- Submit Load information. Please complete this CMP spreadsheet using load information
- Submit the easement information worksheet. Please complete this CMP form and either email or fax back to us.
- Submit any electronic drawings (PDF (preferred) or DWG files) of the site layout and proposed electrical connections if you have them.
- Preliminary meetings with CMP Advisor and Engineer to determine details of job (I will need to schedule with your electrician/contractor-please let me know who this is)
- Field planner design appointment to cost out job and develop CMP Invoice.
- Submit invoice for payment.
- Easements signed and payment received.
- Job scheduled for completion after the electrical inspection has been received.

740 Main Street, Lewiston, ME 04240
Tel (207) 629-4552 office

This process can take several months, depending upon several factors including transformer delivery, potential substation upgrades, return of completed paperwork, and other customer jobs in the system that may be ahead of yours. In addition, contact with the other utilities, including telephone and cable, should be commenced as soon as practical. They may have additional work or charges in addition to the CMP work required to bring your project on line.

For your convenience, here is a link to the CMP Website which contains the Handbook with details regarding most service requirements:

www.cmpco.com/handbook

In the meantime, please contact me if you have any more questions. I can be reached at (207) 629-4552.

Thank you

Regards,

Jeff Lagueux
Central Maine Power Company

740 Main Street, Lewiston, ME 04240
Tel (207) 629-4552 office

An equal opportunity employer

March 2, 2018

Jim Fisher
Northeast Civil Solutions Inc.
381 Payne Road
Scarborough Maine 04074

Re: 130 Bancroft Street, Portland Maine

Dear Mr. Wagner:

Thank you for your interest in using natural gas for the above referenced project.

This is to confirm that natural gas can be made available from our distribution system to serve your proposed project.

Any improvements to the existing distribution system necessary to provide this service, as well as the design of the gas system in the project itself will be established as the overall design and scope of your project progresses.

All work necessary to provide service will be performed in accordance with the Maine Public Utilities Commission requirements.

If you have any further questions or require additional information, please contact me directly at (207) 541-2536 or harmon@unitil.com.

Sincerely,

Bridget Harmon
Business Development Representative
Unitil Corporation
(o) 207-541-2536 (f) 207-541-2586

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

March 15, 2018

Mike Skolnick
Northeast Civil Solutions
381 Payne Road
Scarborough, ME 04074

Re: Bancroft Street, PO
Ability to Serve with PWD Water

Dear Mr. Skolnick:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on March 22, 2018. Based on the information provided per PWD marked up plans dated February 28, 2018, 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 properties requesting water service do not have deeded frontage on a public way containing a public water main, which is a requirement for water service. In order to provide water service to this site, a main extension will be required within the private way to a point equal to the center of the last lot to be served. The District can confirm that the existing water system has the capacity to serve the additional seven single family house lots. As final design plans become available for the next construction phase please send a copy to the MEANS group for review. We will work with you or your representative to ensure that the design meets our current standards.

- **Water District approval of final water infrastructure plans will be required for the project prior to construction.**

Prior to construction, the owner or contractor will need to make an appointment to complete a service application form and pay all necessary fees. The appointment shall be requested through MEANS@pwd.org or by calling 207-774-5961 ext. 3199. Please allow (3) business days to process the service application paperwork. PWD will guide the applicant through the new development process during the appointment.

Existing Site Service

According to District records, the project site does not currently have existing water service.

Water System Characteristics

According to District records, there is a 12-inch diameter cast iron water main in Bancroft Street and a public fire hydrant located approximately 260 feet from the site. The most recent static pressure reading was 88 psi on May 19, 2017.

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 Portland 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

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services,
55 Portland Street,
Portland, Maine 04101-2991

Bradley Roland, P.E.
Water Resources Division

Date: 9-5-2018

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 130 Bancroft Street

Chart Block Lot Number: 193 Block E, parcels 19,26,39 & 40

Proposed Use: 7 new house lots
Previous Use: undeveloped
Existing Sanitary Flows: 0.0 GPD
Existing Process Flows: N/A GPD
Description and location of City sewer that is to receive the proposed building sewer lateral.

Proposing to connect to sewer main in Bancroft Street. (see attached plans)

Site Category		
	Commercial *(see part 4 below)*	
	Industrial *(complete part 5 below)*	
	Governmental	
	Residential	X
	Other *(specify)*	

Clearly, indicate the proposed connections, on the submitted plans.

2. Please, Submit Contact Information.

City Planner's Name: Jean Fraser Phone: 874-8728
Owner/Developer Name: WB Group, Inc. c/o Josh wagner
Owner/Developer Address: 130 Bancroft Street, Portland ME
Phone: Fax: E-mail: joshwagner4545@yahoo.com
Engineering Consultant Name: Northeast Civil Solutions c/o Tony Panciocco
Engineering Consultant Address: 381 Payne Road, Scarborough ME 04074
Phone: 883-1000 Fax: E-mail: tony.panciocco@northeastcivilsolutions.com

Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review.

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: 1,890 GPD
Peaking Factor/ Peak Times:
Specify the source of design guidelines: *(i.e.__"Handbook of Subsurface Wastewater Disposal in Maine," __ "Plumbers and Pipe Fitters Calculation Manual," __ Portland Water District Records, Other (specify)* Maine Waste Water Disposal Rules

Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet.

3 bedroom homes 90/gpd/bedroom=270 gpd/home
7 new homes 7x270 = 1,890 gpd

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values: N/A

Size of External Grease Interceptor: _____

Retention Time: _____

Peaking Factor/ Peak Times: _____

Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet.

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: N/A GPD

Do you currently hold Federal or State discharge permits? Yes ____ No ____

Is the process wastewater termed categorical under CFR 40? Yes ____ No ____

OSHA Standard Industrial Code (SIC): *(http://www.osha.gov/oshstats/sicser.html)*

Peaking Factor/Peak Process Times: _____

Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps.

Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided, or attached, as a separate sheet.

Christopher C. Branch, P.E.
Director of Public Works

Date: October 5, 2018

Re: Wastewater Capacity Authorization

Address: 130 Bancroft Street
Applicant: WB Group, Inc. c/o Josh Wagner

Planner: Jean Fraser

Anticipated Wastewater Flow:

Estimate of Anticipated Design Flows				
Development	Unit Size	Number of Units	Gallons per Day per Unit	Total Gallons per Day
Existing flow to be removed				
Vacant				0
Proposed flow				
Residential Units	3-Bedroom	7	270	1890
			Net Change	**+ 1,890**
*Values based on STATE OF MAINE: SUBSURFACE WASTEWATER DISPOSAL RULES, most recent edition				

Comments:
The Department of Public Works, which includes the Water Resource Division, have reviewed and determined that the downstream sewers from the project address have the capacity to convey the estimated dry weather wastewater flows which will be generated from this development.

If the City can be of further assistance, please contact me at all 874-8840 or brad@portlandmaine.gov

Sincerely,
CITY OF PORTLAND

Bradley A. Roland

Bradley A. Roland, P.E.
Senior Project Engineer

CC:
Jeffrey Levine, Director, Department of Planning and Urban Development, City of Portland
Stuart O'Brien, Planning Director, Department of Planning and Urban Development, City of Portland
Barbara Barhydt, Development Review Services Mgr., Dep't. of Planning and Urban Development, City of Portland

Keith Gray, City Engineer/Engineering Manager, Portland Department of Public Works

Nancy Gallinaro, Water Resources Manager, Portland Department of Public Works
Ben Pearson, Compliance Coordinator, Portland Department of Public Works
John Emerson, Wastewater Coordinator, Portland Department of Public Works

Lauren Swett, Woodard & Curran, DPW Development Review
Scott Firmin, Director of Wastewater, Portland Water District
Charlene Poulin, Wastewater Chief Operator – Systems

SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

www.northeastcivilsolutions.com

41041
May 31, 2018

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our plans for a proposed 8 Lot Subdivision located at 130 Bancroft Street.

Meeting Location: 130 Bancroft Street
Meeting Date: June 19th, 2018
Meeting Time: 4:00pm

(The City code requires that property owners within 500 feet (1000 feet for proposed industrial subdivisions and industrial zone changes) of the proposed development and residents on an "interested parties list", be invited to participate in a neighborhood meeting. A sign-in sheet will be circulated and minutes of the meeting will be taken. Both the sign-in sheet and minutes will be submitted to the Planning Board.)

If you have any questions, please call Northeast Civil Solutions, Inc. @ 207-883-1000 or Joshua Wagner @ 207-831-4345.

Sincerely,
NORTHEAST CIVIL SOLUTIONS, INC.

Michael Skolnick
Land Use Regulatory Specialist

File: Joshua Wagner, Land Owner / Developer

Note:
Under Section 14-32(C) and 14-524(a)d of the City Code of Ordinances, an applicant for a Level III development, subdivision of over five lots/units, or zone change is required to hold a neighborhood meeting within 30 days of submitting a preliminary application or 21 days of submitting a final site plan application, if a preliminary plan was not submitted. The neighborhood meeting must be held at least seven days prior to the Planning Board public hearing on the proposal. Should you wish to offer additional comments on this proposed development, you may contact the Planning Division at 874-8721 or send written correspondence to the Planning and Urban Development Department, Planning Division, 4th Floor, 389 Congress Street Portland, ME 04101 or by email: to bab@portlandmaine.gov

130 Bancroft Street – Proposed 8 Lot Subdivision

June 19, 2018 @ 4:00pm

WELCOME AND PLEASE SIGN IN

NAME	ADDRESS	TELEPHONE	EMAIL
Carmen Bailey	143 Bancroft	761.3911	cbailey@preti.com
Oliver Griswold	38 Redlon Park	917-617-2103	owgriswo@gmail.com
Denis Noonen	64 Rockland Ave	2326210	denisn326x@gmail.com
THOMAS R. LUSSIER	126 BANCROFT ST.	761.3971	TLUSSIER@MAINE.RR.COM
MELODY LUSSIER	126 BANCROFT	761-3971	
DAWN LELAND	119 Bancroft St.	207 459.8589	LelandDM@gmail.com
Connie Hughes	147 Bancroft	207 761.1787	
Steven McClelland	137 Bancroft St	781-738-8429	stevenmcc00@gmail.com
MARY DELOIS	125 BANCROFT	774-9599	
Christopher Holt	135 Bancroft	956-3771	christopherTholt@gmail
Jeff Komp	115 CABFIC ST,	207-332-8277	JEFF.KOMP@YAHOO.COM
Roger Gendron	118 Bancroft St	207-774-6830	
Jean E Gilpatrick	110 Bancroft St	207-775-1094	
Douglas Babkirk	55 Redlon Park	712-5140	doug.babkirk@maine.edu
Scott H. BERRY	36 June St.	774-1904	
Sam Iler	95 Bancroft St	520 307 3482	
Jenn + Don Taylor	80 Bancroft St	879.2248	dandjtaylor@maine.rr.com
Joshua & Tamara Krieger	58 Redlon Park Rd	807-3181	Kriegertamara@yahoo.com
Jackie Harkins	154 Bancroft St.	207-780-8872	

SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

www.northeastcivilsolutions.com

41041
June 19, 2018

City of Portland, Planning and Development
389 Congress Street
Portland, Maine 04101

RE: Level III Subdivision Review – 130 - 144 Bancroft Street – Neighborhood Meeting Minutes
WB Group, Inc. – Capisic Meadows – 8 Lot Subdivision

On Tuesday 19, 2018, members of the NCS team along with Josh Wagner met for a neighborhood meeting at 130 Bancroft Road to discuss the proposed 8 lot subdivision to be constructed off of Bancroft Street.

The following attendees were present:

NCS - Jim Fisher, Michael Skolnick, Brandon Binette
Owner - Josh Wagner (WB Group, Inc.)
Neighborhood Attendees - Please see attached sign in sheet

Please see the following questions which were presented by members of the neighborhood who attended the meeting in regards to the 8 lot subdivision proposed off Bancroft Street. NCS responses to the neighborhood concerns are written in **bold** below the aforementioned concerns.

Discussion Topics:

Concern: Neighbors are concerned about the runoff of water, for example: Redlon Park Road. Neighbors feel many problems were caused by Redlon not being designed properly. Will the work be done correctly?

Answer: The engineering work is reviewed multiple times by different groups (DEP, City Engineers). The design will only be accepted if the engineering is sufficient to control peak runoff in a major storm event and will not cause future issues, meanwhile eliminate increased runoff onto abutting properties from the proposed development.

Concern: Where is the sewer going to go?

Answer: The sewer will tie into existing facilities in the Bancroft Street Right-of-Way. The project has been reviewed by Portland Public Works and an ability to serve letter has been provided stating that the existing infrastructure has sufficient capacity to allow for the proposed sewer connection.

Concern: Will there be blasting? Will the blasting cause damage to surrounding houses? What can you do about the ground moving?

Answer: Blasting will be used if no other means work to remove the material. Any damage done to surrounding properties by blasting will be paid for by the company which is doing the blasting. The blasting will be completed by a licensed blasting contractor and anticipate pre-blast surveys will be required prior to blasting. Before all blasting shall occur surrounding properties will be inspected to ensure no damage will be caused due to such actions.

Concern: Will our basements flood due to the proposed construction?

Answer: John Wagner states, "I currently have water problems with my basement flooding." This engineering will mitigate some flooding issues and will help water move more fluently due to the proposed drainage design. The clearing of existing easement/drainage areas that have not been maintained will allow for the existing stormwater systems to work as designed, meanwhile reduce backup which in turn is causing flooding.

Concern: Who has to clean the existing drainage easement burdening the existing parcels on Bancroft Street?

Answer: The City shall be responsible for cleaning of existing stormwater drainage areas within the existing Bancroft Street subdivision; however as part of the proposed development, the drainage area will be cleared to ensure that all drainage is working properly and efficiently.

Concern: How can the surrounding property owners be sure that the design is done properly?

Answer: Inspections are completed throughout the constructions process, meanwhile an As-Built will be completed post-construction to ensure the stormwater facilities function as designed. Along with inspections and an As-Built, the project will be reviewed by third-party reviewers, the City's engineering department and the Maine DEP to ensure all design elements as following best management practices, meanwhile function as intended.

Concern: If water appears in my basement who will pay for the damages?

Answer: A review of each aspect of the development (engineering, construction, etc.) will be completed to determine who should be held liable for the negative effects of the project on the

abutting project. The party who is determined at fault will be liable for adverse effects on the aforementioned parcel.

Concern: Why are there going to be 7 new lots?

Answer: The proposed development could yield additional lots (more than 7) as per net residential density calculation, however John Wagner opted to move forward with an additional 7 lots for to both fit in with the character of the development, meanwhile minimize adverse effects to the surrounding area.

Concern: Will trees have to be cut down to allow this project to happen?

Answer: Yes, trees will have to be cut to allow for the proposed development. Only trees that are necessary to be cut per grading and stormwater design will be removed.

Concern: How do we know where the water will go after blasting?

Answer: Controlled blasting is done, to disturb as little of the earth as possible. The site will then be graded to control stormwater as designed.

Concern: Problems with a culvert in back of my yard. (Unknown man) Will this be fixed?

Answer: Any work completed in association with the proposed development will function as designed. If there are problems with culverts on an abutter's property not directly correlated with the proposed development, it is home owner's obligation to inform the City of something not working correctly.

Concern: Will road work be done at the corner of Bancroft Street and Capisic Street in coordination with the proposed project?

Answer: No work will be completed at that corner of Bancroft Street and Capisic Street.

Concern: John, would you still put this development in if you planned to still live at your current house on Bancroft for another 10…20 years?

Answer: "I would have done some sort of residential development behind my property, perhaps not to the extent of the proposed subdivision, however I purchased the land for economic gain and would have moved forward with some sort of development."

Construction Management Plan
General Template
WB Group, Inc.
Capisic Meadows - 8 Lot Subdivision

A detailed construction management site plan will be prepared and submitted to City Staff for review once a contractor has been selected for the project. It is requested that this item be a Condition of Approval and submitted for City review prior to the issuance of a building permit or in advance of site work approval. The CMP will address the following Standards and Requirements:

The Capisic Meadows Construction Management Plan shall depict the overall planning, coordination, and control of a construction site, including phases as applicable, from beginning to completion. The City's goal for a construction management plan is to support a safe construction site and protect the public safety, accessibility (including preserving accessible pedestrian, bicycle, and vehicular modes of transport throughout the city), and welfare during construction. In addition, the construction management plan shall minimize construction impacts in their duration and magnitude to the surrounding area and develop an effective communication process for resolving concerns and conflicts.

The Construction Management Plan will be submitted as part of the Site Plan Review and it shall address the construction logistics for a project. The Construction Management Plan shall include the following submissions: 1) a construction management site plan, 2) a construction schedule (time frame); and 3) a written narrative addressing the categories below.

A. Construction Management Principles

The following narrative provides an overview of the construction management principles that the WB Group, Inc and its contractor has identified to minimize impacts from the construction, such as noise, vibrations, ground movement, truck traffic, and other construction related factors to the surrounding building and communities.

B. Development Review of Construction Management Plan

WB Group, Inc and its contractor shall submit a construction management plan that provides a comprehensive logistics and safety program for the construction project, which will be reviewed and approved as part of the site plan review process. The plan minimizing impacts to areas surrounding the building/construction site will be primary considerations in the process. The following details define the intended approach to the successful management of the project construction and the construction management plan will address the general conditions contained below.

C. Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits

Prior to scheduling a preconstruction meeting and the issuance of any City required permits, WB Group, Inc and its contractor shall meet all of the requirements contained in Section 14-530. Development review fees and post approval requirements and 14-532. General requirements and enforcement of Portland's Land Use Code.

Other permits, as applicable, include:

1. **Street Opening and Street Occupancy Permits:** Construction activity in the public right-of-way are controlled by Chapter 25 and sewer and stormwater system connections are controlled by Chapters 24 and 32 of the Land Use Code. All required permits shall be obtained through the Department of Public Works and the requests shall conform with the approved construction management plan.

2. **Blasting:** Blasting, if required, shall conform with all measures of Article VIII. Regulation of Explosives in the Land Use Code and Section 3.7 Standards for Blasting and Regulation of Explosives in Portland's Technical Manual.

3. **Building Code:** Employ the best practices, as applicable, of Chapter 33 Safeguards During Construction, from the 2009 International Building Code.

D. Construction Administration and Communication

WB Group, Inc and its contractor will work diligently to implement a communication strategy as outlined below. The communication strategy is intended to ensure that all construction operations are performed in accordance with all agreements, ordinances and special permits applicable to this project. The Construction Manager will work closely with adjacent abutters, businesses and all parties informed, as far in advance as possible, of scheduled work, particularly work anticipated to cause significant noise, vibrations, or dust.

The final construction management plan shall provide for the following:

1. Contact Person and contact information for the WB Group, Inc and its contractor and who is available 24 hours
2. Construction Signage posted on the site with Contact Information for Contractor
3. Describe any additional communication strategies
4. All construction site signage is temporary and shall be removed at project completion.

E. Construction Schedule

1. The contractor shall submit a schedule or time line for the construction project, including any Phasing.
2. Hours of Construction. Construction may occur during the daytime hours as defined in Section 17-18. Construction Activities for Building permit (Attachment 1) and Section 25-129. Noise, dust and debris (Attachment 2).
3. Extended Hours or Night Work: Pursuant to Section 17-18, this section not apply to emergency utility work or "Situations where the public works authority or the office of building inspections determines that the construction activity is of a unique character which cannot reasonably be completed or performed during the permitted hours and which is not of a recurring nature, provided that prior to engaging in such activity the contractor or his representatives gives notice of the time and scope of such proposed activity, the notice to be given in a manner approved by the public works authority."
4. Material Deliveries: Schedule and designated location for delivery of materials and boxed goods.

F. Security & Public Safety

1. The Construction Management Plan will depict all proposed fencing or other barriers and access gates (with knox locking devices) with the intent of separating pedestrian and vehicle circulation from the construction site.
2. Structures undergoing construction, alteration, or demolition operations, including those in underground locations, shall comply with NFPA 1 Chapter 16. *Safeguarding Construction, Alteration, and Demolition Operations.*
3. Fire Safety Program. An overall construction of demolition fire safety program shall be developed. Essential items to be emphasized include the following:
    - Good Housekeeping
    - On-site security
    - Installation of new fire protection systems as construction progresses
    - Preservation of existing systems during demolition
    - Organization and training of an on-site fire brigade
    - Development of a pre-fire plan with the local fire department
    - Rapid communication
    - Consideration of special hazards resulting from previous occupancies
    - Protection of existing structures and equipment from exposure fires resulting from construction, alteration, and demolition operations
4. Blasting, if required, shall conform with all measures of Article VIII. Regulation of Explosives in the Land Use Code and Section 3.7 Standards for Blasting and Regulation of Explosives in Portland's Technical Manual.
5. Any proposed temporary security lighting shall be shown on CMP and all fixtures shall be full cutoffs.

G. Construction Permitting and Traffic Control Plans

1. <u>Construction Activity in Public Streets:</u> Construction activity in the public right-of-way is controlled by Chapter 25 Article VII of the City Code of Ordinances. Required licenses and permits, restrictions on activity, and fees & area are outlined in that Chapter. Rules and Regulations for Excavation Activity are available through the Street Opening Clerk at the Department of Public Works. At no time can construction activity including delivery vehicles close or block streets or affect public safety access without prior notice and approval of the Department of Public Works.

2. <u>Sewer and Stormwater</u>: Sewer and stormwater water system connections are controlled by Chapters 24 and 32 of the City Code of Ordinance. Required permits for new connections and/or abandonment of existing connections are available through the Street Opening Clerk at the Department of Public Works. Rules and Regulations for these utility systems are available through the City Engineer's office of the Department of Public Works and in Section II of the Technical Manual.

3. <u>Traffic Control Plans</u>: Construction activity that impacts the existing public street system must be controlled to protect the safety of the construction workers and all modes of the traveling public. Projects are required to submit a satisfactory 'maintenance of traffic" (MOT) plan prior to any site plan, subdivision, or street opening permit approval. MOT plans may be required for projects that have impacts on local streets.

Maintenance of Traffic (MOT) plans shall provide for the safe passage of the public through or along the construction work zone. On a case-by-case basis, applicants may be allowed to close a street and/or detour a mode of traffic when absolutely necessary for safety. MOT plans shall employ the appropriate techniques and devices as called for n the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD). In addition:

- Construction speed signing may be used as needed to slow traffic
- Traffic Control signs shall not be placed where they are an obstruction to bicycles or pedestrians.
- In some situations, flaggers may be required.
- Police details may be required at lighted intersections and may be requested by the City's transportation engineer or his designee.

All existing modes of travel in work zone area shall be accommodated if impacted by the activity. The safe passage of pedestrians, bicyclists, transit providers, and motorists are of equal importance when planning out the work zone; no pre-existing travel mode may be eliminated without the express approval of the Department of Public Works. The MOT should also address on-street parking impacts, including deliveries and parking for adjoining businesses and property owners, analysis of roadway capacity or diversion capacity if street closure or change to roadway capacity is required, and coordination with other on-going or future construction or utility projects in the vicinity.

- Traffic control of bicycle and pedestrian facilities or routes through work zones shall be maintained until the bicycle and pedestrian facilities or routes are ready for safe operation. Traffic control will not be removed to allow auto travel at the expense of bicycle and pedestrians.
- Barrier systems utilized to separate the construction activity from the public street and /or sidewalk shall not inhibit sight distances, particularly for visibility of pedestrians and bicyclists.
- ADA compliance shall be maintained.

Use of public parking spaces or the blockage of any portion of sidewalk for the purpose of construction activity shall require an occupancy permit and appropriate fee as assessed by the Department of Public Works.

H. Site Management and Controls

The final Construction Management Plan will address maintaining the site in a safe condition and will include the following:

1. Regular trash and debris removal
2. Street cleaning and damage controls
3. Dust controls- The construction shall comply with Portland's requirements under Section 25-129 on Noise, dust and debris (Attachment 2).
4. Noise: The construction shall comply with Portland's requirements under Section 17-18 of the City Code (Attachment 1) and Section 25-129 on Noise, dust and debris Attachment 2).

5. Rodent Control will be provided, if applicable, by a professional exterminator and consistent with Chapter 22 of the City Code.
6. Snow Removal: Pursuant to Section 25-173 Contractors to ensure a safe means of travel within the work zone.
    1) Snow/ice removal or commence automatically from (1" of snow and up) or Ice
    2) Remove snow as needed within the work zone, including parking spaces & not to block any driveways or sight lines with the piles of snow.
    3) Clear all walks & ramps with the work zone
    4) Sand or Salt as needed
    5) Clear all basin or drainage to help snow melt
    6) This would include Monday-Friday Sat/Sunday/Holidays

I. Erosion Control and Preservation of Trees

1. The WB Group, Inc's selected contractor shall install all erosion and sedimentation controls as depicted on the approved erosion and sedimentation control plan prior to the pre-construction meeting for inspection by the City. The contractor shall regularly inspect the control measures, no less than weekly and after significant storm events, and maintain any installed temporary or permanent stormwater management systems in working order. The contractor shall document all inspection activities and corrective actions and be prepared to provide these documents for inspection by the City, Maine Department of Environmental Protection or the U.S. Environmental Protection Agency upon request.
2. The WB Group, Inc's selected contractor shall maintain all tree and landscaping preservation measures as depicted on the landscaping plan (Exhibit) within the area of construction.
3. The storage of materials shall be identified and avoid being located under/near trees.

J. Construction Staging Area

1. The Construction Management Plan shall depict location of the material staging areas, the location on onsite temporary construction trailers, the location on onsite truck delivery holding areas, the location onsite truck washing stations, masonry mixing stations, the general location of the construction security fence and the general location of temporary construction dumpsters. An open storage areas shall be shown on the plan.
2. Delivery Truck Holding Areas On-Site: The delivery holding area shall be shown on the plan and shall not be blocked during construction. On days when the construction activities require multiple truck deliveries, these deliveries will be carefully scheduled so that there is always adequate on-site area for the holding of the trucks until they can be unloaded. Once at the site all vehicles well be brought within the fence line and will make every attempt to avoid queueing on public streets.
3. Delivery Truck Holding Areas Off-Site: In the event that adequate on-site area for holding of trucks is not available, an off-site marshalling area will be utilized for trucking. The designated off-site location will be identified in the construction management plan.

K. Parking During Construction

1. Construction Parking: Adequate parking for construction workers shall be provided on site or arrangements for off-street parking at an off-site location shall be provided. The parking arrangements shall be included in the construction management plan.
2. Parking: Where existing facilities are remaining in operation during construction, the construction management plan shall identify how the parking for employees and others shall be managed.
3. Truck Routes and Volumes: The Construction Management Plan shall address the designated truck routes and expected truck volumes.

L. Special Measures as Necessary

For construction work that will take place over a long period (e.g. 12 months or more), involve major demolition/ deep excavation/ piling and/or special construction techniques, or are located near sensitive uses (e.g. medical care facilities, schools), the Construction Management Plan should provide details and demonstrate that all appropriate special measures have been taken to avoid, minimize, or possibly compensate for potential impacts. This may include taking baseline measurements before construction, such as arranging to photograph the foundations of nearby properties upon consent of the owners, in order to assess any future impacts of vibration, noise, etc.

SURVEYING ENGINEERING LAND PLANNING

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41041
April 30, 2018

RE: Level III Subdivision Review – Capisic Meadow – Sidewalk Waiver Request

The application for Level III Subdivision Review for the proposed 7 lot development located at 130-144 Bancroft Street would like to request a waiver for the need for sidewalks on both sides of the proposed residential street servicing the subdivision.

In the pre-development state there are no existing sidewalks within the Bancroft Street public Right-of-Way. While sidewalks increase pedestrian circulation throughout a development, the proposed development would not benefit from additional sidewalks on both sides of the street, meanwhile a singular sidewalk will allow for access throughout the subdivision. The proposed sidewalk will not increase interconnectivity because there is no sidewalk along the adjacent subdivision to connect too.

The addition of sidewalks on both sides of the proposed right-of way would increase unnecessary impervious area throughout the subdivision. In order to meet the requirement to incorporate sidewalks on both sides of a proposed road, the project would require further wetland fill and disturbed area. This area will not support the use of duel sidewalks within the Right-of-Way without unnecessary costs and environmental effects within the proposed subdivision.

The site has been designed to conform to the surrounding community in its existing state, meanwhile abide to the requirements of the existing land use standards. Granting of the requested waiver will allow for the proposed subdivision to conform to the surrounding neighborhood, meanwhile reduce any possible adverse effects to the natural environment.

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July 11, 2018

Jean Fraser, Planner
City of Portland
389 Congress Street
Portland, ME 04101

RE: Staff Review Comments – 8 Lot Subdivision, 130 Bancroft Street Portland

Dear Jean:

We are writing to address review comments received from you via email on June 25, 2018, and subsequent emails. Your comments are indicated followed by our responses in bold.

Civil Engineering – Third Party Reviewer

1. The Applicant has submitted a copy of the NRPA Application to the DEP for proposed wetland fill. Copies of all final permit approvals should be forwarded to the City upon receipt.
   The MDEP has approved our application for a Tier I wetland fill permit. A copy of the approved permit has been forwarded to the City via eplan and email. The Army Corps of Engineers is reviewing our permit application. Once we receive a decision from the Army Corps we will forward this along to the City.

2. The stormwater inspection and maintenance plan should include provisions for the requirements of Chapter 32 of the City of Portland Code of Ordinances, as well as inspection and maintenance requirements for the proposed Filterra Units and Detention Pond. Update the stormwater inspection and maintenance plan.
   Stormwater inspection and maintenance plan have been updated in compliance with Chapter 32 of the City of Portland Code of Ordinances. Maintenance requirements for proposed Filterra Units and detentions ponds have been forwarded to the City via eplan and email.

3. The Applicant has stated that the lot impervious areas were included in the HydroCAD model, however the narrative report indicates that there will be 0.62-acres of new impervious area and the model indicates that there will be only 0.48-acres of new impervious area. Clarify the amount of impervious surface that has been modeled, and confirm that it includes all impervious surface anticipated to drain to the pond.

We have confirmed that the new impervious area for the project equals 0.65 acres. The HydroCAD model and the Stormwater Report have been updated to reflect this number. All impervious areas tributary to the pond have been included in the model.

4. Note that the standard detail for Sidewalk Ramp Detectable Warning Panels was revised in October 2017. The acceptable material is now uncoated cast iron. Please revise the detail.
   The sidewalk ramp detectable warning panel detail has been updated on the plans to reflect the October 2017 detail revision.

5. The Grading and Drainage Plan indicates that SD-7 will be a 15-inch pipe, but the HydroCAD model indicates that it is 18-inches. The dimensions of the emergency spillway are also inconsistent between the plans and the model. The Applicant should clarify and ensure that the drawings and the model are consistent.
   The Army Corps of Engineers (in reviewing the Tier I Wetland Impact Permit Application) has requested that all wetland crossing culverts be 36" wide and imbedded at least 6 inches. We have updated all the culverts in the wetland crossing areas to reflect a 36" pipe imbedded 1 foot. The pipe sizes have been updated on the pipe schedule on the plan set and in the HydroCAD model. A detail has been added to the plans to reflect this condition.

6. Proposed details include a "Type B Underdrain Installation Detail – Alternative A" that shows underdrain along the roadside edge under curbing; however, the proposed grading and drainage plan does not show locations or discharge points for proposed underdrain. Clarify the use of underdrain on the site
   Underdrain locations have been identified on the plan set. Underdrains are proposed to discharge into proposed cross culverts.

7. A construction management plan has not been provided. Provide a construction management plan using the City's template which is available online.
   A Construction Management Plan using the City's Template has been submitted to the City via eplan.

8. All piping installation within the proposed roadway is required to be in conformance with the City's Technical Manual, Section 2 Sanitary Sewer and Stormdrain. This includes material types and installation. Note that the City of Portland requires HDPE stormdrain pipe to be ADS HP triple-wall pipe. Refer to figure II-12 for the typical pipe trench installation. Update the plans and details to be in conformance with the City's standards.
   We have updated the pipe schedule to reflect the requirement for ADS HP triple-wall pipe. Additionally, we have added the City's II-12 Typical Pipe Trench Installation and Notes detail to our plan set.

9. We have reviewed the Grading and Drainage Plan, and there are a few areas where the grading is not detailed enough to show that water will not be directed towards the building foundations. Specifically on Lots 5, 6, and 7. Additional spot grades are also recommended in the area between Lots 2 and 3, the area in front of Lot 4 and the area adjacent to the

retaining wall at the edge of the detention pond to clearly define grading such that ponding will not occur. Provide updated Grading and Drainage Plan.
Spot grades have been added to the plans to clarify some of the grading areas. The retaining wall and pool have been removed from the plans as the pool will be removed as part of this project.

10. Filterra units are proposed for installation within the future City Right Of Way. The Applicant should discuss the maintenance of these systems with the City of Portland Department of Public works to determine if they will be maintained by the City or if maintenance will be required by the owners. In addition, a system of culverts extends through the site, both over private property and the City Right Of Way, to a stormwater pond that is located on private property. Responsibility of maintenance of all stormwater systems should be clearly established, and Stormwater Maintenance Agreements are required in conformance with the City's Chapter 32. Provide Stormwater Maintenance Agreements.
The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed. This will include culverts, detention pond and other stormwater infrastructure not accepted by the City. Draft Homeowners Association documentation will be forwarded to the City once it has been completed.

Additionally, in discussions with the City Engineer (Keith Gray) it was indicated that the City may look at a different treatment device other than the FIlterra units. We will continue to work with the City on determining which device best suits the site and the City requirements.

Fire Department

11. All homes will be required to be sprinkled.
We have added a note to the Subdivision Plan indicating that all homes will be required to be sprinklered.

12. Fire Department access to all homes is acceptable.
No response required.

13. A 30 x 30 turnaround is required at the dead end of the road.
The turnaround has been drawn as 30 x 30 per detail I-5.

14. The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.
The hydrant has been removed from the plans.

Additional Comments

15. It is very unusual to have the piping going through private property. This along with the neighbors issues and the scale of wetland fill raises questions and we would like to be sure we are all on the same page (or at least have options clarified with known pros and cons) before it goes to a PB Workshop.
    The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed. Draft Homeowners Association documentation will be forwarded to the City once it has been completed.

16. Also we would like a site plan or lot layout/development and landscape plan (see example attached) that includes the driveways, buildable areas on the lots, key dimensions, and a sidewalk along the north side of the proposed new road- also think about tree saves as this would seem appropriate here.
    An additional Site Layout Plan has been created to satisfy the requirements as indicated above. Building envelopes are indicated on the Subdivision Plan and additionally one story and two story setbacks are identified to show buildable areas. We have identified the clearing limits for the proposed development via pre and post construction tree lines on the submitted plans. We have identified a sidewalk on the southern side of the proposed road and have submitted a waiver request for a sidewalk along the northerly side of the proposed road as there is no sidewalk in Bancroft Street.

17. The issue here is partly re the physical layout, and partly the question of who is going to be responsible for the stormwater system and all parts of it - while the City would accept the street, it would not take responsibility for the stormwater system that is not in the street. And if part of that system is under private properties, will each property be responsible for their section or what? So one of the discussion topics (with DPW present) was this question.
    The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed.

18. Who will be responsible for the proposed stormwater system located within private lots; who will be responsible for the maintenance of the detention pond and the existing easement that will be used for drainage (I would note that the City would not normally take on any of this maintenance and there would need for formal agreements to clarify/confirm)
    The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed.

19. How will your system avoid flooding of neighbors properties (in view of the addition of impervious surfaces)
    Please see the previously submitted stormwater report and calculations explaining the proposed design indicating that the proposed stormwater infrastructure will control the peak flow via a detention pond.

20. Regarding the sidewalk, the other engineers who provide comments on projects wanted the sidewalk on the other side as it impacts less wetland, is less impervious area, and it is on the side of the applicants house
    NCS had met with Keith Gray and the City's 3rd party reviewer and spoken about the request that the sidewalk be located on the northerly side of the road and reached a conclusion that it would not be necessary to change the sidewalk location. The proposed design actually reduces impervious surface due to the fact that the sidewalk is shorter, not extending past the shared driveway between lots #6 and #7. Wetland impacts would remain the same whether the sidewalk were located on the northerly or southerly side of the proposed road due to grading. Necessary grading on both sides of the road, no matter which side the sidewalk were located, would not allow for wetland fill to be reduced.

Abutter Concerns

21. Respond to the comments from neighbors that I have sent (not in detail, but to broad questions)
    A proposed Stormwater Report, Traffic Study and DEP Wetland Fill Permit have been submitted in coordination with this project which addresses the broad spectrum of abutter concerns. We will be happy to discuss any outlying topics in further detail with the Planning Board.

    a. Stormwater
       There is a major concern brought forth by abutters in the surrounding are of stormwater mitigation and the concern that their previously existing "wet" lots will be further affected by the proposed development. The concerns are addressed by the Stormwater Report and calculations provided within the original submission package. The design has taken into account both on-site and off-site watersheds which come in contact with the proposed development. As required by the City, the development is not allowed to increase the peak runoff from the proposed parcel onto any abutting parcel. To control stormwater a partially open and closed drainage system has been implemented throughout the development through a series of drainage ditches and culverts. The proposed impervious surface created by the road will be treated via a Filterra System (or something approved equivalent by the City of Portland) and, along with all created stormwater, directed to a detention pond. The pond has been designed to meet the demands of a 25-year storm event, meanwhile drain within 24 hours after such storm event, eliminating the concern of standing water. Additionally, the stormwater report and calculations are being reviewed by the City's third party reviewer, Woodard and Curran.

b. Wetland Impacts

Wetland impacts have been minimized to the extent practical given the site layout. The MDEP has approved the Tier I wetland fill application for the project. The Army Corps of Engineers is reviewing our application.

c. Open Space

Even though a majority of the land used by the proposed residential development is existing undeveloped (lawn and woods) the land is private property. This land is not part of "Redlon Woods", nor is it part of the Portland Land Bank. The land has not been set aside and dedicated as "open space". As such, development is not restricted by an "open space" designation. The proposed design meets all necessary requirements for lot size and the development does not have an open space requirement that must be met for a traditional subdivision.

d. Underground Piping

A Boundary, Existing Conditions and Topographic Survey have been conducted for the project area identifying all possible on site features that may affect the proposed project or the surrounding area. Additionally, we have looked at City infrastructure plans for Bancroft Street and Capisic Street. As such, we do not anticipate any unknown drainage pipes crossing the property. Should any unknown pipes be encountered will look at all possible solutions to mitigate any effects this may have on the proposed design and ultimately devise a solutions to resolve/re-route any drainage piping. All revised designs will need to be reviewed and approved by the City.

e. Traffic

A Traffic Study conducted by Bill Bray, P.E. of Traffic Solutions was submitted providing information proving that the proposed development will have minimal effect on the existing traffic flows on Bancroft Street. The 6-7 daily trips, 7 per peak hour, will not overburden the existing right-of-way and will not require anything more than a stop bar and sign along the proposed intersection.

f. Site Layout

The proposed design meets the City's requirement for minimum lots size, frontage and building setbacks within the R-3 zone. We have also indicated setbacks for 1 & 1-1/2 story and 2 story houses on the plans.

g. Construction Time

At this point we do not know the timeframe for construction of all the houses. It will depend on the housing market. There will be additional noise and disruption during the construction phase.

h. Redlon Park drainage.

The Redlon Parks development's runoff drains onto the property of the proposed development. We have made provisions in the layout, to allow this runoff to continue to flow across our property to the existing outlet point.

i. Existing drainage easement
The parcels of land owned by Jacqueline Harkins, Dusko Rakovic & Zeljka Rakovic, and William F. Johnson & William R. Johnson, are subject to a 30 ' drainage easement as described in their respective property deeds and as shown on the original subdivision plan, recorded in Planbook 125, Page 8, that created their original parcel configurations. The proposed subdivision will create a Homeowners Association and it will be the responsibility of the Homeowners Association to maintain the 30' Drainage Easement. The City has requested that as part of the project the drainage easement area be cleared of existing vegetation and the ditch line re-graded to ensure positive flow to the pipe inlet. This work will be completed within the 30' drainage easement identified on the plans.

Please contact me if you have any questions or concerns. Thank you.

Sincerely,
Northeast Civil Solutions, Inc.

Michael Skolnick
Land Use Regulatory Specialist

MURRAY PLUMB & MURRAY
ATTORNEYS AT LAW

September 28, 2018

Jean Fraser, Planner
Planning & Urban Development Department
City of Portland
389 Congress Street
Portland, Maine 04101

Re: Capisic Meadows 8 Lot Subdivision, 130 Bancroft Street / Application by WB Group, Inc. for Level III Subdivision Approval / Project # PL0000092-2018

Dear Ms. Fraser:

This office represents WB Group, Inc. (hereafter the "WB Group") with respect to its application for Level III Subdivision Approval of an 8-lot residential subdivision to be known as "Capisic Meadows" (hereafter the "Project") at 130 and 144 Bancroft Street (hereafter the "Project Site").

It is my understanding that your office has asked WB Group to supply the City with a legal opinion confirming that WB Group holds sufficient right, title, and interest in certain properties abutting the Project Site (hereafter the "Abutting Lots") to allow it to (a) discharge stormwater from the stormwater detention basin proposed for the Project Site through a 30'-wide drainage easement (hereafter the "Drainage Easement") located on the Abutting Lots, and (b) to maintain and repair that Drainage Easement either itself or through a Homeowners' Association (hereafter the "HOA"). It is further my understanding that the City has directed WB Group and/or the HOA to improve the functioning of the Drainage Easement by clearing it of current vegetation and regrading the ditch line to ensure positive drainage into the existing outlet culvert within the Drainage Easement. That culvert discharges into a catchbasin at the corner of Bancroft and Capisic Streets.

The Abutting Lots include the following properties:

- 154 Bancroft Street, Tax Lot# 193 EO28001, owned by Jacqueline Harkins (hereafter the "Harkins Property";

- 160 Bancroft Street, Tax Lot# Lot 193 EO20001, owned by Dusko and Rakovic Zeljka (hereafter the "Zeljka Property"); and

- 119 Capisic Street, Tax Lot# Lot 193 EO29001, owned by William R. Johnson (hereafter the "Johnson Property").

It is our opinion that that WB Group has sufficient right, title, or interest to (a) discharge stormwater across the Abutting Lots within the bounds of the Drainage Easement and (b), maintain and improve the Drainage Easement, either by itself or through an HOA, to the extent necessary to allow the Drainage Easement to discharge stormwater from the detention basin into the City's stormwater drainage system.

A. Background on Cheney Realty and Its Original Property.

As of 1965, both the Project Site and the Abutting Lots were commonly owned by Cheney Realty Co. (hereafter "Cheney Realty"), a Maine corporation with an office in Portland. The President and sole shareholder of Cheney Realty was J. Fred Cheney; the Vice President was the President's son, Robert J. Cheney. When J. Fred Cheney died on January 13, 1979, Robert J. Cheney briefly became President until the Corporation was dissolved in 1981. As will later become significant, one of Cheney Realty's principal "customers," Charlotte L. F. Cheney (a/k/a Charlotte F. O'Boyle), was Robert J. Cheney's daughter.

Cheney Realty acquired the Project Site and the Abutting Lots, as a single parcel, by a Deed from George E. Emerson et al to Cheney Realty dated June 21, 1965 and recorded at the Cumberland County Registry of Deeds in Book 2910, Page 255 (hereafter the "Emerson Parcel"). Between 1965 and 1980, Cheney Realty gradually sold lots from the Emerson Parcel to several individuals, and subdivided a small portion of it along Bancroft Street as "Emerson Woods."[1]

B. How Cheney Realty Created the Abutting Lots.

Most importantly, Cheney Realty purportedly conveyed the land that now comprises the Abutting Lots to Charlotte L. F. Cheney by two deeds: one dated August 8, 1967, recorded at the Cumberland County Registry of Deeds in Book 3008, Page 688 (which conveyed the most westerly portion of the Abutting Lots) and another dated January 9,

---

[1] See "Plan of Emerson Woods, Portland, Maine" by Robert P. Titcomb Associates recorded at the Cumberland County Registry of Deeds on January 10, 1973 in Plan Book 93, Page 42 and a revision to that plan recorded at the Cumberland County Registry of Deeds on April 12, 1973 in Plan Book 94, Page 19.

1970, recorded at the Cumberland County Registry of Deeds in Book 3116, Page 96 (which conveyed the easterly remainder of the Abutting Lots). Cheney Realty retained ownership of the Project Site, which adjoins the "Abutting Lots" to the east.[2]

In its 1967 Deed of the westerly portion of the Abutting Lots to Charlotte L. F. Cheney, Cheney Realty reserved the following easement:

> Excepting and reserving, however, for sewer, water, gas, electricity and other utility [a] utility easement/right of way extending easterly across the above-described premises from the easterly side line of Capisic Street to other land of this Grantor, its successors and assigns.

In the 1970 deed of the easterly remainder of the Abutting Lots, Cheney Realty Co. excepted and reserved from the grant "a utility easement right of way extending westerly across the within premises to said above referred to proposed street.[3]" The deeds conveying those utility easements did not prescribe a definite location or width for those easements.

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[2] It is possible that the purported conveyance of the Abutting Lots from Cheney Realty to Charlotte L. F. Emery was in name only, and that Charlotte L. F. Cheney was acting merely as Cheney Realty's nominee. On the Plans of Emerson Woods referenced in Footnote 1 above – which were recorded two years *after* Cheney Realty ostensibly completed the sale of the "Abutting Lots" to Charlotte L. F. Cheney -- the area that now comprises the "Abutting Lots" is described as still being owned by *"Cheney Realty"* rather than *"Charlotte L.F. Cheney."* Given that Charlotte L. F. Cheney was a close lineal descendant of the principals of Cheney Realty, it is reasonable to conclude that she took title to the Abutting Lots for the principal purpose of advancing Cheney Realty's overall development plan rather than as an independent investment. That conclusion is supported by the fact that Cheney Realty had previously conveyed other parcels, including property on Capisic Street just southerly of the Abutting Lots, to Charlotte *A.* Cheney – Robert J. Cheney's *wife*. *See* deed from Cheney Realty Co. to Charlotte A. Cheney dated December 27, 1965 and recorded at the Cumberland County Registry of Deeds in Book 2943, Page 357. The female Cheneys appear to have been "silent partners" of the male principals of Cheney Realty. [Information concerning the familial relationship between J. Fred Cheney, Robert J. Cheney, Charlotte A. Cheney, and Charlotte L. F. Cheney was derived from data available at www. ancestry.com.]

[3] It is unclear exactly what "proposed street" was intended to be referenced in that deed. The most likely explanation is that that "proposed street" was "Hazel Street" or "Kenilworth Street" as shown on the original and revised Plans of Emerson Woods, respectively, referenced in Footnote 1 above.

C. How the Drainage Easement was Created.

On October 5, 1979, Charlotte L. F. Cheney filed in Plan Book 125, Page 8 at the Cumberland County Registry of Deeds the "Plan of Property in Portland, Maine made for Charlotte L.F. Cheney," by H.I. & E.C. Jordan (hereafter the "1979 Cheney Survey"):

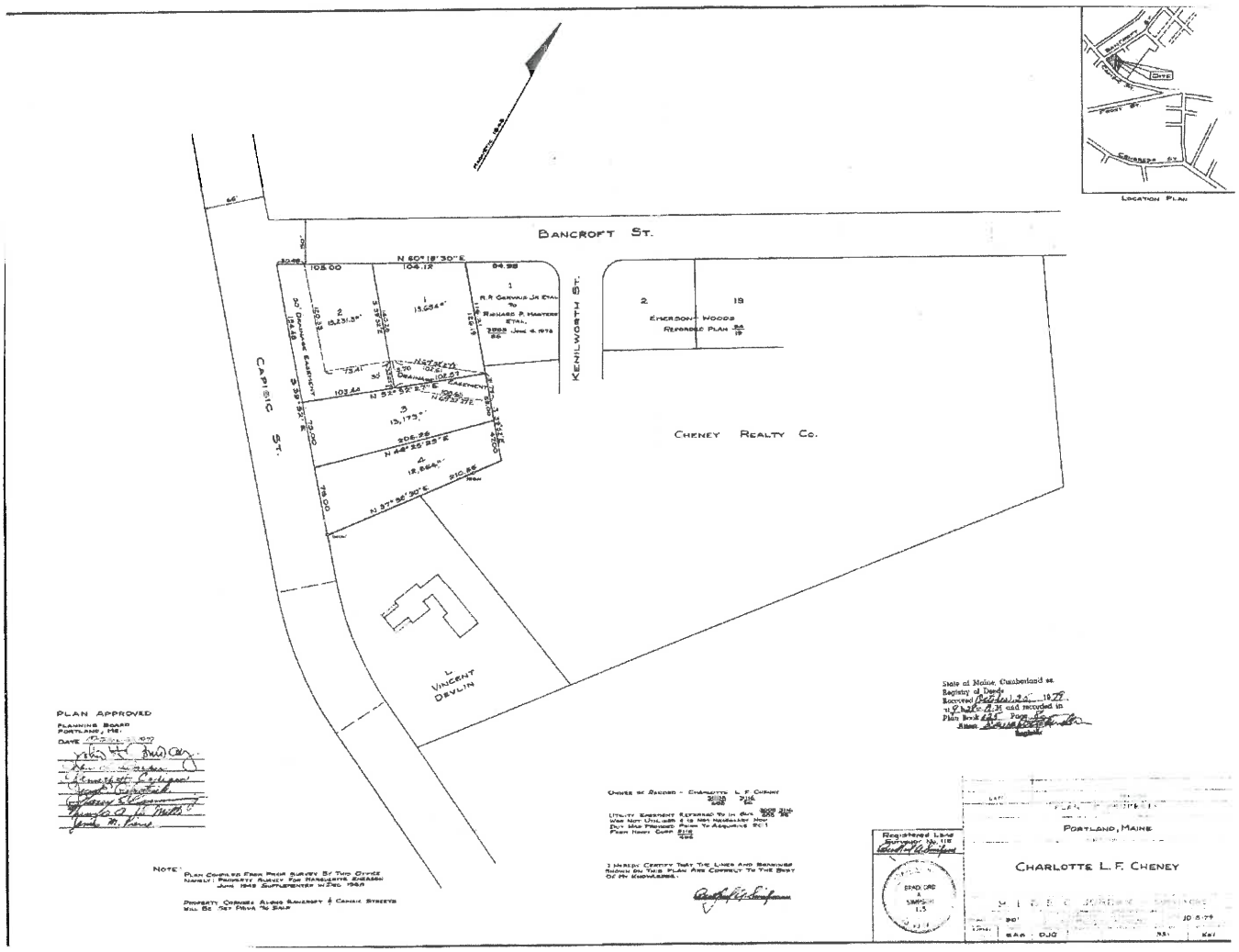

Figure 1
The 1979 Cheney Survey[4]

On the following page of this letter is an enlargement of the 1979 Cheney Survey providing a clearer view of the Abutting Lots and the "Drainage Easement" running through them:

[4] A larger copy of Figure 1 is attached to this letter as Exhibit A.

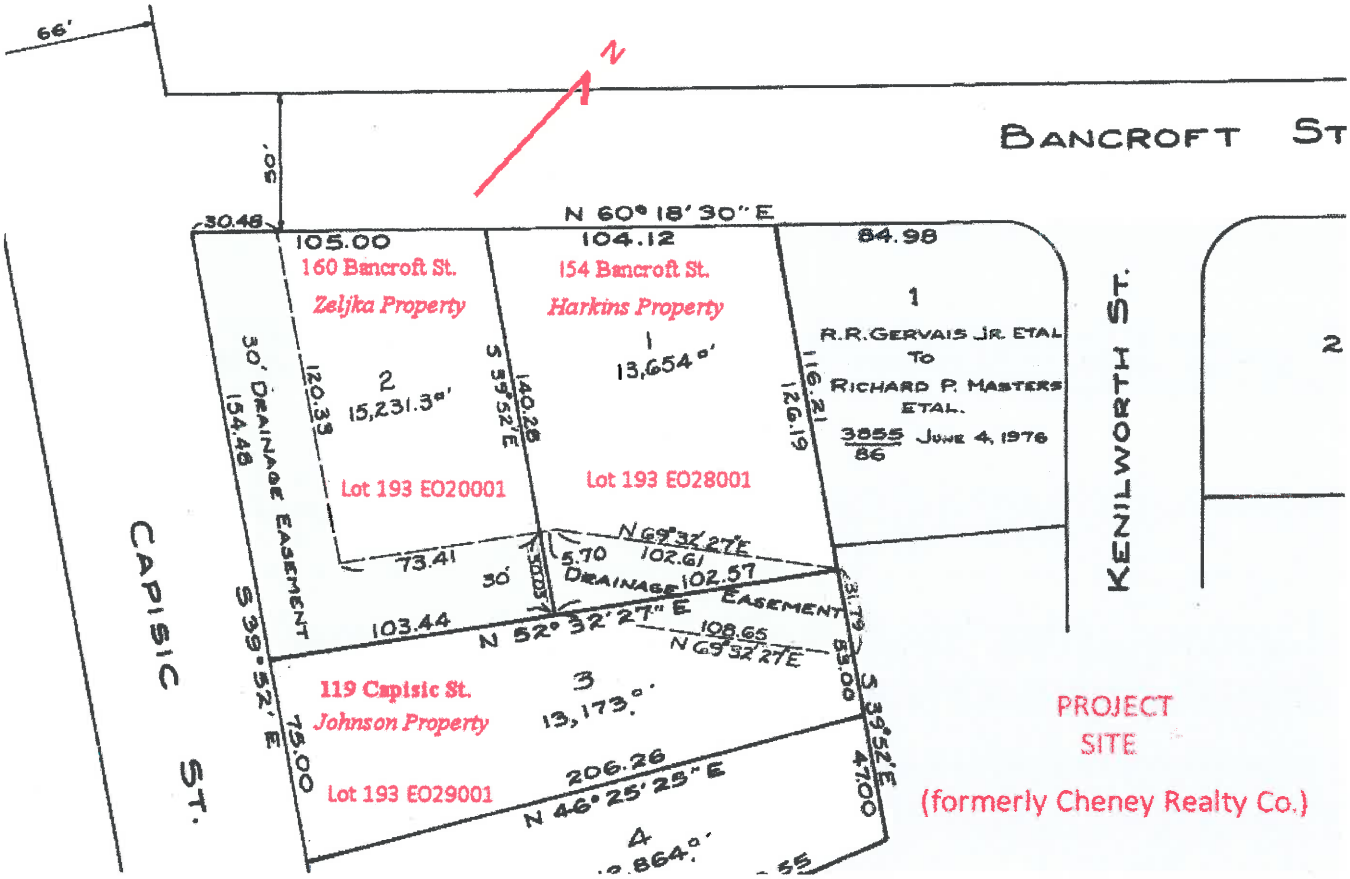

Figure 2
Enlargement of 1979 Cheney Survey Showing "Abutting Lots" and "Drainage Easement"[5]

In Figure 2 above, Lot 1 corresponds to the present Harkins Property, Lot 2 is the current Zeljka Property, and Lot E is now the Johnson Property. The Drainage Easement is shaded in green, while the present Project Site is shaded in blue.

D. The Drainage Easement Created Rights only in Cheney Realty – Not in the Abutters.

The only logical explanation for Charlotte L. F. Cheney's creation of the Drainage Easement on the 1979 Cheney Subdivision was to specify a particular location for the broadly-worded utility easement that Cheney Realty had reserved over the Abutting Lots in

[5] A larger copy of Figure 2 is attached to this letter as Exhibit B.

its deeds to Charlotte L. F. Cheney dated 1967 and 1970.[6] Because stormwater crossing the Cheney Realty property has always flowed in a southwesterly direction toward Capisic Street, the Drainage Easement designated a particular route for the passage of stormwater from the Cheney Realty Property, across the Abutting Lots, to the intersection of Capisic and Bancroft Streets.[7] The Drainage Easement could not have been intended for the benefit of the Abutting Lots, because stormwater from those lots likewise drains southwesterly towards Capisic Street rather than southeasterly toward the Cheney Realty Property. Moreover even if any stormwater on the Abutting Lots *had* flowed to the southeast, the Drainage Easement would have intercepted very little of the stormwater flowing across Lot 3, and *none* of the stormwater from Lot 4.

Charlotte L. F. Cheney married Thomas E. O'Boyle on August 3, 1979 and thereafter adopted the last name "O'Boyle." Charlotte O'Boyle first conveyed out Lots 1, 2, and 3 as shown on Figure 2 above in the following deeds:

Lot 1: Deed from Charlotte Cheney O'Boyle to Michael P. McLaughlin and Deborah J. McLaughlin, dated August 26, 1980 and recorded at the Cumberland County Registry of Deeds in Book 4652, Page 201;

Lot 2: Deed from Charlotte Cheney O'Boyle to Gerard D. Picard dated July 2, 1981 and recorded at the Cumberland County Registry of Deeds in Book 4813, Page 284; and

Lot 3: Deed from Charlotte Cheney O'Boyle to James T. King and Helen J. King dated May 29, 1985 and recorded at the Cumberland County Registry of Deeds in Book 6771, Page 17.[8]

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[6] As discussed above, Charlotte Cheney would have had a natural incentive to protect the interests of her father and grandfather, who were the Vice President and President of Cheney Realty Co., respectively.

[7] *Capisic Meadows Subdivision, Bancroft Street, Portland Maine, Stormwater Management Report, May, 2018 Prepared for WB Group, Inc.,* by Northeast Civil Solutions, pp. 2-5; peer review comments in e-mail from Lauren Swett to Jean Fraser July 13, 2018. A culvert in the section of the Drainage Easement located on the southwesterly side of Lot 2 as shown in Figure 2 above discharges into a catch basin at the intersection of Capisic and Bancroft Streets.

[8] The Kings owned both Lot 3 and Lot 4 as shown on Figure 2 above. Charlotte Cheney O'Boyle had previously conveyed Lot 4 to the Kings by deed dated April 30, 1984 and recorded at the Cumberland County Registry of Deeds in Book 6437, Page 38. *See also* corrective deed of Lot 4 from O'Boyle to the Kings dated July 16, 1984 and recorded at the Cumberland County Registry of Deeds

All three of the above deeds contain language expressly rendering those conveyances subject to both the Drainage Easement shown on the 1979 Cheney Survey and all utility easements of record.[9] Conversely, none of the above deeds conveys to the grantees any easement rights of any kind over the adjacent Cheney Realty Property, including any right to discharge water through the Drainage Easement onto the Cheney Realty Property. In short, under the deeds by which they were first conveyed, the Abutting Lots were burdened, but not benefited, by the Drainage Easement.

E. The Drainage Easement Benefits all Lots in the Project.

When the 1979 Cheney Survey was recorded, none of the land shown on that Survey as being owned by Cheney Realty Co., other than the "Emerson Woods" development, had been subdivided. However, under Maine law, an easement benefitting a previously undivided parcel also benefits any lots subsequently subdivided from that parcel. *Edwards v. Blackman*, 2015 ME 165, ¶ 37, 129 A.3d 971, 982; *Cleaves v. Braman*, 103 Me. 154, 161, 68 A. 857, 860 (1907). Therefore, the Drainage Easement is appurtenant to each of the eight lots proposed for the Project.

F. WB Group and/or an HOA Created by it May Maintain the Drainage Easement.

Finally, it is well settled that WB Group's rights in the Drainage Easement include not only the right to discharge water through the Drainage Easement, but also to perform any maintenance or repairs within the Drainage Easement that are reasonably necessary to fascilitate the flow of stormwater from the Project into the catch basin at the corner of Capisic and Bancroft Streets:

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in Book 6508, Page 68. The deeds to Lot 4 make no reference to the Drainage Easement, nor do they grant the Kings any easement rights in the abutting Cheney Realty Property.

[9] Lot 1: "This conveyance is made subject to a drainage easement shown on said [1979 Cheney Survey] plan and subject to utility easements of record."

Lot 2: "This conveyance is made subject to drainage easement shown on said [1979 Cheney Survey] plan and subject to utility easements of record."

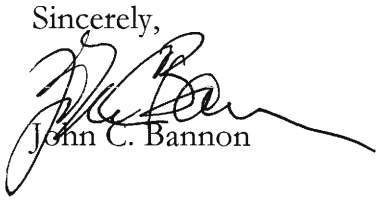
Lot 3: "The above premises are conveyed subject to a drainage easement located at the Northeast corner thereof and as shown on the above mentioned [1979 Cheney Survey] Plan as recorded in the Cumberland County Registry of Deeds and subject to any and all rights and easement for utilities as may be of record."

> As a general rule of interpretation and addition to those rights enumerated in the easement grant, the [grantee of an easement]…may take any action reasonably necessary to realize the full enjoyment of the right….Specifically, all rights necessary for the reasonable enjoyment of the enjoyment, such as *maintenance*, impliedly pass with the easement.

Hermansen & Richards, *Maine Roads and Easements* § 3.5.2 at 15-16 (2d ed. 2003) (emphasis added). "The unrestricted grant of an easement gives the grantee all such rights as are incidental or necessary to the reasonable and proper enjoyment of the easement." *Beckwith v. Rossi,* 157 Me. 532, 536 (Me. 1961). *See, e.g., Gendron v. Central Maine Power Company*, 379 A.2d 1002, 1005 (Me. 1977) (utility pole easement held to include the right to spray vegetation located outside the bounds of the easement to prevent its invading the easement); *Ring v. Walker*, 87 Me. 550 (1895) (grant of a mill right includes authority to build and repair sluice by which lumber is supplied to the mill); *Hammond v. Woodman*, 41 Me. 177 (1856) (owner of a mill privilege has implied right to maintain and repair and maintain flume that supplies water to power the mill). With respect to the Drainage Easement, such maintenance rights would include the right to clear vegetation from the swales and to grade the Drainage Easement to the extent necessary to ensure positive drainage into the culvert leading to the catch basin at the corner of Capisic and Bancroft Streets. WB Group may either exercise those maintenance rights itself or else delegate that authority to an HOA by declaring the Drainage Easement a "common area" of the development and requiring the HOA to maintain it.

Thank you for your attention to this letter. I hope it has answered your questions, but if you have any others, please do not hesitate to contact me.

Sincerely,



John C. Bannon

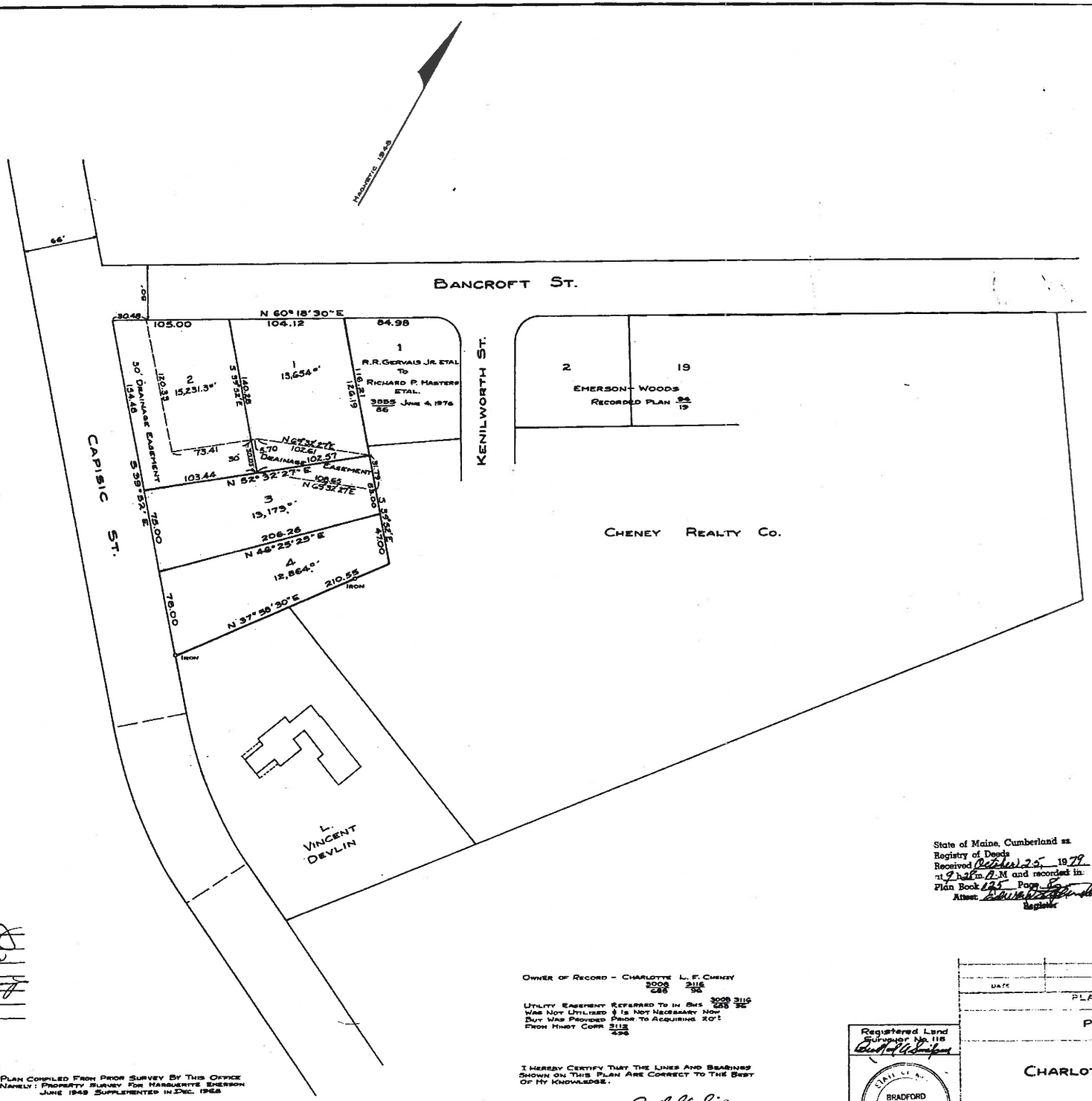
JCB/kwm

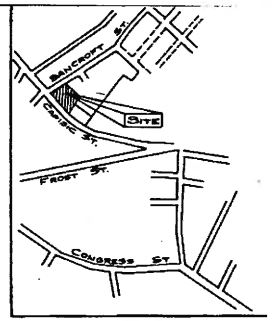
cc: Josh Wagner
Jim Fisher, Northeast Civil Solutions

EXHIBIT

A

ALL-STATE LEGAL®





LOCATION PLAN

PLAN APPROVED
PLANNING BOARD
PORTLAND, ME.
DATE OCTOBER 25, 1979

State of Maine, Cumberland ss.
Registry of Deeds
Received October 25, 1979
at 9 h. 28 m. A.M. and recorded in
Plan Book 125 Page 50
Attest: Register

OWNER OF RECORD – CHARLOTTE L. F. CHENEY
3008 / 286 — 3116 / 96

UTILITY EASEMENT REFERRED TO IN BKS 3008 / 286 & 3116 / 96 WAS NOT UTILIZED & IS NOT NECESSARY NOW BUT WAS PROVIDED PRIOR TO ACQUIRING 20' FROM HINDT CORP 3112 / 494

I HEREBY CERTIFY THAT THE LINES AND BEARINGS SHOWN ON THIS PLAN ARE CORRECT TO THE BEST OF MY KNOWLEDGE.

Registered Land Surveyor No. 115

STATE OF MAINE
BRADFORD A. SIMPSON
115

NOTE: PLAN COMPILED FROM PRIOR SURVEY BY THIS OFFICE NAMELY: PROPERTY SURVEY FOR MARGUERITE EMERSON JUNE 1948 SUPPLEMENTED IN DEC. 1968

PROPERTY CORNERS ALONG BANCROFT & CAPISIC STREETS WILL BE SET PRIOR TO SALE

DATE	REVISION

PLAN OF PROPERTY

PORTLAND, MAINE

MADE FOR

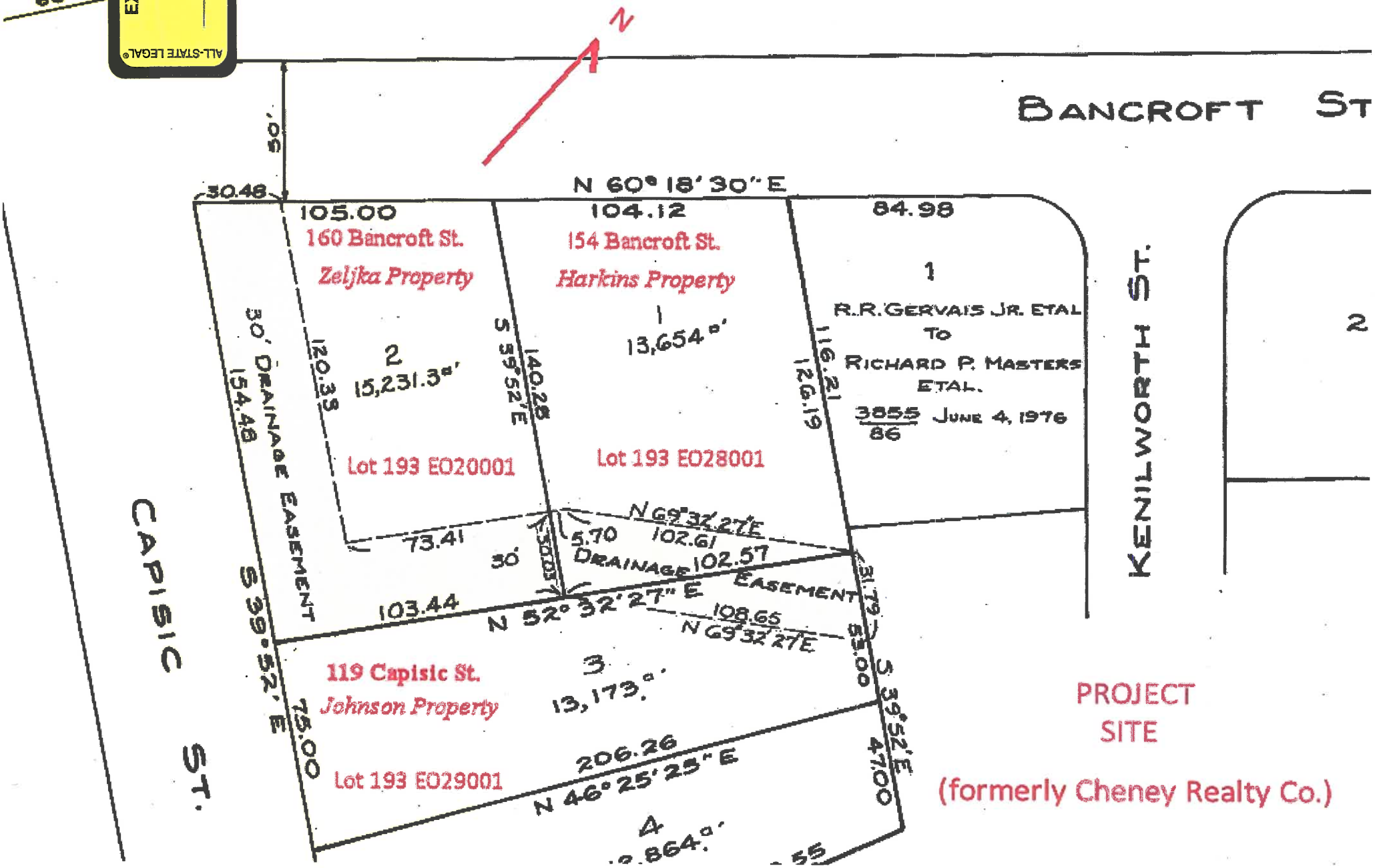
CHARLOTTE L. F. CHENEY

H. I. & E. C. JORDAN – SURVEYORS

SCALE 1" = 50'				DATE JUL 5 79
SURVEY	PLOT BAS	DRAWN DJG		551 / 551

EXHIBIT B

ALL-STATE LEGAL®



SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

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September 7, 2018

Jean Fraser, Planner
City of Portland
389 Congress Street
Portland, ME 04101

RE: Staff Review Comments – 8 Lot Subdivision, 130 Bancroft Street Portland

Dear Jean:

We are writing to address review comments received from you via email on June 25, 2018, and subsequent emails and correspondence. Additionally, we are addressing comments received at the Planning Board workshop which was held on July 17, 2018. Your comments are indicated followed by our responses in bold.

Civil Engineering – Third Party Reviewer

1. The Applicant has submitted a copy of the NRPA Application to the DEP for proposed wetland fill. Copies of all final permit approvals should be forwarded to the City upon receipt.
   The MDEP and the Army Corps of Engineers have approved the Tier I Wetland Fill permit application for the project. Copies of these permits are included with this submission.

2. The stormwater inspection and maintenance plan should include provisions for the requirements of Chapter 32 of the City of Portland Code of Ordinances, as well as inspection and maintenance requirements for the proposed Filterra Units and Detention Pond. Update the stormwater inspection and maintenance plan.
   The Stormwater Inspection, Maintenance & Housekeeping plan has been updated in compliance with Chapter 32 of the City of Portland Code of Ordinances. Maintenance requirements for proposed Filterra Units and the detention pond have been included in the document. A revised copy of the plan is included with this submission.

3. The Applicant has stated that the lot impervious areas were included in the HydroCAD model, however the narrative report indicates that there will be 0.62-acres of new impervious area and the model indicates that there will be only 0.48-acres of new impervious area. Clarify the amount of impervious surface that has been modeled, and confirm that it includes all impervious surface anticipated to drain to the pond.

We have confirmed that the new impervious area for the project equals 0.65 acres. The HydroCAD model and the Stormwater Report have been updated to reflect this number. Impervious areas tributary to the pond have been included in the model. Updated HydroCAD output is included within the revised Stormwater report.

4. Note that the standard detail for Sidewalk Ramp Detectable Warning Panels was revised in October 2017. The acceptable material is now uncoated cast iron. Please revise the detail.
   The sidewalk ramp detectable warning panel detail has been updated on the plans to reflect the October 2017 detail revision.

5. The Grading and Drainage Plan indicates that SD-7 will be a 15-inch pipe, but the HydroCAD model indicates that it is 18-inches. The dimensions of the emergency spillway are also inconsistent between the plans and the model. The Applicant should clarify and ensure that the drawings and the model are consistent.
   The Army Corps of Engineers (in reviewing the Tier I Wetland Impact Permit Application) had requested that all wetland crossing culverts be 36" wide and imbedded at least 6 inches. We have updated all the culverts in the wetland crossing areas to reflect a 36" pipe imbedded 1 foot. The pipe sizes have been updated on the pipe schedule on the plan set and in the HydroCAD model. A detail has been added to the plans to reflect this condition. The emergency spillway has been updated to reflect the HydroCAD model.

6. Proposed details include a "Type B Underdrain Installation Detail – Alternative A" that shows underdrain along the roadside edge under curbing; however, the proposed grading and drainage plan does not show locations or discharge points for proposed underdrain. Clarify the use of underdrain on the site
   Underdrain locations have been identified on the plan set. Underdrains are proposed to either discharge into a proposed cross culvert or discharge directly to the site drainage way.

7. A construction management plan has not been provided. Provide a construction management plan using the City's template which is available online.
   A general Construction Management Plan using the City's Template is included with this submission. We would request that this item be a Condition of Approval and submitted to the City for review once a site contractor has been selected.

8. All piping installation within the proposed roadway is required to be in conformance with the City's Technical Manual, Section 2 Sanitary Sewer and Stormdrain. This includes material types and installation. Note that the City of Portland requires HDPE stormdrain pipe to be ADS HP triple-wall pipe. Refer to figure II-12 for the typical pipe trench installation. Update the plans and details to be in conformance with the City's standards.
   We have updated the pipe schedule to reflect the requirement for ADS HP triple-wall pipe. Additionally, we have added the City's II-12 Typical Pipe Trench Installation and Notes detail to our plan set.

9. We have reviewed the Grading and Drainage Plan, and there are a few areas where the grading is not detailed enough to show that water will not be directed towards the building

foundations. Specifically on Lots 5, 6, and 7. Additional spot grades are also recommended in the area between Lots 2 and 3, the area in front of Lot 4 and the area adjacent to the retaining wall at the edge of the detention pond to clearly define grading such that ponding will not occur. Provide updated Grading and Drainage Plan.
Spot grades have been added to the plans to clarify grading areas around the proposed structures. The retaining wall and pool have been removed from the plans as the pool will be removed as part of this project.

10. Filterra units are proposed for installation within the future City Right Of Way. The Applicant should discuss the maintenance of these systems with the City of Portland Department of Public works to determine if they will be maintained by the City or if maintenance will be required by the owners. In addition, a system of culverts extends through the site, both over private property and the City Right Of Way, to a stormwater pond that is located on private property. Responsibility of maintenance of all stormwater systems should be clearly established, and Stormwater Maintenance Agreements are required in conformance with the City's Chapter 32. Provide Stormwater Maintenance Agreements.
The maintenance of the proposed stormwater systems throughout the proposed development will be maintained by the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure that all stormwater facilities are being maintained to work as designed. This includes culverts, detention pond, detention pond outlet structure and other stormwater infrastructure not accepted by the City. Draft Homeowners Association documentation and a draft Stormwater Drainage System Maintenance Agreement are included with this submission for the City to review.

Fire Department

11. All homes will be required to be sprinkled.
We have added a note to the Subdivision Plan indicating that all homes will be required to be sprinklered.

12. Fire Department access to all homes is acceptable.
No response required.

13. A 30 x 30 turnaround is required at the dead end of the road.
The turnaround has been drawn as 30 x 30.

14. The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.
The hydrant has been removed from the plans.

Additional Comments

(Received via email, June 29, 2018 & July 2, 2018)

15. It is very unusual to have the piping going through private property. This along with the neighbors issues and the scale of wetland fill raises questions and we would like to be sure we are all on the same page (or at least have options clarified with known pros and cons) before it goes to a PB Workshop.
    The maintenance of the proposed stormwater systems, throughout the proposed development will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained and work as designed. Draft Homeowners Association documentation is included with this submission for City review.

16. Also we would like a site plan or lot layout/development and landscape plan (see example attached) that includes the driveways, buildable areas on the lots, key dimensions, and a sidewalk along the north side of the proposed new road- also think about tree saves as this would seem appropriate here.
    An additional plan entitled, Site Layout, Landscape & Tree Save has been added to address the requirements indicated above. Building envelopes are indicated on the Subdivision Plan and additionally one story and two story setbacks are identified to show buildable areas. We have identified a sidewalk on the southern side of the proposed road and have submitted a waiver request for a sidewalk along the northerly side of the proposed road as there is no sidewalk in Bancroft Street. We have identified the clearing limits for the proposed development via pre and post construction tree lines on the project plans as well as call outs for tree saves on the plans. All trees larger than 10 inches in diameter have been survey located and have been added to the Boundary and Topographic survey plan.

17. The issue here is partly re the physical layout, and partly the question of who is going to be responsible for the stormwater system and all parts of it - while the City would accept the street, it would not take responsibility for the stormwater system that is not in the street. And if part of that system is under private properties, will each property be responsible for their section or what? So one of the discussion topics (with DPW present) was this question.
    The maintenance of the proposed stormwater systems throughout the proposed development will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained to work as designed. A copy of the draft Homeowner's Association documentation is attached for review

18. Who will be responsible for the proposed stormwater system located within private lots; who will be responsible for the maintenance of the detention pond and the existing easement that will be used for drainage (I would note that the City would not normally take on any of this maintenance and there would need for formal agreements to clarify/confirm)

The maintenance of the proposed stormwater systems throughout the proposed development (including on private lots) will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained to work as designed.

19. How will your system avoid flooding of neighbors properties (in view of the addition of impervious surfaces)
    Please see the revised Stormwater Report and calculations (attached) explaining the proposed design, indicating that the proposed stormwater infrastructure will control the peak rate of runoff from the property with the use of a detention pond.

20. Regarding the sidewalk, the other engineers who provide comments on projects wanted the sidewalk on the other side as it impacts less wetland, is less impervious area, and it is on the side of the applicants house
    NCS had met with Keith Gray and the City's 3rd party reviewer and spoken about the request that the sidewalk be located on the northerly side of the road and reached a conclusion that it would not be necessary to change the sidewalk location. The proposed design actually reduces impervious surface due to the fact that the sidewalk is shorter, not extending past the shared driveway between lots #6 and #7. Wetland impacts would remain the same whether the sidewalk was located on the northerly or southerly side of the proposed road due to grading associated with the roadway slopes and esplanade. Necessary grading on both sides of the road, no matter which side the sidewalk were located, would not allow for wetland fill to be reduced.

Abutter Concerns

21. Respond to the comments from neighbors that I have sent (not in detail, but to broad questions)
    A proposed Stormwater Report, Traffic Study and DEP/Army Corps Wetland Fill Permit have been submitted in coordination with this project which addresses the broad spectrum of abutter concerns. We will be happy to discuss any outlying topics in further detail with the Planning Board. We have addressed the major concerns below.

    a. Stormwater
       There is a major concern brought forth by abutters in the surrounding area of stormwater mitigation and the concern that their previously existing "wet" lots will be further affected by the proposed development. The concerns are addressed by the Stormwater Report and calculations provided within the original submission package. The design has taken into account both on-site and off-site watersheds which come in contact with the proposed development. As required by the City, the development is not allowed to increase the peak rate of runoff from the proposed project onto any abutting parcel. To control stormwater, a partially open and closed drainage system has been implemented throughout the development through a series of drainage ditches, culverts, and a detention pond. The proposed

impervious surface area created by the road will be treated via a Filterra System (or something approved equivalent by the City of Portland) and, along with all created stormwater, directed to a detention pond. The pond has been designed to meet the demands of a 25-year storm event, meanwhile drain within 24 hours after such storm event, eliminating the concern of standing water. Trash racks and chain link fencing have been incorporated into the pond design as additional safety features. Additionally, the stormwater report and calculations are being reviewed by the City's third party reviewer, Woodard and Curran.

b. Wetland Impacts
Wetland impacts have been minimized to the extent practical given the site layout. The MDEP and the Army Corps of Engineers have approved the Tier I Wetland Fill Permit Application for the project. Copies of those permits are attached for review.

c. Open Space
Even though a majority of the land used by the proposed residential development is existing undeveloped (lawn and woods) the land is private property. This land is not part of "Redlon Woods", nor is it part of the Portland Land Bank. The land has not been set aside and dedicated as "open space". As such, development is not restricted by an "open space" designation. The proposed design meets all necessary requirements for lot size and the development does not have an open space requirement that must be met for a traditional subdivision.

d. Underground Piping
A Boundary Survey, Existing Conditions Survey and a Topographic Survey have been conducted for the project area identifying all possible on site features that may affect the proposed project or the surrounding area. Additionally, we have looked at City infrastructure plans for Bancroft Street and Capisic Street. As such, we do not anticipate any unknown drainage piping crossing the property. Should any unknown pipes be encountered we will evaluate possible solutions to mitigate any effects these pipes may have on the proposed design. We will work with the City to resolve/re-route any drainage piping issues. All revised designs will need to be reviewed and approved by the City.

Additionally, we have spoken with the City Engineer regarding the presence of any unknown piping in the area. It is not anticipated that any unknown pipes will be encountered. Should any unknown pipes be encountered we will contact the City Engineer and work out a solution for re-routing those pipes.

e. Traffic
A Traffic Study conducted by Bill Bray, P.E. of Traffic Solutions was submitted providing information proving that the proposed development will have minimal effect on the existing traffic flows on Bancroft Street. The 6-7 daily trips, 7 per peak hour, will not overburden the existing right-of-way and will not require anything more than a stop bar and sign along the proposed intersection.

f. Site Layout

The proposed design meets the City's requirement for minimum lots size, frontage and building setbacks within the R-3 zone. We have also indicated setbacks for 1 & 1-1/2 story and 2 story houses on the plans to provide building envelopes for different types of structures.

g. Construction Time

At this point we do not know the time frame for construction of all the houses. It will depend on the housing market. There will be additional noise and disruption during the construction phase.

h. Redlon Park drainage

The Redlon Park development's runoff drains onto the property of the proposed development. We have made provisions in the layout, to allow this runoff to continue to flow across our property (via culverts and ditching) to the existing outlet point. Redlon Park is approximately 8-10 feet higher in elevation than the central portion of our site. As such we do not anticipate this development will affect the Redlon Park development.

i. Existing drainage easement

The parcels of land owned by Jacqueline Harkins, Dusko Rakovic & Zeljka Rakovic, and William F. Johnson & William R. Johnson, are subject to a 30 ' drainage easement as described in their respective property deeds and as shown on the original subdivision plan, recorded in Planbook 125, Page 8, that created their original parcel configurations. The proposed subdivision will create a Homeowners Association and it will be the responsibility of the Homeowners Association to maintain the 30' Drainage Easement. The City has requested that as part of the project the drainage easement area be cleared of existing vegetation and the ditch line re-graded to ensure positive flow to the pipe inlet. This work will be completed within the 30' drainage easement identified on the plans. A draft legal opinion, explaining the project's right to access and use this drainage easement area is attached for review.

j. Sewer System impacts

This project is proposing to connect into the public sewer system located in Bancroft Street. We are proposing a single new manhole on the existing sewer line for the connection to the City system. We do not anticipate a rat problem with this connection. We have submitted a Wastewater Capacity Application to the City of Portland Department of Public Works to accept these flows in the public system. Once we receive notification from the Department we will forward that information along to the Planning Department for review.

Next steps (Prior to Final Plan Submission) to Include:

Below are additional comments received during the Planning Board Workshop which was held on July 17, 2018.

22. Submit final Subdivision Plat that clarifies stormwater management system location and responsibilities and includes all dimensions (eg lot Frontage)
    Included with this submission is an updated subdivision plan which shows dimensional requirements for the proposed lots, as well as the proposed stormwater pond area. A note has been added to the subdivision plan indicating that all stormwater infrastructure located outside of the right-of-way area shall be the responsibility of the Capisic Meadows Homeowners Association.

23. Submit documentation as to the rights and responsibilities in relation to the existing drainage easement being upgraded and utilized to drain the detention pond.
    Attached with this submission is a draft legal opinion prepared by Murray Plumb and Murray indicating the applicant's rights to the existing drainage easement.

24. Clarify the mechanism (Homeowners Association) that will ensure future maintenance of the stormwater system.
    Attached with this submission is draft Capisic Meadows Homeowners Association documentation which includes a Stormwater Drainage System Maintenance Agreement.

25. Submit further comparisons information to help determine the preferred location for the sidewalk
    As previously mentioned the sidewalk as shown on the southern side of the proposed roadway will create slightly less impervious surface area than if it was located on the northerly side of the road. Wetland fill numbers will not be reduced if the sidewalk was moved to the northerly side of the road due to the roadway section and associated grading.

26. Submit a landscape plan to include tree saves based on a tree survey.
    We have survey located all the trees larger than 10 inches in diameter. These trees have been added to our Boundary and Topographic survey plan within the plan set. We have added a Site Layout, landscape, and tree save to our plan set. This plan identifies the proposed new tree line as well as surveyed trees to be saved as part of the project.

27. Submit a copy of the MDEP determination that there is not a stream on the site.
    Attached with this submission is the MDEP field determination form that indicates that there are no streams on the property.

28. Clarify regarding street lighting.
    We have added street lighting to the site plan in accordance with the City of Portland Technical Manual section 10 – Municipal Street Lighting Standards.

29. Provide final figures for existing and proposed areas of wetlands and impervious surfaces, and complete zoning assessment.
    Wetland numbers, impervious surface numbers and the zoning assessment have been added to the subdivision plan.

30. Address the staff review memo and Planning Board comments.
    Please see comment responses attached.

Planning Board Comments:

Tree saves and tree survey.

31. **We have survey located all the trees larger than 10 inches in diameter. These trees have been added to our Boundary and Topographic survey plan within the plan set. We have added a Site Layout, landscape, and tree save to our plan set. This plan identifies the proposed new tree line as well as surveyed trees to be saved as part of the project.**

32. Annual stormwater maintenance costs.
    Stormwater maintenance for the detention pond and culverts should be fairly simple once vegetation is established. This would include mowing the pond area twice a year and removing grass clippings, leaves sticks etc. from the pond so the outlet structure does not clog. Removing any debris from culvert ends that would potentially clog culverts. Removing any woody vegetation that begins to regrow in the drainage easement area, pond etc.

If you have any questions or require any additional information please let us know

Sincerely,
Northeast Civil Solutions, Inc.

Anthony P Panciocco

Anthony P. Panciocco
Senior Project Engineer

STORMWATER DRAINAGE SYSTEM
MAINTENANCE AGREEMENT

For SUBDIVISIONS

IN CONSIDERATION OF the site plan and subdivision approval granted by the Planning Board of the City of Portland to the proposed CAPISIC MEADOWS SUBDIVISION (project number _____) shown on the Subdivision Plat (Exhibit A) recorded in Cumberland Registry of Deeds in Plan Book ____, Page ____ submitted by Northeast Civil Solutions, and associated Grading, Drainage & Erosion Control Plan (*insert correct name of plan*) (Exhibit B) prepared by Northeast Civil Solutions (engineer/agent) of 381 Payne Road, Scarborough, Maine 04074 dated _____and pursuant to a condition thereof, **CAPISIC MEADOWS HOMEOWNER'S ASSOCIATION**, a Maine non-profit corporation with a place of business in the City of Portland, County of Cumberland and State of Maine, and having a mailing address of c/o Wagner, 130 Bancroft Street, Portland, Maine 04102 (the "HOA"), does hereby agree, for itself, its successors and assigns, as follows:

Maintenance Agreement

That it, its successors and assigns, will, at its own cost and expense and at all times in perpetuity, maintain in good repair and in proper working order the drainage swale and detention pond, (hereinafter collectively referred to as the "Stormwater System"), as shown on the Plan attached as Exhibit B and in strict compliance with the approved **[**Stormwater Maintenance and Inspection Agreement**]** prepared for the HOA by Northeast Civil Solutions (copy attached as Exhibit C) and Chapter 32 of the Portland City Code. The HOA is owner of the Stormwater System and related property by virtue of a deed dated _____, 2018 and recorded in the Cumberland County Registry of Deeds at Book ____, Page ___ (the "Property").

The HOA further agrees, at its own cost, to keep a Stormwater Maintenance Log. Such log shall be made available for inspection by the City of Portland upon reasonable notice and request.

Said agreement is for the benefit of the said City of Portland and all persons in lawful possession of said premises and abutters thereto; further, that the said City of Portland may enforce this Agreement by an action at law or in equity in any court of competent jurisdiction; further, that after giving the HOA written notice and a stated time to perform, the said City of Portland, by its authorized agents or representatives, may, but is not obligated to, enter upon said premises to maintain, repair, or

replace the Stormwater System in the event of any failure or neglect thereof, the cost and expense thereof to be reimbursed in full to the said City of Portland by the HOA upon written demand. Any funds owed to the City under this paragraph shall be secured by a lien on the Property.

This Agreement shall also not be construed to allow any change or deviation from the requirements of the subdivision and/or site plan most recently and formally approved by the Planning Board of the City of Portland.

This agreement shall bind the undersigned only so long as it retains any interest in the Property, and shall run with the land and be binding upon the HOA's successors and assigns as their interests may from time to time appear.

The HOA agrees to record a copy of this Agreement in the Cumberland County Registry of Deeds within thirty (30) days of final execution of this Agreement. The HOA further agrees to provide a copy of this Agreement to any successor or assign and to forward to the City an Addendum signed by any successor or assign in which the successor or assign states that the successor or assign has read the Agreement, agrees to all its terms and conditions and the successor or assign will obtain and forward to the City's Department of Public Services and Department of Planning and Urban Development a similar Addendum from any other successor or assign.

For the purpose of this agreement and release "HOA" is any person or entity who is a successor or assign and has a legal interest in part, or all, of the Property. The real estate shown by chart, block and lot number in the records on file in the City Assessor's office shall constitute "the property" that may be entered by the City and liened if the City is not paid all of its costs and charges following the mailing of a written demand for payment to the HOA pursuant to the process and with the same force and effect as that established by 36 M.R.S.A. §§ 942 and 943 for real estate tax liens.

Any written notices or demands required by this Agreement shall be complete on the date the notice is mailed by certified mail, return receipt requested and ordinary mail to the HOA to its

registered agent of record at the time such notice is given. The failure to receive any written notice required by this Agreement shall not prevent the City from entering the Property and performing maintenance or repairs on the Stormwater System, or any component thereof, or liening it or create a cause of action against the City.

Dated at Portland, Maine this _____ day of _____, 2018.

WITNESS:

_____

CAPISIC MEADOWS HOMEOWNER'S ASSOCIATION

By_____
Joshua Wagner
Its President

STATE OF MAINE
CUMBERLAND, ss.

_____, 2018

Personally appeared the above-named Joshua Wagner, in his said capacity, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said homeowner's association.

Before me,

_____
Notary Public/Attorney at Law
Print name:_____

Exhibit A: Subdivision Plat as recorded

Exhibit B: Approved Grading and Drainage Plan *(name of the plan showing the Stormwater System in detail)*

Exhibit C: Approved Stormwater Maintenance and Inspection Agreement

WGNR003/1216288

BYLAWS

OF

CAPISIC MEADOWS
HOMEOWNER'S ASSOCIATION

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BYLAWS

OF

CAPISIC MEADOWS
HOMEOWNER'S ASSOCIATION

ARTICLE I

Section 1. Purpose of Association. The purpose of the Capasic Homeowner's Association is to perpetually maintain in good repair and proper working order the drainage swale and detention pond (hereinafter collectively referred to as the "Stormwater System") that serves the Capisic Meadows Subdivision , and to fulfill the ongoing obligations of the Association under that certain Stormwater Drainage System Maintenance Agreement between the Association and the City of Portland, Maine, dated August ____, 2018 (the "Stormwater Agreement").

Section 2. Applicability of Bylaws. The provisions of these Bylaws are applicable to all members of the Capisic Meadows Homeowner's Association (hereinafter called the "Association"), which include Lots 1 through 8 of the Capisic Meadows Subdivision plan, as recorded in Cumberland Registry of Deeds in Plan Book ____, Page ____. The Association is owner of the Stormwater System and related property by virtue of a deed dated _____, 2018 and recorded in the Cumberland County Registry of Deeds at Book ____, Page ___ (the "Property").

Section 3. "Member" Defined. The membership of the Association shall consist of all owners of record of the lots within the Capisic Meadows Subdivision, as they may

be from time to time. Membership shall cease automatically upon recorded transfer or sale by any member of his/her lot.

Section 4. Application. All present and future members, lessees and occupants of the structures and the employees and any other persons who may use the facilities of the area designated as the Property in any manner are subject to these Bylaws, and to any rules and regulations established by the Board of Directors of the Association (the "Board of Directors" or "Board") as hereinafter set forth. The acceptance of a deed of conveyance or the entering into of a lease or the act of occupancy of a member's property by any of the foregoing persons shall constitute an agreement that these Bylaws and the rules and regulations as they may be amended from time to time, are accepted, ratified and will be complied with.

Section 5. Office. The Principal office of the Association and the Board of Directors shall be located at c/o Wagner, 30 Bancroft Street, Portland, Maine, or at such place as the Board of Directors may designate from time to time.

ARTICLE II

Board of Directors

Section 1. Board of Directors. Until the first meeting, the affairs of the Association shall be governed by a Board of Directors consisting of three (3) persons elected by the developer of the Capisic Meadows subdivision, WB Group Inc., who need not be lot owners. Thereafter, the affairs of the Association shall be governed by a Board of Directors elected by the members, initially comprised of three persons, and as

increased or decreased at any annual meeting by a majority vote, within the limits of the Articles of Incorporation of the Association. Each such Director shall be the owner or the spouse of an owner of a lot, or if an owner shall be an entity, then the Director shall be an officer, partner, member, trustee or beneficiary thereof. The Directors shall be entitled to one vote each.

Section 2. Powers and Duties. The Board of Directors shall have the powers and duties necessary for the administration of the affairs of the Association and shall do all such acts and things except those which by law or by these Bylaws may not be delegated to the Board of Directors by the members. Such powers and duties of the Board of Directors shall include, but shall not be limited to, the following:

(a) Operation, care, upkeep and maintenance of the Property.

(b) To fulfill the obligations under the Stormwater Agreement.

(c) Determination of the common expenses required for the affairs of the Association including, without limitation, the operation and maintenance of the Property and the fulfillment of the Associations obligations under the Stormwater Agreement.

(d) Collection of the common charges from the members.

(e) Employment and dismissal of the personnel necessary for the maintenance, operation, repair and replacement of the common areas and facilities.

(f) Adoption and amendment of rules and regulations covering the details of the operation and use of the Property.

(g) Opening of bank accounts on behalf of the association and designating the signatories required therefor.

(h) Making of repairs, additions and improvements to or alterations of the Property and repairs to and restoration of the Property in accordance with the other provisions of these Bylaws, after damage or destruction by fire or other casualty, or as a result of condemnation or eminent domain proceedings.

Section 3. Managing Agent and Manager. The Board of Directors may employ for the Association a managing agent or a manager at a compensation established by the Board of Directors to perform such duties and services as the Board of Directors shall authorize, including but not limited to the duties listed in subdivisions (a), (b), (d), (e) and (h) of Section 2.02.

Section 4. Regular Meetings. Regular meetings of the Board of Directors may be held at such time and place as shall be determined from time to time by a majority of the members of the Board of Directors, but at least one (1) such meeting shall be held during each fiscal year to elect the officers of the Association and to transact such other business as may be necessary. Notice of regular meetings of the Board of Directors shall be given to each member of the Board of Directors, by mail, telephone or telegraph, at least five (5) business days prior to the day named for such meeting.

Section 5. Special Meetings. Special meetings of the Board of Directors may be called by the President on three (3) business days' notice to each member of the Board of

Directors, given by telephone or telegraph, or on five (5) business days' notice given by ordinary first-class mail, which notice shall state the time, place and purpose of the meeting. Special meetings of the Board of Directors shall be called by the President or Secretary in like manner and on like notice on the written request of at least three (3) members of the Board of Directors.

Section 6. Waiver of Notice. Any member of the Board of Directors may at any time waive notice of any meeting of the Board of Directors in writing, and such waiver shall be deemed equivalent to the giving of such notice. Attendance by a member of the Board of Directors at any meeting of the Board shall constitute a waiver of notice by him or the time and place thereof. If all the members of the Board of Directors are present at any meeting of the Board, no notice shall be required and any business may be transacted at such meeting.

Section 7. Quorum of Board of Directors. At all meetings of the Board of Directors, seventy percent (70%) of the voting interests thereof shall constitute a quorum for the transaction of business, and the votes of a seventy percent (70%) of the voting interest of the Board of Directors present at a meeting at which a quorum is present shall constitute the decision of the Board of Directors. If at any meeting of the Board of Directors there shall be less than a quorum present, a majority of those present may adjourn the meeting from time to time. At any such adjourned meeting at which a quorum is present any business which might have been transacted at the meeting originally called may be transacted without further notice.

Section 8. Informal Action by Board of Directors. Any action required to be taken at a meeting of the Board of Directors or any other action which may be taken at a meeting of the Board of Directors, may be taken without a meeting if a consent in writing setting forth the action so taken shall be signed by all of the members of the Board of Directors entitled to vote with respect to the subject matter thereof.

Section 9. Compensation. No member of the Board of Directors shall receive any compensation from the Association for acting as a director, except that members of the Board of Directors may be reimbursed for expenses they incur in connection with their services of Directors, as the Board may from time to time determine.

Section 10. Liability of the Board of Directors. The members of the Board of Directors shall not be liable to the members for any mistake of judgment, negligence, or otherwise, except for their own individual willful misconduct or bad faith. The unit owners shall indemnify and hold harmless each of the members of the Board of Directors against all contractual liability to others arising out of contracts made by the Board of Directors on behalf of the Association unless any such contract shall have been made in bad faith or contrary to the provisions of these Bylaws. It is intended that the members of the Board of Directors shall have no personal liability with respect to any contract made by them on behalf of the Association. It is also intended that the liability of any member arising out of any contract made by the Board of Directors or out of the aforesaid indemnity in favor of the members of the Board of Directors shall be limited to such proportion of the total liability thereunder as his interest in the common areas and

facilities bears to the interests of all the unit owners in the common areas and facilities. Every agreement made by the Board of Directors or by the managing agent or by the manager on behalf of the Association shall provide that the members of the Board of Directors, or the managing agent, or the manager, as the case may be, are acting only as agents for the members and shall have no personal liability thereunder (except as unit owners), and that each unit owner's liability thereunder shall be limited to such proportion of the total liability thereunder as his interest in the common areas bears to the interests of all members in the common areas, provided, however, the failure to so provide will not invalidate such agreement.

Section 11. Fiscal Year. The fiscal year of the Association shall be the calendar year.

ARTICLE III

Members

Section 1. Annual Meetings. The first meeting of the members shall be held, at the call of the developer, WB Group, Inc., within 30 days after the closing of sales of 90% of the lots in the Capisic Meadows subdivision. Thereafter, the annual meeting of the members to appoint the Directors for the following year shall be held each year on the second Tuesday of April, or, in the event that day is a legal holiday, then on the first day thereafter which is not a holiday.

Section 2. Parliamentary Procedure. At all meetings of the members or of the Board of Directors, Roberts' Rules of Order, as then amended, shall be followed, except in the event of conflict, in which case these Bylaws shall prevail.

Section 3. Proxies. Votes may be cast in person or by proxy. Proxies must be filed with the Secretary at or before the time of each meeting. A member or Director may designate any person, who need not be an owner, to act as proxy. The designation of any such proxy shall be made in writing, signed by the member or Director and shall be revocable at any time by written notice to the Secretary by the person designating the proxy.

ARTICLE IV

Officers

Section 1. Designation. The principal officers of the Association shall be the President, Vice President, the Secretary, Clerk, and the Treasurer, all of whom shall be elected by the Board of Directors. The Board of Directors may appoint an Assistant Treasurer, an Assistant Secretary and such other officers as in its judgment may be necessary.

Section 2. Election of Officers. The officers of the Association shall be elected annually by the Board of Directors at the annual meeting of the Board of Directors and shall hold office at the pleasure of the Board of Directors.

Section 3. Removal of Officers. Upon the affirmative vote of a majority of the members of the Board of Directors, any officer may be removed, either with or without

cause, and his successor may be elected at any regular meeting of the Board of Directors or at any special meeting of the Board of Directors called for that purpose.

Section 4. President. The President shall be the chief executive officer of the Association. He shall preside at all meetings of the members and of the Board of Directors. He shall have all of the general powers and duties which are incident to the office of president of a non-profit corporation organized under the laws of the State of Maine, including but not limited to the power to appoint committees from among the members from time to time as he may in his discretion decide is appropriate to assist in the conduct of the affairs of the Association.

Section 5. Vice President. The Vice President shall take the place of the President and perform his duties whenever the President shall be absent or unable to act. If neither the President nor the Vice President is able to act, the Board of Directors shall appoint some other member of the Board of Directors to act in the place of the President, on an interim basis. The Vice President shall also perform such other duties as shall from time to time be imposed upon him by the Board of Directors or by the President.

Section 6. Secretary. The Secretary shall keep the minutes of all meetings of the members and of the Board of Directors; he shall have charge of such books and papers as the Board of Directors may direct; and he shall, in general, perform all the duties incident to the office of secretary of a non-profit corporation organized under the laws of the State of Maine.

Section 7. Treasurer. The Treasurer shall have the responsibility for Association funds and securities and shall be responsible for keeping full and accurate financial records and books of accounts showing all receipts and disbursements and for the preparation of all required financial data. He shall be responsible for the deposit of all monies and other valuable effects in the name of the Association, or the managing agent, in such depositories as may from time to time be designated by the Board of Directors, and he shall, in general, perform all the duties incident to the office of Treasurer of a non-profit corporation organized under the laws of the State of Maine.

Section 8. Agreements, Contracts, Checks, etc. All agreements, contracts, checks and other instruments of the Association shall be executed by two officers of the Association or by such other person or persons as may be designated by the Board of Directors.

Section 9. Compensation of Officers. No officer shall receive any compensation from the Association for acting as such, except that officers may be reimbursed for expenses incurred by them for their services as officers of the Association, as the Board of Directors may from time to time determine.

ARTICLE V

Operation of the Association

Section 1. Determination of Common Expenses and Fixing of Common Charges. The Board of Directors shall from time to time, and at least annually, prepare a budget for the Association, determine the amount of the common charges payable by the

members to meet the common expenses of the Association, and allocate such common charges among the members according to their proportionate share. A proportionate share shall be one (1) share for each lot, so that all lot owners share equally, whether or not a lot has a residence thereon. The common expenses shall include, among other things, (a) the costs of the repairs and maintenance of the Property (b) the cost of fulfilling the Association's obligations under the Sotrmwater Agreement and (c) such amounts as the Board of Directors may deem proper for the operation and maintenance of the Property, including, without limitation, an amount for working capital for the Association, for a general operating reserve, for a reserve fund for replacements, and to make up any deficit in the common expenses for any prior year. Seven days prior to adoption of any proposed budget for the Association, the Board of Directors shall provide a written summary of the budget to all members.

Section 2. Payment of Common Charges. All members shall be obligated to pay the common charges assessed by the Board of Directors pursuant to the provisions of Section 1. No member shall be liable for the payment of any part of the common charges assessed against his property subsequent to a sale, transfer or other conveyance by him of such property, together with the appurtenant interests. No institutional mortgage shall be liable for the payment of common charges.

Section 3. Collection of Assessments; Liens. The Board of Directors shall take prompt action to collect any common charge due from any members which remain unpaid for more than thirty (30) days from the due date for payment thereof. A late

charge equal to five (5%) percent of the common charge due shall be assessed against each lot owner for any common charges not paid within thirty (30) days from the due date for every month such common charge remains unpaid. The total common charge and late payment fees assessed with respect thereto shall, until fully paid, constitute a lien against the lot in favor of the Association. Such lien shall be prior to all liens and encumbrances on a lot except for a first mortgage recorded before or after the date which the assessment sought to be enforced becomes delinquent and liens for real estate taxes and other governmental assessments or charges against the lot. The lien for the common charges may be enforced and foreclosed by the Association in like manner as a mortgage on real estate or by any other means presently or hereafter provided by law or in equity. A suit to recover a money judgment for unpaid common charges including late payment fees may be maintained against the lot owner personally without foreclosing or waiving the lien securing such common charge and a foreclosure may be maintained notwithstanding the pendency of any suit to recover a money judgment.

Section 4. Statement of Common Charges. The Board of Directors shall promptly provide any member requesting in writing a recordable statement setting forth the amount of unpaid assessments currently levied against such member property.

Section 5. Abatement and Enjoinment of Violations by Unit Owners. The violation of any rule or regulation adopted by the Board of Directors, or the breach of any Bylaw contained herein, shall give the Board of Directors the right, in addition to any other rights set forth in these Bylaws:

(a) To enjoin, abate or remedy by appropriate legal proceedings, either at law or in equity, the continuance of any such breach at the cost, including attorney's fees, of such member;

(b) If the Board of Directors has adopted and published rules and regulations governing the use the Stormwater System and the personal conduct of any person thereon violates those rules and regulations, to suspend such use by any such person for violation of such rules and regulations for a period not to exceed thirty (30) days for any single violation.

Section 6. Maintenance and Repairs. All maintenance, repairs and replacements to the Property shall be made by the Board of Directors and be charged to all the members as a common expense.

ARTICLE VI

Records

Section 1. Records and Audits. The Board of Directors or the managing agent shall keep detailed records of the actions of the Board of Directors and the managing agent, minutes of the meetings of the Board of Directors, and financial records and books of account for the Association.

Section 2. Statement. A written report summarizing all receipts and expenditures of the Association shall be rendered by the Board of Directors to all members at least annually.

ARTICLE VII

Miscellaneous

Section 1. Notices. All notices hereunder shall be sent registered or certified mail to the Board of Directors, in care of the managing agent, or if there be no managing agent, to the office of the Board of Directors or to such other address as the Board of Directors may hereafter designate from time to time by notice in writing to all members and to all mortgagees of units. All notices to any unit owner shall be sent by ordinary prepaid mail to the unit address or to such other address as may have been designated by them from time to time, in writing, to the Board of Directors. All notices to mortgagees of units shall be sent by ordinary prepaid mail to their respective addresses, as designated by such unit owner from time to time, in writing, to the Board of Directors. All notices shall be deemed to have been given when mailed, except notices of change of address which shall be deemed to have been given when received.

Section 2. Invalidity. The invalidity of any part of these Bylaws shall not impair or affect in any manner the validity, enforceability or effect of the balance of these Bylaws.

ARTICLE VIII

Amendments to Bylaws

These Bylaws may be altered, amended or added to at any duly called meeting of members, provided: (1) that the notice of the meeting shall contain a full statement of the proposed amendment; and (2) that the amendment shall be approved by at least 75% of

the total votes in the Association. However, so long as any portion of the Property is served by the Stormwater System, no amendment or termination of these Bylaws relating to the repair, replacement, operation or funding of the Stormwater System shall be effective unless approved by the Town of Portland Planning Board.

ARTICLE IX

Dissolution

Upon dissolution or final liquidation of the Association, all assets of the Association shall become the sole and exclusive property of the then existing members of the Association in proportion to their respective membership interests.

END

41041

October 3, 2018

Jean Frasier, Planner
City of Portland
389 Congress Street
Portland, ME 04101

Re: Capisic Woods Development (off of Bancroft Road)

Dear Jean:

I, Joshua Wagner, as developer of the residential subdivision project known as Capisic Meadows, upon your approval by the Planning Board of the proposed development, intend to give the city the fee interest in the entirety of the new street as part of the petition for it to be accepted as a public street.

Sincerely,

Joshua Wagner

Portland Maine Yes. Google's good here.

Jean Fraser <jf@portlandmaine.gov>

RE: Survey lacks info and not clear you have RTi- Bancroft

1 message

Jim Fisher <jim.fisher@northeastcivilsolutions.com> Tue, Oct 2, 2018 at 3:59 PM
To: Jean Fraser <jf@portlandmaine.gov>
Cc: Brandon Binette <brandon.binette@northeastcivilsolutions.com>, Tony Panciocco <tony.panciocco@northeastcivilsolutions.com>

Jean—

Regarding your questions/statements below: the city has no record of ever accepting Kennilworth Street (which was always a paper street only), but even if it did the 1997 Order vacated it by default of not including it in the list of paper streets being excepted from vacation. We do not show the stub of Kennilworth Street on the plan because it does not apply. Both Wagner and Doiron (current property owners on either side of the Kennilworth ROW) are the two parties involved in this development, and the P&S from Doiron to Wagner giving Wagner full ownership of all lands of Doiron (except his actual house lot) is attached. Any people with lots in the "old subdivision" referred to below (PB 94/ Pg 19) are those with properties along Bancroft Street. Any rights they may have to the paper street portion of Kennilworth ends at the back of the lots of N/F Wagner and Doiron (the paper street never, on any previous plan that we have seen, is shown to extend further back than this). And given that this same area of Kennilworth is to be a public street in this new development, I don't see any issues. The only people with any rights in the Kennilworth paper "stub" are Wagner and Doiron, and Doiron's P&S to Wagner shows that he is selling to Wagner all of his interest in the land he owns (including Kennilworth, but excluding his house lot) to Wagner. I think this addresses your questions/concerns; please contact us if you have anything further. JIM

From: Tony Panciocco
Sent: Tuesday, October 02, 2018 8:13 AM
To: Jean Fraser; Brandon Binette
Cc: Jim Fisher
Subject: RE: Survey lacks info and not clear you have RTi- Bancroft

Jean,

I will pass this along to our surveyors for review.

Thanks

Tony

From: Jean Fraser [mailto:jf@portlandmaine.gov]
Sent: Monday, October 01, 2018 4:48 PM
To: Brandon Binette
Cc: Tony Panciocco; Jim Fisher
Subject: Survey lacks info and not clear you have RTi- Bancroft

Hello Brandon

My DPW Surveyor and Associate Corporation Counsel have just noticed that the submitted boundary survey and plat do not clarify what happened when Kenilworth was vacated, and that may have implications for making the street a public street in the future. They have commented:

- The first section of this street is labeled as Kenilworth Street on Plan Book 125 Page 8. That street has apparently been vacated by omission from the 1997 Order Excepting Streets From Deemed Vacation in Deed Book 13326 Page 19. I'm not sure how this affects this project but there's a chance that the land owners for Lot A and the Doiron property may have rights to the portion of the vacated street that abuts their property. Therefore, those land owners may need to be involved in the offer of this new street to the City as a public way. I've attached a copy of Bill Clark's research summary into the status of this street for your review and use.
- The submitted boundary plan doesn't even show the former location of Kenilworth at all. I think they should have because I believe Doiron has rights extending to the center line of the former street, and the other lots in the old subdivision (PB 94 PG 19) could still have easement rights across the vacated street's location. It does look like Doiron is also listed as one of the owners of the property in the title block of the NCS boundary plan. But the plan seems to show Doiron owning part of the back lot, not half of the former street location.
- If the subdivision plan proposes to dedicate the street, the applicant will need to show sufficient right title and interest to do that - either because the developer owns the whole width of the road in fee or has offered a deed dedicating the whole of the road and signed by all with property rights in the road.

Perhaps you have some way to address this that I can forward to my colleagues?

Thank you

Jean

PS I have some more detailed surveyor comments on the plat but the above is more important now (ie for hearing) as its a RTI issue.

Jean Fraser, Planner

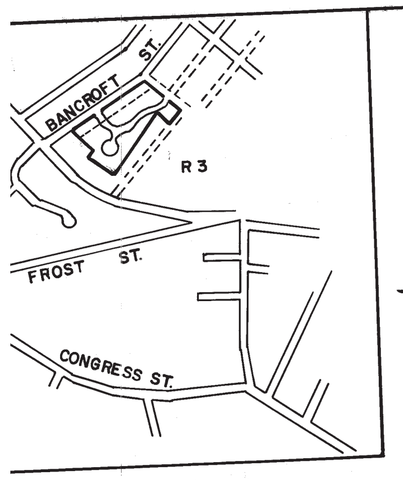
Planning & Urban Development Department

City of Portland
389 Congress Street
Portland, ME 04101
phone: (207) 874-8728

email: jf@portlandmaine.gov

EASI FILE CORP. IRVINE, CA | EFH 22

93	42



LOCATION PLAN

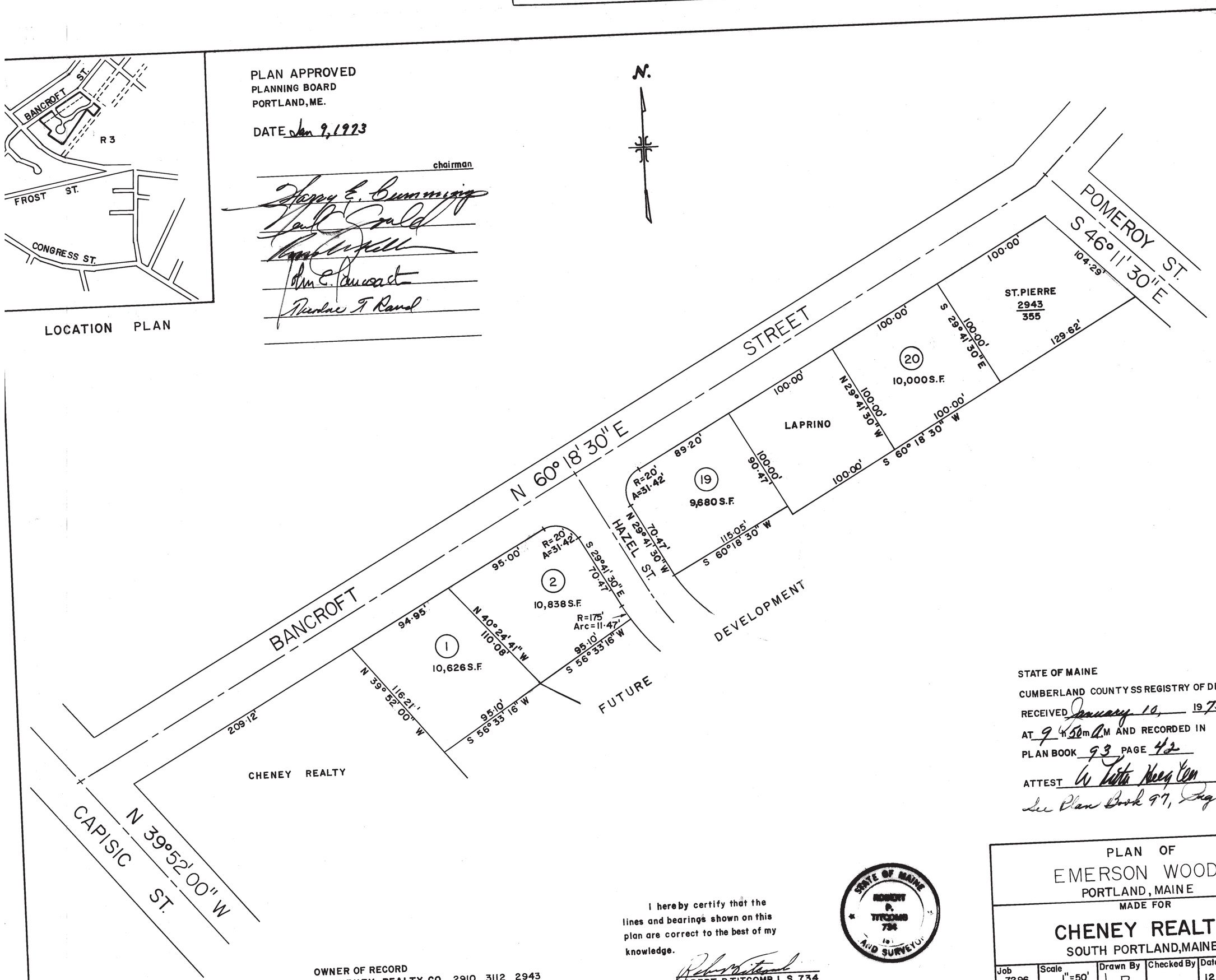
PLAN APPROVED
PLANNING BOARD
PORTLAND, ME.

DATE Jan 9, 1973

chairman

Harry E. Cummings
Paul Gould
[illegible]
John E. Lancaster
Nicholas F. Rand

N.



STATE OF MAINE
CUMBERLAND COUNTY SS REGISTRY OF DEEDS
RECEIVED January 10, 1973
AT 9 H 50 m A.M. AND RECORDED IN
PLAN BOOK 93 PAGE 42
ATTEST [illegible] REGISTER
See Plan Book 97, Page 28.

OWNER OF RECORD
CHENEY REALTY CO. 2910/255, 3112/496, 2943/355

I hereby certify that the lines and bearings shown on this plan are correct to the best of my knowledge.

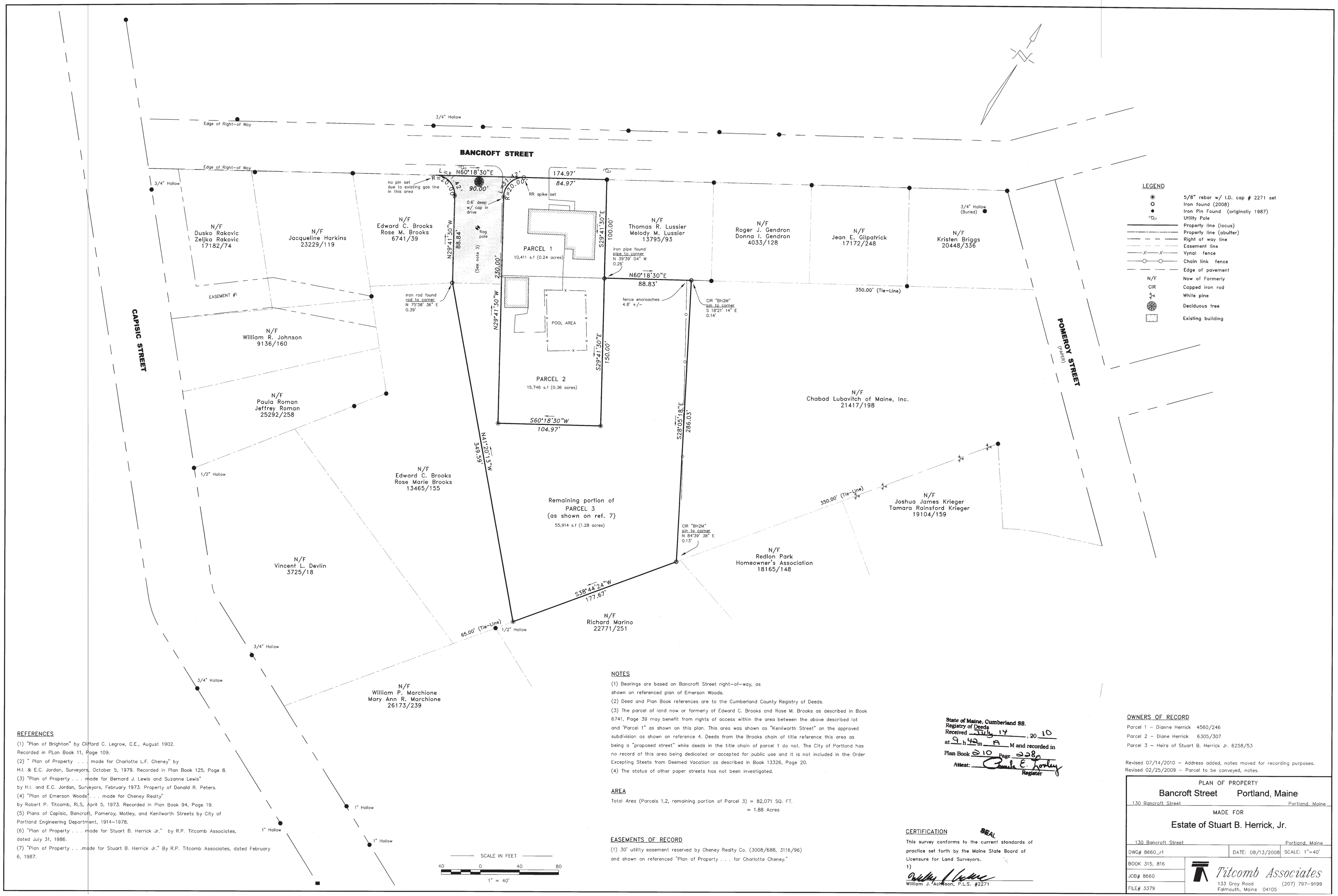
ROBERT P. TITCOMB L.S. 734

STATE OF MAINE ROBERT P. TITCOMB 734 LAND SURVEYOR

PLAN OF
EMERSON WOODS
PORTLAND, MAINE
MADE FOR
CHENEY REALTY
SOUTH PORTLAND, MAINE

Job 7296	Scale 1"=50'	Drawn By M.R.	Checked By	Date 12/20/72	Sheet 1 Of 1
Book 37	ROBERT P. TITCOMB REGISTERED LAND SURVEYOR				
File 415					

93/42



LEGEND

- 5/8" rebar w/ I.D. cap # 2271 set
- Iron found (2008)
- Iron Pin Found (originally 1987)
- Utility Pole
- Property line (locus)
- Property line (abutter)
- Right of way line
- Easement line
- Vynal fence
- Chain link fence
- Edge of pavement
- N/F Now of Formerly
- CIR Capped iron rod
- White pine
- Deciduous tree
- Existing building

REFERENCES

(1) "Plan of Brighton" by Clifford C. Legrow, C.E., August 1902. Recorded in PLan Book 11, Page 109.
(2) " Plan of Property . . . made for Charlotte L.F. Cheney" by H.I. & E.C. Jordan, Surveyors, October 5, 1979. Recorded in Plan Book 125, Page 8.
(3) "Plan of Property . . . made for Bernard J. Lewis and Suzanne Lewis" by H.I. and E.C. Jordan, Surveyors, February 1973. Property of Donald R. Peters.
(4) "Plan of Emerson Woods". . . made for Cheney Realty" by Robert P. Titcomb, RLS, April 5, 1973. Recorded in Plan Book 94, Page 19.
(5) Plans of Capisic, Bancroft, Pomeroy, Motley, and Kenilworth Streets by City of Portland Engineering Department, 1914–1978.
(6) "Plan of Property . . . made for Stuart B. Herrick Jr." by R.P. Titcomb Associates, dated July 31, 1986.
(7) "Plan of Property . . .made for Stuart B. Herrick Jr." By R.P. Titcomb Associates, dated February 6, 1987.

NOTES

(1) Bearings are based on Bancroft Street right–of–way, as shown on referenced plan of Emerson Woods.
(2) Deed and Plan Book references are to the Cumberland County Registry of Deeds.
(3) The parcel of land now or formerly of Edward C. Brooks and Rose M. Brooks as described in Book 6741, Page 39 may benefit from rights of access within the area between the above described lot and 'Parcel 1" as shown on this plan. This area was shown as "Kenilworth Street" on the approved subdivision as shown on reference 4. Deeds from the Brooks chain of title reference this area as being a "proposed street" while deeds in the title chain of parcel 1 do not. The City of Portland has no record of this area being dedicated or accepted for public use and it is not included in the Order Excepting Steets from Deemed Vacation as described in Book 13326, Page 20.
(4) The status of other paper streets has not been investigated.

AREA

Total Area (Parcels 1,2, remaining portion of Parcel 3) = 82,071 SQ. FT.
= 1.88 Acres

EASEMENTS OF RECORD

(1) 30' utility easement reserved by Cheney Realty Co. (3008/688, 3116/96) and shown on referenced "Plan of Property . . . for Charlotte Cheney."

State of Maine, Cumberland SS.
Registry of Deeds
Received July 14, 20 10
at 9 h 42 m A M and recorded in
Plan Book 210 Page 228
Attest: Pamela E. Lovley
Register

CERTIFICATION SEAL

This survey conforms to the current standards of practice set forth by the Maine State Board of Licensure for Land Surveyors.
1)
William J. Acheson, P.L.S. #2271

OWNERS OF RECORD

Parcel 1 – Dianne Herrick 4560/246
Parcel 2 – Diane Herrick 6305/307
Parcel 3 – Heirs of Stuart B. Herrick Jr. 6258/53

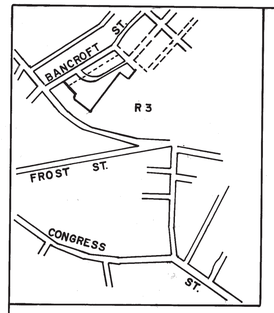
Revised 07/14/2010 – Address added, notes moved for recording purposes.
Revised 02/25/2009 – Parcel to be conveyed, notes.

PLAN OF PROPERTY
Bancroft Street Portland, Maine
130 Bancroft Street Portland, Maine
MADE FOR
Estate of Stuart B. Herrick, Jr.
130 Bancroft Street Portland, Maine

DWG# 8660_r1	DATE: 08/13/2008	SCALE: 1"=40'
BOOK 315, 816	Titcomb Associates	
JOB# 8660	133 Gray Road Falmouth, Maine 04105	(207) 797–9199
FILE# 3379		

EASI FILE CORP. IRVINE, CA EFH 24

94	19

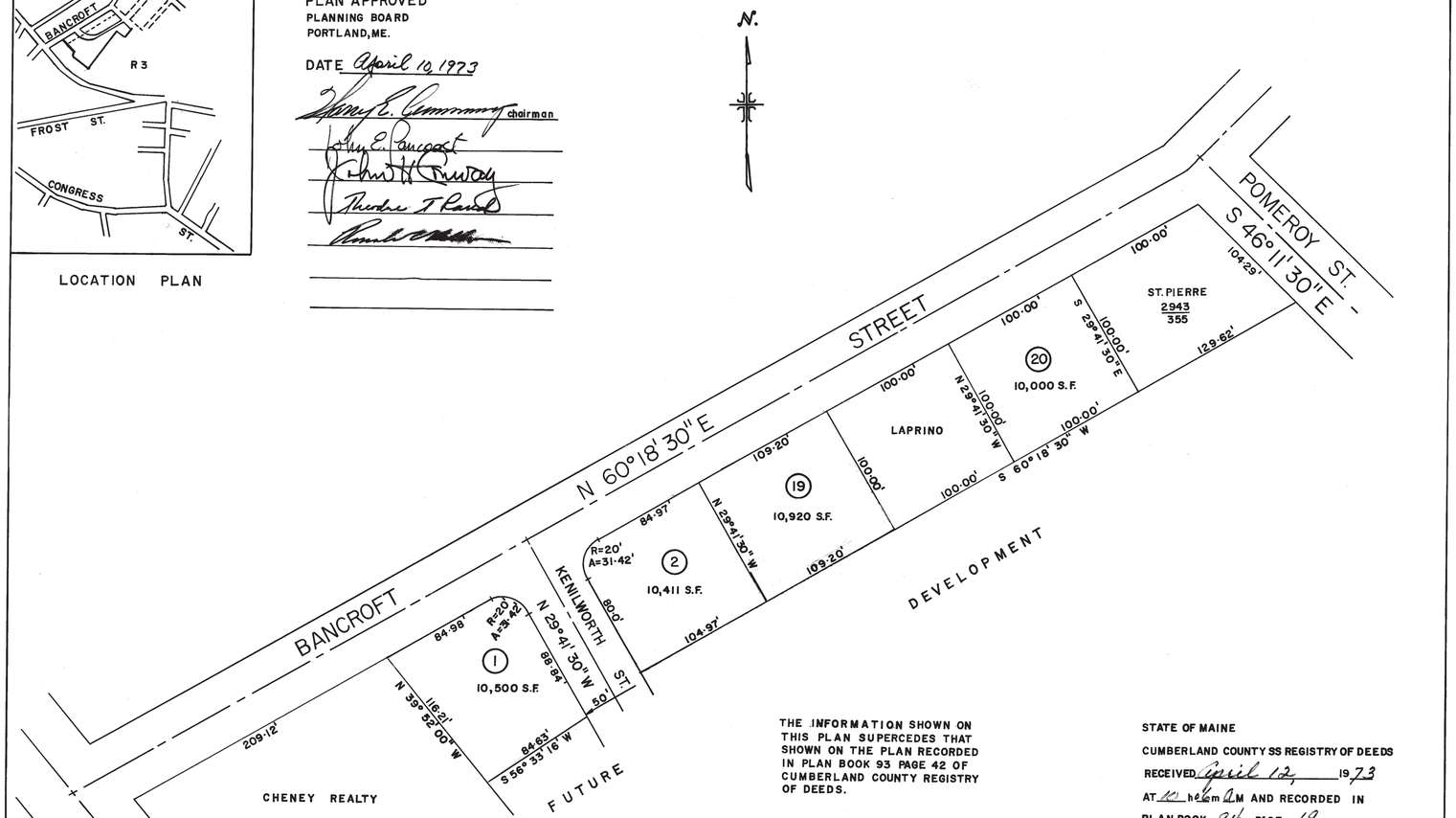


LOCATION PLAN

PLAN APPROVED
PLANNING BOARD
PORTLAND, ME.

DATE April 10, 1973

chairman



THE INFORMATION SHOWN ON THIS PLAN SUPERCEDES THAT SHOWN ON THE PLAN RECORDED IN PLAN BOOK 93 PAGE 42 OF CUMBERLAND COUNTY REGISTRY OF DEEDS.

STATE OF MAINE
CUMBERLAND COUNTY SS REGISTRY OF DEEDS
RECEIVED April 12, 1973
AT 11 hrs 0 m AM AND RECORDED IN
PLAN BOOK 94 PAGE 19.
ATTEST A. Justin Kenney REGISTER

OWNER OF RECORD
CHENEY REALTY CO. 2910/255, 3112/496, 2943/355

I hereby certify that the lines and bearings shown on this plan are correct to the best of my knowledge.

ROBERT P. TITCOMB L.S. 734

STATE OF MAINE
ROBERT P. TITCOMB
734
REGISTERED LAND SURVEYOR

PLAN OF
EMERSON WOODS
PORTLAND, MAINE
MADE FOR
CHENEY REALTY
SOUTH PORTLAND, MAINE

Job 7296	Scale 1"=50	Drawn By M. R.	Checked By	Date 4/5/73	Sheet 1 Of 1
Book 37	ROBERT P. TITCOMB REGISTERED LAND SURVEYOR				
File 415					

Portland Maine Yes. Google's good here.

Jean Fraser <jf@portlandmaine.gov>

Fwd: e-mail re resubmit

1 message

Jean Fraser <jf@portlandmaine.gov> Thu, Oct 4, 2018 at 3:46 PM
To: "Fraser, Jean" <jf@portlandmaine.gov>

FROM APPLICANT- INFORMATION REGARDING THE DETENTION POND

---------- Forwarded message ---------
From: **Brandon Binette** <brandon.binette@northeastcivilsolutions.com>
Date: Thu, Oct 4, 2018 at 3:12 PM
Subject: RE: e-mail re resubmit
To: Jean Fraser <jf@portlandmaine.gov>

Jean

We have added trash racks to the outlet pipes to prevent people from entering the pipes. These are indicated on the detail sheets. We have also added a fence around the pond to prevent people from entering the pond.

As previously mentioned, this pond is not a wet pond. It will not have a constant stand of water in it. It will fill up and drain down in order to control the peak rate of runoff from the project site, per the City's stormwater requirements.

In order to meet the City of Portland's Technical Manual Stormwater requirements (Flooding Standard- controlling the peak rate of runoff) a pond is required.

Please let me know if you have any other questions.

Thanks,

Brandon

Brandon Binette

Project Engineer

(work) 207.883.1000

(fax) 207.883.1001