



TOWN OF BRUNSWICK

PLANNING BOARD

85 UNION STREET
BRUNSWICK, ME 04011

**PLANNING BOARD
-AGENDA-
BRUNSWICK TOWN HALL
85 UNION STREET
COUNCIL CHAMBERS**

TUESDAY, OCTOBER 6, 2015, 7:00 P.M.

1. **Case # 15-020 Brunswick Landing Subdivision, Phase 2:** The Board will review and take action regarding a **Final Plan Major Development Review** application submitted by the Midcoast Regional Redevelopment Authority for the proposed creation of eleven (11) new lots, a proposed private street to intersect with Orion Street, and associated improvements. The project is situated on 21.55 acres to the east of Orion Street, in the **BNAS Reuse District, within the Business & Technology Industries Land Use District (RBTI). Assessor's Map 40, Lots 55 & 81.**
3. **Report on Staff Review Committee Minor Development Plan Approvals**
4. **Zoning Ordinance Rewrite Committee (ZORC) Update**
5. **Approval of Minutes**
6. **Other Business**
7. **Adjourn**

This agenda is mailed to owners of property within 200 feet of the above referenced development proposals as well as others upon request. It is the practice of the Planning Board to allow public comment on development review applications and all are invited to attend and participate.

Please call the Brunswick Department of Planning and Development (725-6660) with questions or comments. Individuals needing auxiliary aids for effective communications please call 725-6659 or TDD 725-5521. This meeting will be televised.

**Draft Findings of Fact
Brunswick Landing Subdivision – Phase II
Major Subdivision Plan Final Review
Review Date: September 22, 2015**

Project Name: Brunswick Landing Subdivision – Phase II
Case Number: 15-020
Tax Map: Map 40, Lots 0, 29, 55, 81, 201, 221, 226 (as submitted)
Map 40, Lots 55 and 81 (as reviewed by staff)
Zoning District: BNAS Reuse District; Land Use District Business and Technology Industries (R-B&TI)
Applicant: Midcoast Regional Redevelopment Authority
15 Terminal Road, Suite 200
Brunswick, Maine 04011
207-798-6512
Authorized Representative: Wright-Pierce
99 Main Street
Topsham, ME 04086
207-725-8721

PROJECT SUMMARY

The Midcoast Regional Redevelopment Authority (MRRA) has submitted the Final Plan Major Development Review application for the Brunswick Landing Phase II Subdivision, dated August 20, 2015. The Sketch Plan for this application, submitted as a 7-lot subdivision on 9.2 acres, was approved by the Planning Board on May 27, 2015. As abutting property is now included in upcoming Findings of Suitability for Transfer (FOSTS) 2015-1 and 2015-2, four additional lots (Lots 52-55) are now proposed for inclusion in the Phase II Final Plan. The subdivision as now submitted includes 11 lots on approximately 21.55 acres, with 6 lots individually occupied by 6 buildings and related parking and 5 lots undeveloped. In addition, a proposed private roadway, to be accessed from Orion Street, will be constructed by the applicant.

Since the plan was originally submitted, the anticipated determinations by the US Navy of FOSTS 2015-1 and 2015-2 have been delayed in order to conduct additional environmental testing. Subsequently, staff recommends and the applicant concurs to remove consideration of proposed lots 52, 53, 54, and 55. The following review is based on the originally approved Sketch Plan configuration of the previously transferred and recorded 7 lots (proposed lots 45-51) and proposed private roadway.

The applicant has requested the following waivers:

1. Section 412.2.B.3 – Lot monumentation. *As was requested and approved as part of the Phase I application, a waiver is requested to defer the lot monumentation until prior to the sale of each lot. This will ensure that the lots are monumented upon their sale and related expenses can be deferred until that time. Staff recommends approval of this waiver as this process has been successfully implemented for the development of Phase I lots.*
2. Section 412.2.B.8 – Profiles and cross-sections and curve radii of existing streets. *No changes to the existing streets are proposed and will remain as private streets maintained by MRRA. Staff recommends approval of this waiver as previously granted as part of the Phase I approval.*
3. Section 412.2.B.13– Profile and cross-section of existing utilities. *The existing sewer profile is indicated on the proposed roadway plan. Existing water and electrical line profiles are not*

shown as the buried depth is not known. Staff recommends approval of this waiver as previously granted as part of the Phase I approval.

4. Section 412.2.B.16 – A Class A (high intensity) Soil Survey prepared in accordance with the standards of the Maine Association of Professional Soil Scientists. *As the proposed development will be connected to the existing Brunswick Landing water and sewer systems, the applicant has included a soils map previously prepared as part of the BNAS Environmental Impact Statement. Staff further notes that federal conveyance documents restrict groundwater extraction. Staff recommends approval of this waiver as previously granted as part of the Phase I approval.*
5. Section 412.2.B.17 – Location of all existing trees over 10 inches in diameter, and locations of tree stands. *Construction of Commerce Drive will require the removal of trees along the easterly 25% of its length. The limits of the proposed clearing are shown on the accompanying Erosion and Sedimentation Control Plan of Commerce Drive by the line labelled “Limit of Work.” Staff recommends approval of this waiver for purposes of road construction and subdivision of lots only.*

Review Standards from Section 411 of the Town of Brunswick Zoning Ordinance

411.1 Ordinance Provisions

The Final Plan complies with all applicable provisions and requirements of the BNAS Reuse Zoning District for Land Use District Business and Technology Industries (R-B&TI). *The Board finds that the provisions of Section 411.1 are satisfied.*

411.2 Preservation of Natural Features

Activity associated with the construction of Commerce Drive will not result in any new disturbances to existing natural features or protected natural resources, including rare, threatened and endangered wildlife habitat and rare natural communities. The proposed subdivision is not within a flood hazard area, there are no proposed disturbances to steep slopes, and natural features have been noted for subdivision purposes. *The Board finds that the provisions of Section 411.2 are satisfied.*

411.3 Surface Waters, Wetlands and Marine Resources

No disturbance to water bodies, streams, wetlands or vernal pools is anticipated with the construction of Commerce Drive or the associated stormwater management system. A 2,130 square foot freshwater wetland (wetland) is shown at the southern boundary of lot 50. The wetland was delineated by Michael Thompson, M.Sc., CWB, PWS, of Penobscot Environmental Consulting, Inc., Camden, Maine. *The Board finds that the provisions of Section 411.3 are satisfied.*

411.4 Flood Hazard Areas

The proposed development activity is not located within a 100-year flood hazard area as depicted on the flood map included with this application as Appendix C. *The Board finds that the provisions of Section 411.4 are satisfied.*

411.5 Stormwater Management

The proposed activity is within an urban impaired stream watershed, Mere Brook (Harpwell Sound). The applicant submitted a stormwater management plan prepared by Wright-Pierce which includes Best Management Practices (BMPs) adopted by the Maine Department of Environmental Protection (DEP). Stormwater from the proposed Commerce Drive (road) will flow from porous pavement on the road to a new drainage swale to the north and associated infiltration trench, to two (2) proposed road culverts directed south. The proposed activity will result in 53,728 square feet of new disturbed area, specifically, 500 square feet of existing bituminous pavement, 13,023 square feet of existing woods, and 40,205 square feet of grass land. The stormwater management plan is designed in accordance with the Chapter 500,

Stormwater Management Law ([06-096(500)])Basic Standard, General Standard, Flooding Standard and Urban Impaired Stream Standard. The proposed activity requires DEP approval pursuant to the Stormwater Management Law at 38 M.R.S. Section 420-D. Stormwater management plans, to the greatest extent practicable, must use site-specific, Low Impact Development stormwater management strategies and best practices for all new development, in accordance with Section 504 of the Town's Zoning Ordinance and the Brunswick Landing Design Guidelines and BNAS Reuse Plan. *The Board finds that the provisions of Section 411.5 are satisfied conditioned upon the applicant revising the Final Subdivision Plan with any changes required by the DEP for the Stormwater Management Law permit; and that stormwater management plans, to the greatest extent practicable, use site-specific, Low Impact Development stormwater management strategies and best practices for all new development, in accordance with Section 504 of the Town's Zoning Ordinance and the Brunswick Landing Design Guidelines and BNAS Reuse Plan.*

411.6 Groundwater

Phase II lots are not located within an Aquifer Protection Overlay Zone as delineated on the Town's Zoning Map. The proposed project should not adversely impact groundwater quantity or quality. As presented in "Section 411.5 Stormwater Management" above, which addresses stormwater runoff from the portion of the site subject to construction activities connected with Commerce Drive, stormwater will be treated prior to being infiltrated into the underlying soils. (see "Section 411.5, Stormwater Management"). Developers of individual lots of the subdivision will be required to develop a SWMP specific to the proposed development in conjunction with obtaining the required Town and State permits.

Institutional land use controls imposed by deed by the U.S. Navy restricts any groundwater extraction for any use, without Navy approval. The Board finds that the proposed subdivision will not - alone or in conjunction with existing activities - adversely affect the quality or quantity of groundwater. *The Board finds that the provisions of Section 411.6 are satisfied with the condition that the Maine DEP Site Location of Development Application for Minor Amendment is approved.*

411.7 Erosion and Sedimentation Control

A written Erosion and Sedimentation Control Plan ("E&S Control Plan") for the construction and long term operation of Commerce Drive has been developed as part of the Maine DEP Site Location of Development Application for Minor Amendment and is included in the application. The E&S Control Plan includes steps to be followed during construction of the site as well as recommendations for maintenance as a part of the ongoing upkeep of the site. All future development activities requiring development review approval will be required to apply Best Management Practices as outlined in the Maine Erosion and Sediment Control BMPs, as published by the Maine DEP. *The Board finds that the provisions of Section 411.7 are satisfied with the condition that the Maine DEP Site Location of Development Application for Minor Amendment is approved.*

411.8 Sewage Disposal

The sewer collection system, including existing sewer lines, manholes, and pump stations, is operated by MRRA and the wastewater is discharged to the Brunswick Sewer District through a trunk line that leaves the site at the main entrance. Future development on any of the subdivision lots will be connected to the existing and proposed sewage system. A letter from the Brunswick Sewer District confirming capacity to serve this subdivision has been provided, also requiring the system be designed in accordance with all applicable local, state and federal requirements. *The Board finds that the provisions of Section 411.8 are satisfied.*

411.9 Water Supply

The water system on the site, including fire hydrants, is operated by MRRA. Water is supplied to the system via two connections to the Brunswick Topsham Water District water distribution system. Future

development on any of the subdivision lots will be connected to the existing and proposed water system. A letter from the Brunswick-Topsham Water District confirming capacity to serve commercial uses has been provided. *The Board finds that the provisions of Section 411.9 are satisfied.*

411.10 Aesthetic, Cultural and Natural Values

In connection with previous projects undertaken at the BNAS in the vicinity of the current project, the applicants or the developers had contacted the Maine Department of Inland Fisheries and Wildlife (IF&W) requesting assistance in determining potential fisheries and wildlife habitat impacts that could result from the proposed developments. In response to a request from the developers of a nearby project which required an amendment to the existing BNAS Site Location of Development Permit, (see DEP #L-20116-26-Z-A and DEP #L-20116-26-AE-C) Steve Walker, Acting Environmental Review Coordinator at IF&W, provided a letter dated October 19, 2012, in which he states that IF&W records indicate no occurrences of rare, threatened, or endangered animal species within the project area. He also states that the Department has not mapped any Essential or Significant Wildlife Habitats or Fisheries Habitats that would be directly impacted by the project. The area of that project reviewed by IF&W overlaps a portion of the area of the project proposed herein (letter included in Appendix I of the application).

The developers of the nearby project referenced above, also contacted the Maine Department of Conservation (MDOC), Maine Natural Areas Program requesting assistance in determining if the proposed project would adversely impact an unusual natural area. As stated in a response letter from Don Cameron, Ecologist for the Maine Natural Areas Program, dated October 19, 2012, *“According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.”*

The overall Brunswick Landing site was the subject of a historical review as part of the Environmental Impact Statement (“EIS”) that was conducted for the closing of the Naval Air Station Brunswick. The resulting Programmatic Agreement identified the culturally sensitive sites that were studied but did not make public the locations. The Maine Historic Preservation Commission (“HPC”) was asked for an official determination requiring any further study and received a response that indicated no concern.

The proposed subdivision will not have any undue adverse effect on the scenic or natural beauty of the area, historic sites, or significant wildlife habitat identified by the Maine Department of Environmental Protection, Inland Fisheries & Wildlife, Maine Historic Preservation Commission or by the Town of Brunswick, or rare and irreplaceable natural areas or any public rights for physical or visual access to the shoreline. There are no areas of concern from a historical/archeological perspective as documented by the Maine Historic Preservation Commission. Future development of all lots must consider such features at the time of proposal in accordance with ordinance standards, materials provided in the Phase II application, the approved Environmental Impact Statement and other materials as available from local, state and federal regulatory agencies. *The Board finds that the provisions of Section 411.10 are satisfied.*

411.11 Community Impact

The proposed new right-of-way and utilities will remain private and be maintained by MRRA in accordance with the “Road and Common Facilities Maintenance Agreement” to be entered into by and between MRRA and the lot owners. Associated fire hydrant locations have been reviewed and approved by the Deputy Fire Chief.

No new site development is proposed at this time. Upon such time when new development occurs, impacts to emergency services, utilities and solid waste will be assessed. Municipal resources are currently available to service the project, and that any on-site or off-site impacts associated with the

development of the project will be mitigated. *The Board finds that the provisions of Section 411.11 are satisfied.*

411.12 Traffic

The proposed and existing streets will remain as a private road network, maintained by MRRA in accordance with the “Road and Common Facilities Maintenance Agreement” to be entered into by and between MRRA and the lot owners. The access to the proposed subdivision will be provided from Orion Street by new Commerce Drive a private drive which leads easterly from Orion Street. Commerce Drive has been designed in accordance with the applicable dimensional requirements for a private street located in the BNAS Reuse District as provided for in “Appendix III:BNAS Reuse District” of the Town of Brunswick Zoning Ordinance.

Review of specific traffic impacts, the need for off-street parking and loading/unloading areas will be completed during site plan reviews for future development. The Board finds that the proposed subdivision will not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed, and the traffic associated with the development shall maintain level of service within 200 feet of any existing or proposed curb cut. *The Board finds that the provisions of Section 411.12 are satisfied.*

411.13 Pedestrian and Bicycle Access and Safety

Bicycle riding will continue to be permitted on all existing and proposed streets within Brunswick Landing. Additional review of specific needs for bicycle parking shall be conducted as part of site plan review for future development.

As stated in Table A-II.1B, Private Street Standards, contained in the Brunswick Zoning Ordinance, sidewalks are required in all growth districts. The BNAS-Reuse District is a growth district. However, sidewalks are not proposed as part of the proposed Commerce Drive. The Board finds that the proposed subdivision will not impact existing accommodations for bicyclists and pedestrian access, safety and circulation within the site. *The Board finds that the provisions of Section 411.13 are satisfied, conditioned upon the provision of sidewalks as part of the construction of Commerce Drive.*

411.14 Development Patterns

No new development is proposed at this time. Any future development will be nonresidential in nature and will be evaluated for compatibility in development patterns as part of the development review process. *The Board finds that the provisions of Section 411.14 are satisfied.*

411.15 Architectural Compatibility

No new development is proposed, and any future development will be required to be architecturally compatible with the Brunswick Landing Design Guidelines administered by MRRA. *The Board finds that the provisions of Section 411.15 are satisfied.*

411.16 Municipal Solid Waste Disposal

Solid waste impact fees shall be accessed at the time of development review for future development proposals. *The Board finds that the provisions of Section 411.16 are satisfied.*

411.17 Recreation Needs

This criteria only applies to residential development. No residential development is proposed. Therefore, this criteria does not apply. *The Board finds that the provisions of Section 411.17 are not applicable.*

411.18 Access for Persons with Disabilities

As no new development is proposed, additional access for persons with disabilities is not required at this time. Any future development proposal will require an evaluation of impacts to access for persons with disabilities. *The Board finds that the provisions of Section 411.18 are satisfied*

411.19 Financial Capacity and Maintenance

A performance guarantee in an amount determined by the Director of Public Works for the construction of Commerce Drive is required to be provided prior to the start of construction of the roadway and/or the issuance of the first building permit for lots accessing Commerce Drive. As mentioned previously, existing roads will be maintained by MRRA, financed through a common area maintenance agreement with all Brunswick Landing landowners. Any future development proposals requiring site plan approval will be required to include evidence of financial capacity. *The Board finds that the provisions of Section 411.19 are satisfied conditioned upon a performance guarantee provided for the construction of Commerce Drive in an amount determined by the Director of Public Works.*

411.20 Noise and Dust

Construction of Commerce Drive will be conducted in accordance with Section 109 of the Brunswick Zoning Ordinance. Any future development requiring site plan approval shall meet ordinance standards. *The Board finds that the provisions of Section 411.20 are satisfied.*

411.21 Right, Title and Interest

MRRA owns the subject properties giving them sufficient right, title and interest to subdivide the land. *The Board finds that the provisions of Section 411.21 are satisfied.*

411.22 Payment of Application Fees

The applicant has paid all applicable development review application fees. *The Board finds that the provisions of Section 411.22 are satisfied.*

411.23 Additional Design Review Guidelines in the BNAS Reuse and Conservation Districts

Activities in the BNAS Reuse District are subject to separate design guidelines established and administered by MRRA. Conformance with the MRRA design guidelines is not subject to consideration as part of the development review process but all applications for development review must demonstrate that they have completed the MRRA design review process. *The Board finds that the design review process is not applicable at this time, but notes that the provisions of Section 411.23 will be completed on a site-specific basis during the development review process.*

411.24 Environmental Compliance in the BNAS Reuse and Conservation Districts

The site is within the BNAS Reuse District and ground disturbance activities at the site will require compliance with MRRA’s Soil Management Plan as well as US Navy imposed groundwater extraction restrictions. A Site Location of Development Minor Revision application, which requires that the project complies with environmental rules and regulations, is under review by Maine DEP.

All land use controls in the BNAS Reuse District and BNAS Conservation Districts must be implemented and monitored in accordance with state and federal laws governing said Districts. All applications for development review must demonstrate that the proposal takes into account the actions necessary to comply with all state, federal and local institutional controls applicable to the property and that the uses are in conformity with any applicable environmental restrictions. *The Board finds that the provisions of Section 411.24 are satisfied conditioned upon evidence of compliance on a site-specific basis at time of future development.*

DRAFT MOTIONS
BRUNSWICK LANDING SUBDIVISION – PHASE II
MAJOR SUBDIVISION PLAN FINAL REVIEW
CASE#: 15-020

Motion 1: That the major final subdivision plan development review application is deemed complete.

Motion 2: That the Board waives the following requirements with the condition that they be submitted as part of an application for development review of any proposed new development in the subdivision:

1. Section 412.2.B.3 – Lot monumentation.
2. Section 412.2.B.8. – Profiles and cross-sections and curve radii of existing streets.
3. Section 412.2.B.13– Profile and cross-section of existing utilities.
4. Section 412.2.B.16. – A Class A (high intensity) Soil Survey prepared in accordance with the standards of the Maine Association of Professional Soil Scientists.
5. Section 412.2.B.17. – Location of all existing trees over 10 inches in diameter, and locations of tree stands.

Motion 3: That the Final Subdivision Plan is approved with the following conditions:

1. That the Board’s review and approval does hereby refer to these findings of fact, the plans and materials submitted by the applicant and the written and oral comments of the applicant, his representatives, reviewing officials, and members of the public as reflected in the public record. Any changes to the approved plan not called for in these conditions of approval or otherwise approved by the Director of Planning and Development as a minor modification shall require a review and approval in accordance with the Brunswick Zoning Ordinance.
2. That Lots 52, 53, 54, and 55 are removed from the Final Plan prior to the recording of the plan.
3. That the applicant revises the Final Subdivision Plan with any changes required by the DEP for the Stormwater Management Law permit prior to recording of the plan.
4. That Stormwater Management Plans be required for all future development and, to the greatest practical extent, site-specific, Low Impact Development stormwater management strategies and practices are required for all new development, in accordance with Section 504 of the Town’s Zoning Ordinance and the Brunswick Landing Design Guidelines and BNAS Reuse Plan.
5. That the Maine DEP Site Location of Development Application for Minor Revision is approved prior to the recording of the plan.
6. That sidewalks are provided as part of the construction of Commerce Drive.
7. That, prior to the start of construction, a performance guarantee is paid for the construction of Commerce Drive in an amount determined by the Director of Public Works.
8. Development review approval by the Planning Board is required for all future development of lots 1-7, 10-12, 35 and 44, in order to demonstrate compliance with the provisions of Section 411.2 of the Town of Brunswick Zoning Ordinance “Preservation of Natural Features”.
9. In accordance with Section 411.24, Environmental Compliance in the BNAS Reuse and Conservation Districts, the applicant must provide evidence of compliance on a site-specific basis at time of future development.

- * *All Subdivisions for which Final Plan approval has been granted, and any conditions that have been imposed by the Planning Board for the subdivision or final plan shall be filed in the Cumberland County Registry of Deeds by the applicant. If the applicant fails to record the subdivision plan within 60 days after Development Plan approval by the Planning Board, the approval shall expire. No building permits associated with a subdivision shall be issued unless evidence of all recording requirements is provided by the applicant to the Codes Enforcement Officer.*

If applicable, subdivision approvals by the Planning Board shall expire at the end of five years after the date of Final Plan approval unless all infrastructure work associated with the development is completed (Section 407.4.C of the Brunswick Zoning Ordinance).

August 26, 2015

STAFF REVIEW COMMITTEE NOTES

Staff present:

Anna Breinich (Planning and Development Director), Jeff Hutchinson (Codes Enforcement), Jared Woolston (Planning), Peter Baecher (Parks and Recreation Department), Rob Pontau, (Sewer District), John Foster (Public Works) and Dick Rizzo (Police Department). Non-voting staff: Julie Erdman (Administrative Assistant)

Applicants present: Steve and Susan Loeb; Byron Bouchard; Will Conway, Sebago Technics; Bob Rocheleau, MRRA; Jan Wiegman, Wright-Pierce; David Latulippe, CJ Developers Inc.; Doug Reynolds, Gorrill-Palmer.

Public present: Elizabeth Butler, Peter Blyberg and Ned Ford.

1. **Case # 15-035 – 25 Monument Lane:** In accordance with Section 304.8.B of the Brunswick Zoning Ordinance, the Staff Review Committee will review and take action on a **Minor Development Review** application submitted by Susan and Stephan Loeb to demolish an existing residence and build a new residence, on an 11,326 square foot parcel located at 25 Monument Lane. **Located in the Coastal Protection 1 (CP1) Zoning District and Natural Resource Protection Zone; Assessor’s Map MP1, Lot 6.**

Present for applicant/comments from the applicant: Stephen Loeb (Applicant/Owner) and Byron Bouchard (Authorized Representative)

Stephen Loeb indicated that his home (existing structure) contains rotting rafters he was advised to demolish and replace that structure within the existing square footage. Byron Bouchard (representative for applicant) represented himself as a contractor with 6 Rivers Construction and indicated that the home was purchased in 1995.

Staff comments/questions of applicant:

Anna Breinich

- o Indicated that the project is within the Natural Resources Protection Zone (NRPZ) and therefore requires staff review for approval and does not require planning board approval.

Jeff Hutchinson:

- o Indicated that he has been on-site twice and has been working with the contractor and owner to determine the location for the proposed replacement home. Jeff further indicated that the proposed location appears to meet the ordinance; however, the proposed 12-foot wide patio (towards the resource) seems excessive and asked if the patio could be reduced as 8-10 feet wide should be sufficient. BB: Stairs will go down to side, tree root system may interfere when reducing size of patio. JH: Is eight feet okay? SL Yes.
- o Stairs on the side are further from shore so that is good. At the rear of the building you have mature trees and the septic tank and pump station, so it would be hard to move the home elsewhere (in consideration of moving to greatest practical extent from resource).
- o We will look at closer at square footage for expansion during building permit process. The proposal is well within the impervious surface requirements.
- o Shared septic system? How many existing and proposed bedrooms? SL: 3 Existing & 3 Proposed. I believe each of the four homes on leach field has three bedrooms. AB: Doesn't "shed" have a guest bedroom? SL: Yes.

Rob Pontau:

- System (septic) is approved for 14 bedrooms which includes four bedrooms at 25 Monument, so as long as there is no increase will send email confirmation for permit to Jeff Hutchinson.

Peter Blyberg, abutter, indicated septic system mound is listed for 14 bedrooms, 4 for 15 Monument, 4 for 19 Monument, 3 for 23 Monument, and 3 for 25 Monument.

Elizabeth Butler, abutter stated that variance was granted for septic for 14 bedrooms only and it is important to bring into conformity, it is the right thing to do for communal system. Trust that square feet, volume, and impervious surface will be addressed in the permit process. As far as location of structure to proximity of water - would like to see patio move to current deck location due to erosion in the area. Think runoff will increase problems and moving will minimize them. We are one good storm away from big problem.

BB: Soil will be disturbed in construction anyway. Patio will be pervious surface.

EB: Please don't allow.

JH: Square footage of structure is not increasing.

EB: Patio and house should be viewed differently.

JH: Not the way it is done. Pervious pavers are a big help. Need retaining wall or something to stabilize the area.

EB: Please analyze impacts on abutters and do not allow new outdoor space.

EB: Please issue no blasting restriction for this project.

JH: We can't. Blasting is allowed in town without a permit.

EB: Is NRPA permit needed?

JW: In my opinion, yes, within 75 feet of coastal wetland.

JH: Simple one page permit process, Jared can help you with.

Ned Ford: Live across from cove and support project and know that they will meet are requirements.

John Foster:

- Have you settled on pervious block? There are different types and recommended installations. Applicant should submit type and manufacturer recommended installation to make sure it is being met.

AB: Application deemed complete?

Moved for approval by Jeff Hutchinson, Dick Rizzo seconded. All in favor, none opposed – motion passed.

Plan application with conditions:

1. That the Committee's review and approval does hereby refer to these findings of fact, the plans and materials submitted by the applicant and the written and oral comments of the applicant, its representatives, reviewing officials, and members of the public as reflected in the public record. Any changes to the approved plan not called for in these conditions of approval or otherwise approved by the Director of Planning and Development as a minor modification shall require a review and approval in accordance with the Brunswick Zoning Ordinance.
2. Patio reduced to eight feet wide and site plan revised to show revised patio, septic tank and pump station.
3. Prior to building permit, submit a NRPA permit to DEP
4. Prior to building permit, submit manufacturer's pervious paver installation information

Moved for approval by Rob Pontau, Jeff Hutchinson seconded. All in favor, none opposed – motion passed.

SL: Next steps?

JH: You've submitted some information, at this point you can meet with Carl – Julie can schedule a meeting for you. He'll look at 30%. All conditions go to Anna Breinich.

2. **Case # 15-037 Brunswick Landing Subdivision Lots 30 and 32 Amendment:** The Committee will review and provide comment to the Planning Board regarding a combined **Major Development Review** application, submitted by Sandy River II, Inc., dba Sandy River Company, to revise boundary lines for Lots 30 and 32 of the approved Brunswick Landing Subdivision Plan, Phase 1. **Located in BNAS Reuse Zoning District Reuse-Residential (RR); Assessor's Map 40, Lots 50 & 82.**

Present for applicant/comments from the applicant: Will Conway, Sebago Technics and Bob Rocheleau, MRRA.

WC: Landry French is the construction manager, plan to start in October. Need nine acres for Avita Project. The proposed change will result in 9.3 acres on Lot 32 and Lot 30 would retain 9.4 acres. Avita owners agreed to easement for access (recommended by Planning Board) and signage to Lot 30. There is also a sewer easement.

BR: Want to make sure we are all on board with the lot lines moving - MRRA still owns the property. Steve Levesque has been away and will check with him on this.

Staff comments/questions of applicant:

Jeff Hutchinson:

- Plan will have to be re-recorded after amendment approved by Planning Board.

3. **Case # 15-020 Brunswick Landing Subdivision, Phase 2:** The Committee will review and provide comment to the Planning Board regarding a **Final Plan Major Development Review** application submitted by the Midcoast Regional Redevelopment Authority for the proposed creation of eleven (11) new lots, a proposed private street to intersect with Orion Street, and associated improvements. The project is situated on 21.55 acres to the east of Orion Street, in the **BNAS Reuse District, within the Business & Technology Industries Land Use District (RBTI). Assessor's Map 40, Lots 55 & 81.**

Present for applicant/comments from the applicant: Jan Wiegman, Wright-Pierce and Bob Rocheleau, MRRA.

Staff comments/questions of applicant:

Anna Breinich:

- Sketch was for 7 lots but now 4 lots have been added for a total of 11 proposed lots because additional land was conveyed. Jan W: 9 acres already conveyed. FOST issued for lots 52; 3, 4 and 5. Entire site covered by purchase and sales agreement, all to be conveyed at some point. Nothing has changed with Commerce Drive. We mapped wetlands around ponds and have kept lots out of ponds. We put a lot line down wetland finger. Utilities are there. Porous pavement roadway to meet stormwater standards. Meet with DEP next week to answer questions they have about permit.

Jeff Hutchinson:

- What's on lot 55? Jan W: 2 Buildings and sewage pump structure.

- Lot 54? BR: Neptune galley, hobby shop on corner of 53.
- Lots seem to meet all space and bulk requirements.
- Jan W: Extended road to give access to 41 and 59. Did not want to put road to end if we'd never need it. Have temporary easement to turnaround. BR: Would look like the end of princess point with a possibility of connection in the future.

John Foster:

- We don't allow a public road turnaround to also be used for driveway lot access but this is a planned private road so we don't require the turnaround to be located beyond any lot driveway.
- AB: There are road standards. Jeff Emerson couldn't be here so we'll get his comments later. Interconnectivity will come up at planning board.
- Hydrant is located in a 3' drop off area at end of road. Do not think Fire Dept. will like this location.
- Shows swale at Lot 48. Development would have to deal with runoff, can't fill lot.

4. Case # 15-040 Bangor Savings Bank: The Committee will review and provide comment to the Planning Board regarding a combined **Major Development Review** application submitted by CJ Properties, Inc. for the construction of a new 3,400 square foot Bangor Savings Bank facility, including two drive-up windows, pocket park and parking lot. The project is located on a 19,641 square foot parcel at the NE corner of Maine and Mason Streets, in the **Town Center 1 (TC1) Zoning District and Village Review Overlay Zone. (Assessor's Map U14, Lots 163 and 165.**

Present for applicant/comments from the applicant: David Latulippe (DL), CJ Developers Inc., and Doug Reynolds (DR), Gorrill-Palmer

DL: Corner of Mason and Maine. Corner is too small of a lot without taking Blessings as well. Blessings finally agreed to sale due to condition of building. Have pocket park plans to be reviewed by Wallace Penfold - BSB will maintain. Proposing all new pavers in town ROW (at BSB cost). Effect on traffic is minimal. We do need "no parking" signs on Mason in right arrow area.

DR: Going from four curb cuts to one. Right turn drive through raised concrete island to provide space for dumpster. Will be able to provide one more parking spot on Maine. Placed building parallel to road – better visually. Directing runoff towards route 1 corridor through riprap slope. Utilities there, want natural gas but can't do this year.

DL: Side entrance visible from Maine St. Bike rack. Sidewalk access to pocket park. Solar awnings, hip roof, red brick to look like older buildings, fits in with adjacent roof lines. Met with members of downtown historic district and they are pleased with plan.

Staff comments/questions of applicant:

John Foster:

- Curb moving down. May have to get pulled back a bit - narrowing roadway. Have 12 ½' for each lane (25').
- Looked at site drainage and have no issue as proposed plan has less impervious area.
- ROW is minimal here. Town doesn't even own enough for sidewalk but BSB has agreed to provide easement for town sidewalk at intersection as shown on the plan. There are existing curb tip downs along Mason Street for discontinued driveways that need to be raised or replaced. DL: We'll replace. We want it to look nice.
- At driveways, provide a straight curb tip-down to roadway, no bullnose or radius curb across the sidewalk space.

Jared Woolston:

- Meet with BBPAC? DL: Sure, just say when. JW: Will send dates.

Jeff Hutchinson:

- How will dumpsters be accessed with a full lot? DG: It will be after hours.
- How about arrows on pavement at entrance in addition to parking lot arrows? DL: Sure.
- Road frontage? DR: 105' on Maine, 107' on Mason.
- How will folks coming from Federal know this bank? DL: Wall sign. Have monument sign on Maine St.

Peter Baecher:

- Possible tree in bump out before bridge. JF: That location won't work with our road crew.
- Will review landscape plan more but looks good. DL: It's a native plant combination.

Dick Rizzo:

- Not sure if Mason Street is designated a no parking zone in ordinance. Would need to go to Town Council to get approval on "no parking" signs. JF checked traffic ordinance and Mason Street is already in ordinance for no parking for entire length, both sides. Therefore, town can erect no parking signs now if deemed needed.

END

Julie Erdman

From: Jared Woolston
Sent: Friday, October 02, 2015 1:41 PM
To: Anna Breinich
Cc: Julie Erdman
Subject: FW: Hydrant at Brunswick Landing
Attachments: image001.gif; image002.gif; image003.gif; image004.gif; image005.gif; image006.gif

RE: revised hydrant location and fill extension.

From: Jeff Emerson
Sent: Wednesday, September 16, 2015 10:56 AM
To: Jared Woolston
Subject: Re: Hydrant at Brunswick Landing

New location was ok.

Sent from my Verizon Wireless 4G LTE DROID

Jared Woolston <jwoolston@brunswickme.org> wrote:

Jeff and/or Ken: Do you approve of the revised hydrant location and fill extension on Commerce Drive (Brunswick Landing Subdivision Phase II)? If not, I need to contact the applicant as soon as possible because the findings for the planning board need to be drafted by this Friday. I can provide more information if you need it. Thanks for your time!

From: Jared Woolston
Sent: Friday, September 11, 2015 9:45 AM
To: Jeff Emerson
Subject: FW: Hydrant at Brunswick Landing

FYI

From: Jan Wiegman [<mailto:jan.wiegman@wright-pierce.com>]
Sent: Friday, September 11, 2015 9:41 AM
To: Jared Woolston
Cc: Robert J Rocheleau (bohr@mrra.us)
Subject: Hydrant at Brunswick Landing

Jared,

Here is a detail of the end of the road with the revised grading to accommodate the hydrant. Let me know if you have any other questions.

Jan

an Wieg an ro ect anager

99 Main Street | Topsham, ME 04086
ice 207.725.8721 | Direct 207.319.1520 | ell 207.576.0282

August 20, 2015
W-P Project No. 12218D

Ms. Anna Breinich
Director of Planning and Development
Department of Planning and Development
85 Union Street
Brunswick, ME 04011

Subject: Major Development Review, Final Plan Application
Brunswick Landing Subdivision - Phase II

Dear Ms. Breinich:

On behalf of the Midcoast Regional Redevelopment Authority (MRRA), we are pleased to submit the final application for Brunswick Landing Subdivision - Phase II. The Phase II portion of the Brunswick Landing Subdivision includes approximately 21.55 acres of the overall Brunswick Landing site. The area included in Phase II is comprised of three contiguous parcels that have transferred to MRRA from the USA, three buildings and land that are included in a recent Finding Of Suitability to Transfer (FOST) and additional land that is included in the purchase and sale agreement between MRRA and USA as noted on the subdivision plan. This Phase II area is located southerly of the Brunswick Landing Subdivision - Phase I.

The existing site is occupied by six separate buildings with associated paved parking areas, and by undeveloped grassland and woods. The proposed subdivision layout follows the approach taken in developing Phase I in that, where possible, subdivision lot boundaries are defined around existing buildings and other lot features. Phase II is made up of lots and a proposed roadway, with six of the lots each including an existing building and parking areas, and five lots currently being undeveloped.

The proposed roadway, to be named Commerce Drive, will be constructed by the applicant and is the only construction activity proposed as part of this subdivision application. Construction of the roadway will require obtaining a Minor Revision Permit to the existing Maine Department of Environmental Protection (“DEP”) Site Location of Development Permit. The application for Minor Revision has been submitted to the DEP.

In connection with this Final Plan Application, MRRA is requesting a waiver of the following items:

1. *Lot Monumentation*: As with the Phase I application, we are requesting a waiver to defer the lot monumentation until prior to the sale of the lot. This will ensure that the lots are monumented upon their sale and the expense to monument can be deferred until that time.
2. *Profiles and cross sections and curve radii of existing streets*: The existing streets are proposed to remain as private roads that will be maintained by MRRA.
3. *Profiles of existing underground utilities*. The existing sewer profile is shown on the roadway plan. The existing water and electrical line profiles are not shown as the buried depth is not known.



4. *A Class A (high intensity) Soil Survey prepared in accordance with the standards of the Maine Association of Professional Soil Scientists:* As the proposed development will be connected to the existing Brunswick Landing water and sewer system and will not use private wells or subsurface sewage disposal systems, the applicant proposes to submit a soils map prepared as part of the closure of the BNAS.

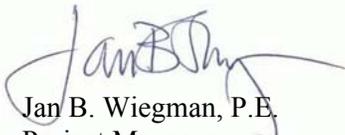
5. *Location of all existing trees over 10 inches in diameter, locations of tree stands and a plan showing all trees to be removed as a result of the development proposal:* Construction of Commerce Drive will require the removal of trees along the easterly 25% of its length. The limits of the proposed clearing are shown on the accompanying Erosion and Sedimentation Control Plan of Commerce Drive by the line labelled "Limit of Work".

The subdivision plan is a key step in the continuing effort at redevelopment of the base and will allow for land negotiations and marketing efforts. The redevelopment of the base will provide an economic benefit to the region.

Please review the materials and let me know if you have any questions.

Very truly yours,

WRIGHT-PIERCE



Jan B. Wiegman, P.E.
Project Manager

JBW/
Enclosure

cc: Steve Levesque - MRRA

**BRUNSWICK LANDING SUBDIVISION
PHASE II**

**TOWN OF BRUNSWICK
MAJOR DEVELOPMENT REVIEW
FINAL PLAN APPLICATION**

**for the
MIDCOAST REGIONAL REDEVELOPMENT
AUTHORITY**

AUGUST 2015

**MAJOR DEVELOPMENT REVIEW
FINAL PLAN APPLICATION
BRUNSWICK LANDING SUBDIVISION - PHASE II**

1. Project Name: Brunswick Landing Subdivision - Phase II

2. Project Applicant

Name: Midcoast Regional Redevelopment Authority
 Address: 15 Terminal Road, Suite 200
Brunswick, ME 04011
 Phone Number: (207) 798-6512

3. Authorized Representative

Name: Wright-Pierce
 Address: 99 Main Street
Topsham, ME 04086
 Phone Number: (207) 725-8721

4. List of Design Consultants. Indicate the registration number, address and phone number of any engineer, surveyor, architect, landscape architect or planner used:

1. Wright-Pierce - Jan B. Wiegman, P.E. #5852
2. Wright-Pierce - Robert Clunie Jr., PLS #1213
3. _____

5. Physical location of property being affected: Brunswick Landing - Easterly of Orion Street

6. Lot Size: 21.55 acres

7. Zoning District: BNAS Reuse District - Proposed Business & Technology Industries Zone

8. Indicate the interest of the applicant in the property and abutting property. For example, is the applicant the owner of the property and abutting property? If not, who owns the property subject to this application? The applicant holds fee title to a portion of the land involved in this Phase II of the Brunswick Landing Subdivision with the remaining land and buildings owned by the USA but subject to the Purchase & Sale Agreement. Abutting land is owned by the USA and the future transfer of abutting land from the USA to the applicant is covered under an existing agreement with the US Navy.

0, 29, 201, 221, 226

9. Assessor's Tax Map 40 Lot Number 81 & 55 of subject property.

10. Brief description of proposed use: Proposed Phase II to Brunswick Landing
Subdivision by the addition of 11 proposed lots and an associated access road on the easterly side of Orion Street. The proposed lots will be created as part of the applicant's efforts at re-development of the BNAS property into private development projects.

11. Describe specific physical improvements to be done: Development of eight of the eleven lots as proposed will require the construction of a 650 foot-long access roadway (Commerce Drive) leading easterly from Orion Street. The development of Commerce Drive will include the extension of existing utilities, as required, and the construction of stormwater treatment BMPs.

Owner Signature: X Steven W. Seresgue

Applicant Signature (if different): _____

Required Attachments (by Applicant):

- Final Plan Check List
- Final Plan Requirements for Open Space Developments (if applicable)
- Request for Waivers (if applicable)
- Required Copies of Final Plan

Required Attachment (by Planning and Development Department):

- Listing of all owners of property within 200-foot radius of property under review.

FINAL PLAN REQUIREMENTS

Key: “O” = omit; “S”=submit; “NA”=not applicable; “W” = waiver P=pending

Item	O	S	NA	W	P	Comments
Name of Development						
Scale, date, north point, area, number of lots (if subdivision)						
Boundaries of all lots and tracts with accurate distances and bearings, locations of all permanent monuments property identified as existing or proposed.						
Certification by a professional land surveyor that the land has been surveyed and the boundaries established in accordance with the State of Maine Board of Licensure for Professional Surveyors standards for Category 1 (Standard Boundary Survey), conditions 1, 2, or 3.						
Existing zoning district and overlay designation.						
Names of engineer and surveyor; and professional registration numbers of those who prepared the plan.						
Names of current owner(s) of subject parcel and abutting parcels.						
Name, location, width of paving and rights-of-way, profile, cross-section dimensions, curve radii of existing and proposed streets; profiles of center-lines of proposed streets, at a horizontal scale of 1" equals 50' and vertical scale of 1 inch equals 5 feet, with all elevations referred to in U.S.G.S. datum.						
A general road plan noting circulation, direction, traffic control devices, street lighting and type of lighting proposed.						
Existing and proposed easements associated with the development.						
Kind, location, profile and cross-section of all proposed drainage facilities, both within the development and outside of it, and a storm-water management plan which includes the submission requirements listed in the storm-water management checklist available in the Planning Department.						
Location of features, natural and artificial, such as water bodies, wetlands, streams, vegetation, railroads, ditches and buildings.						

Location of existing and proposed utilities; water, sewer, electrical lines, and profiles of underground facilities. Tentative locations of any private wells.					
Existing and proposed location, size, profile and cross section of sanitary sewers; description, plan and location of other means of sewage disposal with evidence of soil suitability.					
Topography with counter intervals of not more than 2 feet.					
A Class A (high intensity) Soil Survey prepared in accordance with the standards of the Maine Association of Professional Soil Scientists.					
Location of all existing trees over 10 inches in diameter, locations of tree stands, and a plan showing all trees to removed as a result of the development proposal.					
Lighting plan showing details of all proposed lighting and the location of that lighting in relation to the site.					
Existing locations and proposed locations, widths and profiles of sidewalks.					
Location map.					
Approximate locations and dimensions of proposed parking areas.					
Proposed ownership and approximate location and dimensions of open spaces for conservation and recreation.					
Grading, erosion control, and landscaping plan; proposed finished grades, slopes, swells, and ground cover or other means of stabilization.					
Reference to special conditions stipulated by the Planning Board, with conditions either set forth in full or on the plan or identified as specific documents filed with the Board.					
A wetlands map drawn by a specialist delineating wetland boundaries in accordance with the methods prescribed by the US Army Corps of Engineers.					
Dedicated public open specs, areas protected by conservation easements, and existing and proposed open spaces or recreation areas.					

For Open Space Development, a note indicating the total permitted lot count of the entire land tract based upon the destiny standards in this Ordinance, the number of lots created by the Plan, and the number of lots permitted to be subdivided in the future, as well as a table showing setback requirements and impervious surface coverage limits for each lot.						
Building envelopes showing acceptable locations for principal and accessory structures.						

FINAL PLAN/SUPPORTING DOCUMENTS

Key: "O" = omit; "S"=submit; "NA"=not applicable; "W" = waiver P=pending

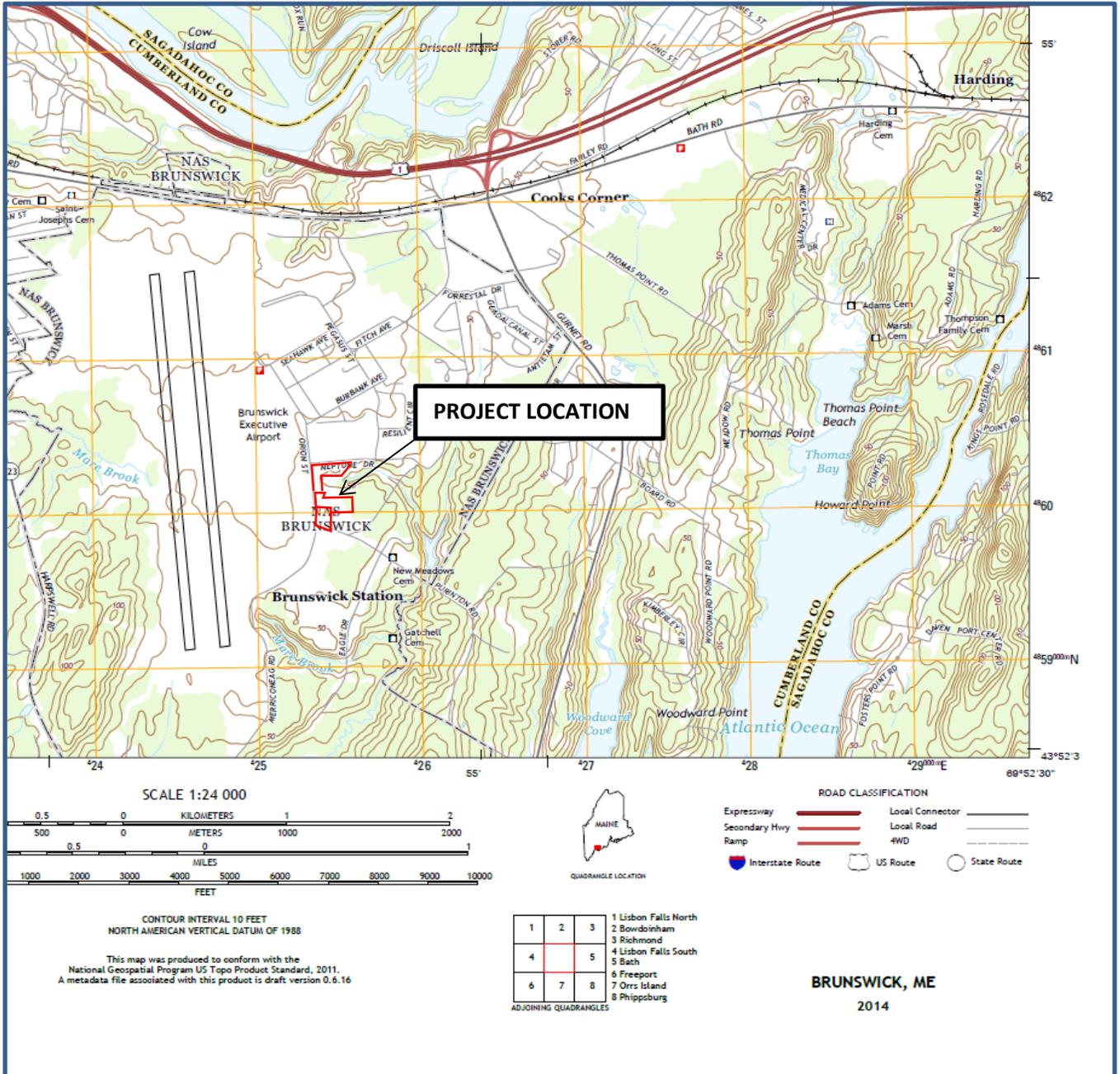
Item	O	S	NA	W	P	Comments
Documentation of Ownership or contract.						
Drafts of legal documents appropriate to the application, including: deeds, easements, conservation easements, deed restrictions or covenants, home/property owners association declarations and by-laws, and such other agreements or documents as are necessary to show the manner in which conservation land will be owned, maintained, and protected.						
Draft performance guarantee or conditional agreement.						
Disclosure of any required permits from the Department of Environmental Protection, Marine Resources, US Army Corps of Engineers, Department of Inland Fisheries and Wildlife, or other agencies, as applicable; or, if a permit has already been granted, a copy of that permit.						
Any additional studies required by the Planning Board, which are deemed necessary in accordance with this Ordinance.						
Storm water management program for the proposed project prepared by a professional engineer.						
A storm water management checklist prepared by the Cumberland County Soil and Water Conservation District made available at the Brunswick Department of Planning and Development.						

An erosion and sedimentation control checklist prepared by the Cumberland County Soil and Water Conservation District.						
A statement from the Brunswick-Topsham Water District of conditions under which water will be provided.						
A statement from the Brunswick-Topsham Water District of its review and comments on the proposed use if the project involves development within the Aquifer Protection Zone.						
A Statement from the Fire Chief recommending the number, size, and location of hydrants, available pressure levels, road layout and street and project name, and any other fire protection measures to be taken.						
A statement from the Superintendent of the Brunswick Sewer District of the conditions under which the Sewer District will provide sewerage disposal service and approval of the sanitary sewers proposed within the development.						
Where a septic system is to be used, evidence of soil suitability.						
All applicable materials necessary for the reviewing entity to review the proposal in accordance with the Criteria of Section 411.						
A plan of all buildings with new construction or expansion of an existing facility, including type, size, and footprint, floor layout, setback, elevation of first floor slab, storage, and loading areas.						
An elevation view of all sides of each building proposed indicating height, color, bulk, surface treatment, and signage.						
A circulation plan describing all pedestrian and vehicle traffic flow on surrounding road systems.						
The size and proposed location of water supply and sewage disposal systems.						
A site landscaping plan indicating grade change, vegetation to be preserved, new plantings used to stabilize areas of cut and fill, screening, the size, location and purpose and type of vegetation.						

BRUNSWICK LANDING SUBDIVISION – PHASE II

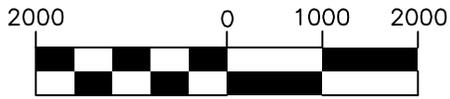
Midcoast Regional Redevelopment Authority
 Brunswick Landing
 Brunswick, Maine

LOCATION MAP





GRAPHIC SCALE



(IN FEET)
1 inch = 2000 ft.

LOCATION PLAN BRUNSWICK LANDING SUBDIVISION – PHASE II BRUNSWICK, MAINE			
PROJ NO:	12218D	DATE: JUNE 2015	FIGURE:
WRIGHT-PIERCE 			1
Engineering a Better Environment			

**TOWN OF BRUNSWICK
FINAL SITE PLAN REVIEW APPLICATION**

Development Description

**Brunswick Landing Subdivision – Phase II
Midcoast Regional Redevelopment Authority
Brunswick Landing, Brunswick, Maine**

The project site is part of the facility formerly known as the Brunswick Naval Air Station (BNAS) now referred to as Brunswick Landing. The BNAS had been in operation since 1942 and since its closure in 2011 as a military installation, the Midcoast Regional Redevelopment Authority (MRRRA) has acquired and is continuing to acquire land within the former BNAS from the United States of America under a Purchase and Sales Agreement. MRRRA's goal with the acquisition of the land is to facilitate the redevelopment of the property into private projects which will provide economic benefit for the region.

A significant planning effort has gone into the closure of the base and the impacts associated with the closure and redevelopment. A report was prepared for the base closure entitled Final Environmental Impact Statement for the Disposal and Reuse of Naval Air Station Brunswick, Maine, dated November 2010, published by the U.S. Department of the Navy, (EIS). This application utilizes information from the EIS as supporting information. Following is a link to the full EIS:

<http://www.bracpmo.navy.mil/BrunswickFinalEIS.aspx>

The proposed project is located in the Brunswick Naval Air Station Reuse District, and as such, is subject to the provisions of "Appendix III: BNAS Reuse District" of the Town's Zoning Ordinance. As stated in "Section A-III.1, Purpose of the BNAS Reuse District" of Appendix III, *The purpose of the BNAS Reuse District is to provide for the reuse, redevelopment, and development of the portion of the former Brunswick Naval Area Station (BNAS) that is designated for development and active use in the adopted BNAS Reuse Master Plan in accordance with the land use district designations set forth in the Reuse Master Plan. The Reuse District includes provisions for the expedited review of development proposals to encourage the timely reuse of this facility.*

The development project proposed in this application includes the creation of an eleven-lot commercial subdivision, to be known as "Brunswick Landing Subdivision – Phase II", and the construction of an approximately 650-foot long, 26-foot wide private commercial roadway to be known as Commerce Drive that is intended to provide access to eight lots in the proposed subdivision. Development of the roadway will include the installation of associated stormwater quality and quantity control best management practices and the extension of existing utilities. The proposed Phase II subdivision is an extension of the existing and previously-approved fifty-lot Brunswick Landing Subdivision – Phase I.

Six of the eleven subdivision lots have been configured around seven existing buildings and the associated paved parking and maneuvering areas. Although this configuration causes the

improvements to be in non-compliance with certain minimum setback requirements of the BNAS Reuse District, said improvements are not to be considered non-conforming as provided for in “Section A-III.4.1, Non-Conformity (Section 304)” of the Zoning Ordinance.

Individual land development projects that include construction activities at Brunswick Landing, such as the construction of Commerce Drive proposed herein, constitute changes or revisions to existing Maine Department of Environmental Protection (MDEP) Site Location of Development Act (SLODA) permits originally granted to the United States Government (USA) for development projects at the then BNAS. Review by the MDEP under the SLODA is limited to the road construction portion of the project proposed herein and MDEP will not be involved in a review of the overall subdivision. The Town of Brunswick (Town) as provided for in the Town’s Zoning Ordinance will be reviewing both the road construction proposal and the subdivision. The applicant has submitted the appropriate application to the MDEP in July and is awaiting approval.

Commerce Drive will be constructed within the first 650 feet of the approximately 825-foot long right of way which extends to the easterly boundary of the applicant’s current ownership. Commerce Drive may be extended through the remaining portion of the right of way in the future if and when the applicant gains ownership of the abutting land to the east and if development of that land is warranted. The applicant will, at that point, apply for the appropriate State and Local permits to extend the roadway.

Commerce Drive will be designed and constructed in conformance with the Town of Brunswick’s standards for new private commercial streets located at the former BNAS as provided for in Appendix III: BNAS Reuse District of the Brunswick Zoning Ordinance.

The 50,128-square foot right of way parcel established for the location of Commerce Drive and the 3,600-square foot portion of proposed Lot 49 to be used as a temporary turnaround, currently consist of:

- 500 square feet of existing bituminous pavement;
- 13,023 square feet of existing woods; and
- 40,205 square feet of grass land, for a total area of
- 53,728 square feet.

Development of the roadway project as proposed will result in:

- 20,930 square feet of new porous pavement w/shoulders, installed;
- 10,257 square feet of retained woods;
- 224 square feet of Infiltration Trench, installed; and
- 22,317 square feet of grass, installed, for a total area of
- 53,728 square feet.

With the development of Commerce Drive, two driveway access connections from the roadway to the proposed subdivision lots will be made, and an existing paved driveway and portions of existing paved parking areas situated on land of the applicant adjacent to the roadway will be removed and converted to lawn.

As part of meeting the application requirements of both the SLODA and the Town's Major Development standards, the roadway portion of this project will need to meet the Urban Impaired Stream Standards, MDEP's Basic Standards, General Standards and Flooding Standards:

- The Urban Impaired Stream Submissions are included in Appendix A;
- The Stormwater Management Plan is attached as part of Appendix D (General and Flooding Standards).
- The Inspection, Maintenance & Housekeeping Plan for this project is attached as Appendix E (Basic Standards); and
- The Erosion and Sedimentation Control Plan for this project is attached as Appendix G (Basic Standards).

**TOWN OF BRUNSWICK
FINAL SITE PLAN REVIEW APPLICATION**

Other Permits

**Brunswick Landing Subdivision – Phase II
Midcoast Regional Redevelopment Authority
Brunswick Landing, Brunswick, Maine**

MRRA has received a letter from the Maine Department of Environmental Protection (DEP) regarding the applicability of the Site Location permitting for the Phase I Subdivision of Brunswick Landing. The letter specifically cites the exemption in Title 38 MSRA Section 488 (15): exemption for former military bases. The Site Law exemption indicates that development at the time of ownership change from the military to the local development authority is exempt from review.

If improvements are made, such as additional roads or expansion of developed area, an Amendment or Minor Revision to the base's Site Location Permit will be necessary. This provision also applies to the developers of lots within the Brunswick Landing Subdivision, if changes to the site are proposed, the developer will be required to make an application for an amendment to the Site Location Permit for the facility.

This subdivision project proposal includes construction of the access roadway, Commerce Drive, and, according to communications with DEP staff, the project will require submission of a Minor Revision application to the base's Site Location Permit which will apply only to the road construction aspects of the project. This application was filed with the MDEP in July.

**TOWN OF BRUNSWICK
FINAL SITE PLAN REVIEW APPLICATION**

Section 411 - Standards

**Brunswick Landing Subdivision – Phase II
Midcoast Regional Redevelopment Authority
Brunswick Landing
Brunswick, Maine**

411.1 Ordinance Provisions

The proposed development complies with all applicable provisions and requirements of the Ordinance.

The proposed project is located in the Brunswick Naval Air Station Reuse District. As stated in Section A-III.1, Purpose of the BNAS Reuse District”, of “Appendix III: BNAS Reuse District” of the Town’s Zoning Ordinance, *The purpose of the BNAS Reuse District is to provide for the reuse, redevelopment, and development of the portion of the former Brunswick Naval Area Station (BNAS) that is designated for development and active use in the adopted BNAS Reuse Master Plan in accordance with the land use district designations set forth in the Reuse Master Plan. The Reuse District includes provisions for the expedited review of development proposals to encourage the timely reuse of this facility.*

- A. The proposed subdivision plan meets the Town’s zoning requirements for use, density and dimensional requirements for the R-B&TI Zoning District of the BNAS Reuse District. A Setback Dimension Table can be found on Drawing 1 of 2 of the accompanying subdivision plans and the applicable setback lines are delineated on Drawing 2 of 2.
- B. The proposed subdivision meets the Town’s requirements as listed in “Chapter A-III.4 Applicability of Chapter Three: Specific Dimensional Standards and Use to the BNAS Reuse District” of the Town’s Zoning Ordinance. The subdivision lots with existing buildings are covered by the provisions of “Section A-III.4.1 Non-Conformity (Section 304)”.
- C. There are no conditions of a Special Permit, Zoning Variance, or Special Exception connected to this subdivision.
- D. The proposed subdivision is not an Open Space Development.

411.2 Preservation of Natural Features

The proposed development maximizes the preservation of natural features of the landscape, and does not occur within or cause harm to any land which is not suitable for development. Specifically:

- A. Section 211 (Natural Resource Protection Zone)(“NRPZ”): The only NRPZ in the vicinity of the subdivision is the NRPZ connected with “Stormwater Pond A”, “Stormwater Pond B” and a drainageway leading from Neptune Drive to “Stormwater Pond B”. The pond and adjacent wetland were mapped by PEC in August 2015. The boundaries of the subdivision encroach into the limits of that NRPZ as they are depicted on the accompanying Phase II Subdivision Plan. The actual limits of the NRPZ are field-verified based on the wetland mapping.

In order to ensure that the proposed project would not impact any on-site wetlands, the applicant engaged Michael Thompson, M.Sc., CWB, PWS, of Penobscot Environmental Consulting, Inc., Camden, Maine,

to investigate the site. According to his findings presented in his Wetland Delineation Report (“Wetlands Report”) submitted to Wright-Pierce, he found and delineated a small 2,130 square-foot forested wetland with a minor shrub inclusion straddling the southerly boundary of the applicant’s property approximately 150 feet southerly of the proposed roadway on proposed Lot 50. Approximately 1,040 square feet of the wetland is located on the applicant’s property but will not be directly impacted by the proposed construction of Commerce Drive.

The Wetlands Report is included in Appendix B.

- B. Section 501 (Natural Features & Net Site Area): The proposed subdivision does not disturb significant natural features at or near the site. See documentation in “Section 411.10 Aesthetic, Cultural and Natural Values”, of this Section.
- C. Section 502 (Flood Hazard Areas): The project is not located in or near a FEMA-determined Flood Hazard Area. (See documentation in “Section 411.4, Flood Hazard”, below.)
- D. Section 503 (Steep Slopes): The project is not located in an area of steep slopes.

411.3 Surface Waters, Wetlands and Marine Resources

The proposed development will not adversely affect any water body or its shoreline when the property is located in part or in whole in the water body's watershed. The proposed development will not adversely affect the water quality of Casco Bay or its estuaries.

- A. The impact of water discharges on the water quality of Casco Bay and estuaries: The only construction activities proposed in conjunction with this proposal is the construction of Commerce Drive, the proposed access road to the subdivision. The project is located in the Mare Brook Watershed, a tributary of Casco Bay, and Mare Brook is considered by the State to be an Urban Impaired Stream. Proposed construction activities in the watershed need to meet the State’s Urban Impaired Stream Standards as well as the State’s Site Location of Development Water Quality and Water Quantity Standards. The stormwater from the development of Commerce Drive will be treated in accordance with the applicable standards and the treatment will mitigate site impacts to the downstream water resources.

Reference is made to “Section 411.3A, Urban Impaired Stream Submissions” included as Appendix A and “Section 411.5, Stormwater Management” included as Appendix D of this application.

- B. Section 211 (Natural Resource Protection Zone)(“NRPZ”): (see “Section 411.2.A, Preservation of Natural Features”).
- C. Section 209 (Coastal Protection): The proposed project is not located within a Coastal Protection Zone.
- D. Section 504 (Storm Water Management): (see “Section 411.5, Stormwater Management”).
- E. Section 505 (Groundwater): (see “Section 411.6, Groundwater”).
- F. Section 506 (Erosion and Sedimentation): (see “Section 411.7, Erosion Control”).
- G. Section 507 (Sewage Disposal): (see “Section 411.8, Sewage Disposal”).

411.4 Flood Hazard

The proposed development activity is not located within a 100-year flood hazard area as depicted on the flood map included with this application as Appendix C.

411.5 Stormwater Management

The proposed development shall satisfy the recommended storm water quality standards described in Storm Water Management for Maine: Best Management Practices, published by the State of Maine Department of Environmental Protection, November, 1995 as amended.

- A. Section 209 (Coastal Protection): The proposed project is not located within a Coastal Protection Zone.
- B. Section 503 (Steep Slopes): The project is not located in an area of steep slopes.
- C. Section 504 (Storm Water Management): The stormwater management plan (“SWMP”) connected with the development of Commerce Drive includes the quality and quantity treatment of the stormwater from the developed portion of the site in accordance with the Maine Stormwater Management Law. Developers of individual lots of the subdivision will be required to develop a SWMP specific to the proposed development in conjunction with obtaining the required Town and State permits.

The Stormwater Management Plan is attached as part of Appendix D.

The Inspection, Maintenance & Housekeeping Plan for this project is attached as Appendix E.

411.6 Groundwater

The proposed development will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water.

- A. Section 210 (Aquifer Protection Zone): According to the Town GIS, the project is not located within an Aquifer Protection Zone.

Attached as Appendix F, are Aquifer Location Maps, a Bedrock Geology Map and a Surficial Geology Map for the project area.

- B. Section 504 (Storm Water Management): The proposed project should not adversely impact groundwater quantity or quality. As presented in “Section 411.5 Stormwater Management” above, which addresses stormwater runoff from the portion of the site subject to construction activities connected with Commerce Drive, stormwater will be treated prior to being infiltrated into the underlying soils. (see “Section 411.5, Stormwater Management”). Developers of individual lots of the subdivision will be required to develop a SWMP specific to the proposed development in conjunction with obtaining the required Town and State permits.
- C. Section 505 (Groundwater Pollution): No groundwater will be used, discharged or otherwise extracted by this development. There will be no sources of potential contamination including hazardous materials, fuel, solvents or other chemicals handled, stored or disposed of on site. Dewatering activities during construction are not anticipated; however, if needed, the activities are the responsibility of the contractor conducting the work. Any dewatering will be directed to temporary sedimentation basins established as necessary on the construction site.
- D. Section 507 (Sewage Disposal): (see “Section 411.8, Sewage Disposal”).

411.7 Erosion Control

The proposed development will be constructed in accordance with Best Management Practices and will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy situation results.

- A. Section 503 (Steep Slopes): The project is not located in an area of steep slopes.

- B. Section 506 (Erosion and Sedimentation): A written Erosion and Sedimentation Control Plan (“E&S Control Plan”) for the construction and long term operation of Commerce Drive has been developed as part of the Maine DEP Site Location of Development Application for Minor Revision and is included with this application. The E&S Control Plan includes steps to be followed during construction of the site as well as recommendations for maintenance as a part of the ongoing upkeep of the site. Developers of individual lots in the subdivision will be required to develop an E&S Control Plan specific to the proposed development in conjunction with obtaining the required Town and State permits.

The Erosion and Sedimentation Control Plan for this project is attached as Appendix G.

411.8 Sewage Disposal

The proposed development can be served by municipal sewer, or where on-site disposal is proposed, the system is designed in accordance with all applicable local, state and federal requirements.

- A. Section 209 (Coastal Protection): The proposed project is not located within a Coastal Protection Zone.
- B. Section 507 (Sewage Disposal): The existing buildings within the proposed subdivision are currently served by the public sewer system infrastructure operated by MRRA and served by the Brunswick Sewer District (BSD). Future development on any of the subdivision lots will be connected to the existing sewage system.

A letter from the BSD indicating the ability to serve the project has been included with this application in Appendix H.

411.9 Water

The proposed development has a water source that is adequate to serve the proposed development, and that will have no adverse impact on existing water supplies.

- A. Section 210 (Aquifer Protection Zone): According to the Town GIS, the project is not located within an Aquifer Protection Zone. (See “Section 411.6, Groundwater”)
- B. Section 508 (Water Systems): The existing buildings within the proposed subdivision are currently served by the public water system infrastructure operated by MRRA and served by the Brunswick Topsham Water District (BTWD). Future development on any of the subdivision lots will be connected to the existing water system.

A letter indicating the BTWD’s ability to serve the project has been included with this application in Appendix H.

411.10 Aesthetic, Cultural and Natural Values

The proposed development will not have an undue adverse effect on the scenic or natural beauty of the area, historic sites, significant wildlife habitats identified by the Maine Department of Environmental Protection or by the Town of Brunswick, or rare and irreplaceable natural areas or any public rights for physical or visual access to the shoreline.

- A. Section 209 (Coastal Protection): The proposed project is not located within a Coastal Protection Zone.
- B. Section 211 (Natural Resource Protection Zone)(“NRPZ”): (see “Section 411.2.A, Preservation of Natural Features”).
- C. Section 216 (Village Review Zone): The proposed project is not located within the Village Review Zone.

- D. Section 501 (Preservation of Natural Features & Net Site Area): (see “Section 411.2 Preservation of Natural Features”).
- E. Section 503 (Steep Slopes): The project is not located in an area of steep slopes.
- F. Section 517 (Preservation of Historic Resources): The Phase II subdivision is located just easterly of the Brunswick Executive Airport facility in an area of commercial development and includes existing commercial structures on six of the proposed eleven subdivision lots. There are no areas of concern from a historical/archeological perspective as indicated by the attached letter and response to the MHPC inquiry.

In connection with previous projects undertaken at the BNAS in the vicinity of the current project, the applicants or the developers had contacted the Maine Department of Inland Fisheries and Wildlife (IF&W) requesting assistance in determining potential fisheries and wildlife habitat impacts that could result from the proposed developments. In response to a request from the developers of a nearby project which required an amendment to the existing BNAS Site Location of Development Permit, (see DEP #L-20116-26Z-A and DEP #L-20116-26-AE-C) Steve Walker, Acting Environmental Review Coordinator at IF&W, provided a letter dated October 19, 2012, in which he states that IF&W records indicate no occurrences of rare, threatened, or endangered animal species within the project area. He also states that the Department has not mapped any Essential or Significant Wildlife Habitats or Fisheries Habitats that would be directly impacted by the project. The area of that project reviewed by IF&W overlaps a portion of the area of the project proposed herein.

The Walker letter is included in Appendix I herein for reference.

The developers of the nearby project referenced above, also contacted the Maine Department of Conservation (MDOC), Maine Natural Areas Program requesting assistance in determining if the proposed project would adversely impact an unusual natural area. Attached is a letter from Don Cameron, Ecologist for the Maine Natural Areas Program, dated October 19, 2012, in response to the request in which he states that “*According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.*”

The response letter from MDOC is included in said Appendix I for reference.

The overall Brunswick Landing site was the subject of a historical review as part of the Environmental Impact Statement (“EIS”) that was conducted for the closing of the Naval Air Station Brunswick. The resulting Programmatic Agreement identified the culturally sensitive sites that were studied but did not make public the locations. We have reviewed the identified locations and found the closest to be approximately 300 feet from the closest subdivision lot corner. We sent a letter to the Maine Historic Preservation Commission (“HPC”) for an official determination if any further study is recommended and received a response that indicated no concern.

Our letter to the HPC dated June 19, 2015, and their response dated June 30, 2015, is included in said Appendix I.

411.11 Community Impact

Municipal resources are available to service the project, and that any on-site or off-site impacts associated with the development of the project will be mitigated.

- A. Section 509 (Community Features Impact Analysis): Proposed Commerce Drive will be a private way. The project will require minimal community resources that will essentially be limited to fire and police protection. The roadways and utilities (except for natural gas) within Brunswick Landing are operated and maintained by MRRA. The impact of the project on community resources will be minimal.

The interior road network and common facilities within the former BNAS and any necessary maintenance, repair and/or reconstruction of the road network and common facilities will be managed in accordance with the "Road and Common Facilities Maintenance Agreement" (CFMA) to be entered into by and between MRRA and owners of the lots within the subdivision. Reference is made to the CMFA dated July 26, 2013, recorded in CCRD in Book 30884, Page 170 and to three "joinders to (CMFA)", dated December 27, 2013, February 21, 2014 and March 6, 2014 recorded in CCRD in Book 31260, Page 142, Book 31363, Page 219 and Book 31437, Page 324 respectively.

If and when any of the roads within the interior road network of the Brunswick Landing Subdivision, Phase I and Phase II, are offered to and accepted by the town of Brunswick as town ways, the CFMA will be modified accordingly

The existing utilities distribution system and associated components of the former BNAS, including sanitary sewer, storm drainage, electrical, communications, water and natural gas, are not shown on the accompanying subdivision plan.

In connection with the construction of Commerce Drive, extensions or modifications to certain existing utilities distribution systems will be necessary. The extent of and location of any extensions or modifications of utilities required as part of the development of any subdivision lot will be determined on a case-by-case basis.

Where applicable, lots within the Phase II subdivision will be conveyed:

- subject to undefined utility easements for the locations of the existing utilities crossing said lots; and/or
- together with rights to connect to and use the existing utilities infrastructure.

With the exception of the natural gas system, the existing utilities distribution system and associated components and any necessary maintenance, repair and/or reconstruction of the utilities will be managed by MRRA and supported by user fees. The natural gas system will continue to be managed by Maine Natural Gas.

- B. Section 510 (Development Impact Fees): The project should not require municipal infrastructure and/or service systems improvements.

411.12 Traffic

The proposed development will not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed, and the traffic associated with the development shall maintain level of service within 200 feet of any existing or proposed curb-cut.

The existing internal street and road network ("Network") of Brunswick Landing will be used to provide access from Bath Road to the Subdivision. The Network will continue to be maintained privately and any necessary maintenance, repair and/or reconstruction of the streets within the Network will be managed by a Common Area Maintenance (CAM) agreement to be entered into by and between the applicant (MRRA) and owners of the lots within the Subdivision, both Phase I and Phase II.

(See “Section 411.11 Community Impact”, above.)

- A. Traffic: See the attached supporting information which was excerpted from the final Environmental Impact Statement (EIS) prepared by the Navy for the closing of BNAS and other studies that were conducted by MRRA as part of planning for future development on the site. Of the two alternatives presented in the EIS for possible overall development designs of the property, the development of Brunswick Landing is based on the design referred to in the EIS as Alternative 1, which is consistent with the Brunswick Naval Air Station Master Reuse Plan.

Excerpts from the traffic study section of the EIS that includes estimates of traffic at full build out of Alternate 1 and the improvements necessary to support the traffic are included herein as part of Appendix J of this application.

- B. Statements from the Fire Chief, Police Chief and Public Works Director evaluating the project for highway or public road congestion or safety.

Letters from the Fire Chief, Police Chief and Public Works Director are not included in this application. The three Departments were represented at the Staff Sketch Plan Review meeting where the project was presented as proposed herein.

- C. Section 509 (Community Facilities Impact Analysis): (see “Section 411.11”, above.)

- D. Section 510 (Development Impact Fees): (see “Section 411.11”, above.)

- E. Section 511 (Development of New Streets): The access to the proposed subdivision will be provided from Orion Street by new Commerce Drive a private drive which leads easterly from Orion Street. Commerce Drive has been designed in accordance with the applicable dimensional requirements for a private street located in the BNAS Reuse District as provided for in “Appendix III:BNAS Reuse District” of the Town of Brunswick Zoning Ordinance (“Zoning Ordinance”).

Reference is made to the project plans submitted with this application.

- F. Section 512 (Off Street Parking): Developers of individual lots within the subdivision shall be responsible for meeting the applicable off-street parking standards and requirements as provided for in the Zoning Ordinance.

- G. Section 513 (Curb Cuts and Highway Access): The existing entrance to the property being subdivided will be discontinued as part of the construction of Commerce Drive. Access from Orion Street to each of the seven subdivision lots will be via Commerce Drive. The nearest entrance to other facilities at Brunswick Landing is located approximately 245 feet along Orion Street from the proposed location of Commerce Drive, exceeding the minimum distance between curb cuts standard set forth in the Zoning Ordinance for the Orion Street speed limit of 25 mph by over 135 feet.

- H. Section 514 (Off Street Loading): Developers of individual lots within the subdivision shall be responsible for meeting the applicable off-street loading standards and requirements of the Zoning Ordinance.

411.13 Pedestrian and Bicycle Access and Safety

The proposal shall be designed to accommodate bicyclists and pedestrians, and shall address issues of bicycle and pedestrian access, safety and circulation both within the site and to points outside of the site.

- A. Section 511 (Development of New Streets): The access to the site will be wide enough to accommodate bicycles and pedestrians within proposed Commerce Drive. The traffic to the site will be very light and pedestrian vehicle conflicts are not anticipated.
- B. Section 512 (Off Street Parking): (see “Section 411.12” above.)
- C. Section 513 (Curb Cuts and Highway Access): (see Section 411.12” above.)
- D. Section 515 (Appearance Assessment): Because the anticipated uses within the proposed commercial subdivision will be compatible with the industrial/commercial uses existing on the site and adjacent to the site, and the fact that the project does not involve areas of special sensitivity or significance, the applicant believes that an “Appearance Assessment” should not be required by the Planning Board.
- E. Section 516 (Building Configuration): Developers of individual lots within the subdivision shall be responsible for meeting the applicable Building Configuration standards and requirements of the Zoning Ordinance.

411.14 Development Patterns

The proposed development shall be respectful of Brunswick's historic development patterns. In making this determination, the reviewing entity shall consider whether the proposed development is located within a rural or growth area. In addition, the reviewing entity shall consider whether proposed non-residential development will have an adverse impact on areas which are primarily residential.

In consideration of the fact that the proposed project is located at Brunswick Landing and because the anticipated uses within the proposed commercial subdivision will be compatible with the industrial/commercial uses existing on the site and adjacent to the site, the existing development pattern of the area will remain intact.

- A. Section 507 (Sewage Disposal): (see “Section 411.8, Sewage Disposal” above.)
- B. Section 511 (Development of New Streets): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- C. Section 512 (Off Street Parking): (see “Section 411.12, Traffic” above.)
- D. Section 515 (Appearance Assessment): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- E. Section 516 (Building Configuration)): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- F. Section 517 (Preservation of Historic Resources): (see “Section 411.10, Aesthetic, Cultural and Natural Values” above.)

411.15 Architectural Compatibility

The proposed development shall be compatible with its surroundings in terms of its size, scale, mass and design.

The existing buildings on six of the proposed subdivision lots were constructed as part of the BNAS facility and the buildings’ architecture is in keeping with the surrounding industrial appearance of adjacent structures. No building construction is proposed as part of this application. The architecture of

any buildings proposed for construction on any of the vacant subdivision lots will be subject to review by the Brunswick Planning Board in connection with development of the lot.

- A. Section 216 (Village Review Zone): The proposed project is not located within the Village Review Zone.
- B. Section 515 (Appearance Assessment): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- C. Section 516 (Building Configuration): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- D. Section 517 (Preservation of Historic Resources): (see “Section 411.10, Aesthetic, Cultural and Natural Values” above.)

411.16 Municipal Solid Waste

The proposed development will not cause an unreasonable burden on the municipality's ability to dispose of solid waste, if municipal services are to be utilized.

It is anticipated that the project will produce minimal operational solid waste. The developers of each individual subdivision lot will contract with a solid waste hauler for the trash generated at its particular facility.

- A. Section 509 (Community Features Impact Analysis): (see “Section 411.11, Community Impact” above.)
- B. Section 510 (Development Impact Fees): (see “Section 411.11, Community Impact” above.)

411.17 Recreational Needs

The proposed residential development will not cause an unreasonable burden on the municipality's ability to provide recreational services.

- A. Section 509 (Community Features Impact Analysis): (see “Section 411.11, Community Impact” above.)
- B. Section 519 (Recreation): The project is not a residential project so this requirement is not applicable to this commercial project.

411.18 Access for Person with Disabilities

The project complies with the Americans With Disabilities Act, in a manner which is compatible with Brunswick's historic architecture.

- A. Section 216 (Village Review Zone): The proposed project is not located within the Village Review Zone.
- B. Section 515 (Appearance Assessment): (see “Section 411.13, Pedestrian and Bicycle Access and Safety” above.)
- C. Section 517 (Preservation of Historic Resources): (see “Section 411.10, Aesthetic, Cultural and Natural Values” above.)
- D. Section 518 (Access for Persons With Disabilities): The site and buildings will be accessible to the extent required. Required access to future buildings will be provided by the developer of those buildings at the time of construction.

411.19 Financial Capacity and Maintenance

The developer has adequate financial and technical capacity to complete the project, and that once it is completed, the project is expected to have adequate resources to maintain itself.

- A. Section 520 (Fiscal Capacity): The project will be funded by MRRA through their capital improvement budget.
- B. Section 521 (Performance Guarantee): Construction of Commerce Drive may not take place immediately and the applicant proposes to provide the Performance Guarantee prior to the commencement of construction.
- C. Section 522 (Home/Property Owner's Associations): The proposed Commerce Drive and the associated utilities (with the exception of natural gas, which will continue to be operated and maintained by Maine Natural Gas), as is the case with the other roads within the BNAS complex, will be operated and maintained by MRRA. There is a road maintenance agreement for all the private roads at Brunswick Landing that are maintained by MRRA. Commerce Drive will be included in the road maintenance agreement.

(See "Section 411.11, Community Impact" and "Section 411.12, Traffic", above.)

- D. Section 523 (Protected Open Space): There are no Protected Open Space provisions proposed by this project.

411.20 Noise and Dust

The proposed development will not contribute to unreasonable noise and dust, both during construction and after the development has been completed.

- A. Section 524 (Noise and Dust): Construction activities will be conducted in conformance with the applicable standards set forth in "Section 524, Noise and Dust", of the Zoning Ordinance.

The commercial developments existing at the site have and it is anticipated that those developments that will occupy the subdivision lots will most likely have a low noise profile. The construction aspect of the current project involves only the new access roadway to serve the subdivision which is located in an area of similar uses and will produce little or no noise. The project is located just easterly of the Brunswick Executive Airport facility, and the closest residential use is over 2,000 feet away.

The facility will not generate dust during operation. Minimal dust generation is anticipated during construction which will be minimized as addressed in the Erosion and Sedimentation Control Plan, included with this application in Appendix F.

411.21 Finding of Right, Title and Interest

The applicant has sufficient right, title and interest in the subject property.

The project site is a portion of property owned by the Midcoast Regional Redevelopment Authority (MRRA), see the following reference deeds dated and recorded in Cumberland County Registry of Deeds:

- dated March 28, 2011, recorded in Book 28607, Page 1 (204 pages), Airport parcel;
- dated September 30, 2011, recorded in Book 29004, Page 173 (133 pages), Sewage Pump House utility easement;
- dated September 20, 2012, recorded in Book 30069, Page 1 (185 pages), parcel EDC-47;
- dated March 5, 2014, recorded in Book 31376, Page 1 (268 pages), parcel EDC-27;
- dated September 29, 2014, recorded in Book 31836, Page 103 (156 pages), parcel EDC-12;

- dated _____, 2015, not yet recorded, parcels EDC-43A, EDC-43B, EDC-43C, EDC-43D, and EDC-49; and
- dated September 30, 2011, unrecorded “Agreement for the Purchase of Real Property between the USA and MRRA”.

The pertinent pages of the above deeds are included in the attached Appendix L.

411.23 Additional Design Review Guidelines in the BNAS and Conservation Districts

In addition to the development review requirements of this Chapter, activities in the BNAS Reuse District and BNAS Conservation District are subject to separate design guidelines established and administered by the Midcoast Regional Redevelopment Authority (MRRA). Conformance with the MRRA design guidelines is not subject to consideration as part of the development review process but all applications for development review must demonstrate that they have completed the MRRA design review process.

The site is within the BNAS Reuse District and future development on the subdivision lots will require approval from MRRA’s design review process.

411.24 Environmental Compliance in the BNAS Reuse and Conservation Districts

All land use controls in the BNAS Reuse District and BNAS Conservation Districts must be implemented and monitored in accordance with state and federal laws governing said Districts. All applications for development review must demonstrate that the proposal takes into account the actions necessary to comply with all state, federal and local institutional controls applicable to the property and that the uses are in conformity with any applicable environmental restrictions.

The site is within the BNAS Reuse District and ground disturbance activities at the site will require compliance with MRRA’s Soil Management Plan. The applicant is also filing a Site Location of Development, Minor Revision application concurrently with this application which requires that the project complies with environmental rules and regulations.

APPENDIX A

Section 411.3
Urban Impaired Stream Submission

APPENDIX A

Section 411.3A URBAN IMPAIRED STREAM SUBMISSION

Brunswick Landing Subdivision – Phase II Midcoast Regional Redevelopment Authority Brunswick Landing Brunswick, Maine

Urban Impaired Stream Submissions

The project is located within the Mare Brook/Harpswell Cove Watershed. According to “Appendix B, Urban Impaired Streams”, of Chapter 502: Direct Watersheds of Lakes Most at Risk from New Development, and Urban Impaired Streams, Mare Brook is an urban impaired stream and thus the proposed project is subject to the provisions of subsection “D. Urban Impaired Stream Standard” of “Section 4. Stormwater Standards” in Chapter 500, Stormwater Management (“Chapter 500”).

Development of the proposed roadway project, including limited off-site improvements, will result in the creation of 0.53 acres of non-roof impervious surfaces, and 0.49 acres of landscaped areas. It is worth noting that, although the proposed road will be “paved”, it will be paved with porous pavement, which will all but eliminate the prospect of precipitation falling on the road surface from creating any runoff. The precipitation will be allowed to infiltrate directly through the road surface into the stone storage areas and filter material below the road prior to being released into the underlying soils. The precipitation falling on the road surface will not run off and will not make its way directly to Mare Brook or its tributaries.

According to “Section 3, Mitigation through compensation fees or projects” in Chapter 501: Stormwater Management Compensation Fees and Mitigation Credit (“Chapter 501”), “...*compensation fees may only be used in watersheds where a compensation fee utilization plan developed by a municipality or other entity has been approved by the Department.*” As no such entity has been approved by the Department for the Mare Brook Watershed, the applicant proposes to meet the urban impaired stream standard by obtaining mitigation “credits” for treating and/or reducing on-site and off-site pre-development impervious stormwater sources in accordance with the provisions of said “Section 3” of Chapter 501.

As set forth in “Section 3 A(1), Compensation fees or mitigation credits used to meet the urban impaired stream standard” of Chapter 501, the total number of mitigation credits a project is required to obtain is determined by multiplying the number of developed project-acres of non-roof impervious area, roof impervious area and landscaped area by pre-determined required mitigation credit per-acre values for each category and then summing the total of required credits. This project will involve developed project-acres of non-roof impervious area and landscaped area. The required project mitigation credits per acre for each of the two surface

types were obtained from Table 1 given in “Section 3 A(1)” of Chapter 501. A modified version of Table 1 is presented as **Table A** below which calculates the number of Mitigation Credits this project requires:

TABLE A
Mitigation Credits Required Based on Project Development Type

Type of surface	Mitigation Credits Required (per acre*)	Acres of Surface	Mitigation Credits Required
Non-roof impervious area	0.5 credits	0.53**	0.26
Roof	0.2 credits	0	0
Landscaped area	0.1 credits	0.49	0.05
Totals	-	-	<u>0.31</u>

**Approximately 0.52 acres of non-roof impervious area of the project will consist of porous pavement.

To determine the amount of credits earned for the proposed project mitigation activities, the values given in Table 2 found in “Section 3 A(3)” of Chapter 501 are used. The amount of mitigation credits earned by the project for the proposed mitigation activities are calculated and summarized in the modified version of Table 2 presented below as **Table B**:

TABLE B
Mitigation Credits Based on Type of Activity and Type of Development

Mitigation Activity	Development type and (Proposed Mitigation)	Credit earned (per acre* treated)
Eliminate impervious source area, replace with landscaped area	Road or high use parking lot	1.5 credits/acre
	(Adjacent site – Remove High- Use paved driveway entrance-Install grass)	<u>0.06 acres * 1.5 = 0.09 credits</u>
	Medium use parking lot	1.2 credits/acre
	(Remote site – Remove paved Medium-Use parking areas-Install grass)	<u>0.16 acres*1.2 = 0.19 credits</u>
	Other parking lot	0.9 credits/acre
	(Adjacent site – Remove paved Other parking areas-Install grass)	<u>0.03 acres*0.9 = 0.03 credits</u>
	Total Credits Earned	= 0.31 credits
	Total Credits Required	= 0.31 credits

Table B shows that by removing existing impervious areas at the project site and at another parking area owned by the applicant in the Mere Brook watershed and replacing those areas with landscaping, the project achieves the required level of mitigation.

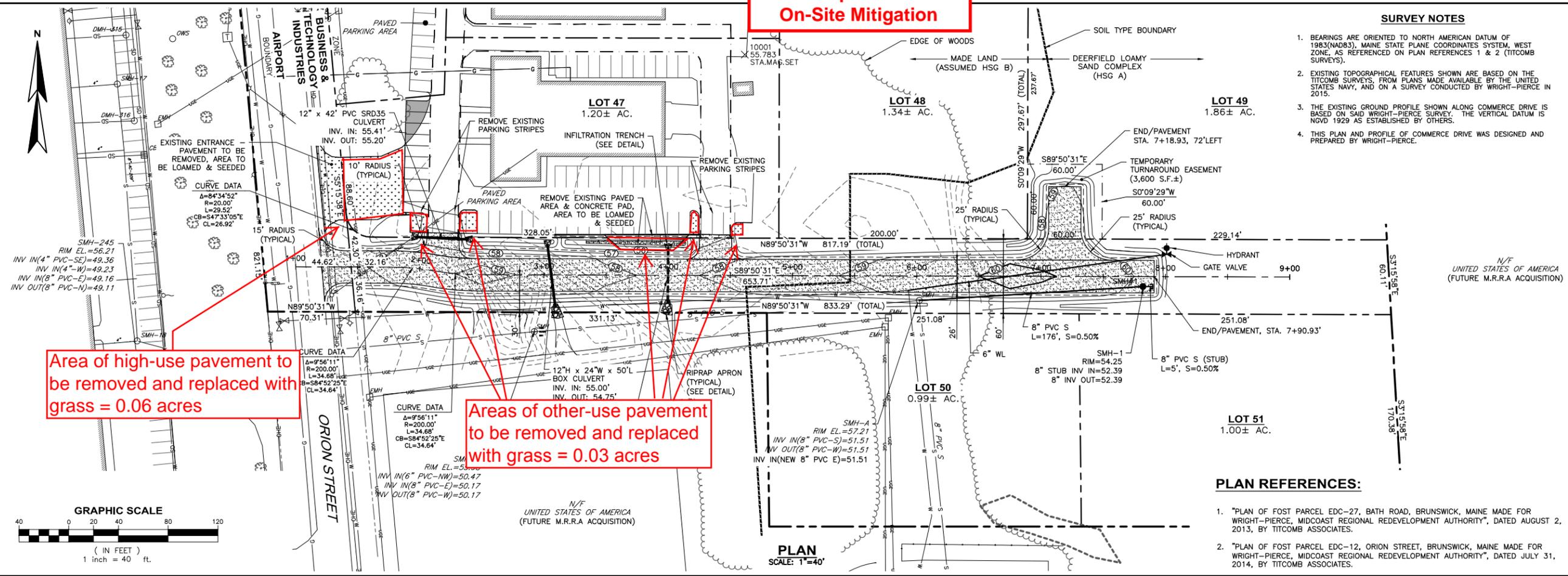
Reference is made to the existing conditions and proposed conditions site plans of the applicant’s off-site parking area, located on Burbank Avenue used herein for credit purposes, included herewith.

Reference is also made to the attached “Declarations of Covenants and Restrictions, Urban Impaired Stream Mitigation Areas” as it pertains to the herein proposed mitigation sites.

Urban Impaired Stream Mitigation Plans

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**Urban Impaired Stream
On-Site Mitigation**

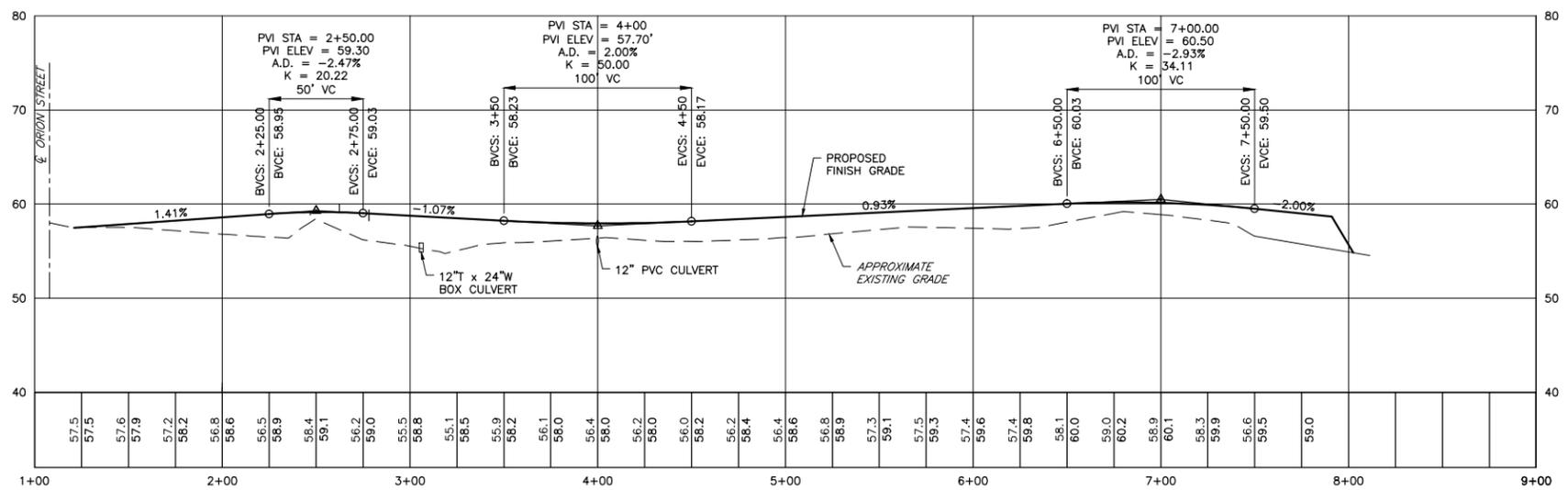
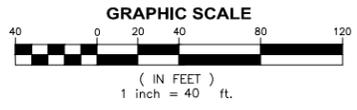


SURVEY NOTES

- BEARINGS ARE ORIENTED TO NORTH AMERICAN DATUM OF 1983(NAD83), MAINE STATE PLANE COORDINATES SYSTEM, WEST ZONE, AS REFERENCED ON PLAN REFERENCES 1 & 2 (TITCOMB SURVEYS).
- EXISTING TOPOGRAPHICAL FEATURES SHOWN ARE BASED ON THE TITCOMB SURVEYS, FROM PLANS MADE AVAILABLE BY THE UNITED STATES NAVY, AND ON A SURVEY CONDUCTED BY WRIGHT-PIERCE IN 2015.
- THE EXISTING GROUND PROFILE SHOWN ALONG COMMERCE DRIVE IS BASED ON SAID WRIGHT-PIERCE SURVEY. THE VERTICAL DATUM IS NGVD 1929 AS ESTABLISHED BY OTHERS.
- THIS PLAN AND PROFILE OF COMMERCE DRIVE WAS DESIGNED AND PREPARED BY WRIGHT-PIERCE.

PLAN REFERENCES:

- "PLAN OF FOST PARCEL EDC-27, BATH ROAD, BRUNSWICK, MAINE MADE FOR WRIGHT-PIERCE, MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY", DATED AUGUST 2, 2013, BY TITCOMB ASSOCIATES.
- "PLAN OF FOST PARCEL EDC-12, ORION STREET, BRUNSWICK, MAINE MADE FOR WRIGHT-PIERCE, MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY", DATED JULY 31, 2014, BY TITCOMB ASSOCIATES.



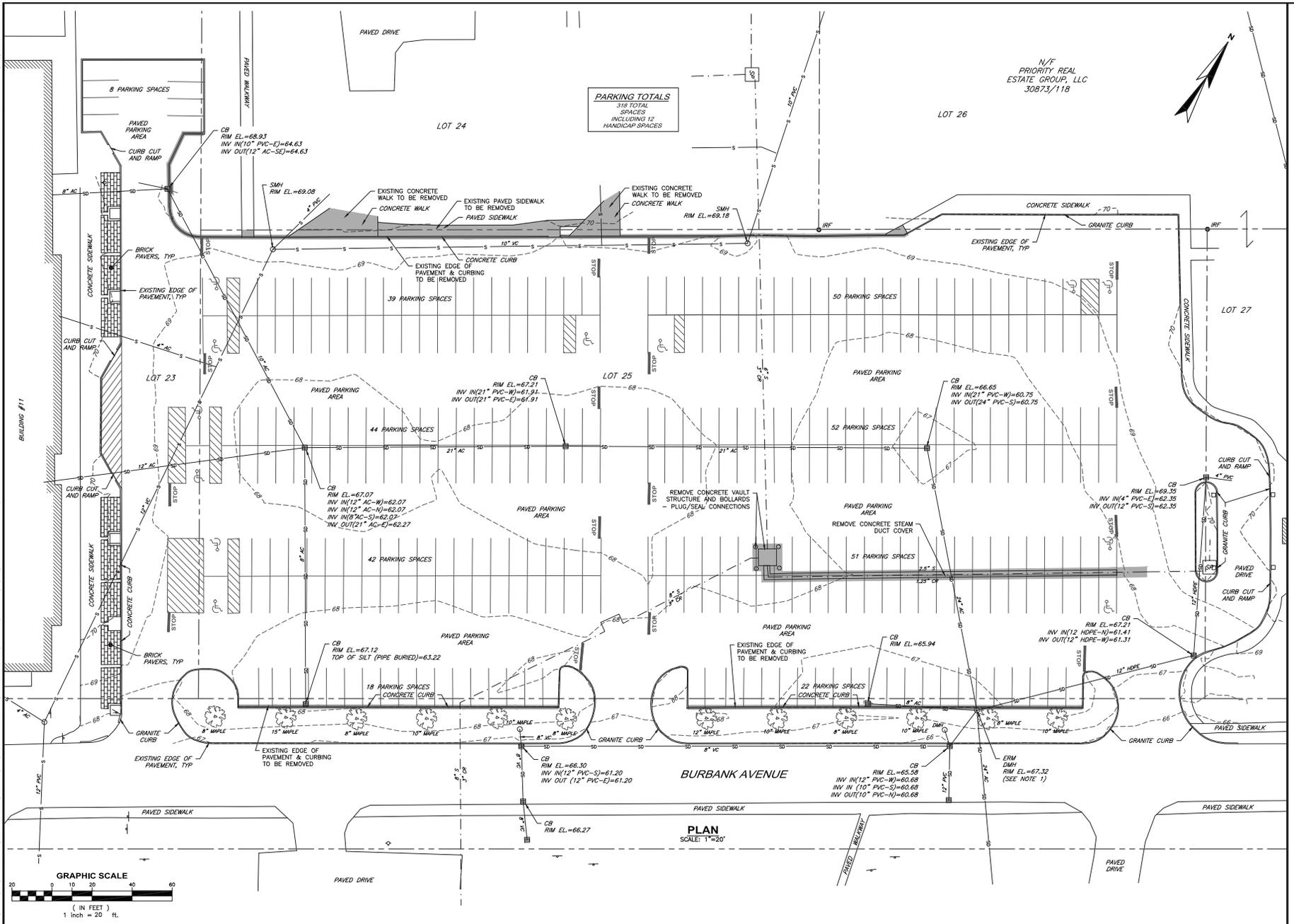
DATE	6-15
APP'D	
SUBMISSIONS/REVISIONS	
SITE PLAN	MINOR MODIFICATION
DESIGNED BY	JBW
CAD COORD.	RCC
CAD	RCC
CHECKED BY	JBW
DATE	6-18-15
APPROVED BY	JBW
DATE	6-18-15
PROJECT NO.	12218D

BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE

ROAD PLAN & PROFILE

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DRAWING
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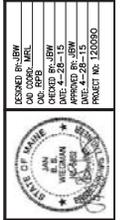


N/F
 PRIORITY REAL
 ESTATE GROUP, LLC
 30873/118

PARKING TOTALS
 318 TOTAL
 SPACES
 INCLUDING 12
 HANDICAP SPACES

PLAN
 SCALE: 1"=20'

NO.	ISSUED FOR	DATE
1	ISSUED FOR PERMITS	4.7.15
2		
3		
4		
5		



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PARKING LOT REHABILITATION
 BURBANK AVENUE, BRUNSWICK LANDING
 MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY
 BRUNSWICK, MAINE
 EXISTING CONDITIONS & DEMOLITION PLAN

**Urban Impaired Stream
Declaration of Covenants and Restrictions**

**DECLARATION OF COVENANTS AND RESTRICTIONS
URBAN IMPAIRED STREAM MITIGATION AREAS**

THIS DECLARATION OF COVENANTS AND RESTRICTIONS is made this _____ day of _____, 20____, by

MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY, a body corporate and politic and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., with a mailing address of 15 Terminal Road, Suite 200, Brunswick, Cumberland County, Maine 04011, (herein referred to as the "Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, in Brunswick at Brunswick Landing (former Naval Air Station Brunswick) #L-22222-22-E-X/X, dated September 22, 2015, (hereinafter referred to as "Order") relating to preservation of approximately 11,070 square feet (0.25 acres±) of land, consisting of eighteen individual areas, six of the areas are located on a parcel of land adjacent to Orion Street and twelve areas located on a parcel of land adjacent to Burbank Street, all on land of Declarant situate at Brunswick Landing.

RECITALS

WHEREAS, the Declarant holds title to certain real property situated at Orion Street in Brunswick, Maine, described in a deed from United States of America to Midcoast Regional Redevelopment Authority, dated March 5, 2014, recorded in Book 31376, Page 1, hereinafter referred to as the "Orion Street Property"; and

WHEREAS, the Declarant holds title to certain real property situated at Burbank Street in Brunswick, Maine, described in a deed from United States of America to Midcoast Regional Redevelopment Authority, dated June 27, 2012, recorded in Book 29754, Page 1, hereinafter referred to as the "Burbank Street Property"; and

WHEREAS, Declarant desires to place certain deed covenants and restrictions, under the terms and conditions herein, over portions of said real property (hereinafter collectively referred to as the "Covenant Areas") described as follows:

SEE ATTACHED SCHEDULE A and EXHIBITS 1 and 2

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 501 of rules promulgated by the Maine Department of Environmental Protection, Declarant has agreed, in satisfaction of paragraphs of the Order, to impose certain covenants and restrictions on the Covenant Areas as more particularly set forth herein and has agreed that such covenants and restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"), or any successor in interest.

NOW, THEREFORE, the Declarant hereby declares that the Covenant Areas are and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the covenants, conditions and restrictions set forth herein (sometimes referred to as the "Covenants and Restrictions"). The Covenants and Restrictions shall run with the Covenant Areas and shall be binding on all parties having any right, title or interest in and to the Covenant Areas, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Covenant Areas

or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Covenant Areas subject to the Covenants and Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Covenants and Restrictions hereinafter set forth.

1. **Covenants and Restrictions on Covenant Areas.** Unless the owner of the Covenant Areas, or any successors or assigns, obtains the prior written approval of the MDEP, the Covenant Areas must remain undeveloped in perpetuity. To maintain the ability of the Covenant Areas to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Covenant Areas is hereinafter limited as follows.
 - a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Covenant Areas, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;
 - b. A dense cover of grassy vegetation must be maintained over the Covenant Areas, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. ~~The Covenant Areas may not be maintained as a lawn or used as a pasture. If vegetation in the Covenant Areas is mowed, it may be mown no more than two times per year.~~
 - c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Covenant Areas, except for a sign, utility pole or fence;
 - d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Covenant Areas, except for vehicles used in mowing.
 - e. ~~Any level lip spreader directing flow to the Covenant Areas must be regularly inspected and adequately maintained to preserve the function of the level spreader.~~

Any activity on or use of the Covenant Areas inconsistent with the purpose of these Covenants and Restrictions is prohibited. Any future alterations or changes in use of the Covenant Areas must receive prior approval in writing from the MDEP (or any successor thereto). The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Covenant Areas or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. **Enforcement.** The MDEP may enforce any of the Covenants and Restrictions set forth in Section 1 above. Any future alterations of the Covenant Areas must first receive the prior approval in writing from the MDEP (or any successor thereto).
3. **Binding Effect.** The Covenants and Restrictions set forth herein shall be binding on any present or future owner of the Covenant Areas. If the Covenant Areas are at any time owned by more than one owner, each owner shall be bound by the foregoing Covenants and Restrictions to the extent that any of the Covenant Areas are included within such owner's property.

4. **Amendment.** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Covenant Areas and by the MDEP (or any successor thereto).
5. **Effective Provisions of Declaration.** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Covenant Areas.
6. **Severability.** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
7. **Governing Law.** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

IN WITNESS WHEREOF, Midcoast Regional Redevelopment Authority has caused this instrument to be executed by Steven H. Levesque, its Executive Director, hereunto duly authorized, as of the ____ day of _____, 2015.

WITNESS:

MIDCOAST REGIONAL
REDEVELOPMENT AUTHORITY

By: Steven H. Levesque
Its: Executive Director

STATE OF MAINE,
COUNTY OF CUMBERLAND, ss

September 21, 2015

Then personally appeared before me the above named Steven H. Levesque, Executive Director of Midcoast Regional Redevelopment Authority, who swore to the truth of the foregoing to the best of his knowledge, information and belief and acknowledged the foregoing instrument to be his free act and deed of Midcoast Regional Redevelopment Authority.

Before me,

Notary Public/Attorney at Law

SCHEDULE A
Covenant Areas

The following six individual parcels of land, collectively containing 3,870 square feet, more or less, situated off the easterly side of Orion Street on land of Midcoast Regional Redevelopment Authority, reference deed recorded in Cumberland County Registry of Deeds in Book 31376, Page 1, all as shown on the attached plan entitled “Exhibit 1, Proposed Covenant Areas, Urban Impaired Stream On-Site Mitigation, Midcoast Regional Redevelopment Authority, Brunswick Landing Subdivision – Phase II, Orion Street, Brunswick Landing, Brunswick, Cumberland County, Maine”, dated July 3, 2015, by Wright-Pierce (“Exhibit 1”), comprise the On-Site Mitigation Areas to be subject to the Covenants and Restrictions hereinabove set forth:

Covenant Area #1:

Being a parcel of land containing 2,470 square feet, more or less, situated on the easterly side of Orion Street and shown as “COVENANT AREA #1 (2,470 S.F.±)” on attached Exhibit 1;

Covenant Area #2:

Being a parcel of land containing 220 square feet, more or less, situated off the easterly side of Orion Street and shown as “COVENANT AREA #2 (220 S.F.±)” on attached Exhibit 1;

Covenant Area #3:

Being a parcel of land containing 220 square feet, more or less, situated off the easterly side of Orion Street and shown as “COVENANT AREA #3 (270 S.F.±)” on attached Exhibit 1;

Covenant Area #4:

Being a parcel of land containing 685 square feet, more or less, situated off the easterly side of Orion Street and shown as “COVENANT AREA #4 (685 S.F.±)” on attached Exhibit 1;

Covenant Area #5:

Being a parcel of land containing 140 square feet, more or less, situated off the easterly side of Orion Street and shown as “COVENANT AREA #5 (140 S.F.±)” on attached Exhibit 1; and

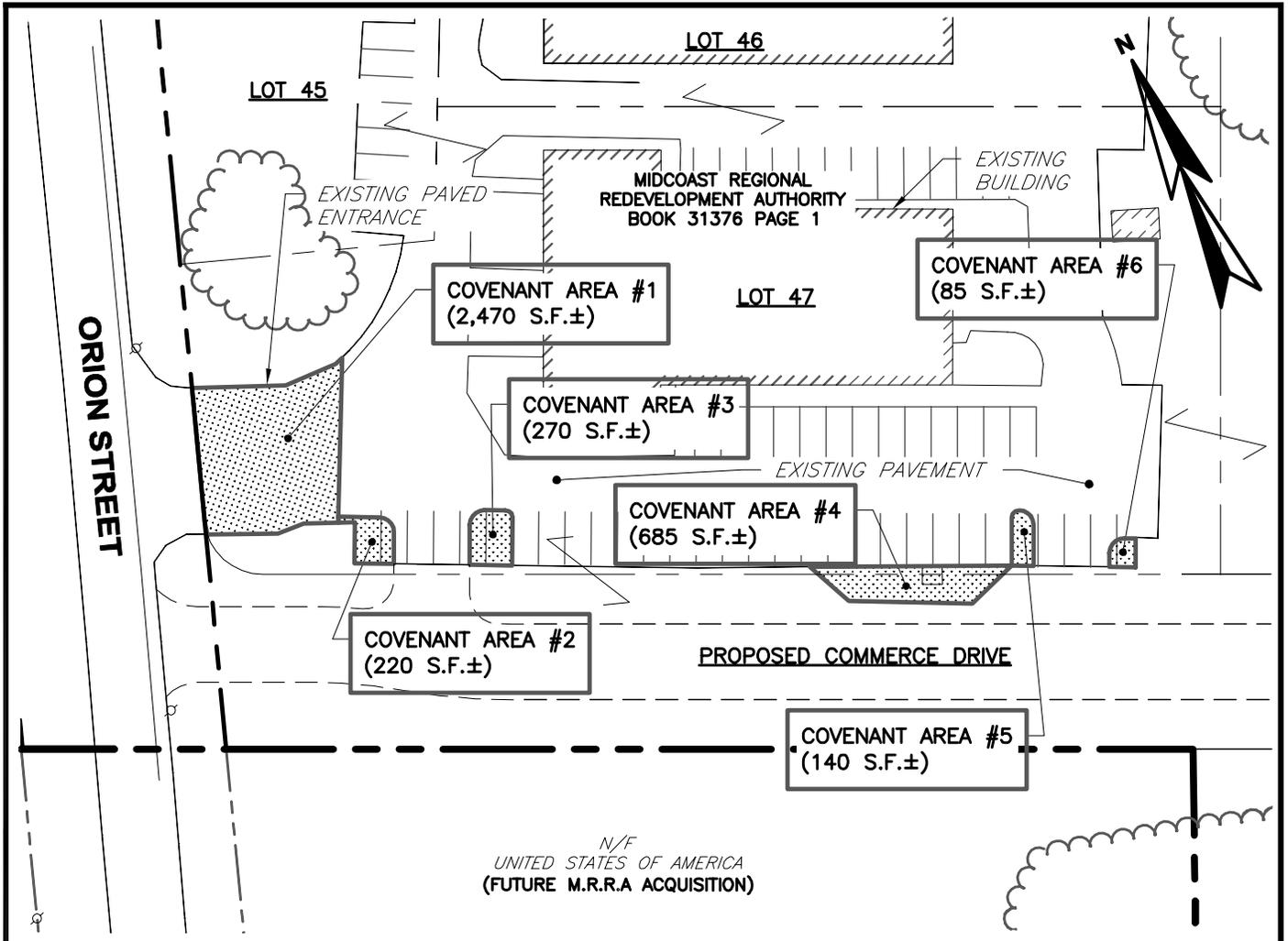
Covenant Area #6:

Being a parcel of land containing 85 square feet, more or less, situated off the easterly side of Orion Street and shown as “COVENANT AREA #6 (85 S.F.±)” on attached Exhibit 1.

Also including the following twelve individual areas of land, collectively containing 7,200 square feet, more or less, situated in a parking lot off the northerly side of Burbank Street on land of Midcoast Regional Redevelopment Authority, reference deed recorded in Cumberland County Registry of Deeds in Book 29754, Page 1, all as shown on the attached plan entitled “Exhibit 2, Proposed Covenant Areas, Urban Impaired Stream Off-Site Mitigation, Midcoast Regional Redevelopment Authority, Brunswick Landing Subdivision – Phase II, Burbank Street, Brunswick Landing, Brunswick, Cumberland County, Maine”, dated July 3, 2015, by Wright-Pierce (“Exhibit 2”), comprise the Off-Site Mitigation Areas to be subject to the Covenants and Restrictions hereinabove set forth:

Covenant Areas #7 through #18:

Being twelve certain parcels of land, each containing 600 square feet, more or less, for a total of 7,200 square feet, all situated on the northerly side of Burbank Street and shown as “COVENANT AREA (TYPICAL)(12 AREAS AT 600 S.F.±)” on attached Exhibit 2.



NOTES:

THE COVENANT AREAS SHOWN HAVE BEEN DELINEATED AS PART OF A STORMWATER MANAGEMENT PLAN PREPARED FOR MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY ("MRRA") IN CONNECTION WITH AN APPLICATION FOR A MINOR REVISION TO AN EXISTING MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ("MDEP") SITE LOCATION OF DEVELOPMENT LAW ("SLOD") PERMIT.

BECAUSE THE DEVELOPMENT IS LOCATED IN THE WATERSHED OF AN URBAN IMPAIRED STREAM (MARE BROOK), MRRA IS ALSO REQUIRED TO MEET THE URBAN IMPAIRED STREAM STANDARDS. IN ORDER TO MEET THE URBAN IMPAIRED STREAM STANDARDS, MRRA PROPOSES, IN PART, TO ELIMINATE EXISTING ON-SITE IMPERVIOUS SURFACES AND REPLACE THOSE AREAS WITH GRASS OR LANDSCAPING. THOSE AREAS ARE SHOWN HEREON AS COVENANT AREAS.

FOR SUBDIVISION DETAILS SEE PLAN ENTITLED "SUBDIVISION PLAN, BRUNSWICK LANDING SUBDIVISION - PHASE II, BRUNSWICK LANDING, BRUNSWICK, CUMBERLAND COUNTY, MAINE", DATED JUNE 18, 2015, REVISED THROUGH JULY 2015, BY WRIGHT-PIERCE.

LEGEND

	PROPERTY LINE
	PROPOSED SUBDIVISION LOT LINE
LOT 47	LOT NO. 47 BRUNSWICK LANDING SUBDIVISION, PHASE II
<i>N/F</i>	NOW OR FORMERLY
<i>31376/1</i>	DEED BOOK & PAGE FILED AT CUMBERLAND COUNTY REGISTRY OF DEEDS
S.F.	SQUARE FEET
±	MORE OR LESS
	AREA SUBJECT TO COVENANTS & RESTRICTIONS
	PARCELS IN COMMON OWNERSHIP

EXHIBIT 1

WRIGHT-PIERCE

Engineering a Better Environment

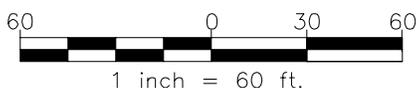
Offices Throughout New England

888.621.8156 | www.wright-pierce.com

**PROPOSED COVENANT AREAS
URBAN IMPAIRED STREAM ON-SITE MITIGATION**

**MIDCOAST REGIONAL
REDEVELOPMENT AUTHORITY
BRUNSWICK LANDING SUBDIVISION - PHASE II
ORION STREET, BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE**

GRAPHIC SCALE

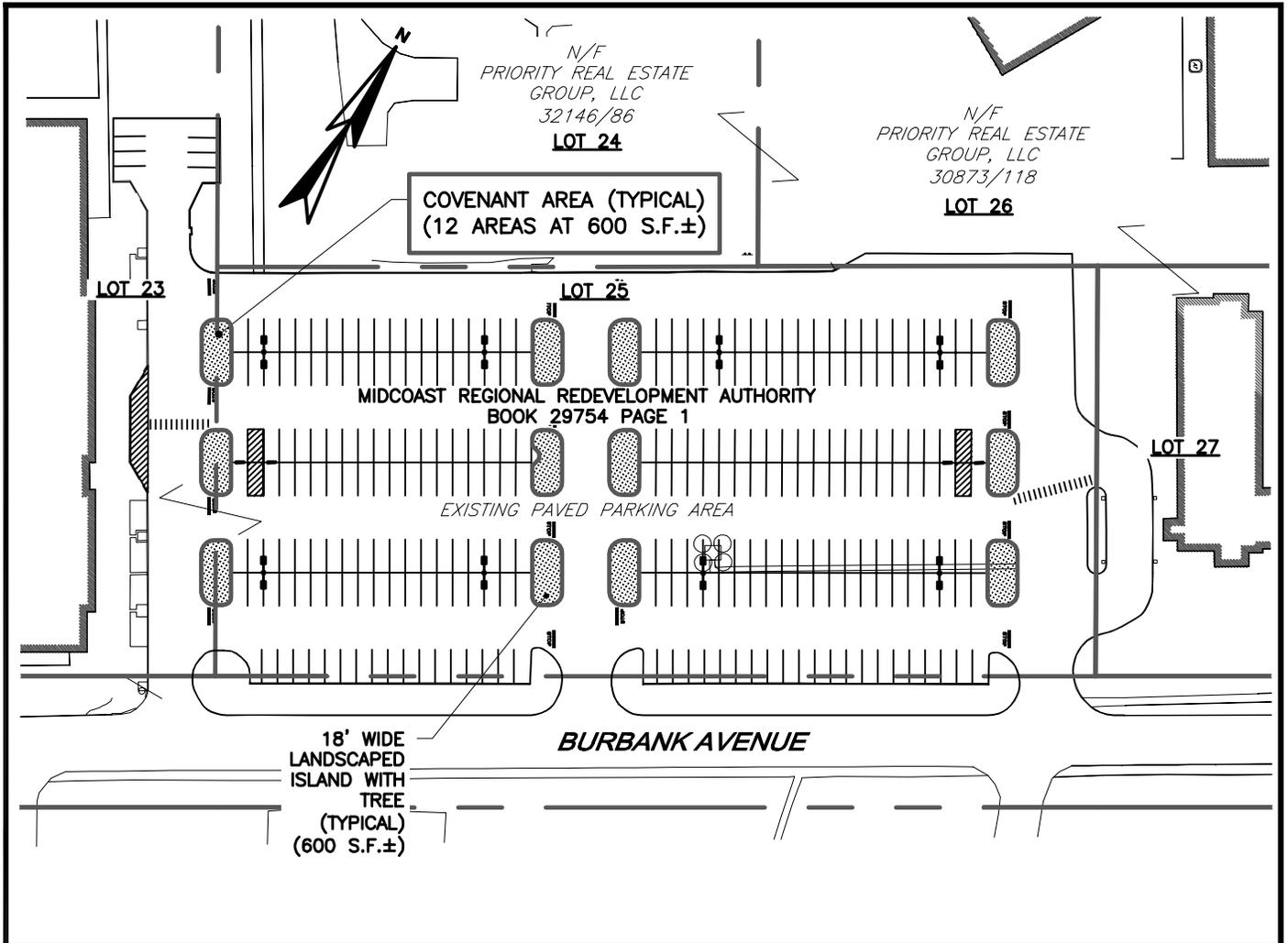


PROJ NO: 12218D

FIGURE:

DATE: JULY 3, 2015

E-1



NOTES:

THE OFF-SITE COVENANT AREAS SHOWN HAVE BEEN DELINEATED AS PART OF A STORMWATER MANAGEMENT PLAN PREPARED FOR MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY ("MRRA") IN CONNECTION WITH AN APPLICATION FOR A MINOR REVISION TO AN EXISTING MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ("MDEP") SITE LOCATION OF DEVELOPMENT LAW ("SLOD") PERMIT. THE SUBJECT OF THE MINOR REVISION INVOLVES THE CONSTRUCTION OF COMMERCE DRIVE WHICH WILL PROVIDE ACCESS FROM ORION STREET TO A PROPOSED SEVEN-Lot SUBDIVISION TO BE REFERRED TO AS "BRUNSWICK LANDING SUBDIVISION - PHASE II".

BECAUSE THE COMMERCE DRIVE DEVELOPMENT IS LOCATED IN THE WATERSHED OF AN URBAN IMPAIRED STREAM (MARE BROOK), MRRA IS ALSO REQUIRED TO MEET THE URBAN IMPAIRED STREAM STANDARDS. IN ORDER TO MEET THE URBAN IMPAIRED STREAM STANDARDS, MRRA PROPOSES, IN PART, TO ELIMINATE EXISTING OFF-SITE IMPERVIOUS SURFACES AND REPLACE THOSE AREAS WITH GRASS OR LANDSCAPING. THOSE AREAS ARE SHOWN HEREON AS COVENANT AREAS.

FOR DETAILS OF BRUNSWICK LANDING SUBDIVISION - PHASE II SEE PLAN ENTITLED "SUBDIVISION PLAN, BRUNSWICK LANDING SUBDIVISION - PHASE I, BRUNSWICK LANDING, BRUNSWICK, CUMBERLAND COUNTY, MAINE", DATED JUNE 18, 2015, REVISED THROUGH JULY 2015, BY WRIGHT-PIERCE.

FOR DETAILS OF THE IMPROVEMENTS TO BE MADE TO THE PARKING LOT ON BURBANK AVENUE, SEE PLAN SET ENTITLED "CONTRACT DRAWINGS FOR PARKING LOT REHABILITATION, BURBANK AVENUE, BRUNSWICK LANDING, MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY, BRUNSWICK, MAINE", DATED APRIL 2015, BY WRIGHT-PIERCE.

LEGEND

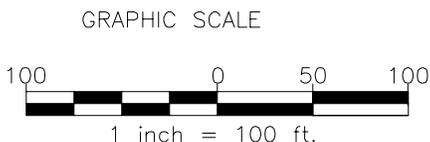
- PROPERTY LINE
- SUBDIVISION LOT LINE
- LOT 25**
- N/F*
29754/1 DEED BOOK & PAGE FILED AT CUMBERLAND COUNTY REGISTRY OF DEEDS
- S.F.
± SQUARE FEET MORE OR LESS
- AREA SUBJECT TO COVENANTS & RESTRICTIONS
- PARCELS IN COMMON OWNERSHIP

EXHIBIT 2

WRIGHT-PIERCE
Engineering a Better Environment
 Offices Throughout New England
 888.621.8156 | www.wright-pierce.com

**PROPOSED COVENANT AREAS
 URBAN IMPAIRED STREAM OFF-SITE MITIGATION**

**MIDCOAST REGIONAL
 REDEVELOPMENT AUTHORITY
 BRUNSWICK LANDING SUBDIVISION - PHASE II
 BURBANK STREET, BRUNSWICK LANDING
 BRUNSWICK, CUMBERLAND COUNTY, MAINE**



PROJ NO: 12218D
 DATE: JULY 3, 2015

FIGURE:
E-2

APPENDIX B

**Section 411.3
Wetlands Delineation Report**



Wetland Delineation Report

Client	Wright-Pierce, 99 Main Street, Topsham, Maine 04086
Project	Brunswick Landing, BNAS, Brunswick, Maine
Delineator	M.E. Thompson, PWS #831
Delineation Date	November-December, 2014
Flagging	Pink numbered (i.e., A-1, A-2...; B-1, B-2...)
Flagging Survey	GPS survey by Licensed Professional Surveyors

Wright-Pierce is assisting the Midcoast Regional Redevelopment Authority (MRRRA) with subdivision planning for parcels located on the former Brunswick Naval Air Station (BNAS). This wetland delineation was conducted in support of these efforts.

METHODS

Wetlands were delineated according to the 1987 US Army Corps of Engineers *Wetlands Delineation Manual*, as modified by the recent *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. The delineation took place in November-December, 2014, and streams were identified at the same time. Potential vernal pools were also identified based on work done for an Environmental Impact Statement (EIS) conducted as part of the BNAS re-development planning process. Potential vernal pools should be examined and confirmed, however, during the appropriate sampling season.

Existing electronic databases were also used to develop a GIS file for the project area that include such resources as Atlantic salmon habitat, US Fish and Wildlife Service (USFWS) Endangered Species Critical Habitat, bald eagle nests, Maine Inland Waterfowl and Wading Bird Habitat, and Deer Wintering Areas.

OVERVIEW

Wetlands were found in wooded areas of the former BNAS. Despite forested conditions, the history of the Navy's use of the area is clear, as evidenced by long ditches designed to drain adjacent areas, bulldozed and excavated areas, and old construction roads. In addition, many of the trees are planted pines. In summary, wetlands in the area are typically associated with altered soils, hydrology, and vegetation conditions.

Soils are primarily Windsor loamy sands and Walpole fine sandy loams in the immediate proximity of wetlands identified as part of this effort (see attached report). Although these soils are often associated with relatively deep water tables, past land use appears to have resulted in a water table that is closer to the surface in many areas. Wetlands, in general, were characterized by deep, sandy soils, but the surface horizon typically consisted of a mucky loam that varied in thickness, and water was usually found at or near the soil surface.

Vegetation, as noted above, is predominantly planted pine, although some areas appeared to be natural white pine and red oak. Wetlands were typically dominated by red maple or by white pines and red oak with shallow roots and buttressed trunks, indicating the shallowness of the water table.

STREAMS, FRESHWATER WETLANDS, AND VERNAL POOLS

The project area is not in close proximity to mapped Essential Wildlife Habitat (EWH) for known State-listed threatened or endangered species, such as roseate terns, least terns, or piping plovers, although Upland Sandpipers and Grasshopper Sparrows are known to use nearby grasslands. There are no known bald eagle nests within a quarter-mile of the project area, although one nest is situated approximately 2,400' to the north. In addition, there are no mapped Significant Wildlife Habitats (SWH) in the project area. The Maine Department of Inland Fisheries and Wildlife (MDIFW) should be consulted to determine if there are any known occurrences of State-listed threatened or endangered wildlife species in the project area and the Maine Natural Areas Program (MNAP) should be contacted regarding rare plants or natural communities that are known to occur near the project area.

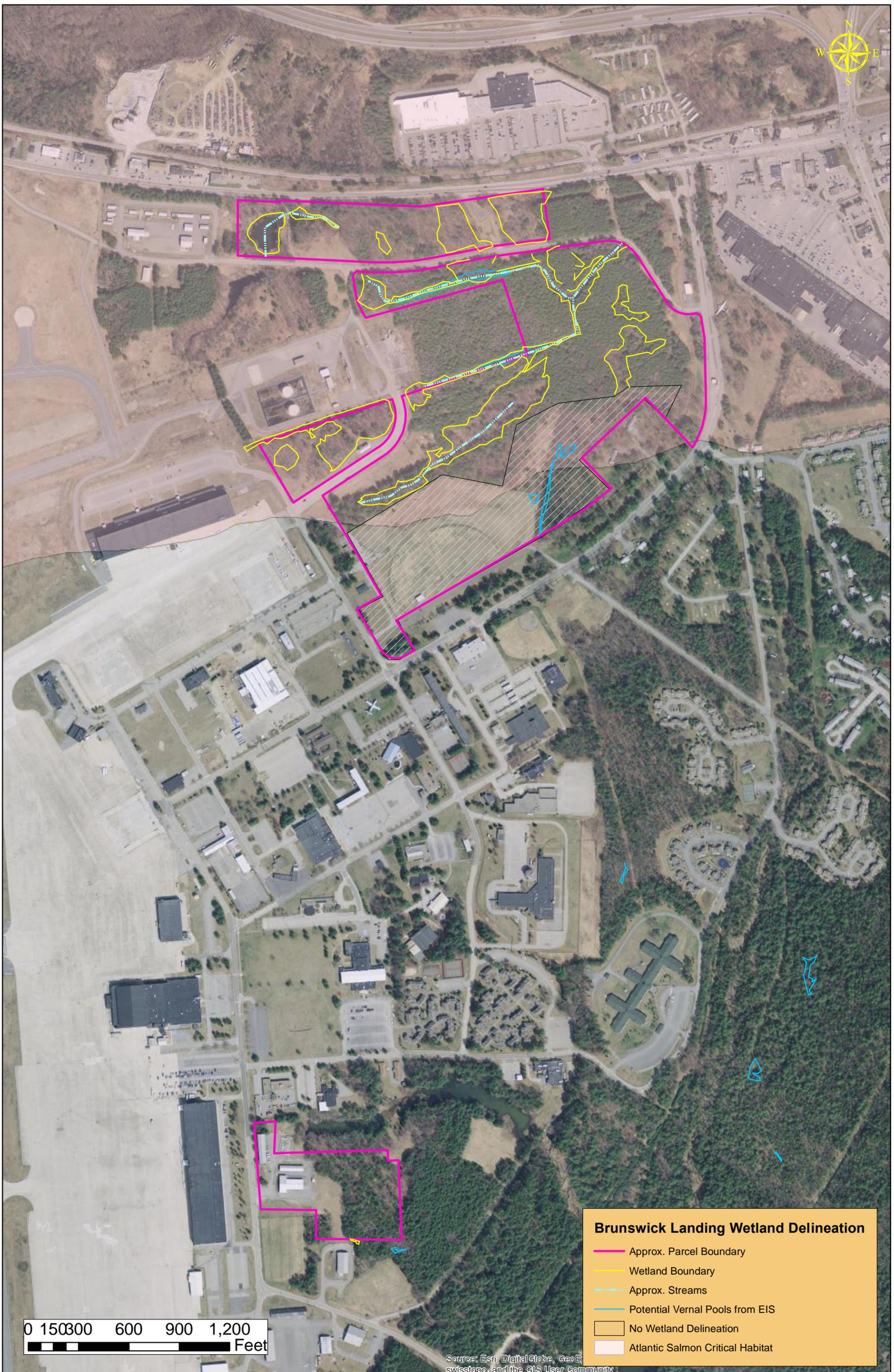
Several potential vernal pools were identified as part of BNAS re-development planning process (see Figure); all such areas appear to be man-made and whether or not they are actually vernal pools should be confirmed during the Spring amphibian breeding season. Intermittent streams are associated with some of the delineated wetlands (see Figure), although none appear to be fish-bearing. Some so-called streams are associated with long ditches constructed by the Navy. These ditches are no longer maintained and it is likely that the regulatory agencies will consider these features to be regulated streams; this should, however, be confirmed prior to any permitting processes.

Wetlands are noted on the attached figure. All are forested wetlands with minor shrub inclusions in wetter areas.

REGULATORY JURISDICTION

All freshwater wetlands are regulated by the US Army Corps of Engineers (Corps) and any impacts to these areas would require some form of permit, depending on the scale of the impacts. Freshwater wetlands are also regulated by the Maine Department of Environmental Protection (MDEP) and certain wetlands in the project area would be classified as Wetlands of Special Significance, including wetlands within 25' of a stream. As noted above, the Corps and MDEP should be consulted regarding their jurisdiction over the legacy ditches that are common on the site.

Portions of the site fall within Critical Habitat for Atlantic salmon, as identified by the US Fish and Wildlife Service (see Figure). Any work involving streams or culverts in this area are subject to additional Corps permitting requirements and consultation under Section 7 of the Endangered Species Act, which can be a lengthy process.



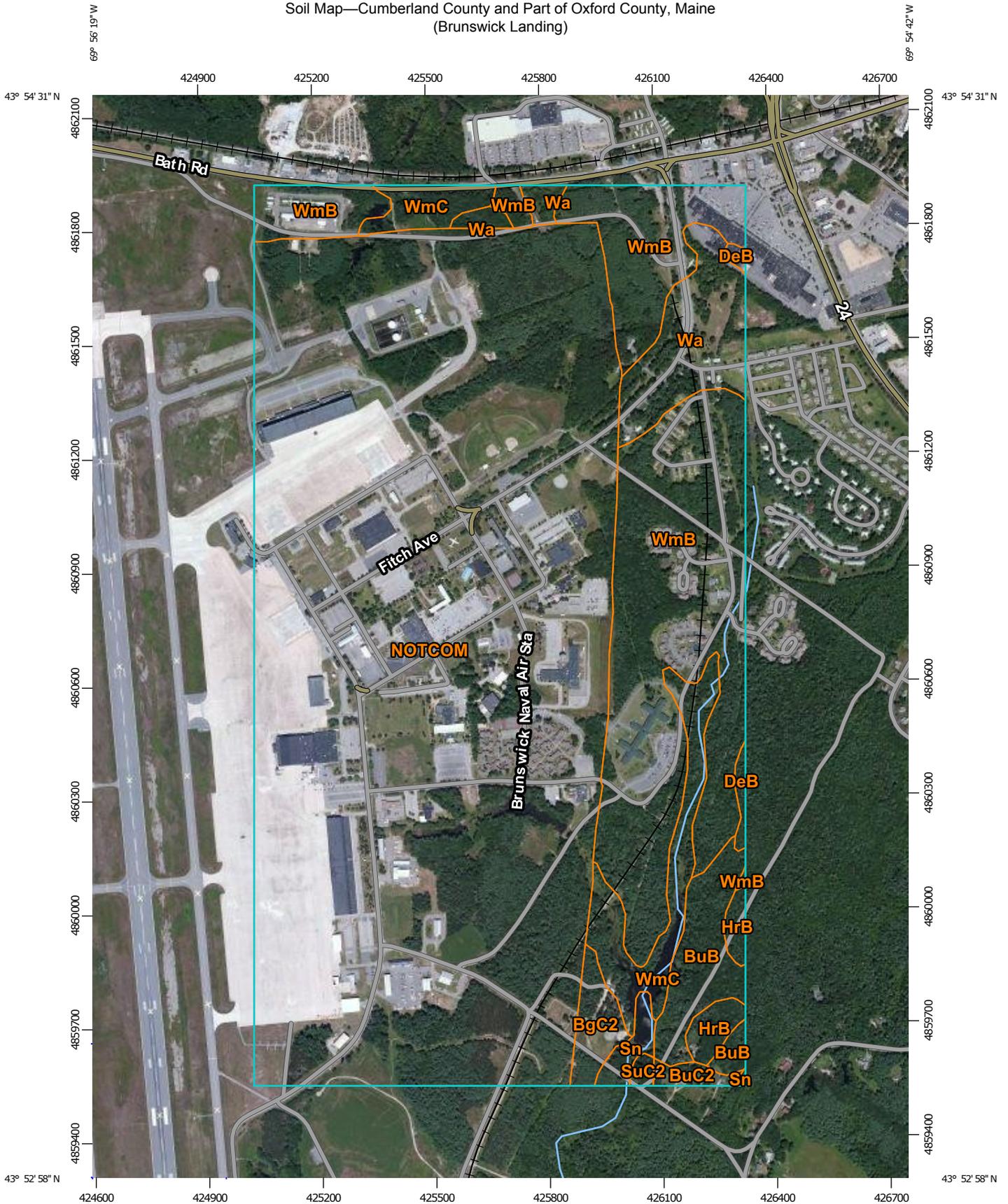
0 150 300 600 900 1,200 Feet

Brunswick Landing Wetland Delineation

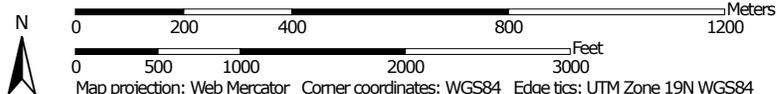
- Approx. Parcel Boundary
- Wetland Boundary
- Approx. Streams
- Potential Vernal Pools from EIS
- No Wetland Delineation
- Atlantic Salmon Critical Habitat

Source: Esri, DigitalGlobe, GeoEye, swisstopo, and the GIS User Community

Soil Map—Cumberland County and Part of Oxford County, Maine
(Brunswick Landing)



Map Scale: 1:113,900 if printed on A portrait (8.5" x 11") sheet.



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

Soil Map—Cumberland County and Part of Oxford County, Maine
(Brunswick Landing)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Cumberland County and Part of Oxford County, Maine

Survey Area Data: Version 9, Sep 13, 2014

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

Date(s) aerial images were photographed: Jul 17, 2010—Jul 27, 2010

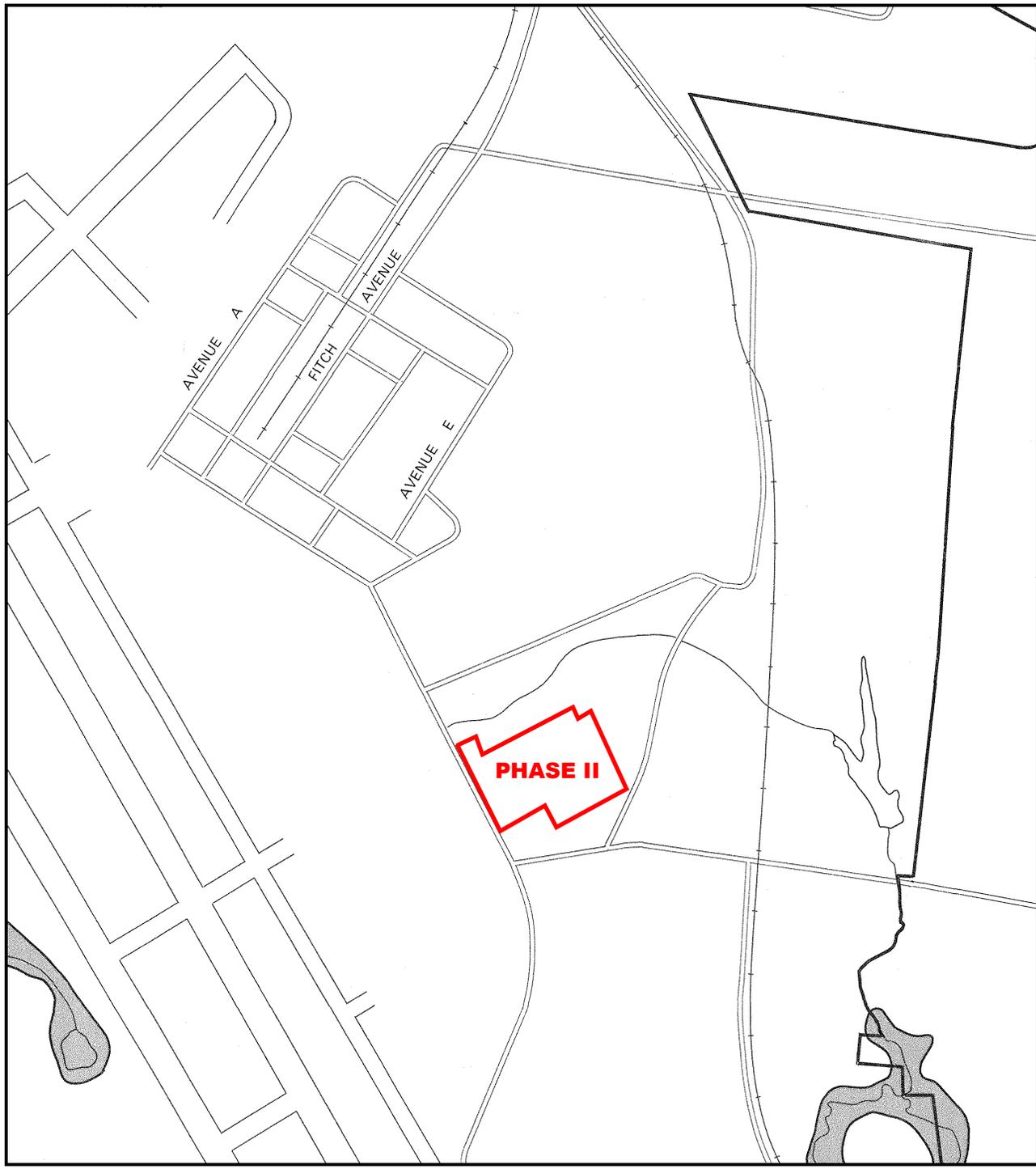
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Cumberland County and Part of Oxford County, Maine (ME005)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BgC2	Belgrade very fine sandy loam, 8 to 15 percent slopes, eroded	7.8	1.0%
BuB	Buxton silt loam, 3 to 8 percent slopes	19.7	2.6%
BuC2	Buxton silt loam, 8 to 15 percent slopes, eroded	2.8	0.4%
DeB	Deerfield loamy sand, 3 to 8 percent slopes	2.2	0.3%
HrB	Hollis fine sandy loam, 3 to 8 percent slopes	6.4	0.8%
NOTCOM	No Digital Data Available	514.5	67.4%
Sn	Scantic silt loam, 0 to 3 percent slopes	4.3	0.6%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	1.1	0.1%
Wa	Walpole fine sandy loam	29.7	3.9%
WmB	Windsor loamy sand, 0 to 8 percent slopes	145.9	19.1%
WmC	Windsor loamy sand, 8 to 15 percent slopes	29.3	3.8%
Totals for Area of Interest		763.8	100.0%

APPENDIX C

Section 411.4 Flooding



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
BRUNSWICK, MAINE
CUMBERLAND COUNTY

PANEL 15 OF 35
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230042 0015 B

EFFECTIVE DATE:
JANUARY 3, 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

APPENDIX D

**Section 411.5
Stormwater Management Plan,
HydroCAD Calculation Sheets, Drainage Plans & Soils Map**

APPENDIX D

Section 411.5 STORMWATER MANAGEMENT PLAN

Brunswick Landing Subdivision – Phase II Midcoast Regional Redevelopment Authority Brunswick Landing Brunswick, Maine

1.1 INTRODUCTION

This Stormwater Management Plan has been prepared to address the stormwater runoff impacts for both stormwater quantity and stormwater quality associated with the installation of the proposed roadway.

2.1 EXISTING CONDITIONS

The 53,728-square foot (1.23 acres) area proposed for development is situated on the easterly side of existing Orion Street, and consists of:

- 500 square feet of existing bituminous pavement;
- 13,023 square feet of existing woods; and
- 40,205 square feet of grass land, for a total area of
- 53,728 square feet.

The project area is located at or very near the top of its watershed with stormwater sheeting off the site via overland flow to the north, east and south onto lands owned by the United States Government (“USA”). The flows headed in the northerly direction eventually make their way via a shallow swale to an existing Stormwater Pond which retains and releases runoff to an existing drainage course that runs southwesterly to Mare Brook. It appears that a large portion of the surface runoff does not extend much beyond the project boundaries; rather, the runoff is retained in the small surface undulations and eventually infiltrates into the underlying soils. There is no apparent outlet for stormwater flowing in this direction.

According to Chapter 502, “Appendix B, Urban Impaired Streams”, Mare Brook is an urban impaired stream, and therefore, the proposed project is required to meet the “Urban Impaired

Stream Standard” of Chapter 500, “Section 4. Stormwater Standards”. Reference is made to “13. Urban Impaired Stream Submissions” of this application.

2.1.1 Land Cover

See “2.1 Existing Conditions”, above.

2.1.2 Site Topography

The topography of the site is relatively flat with intermittent and shallow undulations. A shallow, broad swale directs surface runoff from a portion of the paved parking areas and from a portion of the buildings on land located northerly of the site to land of the USA abutting the site to the south. The wooded, easterly portion of the site slopes down gently to the east and runoff eventually reaches the existing stormwater pond located northeasterly of the site.

2.1.3 Surface Water Features

There are no streams on or adjacent to the developed portion of the site. The site is not tributary to any lakes that are impaired or threatened by phosphorous. The site is located within the watershed of Mare Brook, an Urban Impaired Stream.

2.1.4 Soils

Soils on the Brunswick Landing Subdivision site are shown on the map entitled “Figure 2-5, Soils of NAS Brunswick, Brunswick, Maine”, prepared by Ecology & Environment, Inc. included in Appendix F, Ecological Communities and Wetland Resources Report, of the Final Environmental Impact Statement for the Disposal and Reuse of Naval Air Station Brunswick, Maine, dated November 2010, published by the U.S. Department of the Navy, (EIS) (Soils Map).

The figure has been modified by Wright-Pierce to show the location of the project site and to highlight the pertinent soil types and is included as part of attached Appendix D.

The soil types and delineations shown on the Soils Map are the result of a medium-intensity soil survey performed by Normandeau Associates in 1998. See Section 2 of Appendix F of the EIS. As shown on the Soils Map, the site is situated partly in the Deerfield Loamy Sand complex (Soils Map symbol “DeA”) and partly in an area of “made land”. The Deerfield Loamy Sand complex soil type is considered to be in Hydrologic Soil Group “A” and the made land is assumed to be in Hydrologic Soil Group “B”.

In order to ensure that the proposed project would not impact any on-site wetlands, the applicant engaged Michael Thompson, M.Sc., CWB, PWS, of Penobscot Environmental Consulting, Inc., Camden, Maine, to investigate the site. According to his findings presented in his Wetland Delineation Report (“Wetlands Report”) submitted to Wright-Pierce, and attached hereto, he found and delineated a small 2,130 square-foot forested wetland with a minor shrub inclusion was found straddling the southerly boundary of the applicant’s property approximately 150 feet southerly of the proposed roadway. Approximately 1,040 square feet of the wetland is located on the applicant’s property but will not be directly impacted by the proposed construction of Commerce Drive. He found no other evidence of wetlands or other regulated natural resources on or adjacent to the site.

The Wetlands Delineation Report is included in Appendix B.

3.1 PROPOSED CONDITIONS

Development of the site as proposed will involve grading and filling the area of the proposed roadway to achieve the desired profile. In the wooded area, the trees will be cut and the stumps removed. In order to reduce the flow of runoff from a portion of the adjacent paved area into the area of the site reserved for the Infiltration Trench, curb will be installed along the edge of the paved area. The curb will channel the runoff from the existing parking area down to the exiting low spot in the pavement, where it will be directed into a culvert crossing under the roadway. The outflows from the culvert will be released into the existing broad swale and will follow the swale onto land of the USA as it does in the existing condition.

The roadway and the two driveway connections will be “paved” with porous pavement which will absorb the rain falling on its surface, allow the rain to pass through layers of gravel and a stone filter layer and infiltrate into the soil beneath. The gravel reservoir course will have the capacity to retain the amount of runoff generated by the 25-year, 24-hour storm event in addition to treating the 1-inch of runoff for water quality treatment purposes.

The proposed Infiltration Trench to be installed in the ditch line between the roadway and the existing paved area to the north, will afford treatment of the runoff from the grassed ditch and will help meet the required level of treatment of the project’s developed area. The water passing through the Infiltration Trench will be treated by the layers of gravel and stone in the trench prior to being released into the soils below. The Infiltration Trench will also have the capacity to store the amount of runoff generated by the 25-year, 24-hour storm event in addition to treating the 1-inch of runoff for water quality treatment purposes

Development of the roadway project as proposed will result in:

- 20,930 square feet of new porous pavement w/ shoulders, installed;
- 10,257 square feet of retained woods;
- 224 square feet of Infiltration Trench, installed; and
- 22,317 square feet of grass, installed, for a total area of
- 53,728 square feet.

The applicant proposes to meet the Urban Impaired Stream standard by obtaining “credits” for reducing on-site and off-site pre-development impervious stormwater sources in accordance with “Section 3 A. Mitigation through compensation fees or projects” of Chapter 501, Stormwater Management Compensation Fees and Mitigation Credit.

See Appendix A, Urban Impaired Stream Submissions of this application.

3.1.1 Alteration to Land Cover

Several areas of off-site pavement will be replaced with vegetation, the pavement width of the access road will be expanded into areas that are currently grass, and areas of grass will be converted to landscaped areas and/or impervious facility features.

3.1.2 Downstream Waterbodies

Surface runoff from the development is tributary to Mere Brook located approximately 6,000 feet southerly of the project site.

4.1 REGULATORY REQUIREMENTS

4.1.1 Town of Brunswick

The proposed project will require Development Review approval by the Town of Brunswick Planning Board. According to the Town of Brunswick Zoning Ordinance, “Subsection 411.5, Storm Water Management” of “Section 411, Review Standards”, “...The proposed development shall satisfy the recommended storm water quality standards described in Storm Water Management for Maine: Best Management Practices, published by the State of Maine Department of Environmental Protection, November, 1995, as amended.”

4.1.2 Maine Department of Environmental Protection (MDEP)

The MDEP Rules Chapter 500 describes stormwater management requirements for new development and redevelopment projects which involve modification to an existing Site Location of Development Permit (SLODP). These rules describe performance standards divided into five major categories: Basic Standards, General Standards, Phosphorous Standards, Urban Impaired Stream Standards and Flooding Standards.

- A. Basic Standards: As a modification of an existing SLODP, the proposed project must meet the Basic Standards.

- B. General Standards: As a modification of an existing SLODP, the proposed project must meet the General Standards.

- C. Phosphorous Standards: A project is subject to the phosphorous standards when it is in the watershed of a lake most at risk as identified in Chapter 502. The project is not in the watershed of a lake that is identified as being Most at Risk in Chapter 502 and therefore the project is not subject to the Phosphorous Standards.
- D. Urban Impaired Stream Standard: The proposed project is located in the direct watershed of Mare Brook, an urban impaired stream. As a modification of an existing SLODP, the proposed project must meet the Urban Impaired Stream Standard.
- E. Flooding Standard: As a modification of an existing SLODP, the proposed project must meet the Flooding Standard.

4.2 WATER QUALITY TREATMENT

4.2.1 General Considerations

Stormwater quality treatment for the project will be provided by the infiltration of runoff into the underlying soils at the site. Infiltration of the runoff will be accomplished by the installation of an Infiltration Trench that will collect and treat runoff from an isolated grassed landscaped area adjacent to the roadway and by the use of Porous Pavement for all new project paved areas.

For the purposes of determining the extent of required post-development stormwater quality treatment, the proposed roadway can be considered as the “linear portion” of the project and as such is eligible for an exception from the General Standards as provided in “Section 4.B.(3)(c), A linear portion of a project”, which states: “...*For a linear portion of a project, runoff volume control may be reduced to no less than 75% of the volume from the impervious area and no less than 50% of the developed area that is impervious or landscaped, or the runoff volume to each treatment measure described in Section 4(B)(2) above may be reduced by 25%.*”

The location of the proposed Infiltration Trench and the extent of Porous Pavement are shown on the attached Project Plan Set. The details, design and specifications for the proposed infiltration BMPs are also shown on the attached Project Plan Set.

4.2.2 BMP Design Considerations

The Infiltration Trench was designed and sized in accordance with “Chapter 6, Infiltration BMPs” and “Section 6.2.2 Infiltration Trench”, of MDEP Volume III. BMP Technical Design Manual:

1. Treatment Volume - *Infiltration systems must be designed to retain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped developed area and infiltrate this volume into the ground. The Linear Portion of a Project exception provides for a reduction in the volume of runoff that needs to be treated;*
2. Stone Porosity – *A porosity value of 0.4 shall be used in the design of stone reservoirs for infiltration practices; and*
3. Separation From Seasonal High Water Table - *The bottom of the infiltration system, including any stone layer or other material below the depth of any manufactured components of the system, must be at least three feet above the elevation of the seasonal high water table.*

The Porous Pavement BMP was designed and sized in accordance with “Section 7.7, Manmade Pervious Surfaces”, of MDEP Volume III. BMP Technical Design Manual:

1. Treatment Volume - *To meet the General Standards requirements (1 inch infiltration), a minimum storage capacity within the filter layer or subbase and base is needed to allow the direct entry of one inch or more and to meet the Flooding Standards requirements, the road design needs to provide a minimum storage capacity for the direct entry of the rain precipitation from a 24-hour, 25-year storm (5 +inches);*
2. Filter Layer - *A filter layer providing pretreatment before infiltration to groundwater needs to be included in the road design and can be part of the subbase and base. The media must be a mineral soil with between 4 and 7% fines (passing #200 sieve) and should be a minimum of 8 inches thick.; and*
3. Separation From Seasonal High Water Table - *At a minimum, one foot separation is needed below the road subbase and above the groundwater table.*

4.2.3 Required and Proposed Project Stormwater Runoff Treatment

As it applies to the project's proposed roadway, the exception from the General Standards provides that for a linear portion of a project, runoff volume control may be reduced to no less than 75% of the volume from the impervious area and no less than 50% of the developed area that is impervious or landscaped, or the runoff volume to each treatment measure may be reduced by 25%.

The project must also meet the applicable Urban Impaired Stream Standards. See Appendix A, "Urban Impaired Stream Submissions" of this application.

The following **Table 1** shows the calculations used for sizing the Infiltration Trench and the extent of Pervious Pavement, the comparison between the required and the provided water quality treatment volumes of the BMPs and the required and provided water quality treatment percentages.

As can be seen in **Table 1**, both the proposed Infiltration Trench and the Pervious Pavement BMPs exceed the minimums for providing the required water quality storage volumes and treatment percentages. By incorporating the BMPs into the project's stormwater management system, the required standard of 50% treatment of the project's developed area is exceeded by achieving 53% treatment and the required standard of 75% treatment of the project's impervious areas is exceeded by achieving 100% treatment.

4.3 RUNOFF ANALYSIS

This section has been prepared to outline the proposed changes to the stormwater runoff peak flow rates as a result of the development.

4.3.1 Modeling Technique

The computer program HydroCAD, which is based on SCS TR-20 and TR-55 methodology, was used to analyze pre-development and post-development conditions. The 24-hour SCS Type III storm distribution for the 2, 10, and 25-year storm frequencies were used for this analysis. The corresponding rainfall amounts for these storms are 3.0", 4.7" and 5.5" respectively.

Reference is made to the HydroCAD calculation sheets for the pre-development and post-development conditions, attached hereto in Appendix D.

Land use cover, watershed delineations, flow paths and hydrologic soils data were obtained using the following sources of information:

1. Existing topography from Navy records and on-the-ground surveys conducted by Titcomb Associates and Wright-Pierce personnel;
2. Aerial photography; and
3. The description of the soils as presented in "2.1.4. Soils" of this Plan.

The study area involved in the Runoff Analysis includes the proposed road right of way and the undeveloped seven proposed subdivision lots, covering approximately 9.16 acres.

4.3.2 Study Points

There are three common study points (SPs) identified for this project for both the pre-development conditions and the post-development conditions. SP 1, being the output of SC-1 (Subcatchment 1), is at the northerly property line of land of the applicant situated approximately 450 feet northerly of the proposed roadway and about 300 feet westerly of the eventual runoff destination, the existing BNAS stormwater pond. SP 2, located in a low spot on land of the USA situated approximately 150 feet southerly of the roadway, summarizes runoff rates from SC-2 and SC-3. SP-3 summarizes the output of SC-4 and is located approximately 230 feet southeasterly of the roadway at the southeasterly corner of land of the applicant.

Reference is made to the pre and post development drainage plans accompanying this application in Appendix D.

4.3.3 Pre-Development

The pre-development model represents the site in the current conditions. The project study area was broken down into four subcatchments, SC-1, SC-2, SC-3 and SC-4.

Reference is made to the HydroCAD diagram and calculation sheets and the pre-development drainage plan included in Appendix D for the pre-development condition.

4.3.4 Post-Development

The post-development model conditions reflect the construction of the proposed roadway and the stormwater BMPs. Within the post-development drainage model the project site is divided into six subcatchments; SC-1, SC-2, SC-2A, SC-2B, SC-3 and SC-4. The post-development model maintains the locations and designations of the three pre-development Study Points, SC-1, SP-2 and SC-4.

Reference is made to the HydroCAD diagram and calculation sheets and the post-development drainage plan included in Appendix D for the post-development condition.

In general terms, the entire roadway will be surfaced with Pervious Pavement and the Infiltration Trench will be installed in the portion of the roadway ditch located between the roadway and the existing paved area. The two BMPs will provide water quality treatment as well as water quantity control such that the post-development runoff flow rates at each of the Study Points is equal to or less than the flow rates in the pre-development condition.

4.3.5 Comparison of Peak Flow Rates

Table 2, below, summarizes the results of the stormwater runoff calculations at the three Study Points for the 2, 10 and 25 year storm events for the project.

**Table 2 Stormwater Peak Flow Rates Summary
Pre-Development vs Post-Development**

Study Point	2-Year Storm (3.0")			10-Year Storm (4.7")			25-Year Storm (5.5")		
	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)
SC-1	0.94	0.97	+0.03*	3.56	3.68	+0.12*	5.07	5.23	+0.16*
R-3	1.81	1.02	-0.79	3.70	1.85	-1.85	4.67	2.29	-2.38
SC-4	0.00	0.00	NC	0.00	0.01	+0.01*	0.02	0.04	+0.02*

*See Section 4.3.6 below

4.3.6 Request for Waiver of the Flooding Standard

The applicant requests a waiver for the instances of insignificant increases (<0.2 cfs) in peak flow rates from the project site as shown in Table 2.

5.1 CONCLUSIONS

By incorporating the proposed BMPs presented in this report into the stormwater runoff management system, by keeping the amount of existing impervious surfaces to the minimum necessary, and if the request for waiver of the Flooding Standard is granted, runoff from the proposed facility will receive treatment/control that meets the applicable General and Flooding Standards of Chapter 500, Stormwater Management.

5.2 MAINTENANCE & PROTECTION OF STORMWATER SYSTEM

Long-term responsibilities for maintenance and protection of the project's stormwater drainage system, stormwater treatment systems, the road, paved areas and permanent erosion control measures will be assumed by the applicant.

A Maintenance Plan has been developed for the project and the components of the plan are detailed in Appendix E of this application.

Post Project Construction Erosion Control Inspection and Maintenance Tasks Log

Proposed Commerce Drive
Brunswick Landing
Brunswick, Maine
W-P 12218D

Midcoast Regional Redevelopment Authority

Inspector: _____

Date: _____

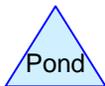
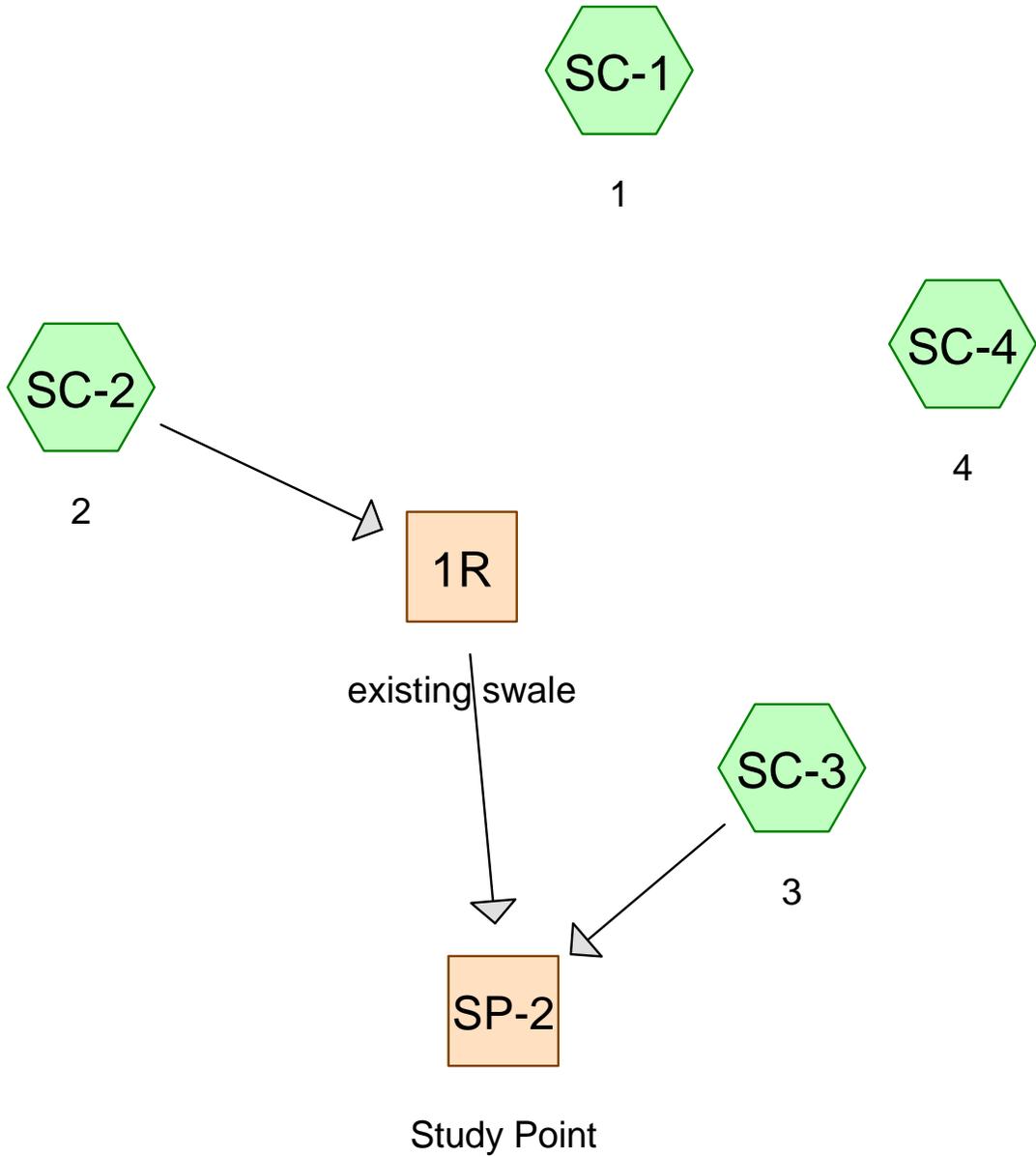
Maintenance Personnel: _____

Permanent Erosion Control Measures	Inspection		Maintenance	
	Date	Comments	Date	Corrective Action
Repair Eroded Vegetated Slopes				
Replant Bare or Sparsely Vegetated Areas				
Remove Accum. Sediment in Infiltration Trench				
Remove Winter Sand and Debris				
Remove Sediment and Debris from Ditches				
Remove Woody Growth from Ditches				
Remove Obstructions from Culvert Inlets-Outlets				
Repair Any Other Site Stability Problem Areas				

Sediment/Debris Disposal

Location of Sediment/Debris Accumulation	Location of Sediment/Debris Disposal	Date of Disposal

**Pre-Development HydroCAD Calculation Sheets &
Pre-Development Drainage Plan**



12218D Commerce Drive PRE Brunswick

Prepared by Wright-Pierce

HydroCAD® 10.00 s/n 01135 © 2013 HydroCAD Software Solutions LLC

Printed 6/18/2015

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.597	39	>75% Grass cover, Good, HSG A (SC-3, SC-4)
1.897	61	>75% Grass cover, Good, HSG B (SC-1, SC-2, SC-3)
0.498	98	Bldgs, HSG B (SC-1, SC-2)
0.301	96	Gravel surface, HSG B (SC-1)
1.161	98	Paved area, HSG B (SC-1, SC-2)
3.701	30	Woods, Good, HSG A (SC-1, SC-4)
0.964	55	Woods, Good, HSG B (SC-1, SC-3)
9.118	54	TOTAL AREA

Summary for Subcatchment SC-1: 1

Runoff = 3.56 cfs @ 12.42 hrs, Volume= 0.463 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	56,672	61	>75% Grass cover, Good, HSG B
	174,150	64	Weighted Average
	136,352		78.30% Pervious Area
	37,798		21.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 3.89 cfs @ 12.14 hrs, Volume= 0.321 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.11 cfs @ 12.70 hrs, Volume= 0.028 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
124,608	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,217	31	Weighted Average
132,217		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
30.4	410	Total			

Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 2.90" for Brunswick 10 yr event
 Inflow = 3.89 cfs @ 12.14 hrs, Volume= 0.321 af
 Outflow = 3.85 cfs @ 12.16 hrs, Volume= 0.321 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 4.7 min

Peak Storage= 366 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area =	2.085 ac, 37.92% Impervious, Inflow Depth = 2.01"	for Brunswick 10 yr event
Inflow =	3.85 cfs @ 12.16 hrs, Volume=	0.349 af
Outflow =	3.85 cfs @ 12.16 hrs, Volume=	0.349 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Subcatchment SC-1: 1

Runoff = 5.07 cfs @ 12.41 hrs, Volume= 0.638 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	56,672	61	>75% Grass cover, Good, HSG B
	174,150	64	Weighted Average
	136,352		78.30% Pervious Area
	37,798		21.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 4.84 cfs @ 12.14 hrs, Volume= 0.401 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.23 cfs @ 12.63 hrs, Volume= 0.046 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.02 cfs @ 17.22 hrs, Volume= 0.012 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
124,608	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,217	31	Weighted Average
132,217		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
30.4	410	Total			

Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 3.63" for Brunswick 25 yr event
 Inflow = 4.84 cfs @ 12.14 hrs, Volume= 0.401 af
 Outflow = 4.79 cfs @ 12.16 hrs, Volume= 0.401 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.87 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 4.5 min

Peak Storage= 427 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area = 2.085 ac, 37.92% Impervious, Inflow Depth = 2.57" for Brunswick 25 yr event
Inflow = 4.82 cfs @ 12.16 hrs, Volume= 0.447 af
Outflow = 4.82 cfs @ 12.16 hrs, Volume= 0.447 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Subcatchment SC-1: 1

Runoff = 0.94 cfs @ 12.50 hrs, Volume= 0.156 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	56,672	61	>75% Grass cover, Good, HSG B
	174,150	64	Weighted Average
	136,352		78.30% Pervious Area
	37,798		21.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 1.93 cfs @ 12.15 hrs, Volume= 0.160 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.00 cfs @ 15.66 hrs, Volume= 0.003 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
124,608	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,217	31	Weighted Average
132,217		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
30.4	410	Total			

Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 1.45" for Brunswick 2yr event
 Inflow = 1.93 cfs @ 12.15 hrs, Volume= 0.160 af
 Outflow = 1.89 cfs @ 12.17 hrs, Volume= 0.160 af, Atten= 2%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.40 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 5.5 min

Peak Storage= 224 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

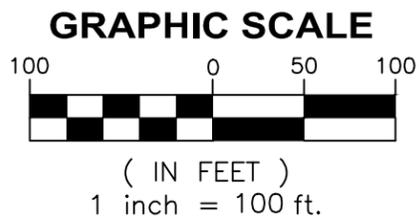
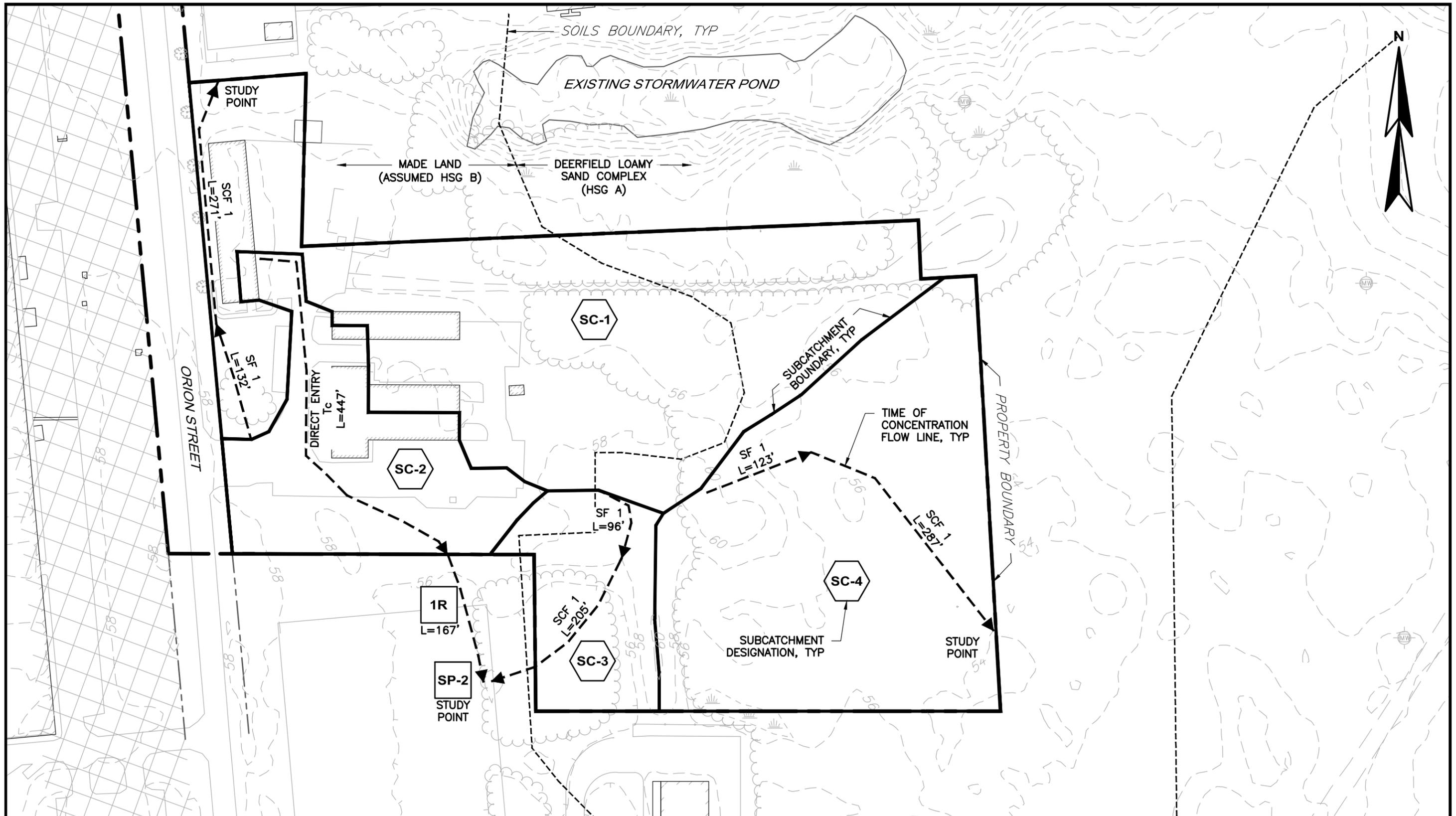
20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area =	2.085 ac, 37.92% Impervious, Inflow Depth = 0.94"	for Brunswick 2yr event
Inflow =	1.89 cfs @ 12.17 hrs, Volume=	0.163 af
Outflow =	1.89 cfs @ 12.17 hrs, Volume=	0.163 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs



SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE

PROJ NO: 12218D DATE: JUNE 2015

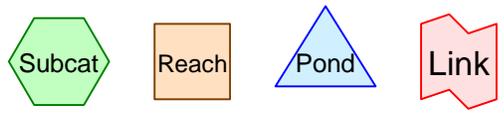
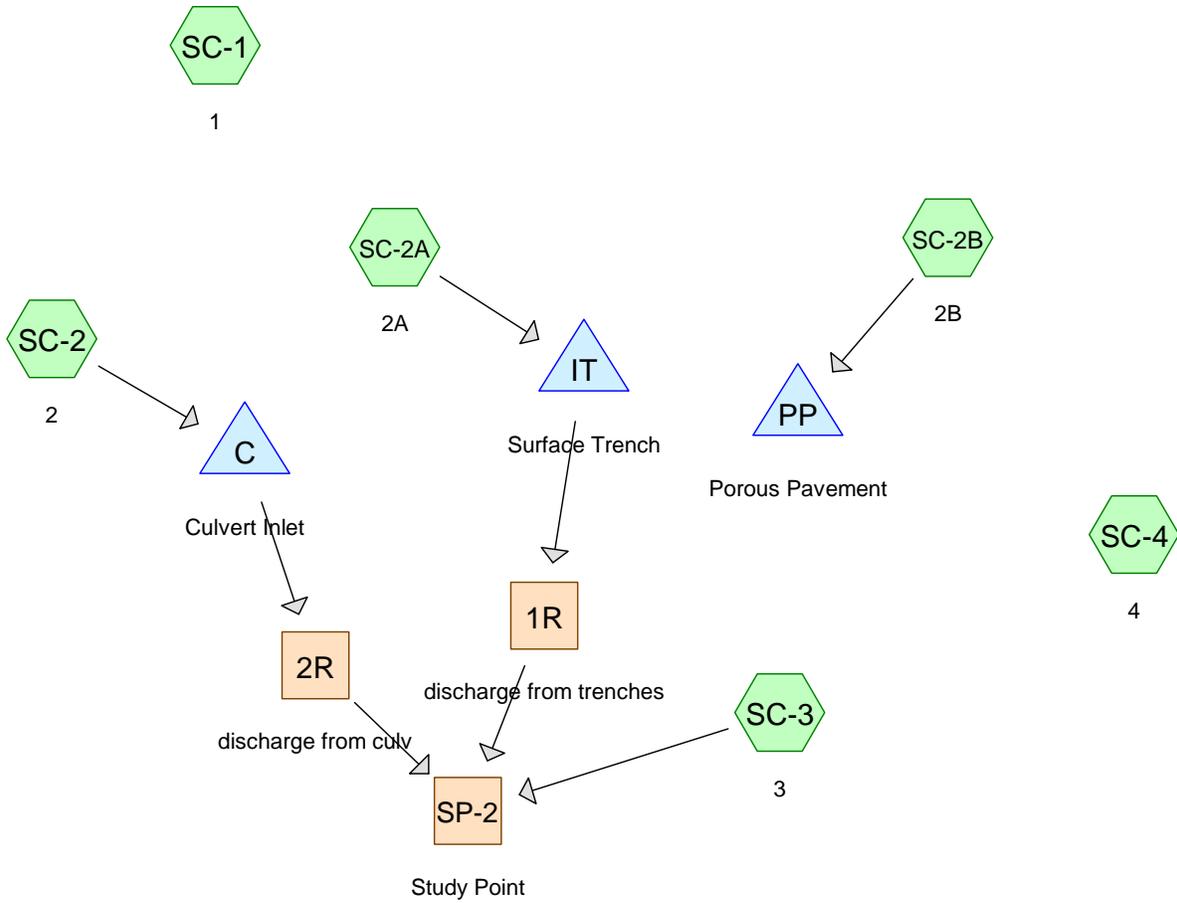
WRIGHT-PIERCE 
 Engineering a Better Environment

NO.	REVISIONS	APP'D
1		
2		
3		

PREDEVELOPMENT DRAINAGE PLAN

FIGURE:
1 - 2

**Post-Development HydroCAD Calculation Sheets &
Post-Development Drainage Plan**



12218D Commerce Drive POST Brunswick

Prepared by Wright-Pierce

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.411	39	>75% Grass cover, Good, HSG A (SC-3, SC-4)
1.487	61	>75% Grass cover, Good, HSG B (SC-1, SC-2)
0.498	98	Bldgs, HSG B (SC-1, SC-2)
0.304	96	Gravel surface, HSG B (SC-1, SC-2A)
0.570	98	Paved area, HSG B (SC-1)
0.567	98	Paved parking, HSG B (SC-2)
3.384	30	Woods, Good, HSG A (SC-1, SC-4)
0.964	55	Woods, Good, HSG B (SC-1, SC-3)
0.499	61	new >75% Grass cover, Good, HSG B (SC-1, SC-2A, SC-3, SC-4)
0.008	98	new Paved parking, HSG B (SC-2)
0.452	98	new Paved roads, HSG B (SC-2B)
9.142	58	TOTAL AREA

Summary for Subcatchment SC-1: 1

Runoff = 3.68 cfs @ 12.42 hrs, Volume= 0.478 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
* 24,838	98	Paved area, HSG B
* 12,960	98	Bldgs, HSG B
* 36,604	30	Woods, Good, HSG A
* 29,950	55	Woods, Good, HSG B
* 13,126	96	Gravel surface, HSG B
* 59,274	61	>75% Grass cover, Good, HSG B
* 2,963	61	new >75% Grass cover, Good, HSG B
179,715	64	Weighted Average
141,917		78.97% Pervious Area
37,798		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00"
					Shallow Concentrated Flow, SCF 1
					Unpaved Kv= 16.1 fps
27.1	402	Total			

Summary for Subcatchment SC-2: 2

Runoff = 3.36 cfs @ 12.14 hrs, Volume= 0.293 af, Depth= 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
24,682	98	Paved parking, HSG B
* 8,712	98	Bldgs, HSG B
* 341	98	new Paved parking, HSG B
5,493	61	>75% Grass cover, Good, HSG B
39,228	93	Weighted Average
5,493		14.00% Pervious Area
33,735		86.00% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.06 cfs @ 12.16 hrs, Volume= 0.005 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	1,948	61	new >75% Grass cover, Good, HSG B
	122	96	Gravel surface, HSG B
	2,070	63	Weighted Average
	2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 1.80 cfs @ 12.14 hrs, Volume= 0.168 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	19,683	98	new Paved roads, HSG B
	19,683		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.24 cfs @ 12.34 hrs, Volume= 0.037 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
	10,880	39	>75% Grass cover, Good, HSG A
	12,036	55	Woods, Good, HSG B
*	8,272	61	new >75% Grass cover, Good, HSG B
	31,188	51	Weighted Average
	31,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
3.8	167	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
16.2	205	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.01 cfs @ 21.89 hrs, Volume= 0.005 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
* 110,804	30	Woods, Good, HSG A
* 7,006	39	>75% Grass cover, Good, HSG A
* 8,545	61	new >75% Grass cover, Good, HSG B
126,355	33	Weighted Average
126,355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
10.8	270	0.0070	0.42		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
32.7	383	Total			

Summary for Reach 1R: discharge from trenches

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.00" for Brunswick 10 yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 113.59 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 160.0' Slope= 0.0183 '/'
 Inlet Invert= 55.58', Outlet Invert= 52.66'



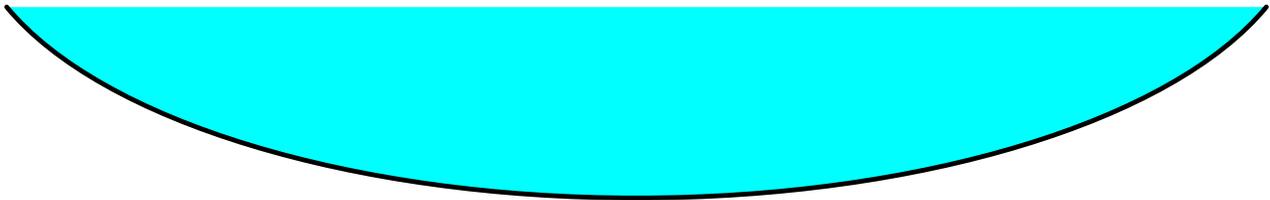
Summary for Reach 2R: discharge from culv

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 3.90" for Brunswick 10 yr event
 Inflow = 2.15 cfs @ 12.17 hrs, Volume= 0.293 af
 Outflow = 1.61 cfs @ 12.35 hrs, Volume= 0.293 af, Atten= 25%, Lag= 10.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.27 fps, Min. Travel Time= 15.0 min
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 64.9 min

Peak Storage= 1,448 cf @ 12.35 hrs
 Average Depth at Peak Storage= 0.76'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/
 Inlet Invert= 54.98', Outlet Invert= 52.70'



Summary for Reach SP-2: Study Point

Inflow Area = 1.664 ac, 46.54% Impervious, Inflow Depth = 2.38" for Brunswick 10 yr event
 Inflow = 1.85 cfs @ 12.35 hrs, Volume= 0.330 af
 Outflow = 1.85 cfs @ 12.35 hrs, Volume= 0.330 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 3.90" for Brunswick 10 yr event
 Inflow = 3.36 cfs @ 12.14 hrs, Volume= 0.293 af
 Outflow = 2.15 cfs @ 12.17 hrs, Volume= 0.293 af, Atten= 36%, Lag= 2.2 min
 Primary = 2.15 cfs @ 12.17 hrs, Volume= 0.293 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.80' @ 12.37 hrs Surf.Area= 5,021 sf Storage= 1,505 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 9.6 min (793.4 - 783.9)

Volume	Invert	Avail.Storage	Storage Description
#1	55.10'	2,726 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
55.10	260	144.0	0	0	260
56.00	7,437	436.0	2,726	2,726	13,740

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.61 cfs @ 12.17 hrs HW=55.74' TW=55.65' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.61 cfs @ 1.46 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 1.32" for Brunswick 10 yr event
 Inflow = 0.06 cfs @ 12.16 hrs, Volume= 0.005 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 52.55' @ 24.60 hrs Surf.Area= 224 sf Storage= 228 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	50.00'	2,284 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.00	224	164.0	0.0	0	0	224
50.10	224	164.0	40.0	9	9	240
54.00	224	164.0	40.0	349	358	880
54.50	224	164.0	40.0	45	403	962
54.60	224	164.0	100.0	22	426	978
55.00	601	279.0	100.0	159	585	5,033
56.00	1,329	297.0	100.0	941	1,526	5,907
56.50	1,712	306.0	100.0	758	2,284	6,365

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.00'	2.300 in/hr Exfiltration over Surface area above 50.00' Excluded Surface area = 224 sf
#2	Primary	55.58'	12.0" Round Culvert

L= 44.0' CPP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 55.58' / 55.58' S= 0.0000 '/ Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' TW=55.58' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.452 ac, 100.00% Impervious, Inflow Depth = 4.46" for Brunswick 10 yr event
 Inflow = 1.80 cfs @ 12.14 hrs, Volume= 0.168 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.71' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 7,322 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Summary for Subcatchment SC-1: 1

Runoff = 5.23 cfs @ 12.41 hrs, Volume= 0.658 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
* 24,838	98	Paved area, HSG B
* 12,960	98	Bldgs, HSG B
* 36,604	30	Woods, Good, HSG A
* 29,950	55	Woods, Good, HSG B
* 13,126	96	Gravel surface, HSG B
* 59,274	61	>75% Grass cover, Good, HSG B
* 2,963	61	new >75% Grass cover, Good, HSG B
179,715	64	Weighted Average
141,917		78.97% Pervious Area
37,798		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00"
					Shallow Concentrated Flow, SCF 1
					Unpaved Kv= 16.1 fps
27.1	402	Total			

Summary for Subcatchment SC-2: 2

Runoff = 4.00 cfs @ 12.14 hrs, Volume= 0.352 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
24,682	98	Paved parking, HSG B
* 8,712	98	Bldgs, HSG B
* 341	98	new Paved parking, HSG B
5,493	61	>75% Grass cover, Good, HSG B
39,228	93	Weighted Average
5,493		14.00% Pervious Area
33,735		86.00% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.007 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	1,948	61	new >75% Grass cover, Good, HSG B
	122	96	Gravel surface, HSG B
	2,070	63	Weighted Average
	2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 2.11 cfs @ 12.14 hrs, Volume= 0.198 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	19,683	98	new Paved roads, HSG B
	19,683		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.44 cfs @ 12.29 hrs, Volume= 0.058 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
	10,880	39	>75% Grass cover, Good, HSG A
	12,036	55	Woods, Good, HSG B
*	8,272	61	new >75% Grass cover, Good, HSG B
	31,188	51	Weighted Average
	31,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
3.8	167	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
16.2	205	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.04 cfs @ 15.50 hrs, Volume= 0.023 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
* 110,804	30	Woods, Good, HSG A
* 7,006	39	>75% Grass cover, Good, HSG A
* 8,545	61	new >75% Grass cover, Good, HSG B
126,355	33	Weighted Average
126,355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
10.8	270	0.0070	0.42		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
32.7	383	Total			

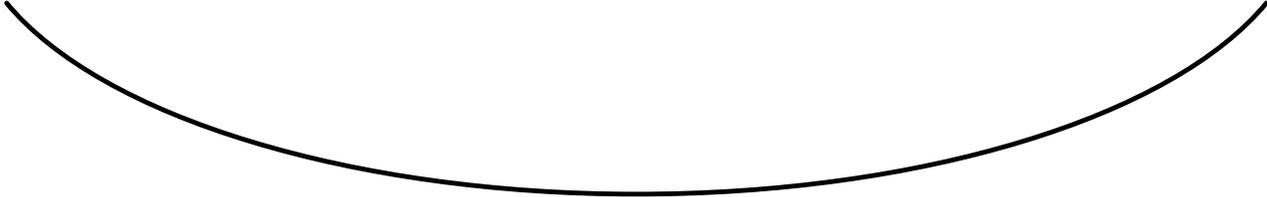
Summary for Reach 1R: discharge from trenches

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.00" for Brunswick 25 yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 113.59 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 160.0' Slope= 0.0183 '/'
 Inlet Invert= 55.58', Outlet Invert= 52.66'



‡

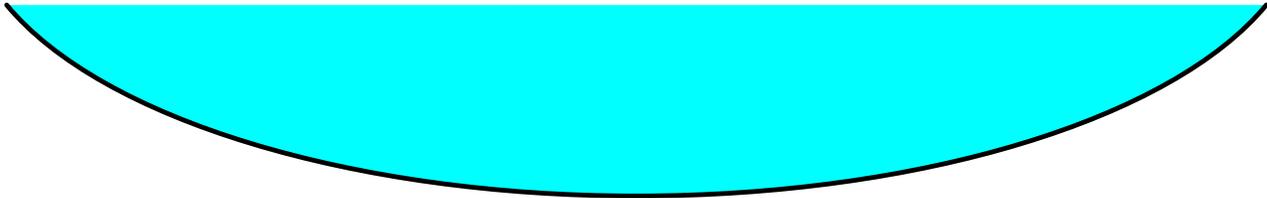
Summary for Reach 2R: discharge from culv

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 4.69" for Brunswick 25 yr event
 Inflow = 2.44 cfs @ 12.17 hrs, Volume= 0.352 af
 Outflow = 1.85 cfs @ 12.36 hrs, Volume= 0.352 af, Atten= 24%, Lag= 11.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.28 fps, Min. Travel Time= 14.7 min
 Avg. Velocity = 0.07 fps, Avg. Travel Time= 61.6 min

Peak Storage= 1,627 cf @ 12.36 hrs
 Average Depth at Peak Storage= 0.83'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/
 Inlet Invert= 54.98', Outlet Invert= 52.70'



‡

Summary for Reach SP-2: Study Point

Inflow Area = 1.664 ac, 46.54% Impervious, Inflow Depth = 2.96" for Brunswick 25 yr event
 Inflow = 2.29 cfs @ 12.32 hrs, Volume= 0.410 af
 Outflow = 2.29 cfs @ 12.32 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 4.69" for Brunswick 25 yr event
 Inflow = 4.00 cfs @ 12.14 hrs, Volume= 0.352 af
 Outflow = 2.44 cfs @ 12.17 hrs, Volume= 0.352 af, Atten= 39%, Lag= 2.1 min
 Primary = 2.44 cfs @ 12.17 hrs, Volume= 0.352 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.88' @ 12.38 hrs Surf.Area= 5,920 sf Storage= 1,931 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 10.4 min (789.6 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.10'	2,726 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
55.10	260	144.0	0	0	260
56.00	7,437	436.0	2,726	2,726	13,740

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.80 cfs @ 12.17 hrs HW=55.80' TW=55.72' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.80 cfs @ 1.50 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 1.83" for Brunswick 25 yr event
 Inflow = 0.08 cfs @ 12.15 hrs, Volume= 0.007 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 53.53' @ 24.60 hrs Surf.Area= 224 sf Storage= 316 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	50.00'	2,284 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.00	224	164.0	0.0	0	0	224
50.10	224	164.0	40.0	9	9	240
54.00	224	164.0	40.0	349	358	880
54.50	224	164.0	40.0	45	403	962
54.60	224	164.0	100.0	22	426	978
55.00	601	279.0	100.0	159	585	5,033
56.00	1,329	297.0	100.0	941	1,526	5,907
56.50	1,712	306.0	100.0	758	2,284	6,365

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.00'	2.300 in/hr Exfiltration over Surface area above 50.00' Excluded Surface area = 224 sf
#2	Primary	55.58'	12.0" Round Culvert

L= 44.0' CPP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 55.58' / 55.58' S= 0.0000 '/ Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' TW=55.58' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.452 ac, 100.00% Impervious, Inflow Depth = 5.26" for Brunswick 25 yr event
 Inflow = 2.11 cfs @ 12.14 hrs, Volume= 0.198 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.87' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 8,632 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Summary for Subcatchment SC-1: 1

Runoff = 0.97 cfs @ 12.50 hrs, Volume= 0.161 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
* 24,838	98	Paved area, HSG B
* 12,960	98	Bldgs, HSG B
* 36,604	30	Woods, Good, HSG A
* 29,950	55	Woods, Good, HSG B
* 13,126	96	Gravel surface, HSG B
* 59,274	61	>75% Grass cover, Good, HSG B
* 2,963	61	new >75% Grass cover, Good, HSG B
179,715	64	Weighted Average
141,917		78.97% Pervious Area
37,798		21.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
					Grass: Dense n= 0.240 P2= 3.00"
2.8	270	0.0100	1.61		Shallow Concentrated Flow, SCF 1
					Unpaved Kv= 16.1 fps
27.1	402	Total			

Summary for Subcatchment SC-2: 2

Runoff = 2.00 cfs @ 12.14 hrs, Volume= 0.169 af, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
24,682	98	Paved parking, HSG B
* 8,712	98	Bldgs, HSG B
* 341	98	new Paved parking, HSG B
5,493	61	>75% Grass cover, Good, HSG B
39,228	93	Weighted Average
5,493		14.00% Pervious Area
33,735		86.00% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.01 cfs @ 12.20 hrs, Volume= 0.002 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	1,948	61	new >75% Grass cover, Good, HSG B
	122	96	Gravel surface, HSG B
	2,070	63	Weighted Average
	2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 1.14 cfs @ 12.14 hrs, Volume= 0.104 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	19,683	98	new Paved roads, HSG B
	19,683		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.01 cfs @ 13.76 hrs, Volume= 0.006 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
	10,880	39	>75% Grass cover, Good, HSG A
	12,036	55	Woods, Good, HSG B
*	8,272	61	new >75% Grass cover, Good, HSG B
	31,188	51	Weighted Average
	31,188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
3.8	167	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
16.2	205	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
* 110,804	30	Woods, Good, HSG A
* 7,006	39	>75% Grass cover, Good, HSG A
* 8,545	61	new >75% Grass cover, Good, HSG B
126,355	33	Weighted Average
126,355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
10.8	270	0.0070	0.42		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
32.7	383	Total			

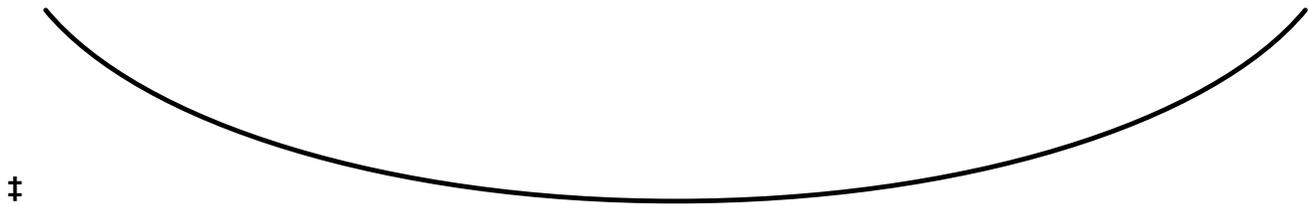
Summary for Reach 1R: discharge from trenches

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.00" for Brunswick 2yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 113.59 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 160.0' Slope= 0.0183 '/'
 Inlet Invert= 55.58', Outlet Invert= 52.66'



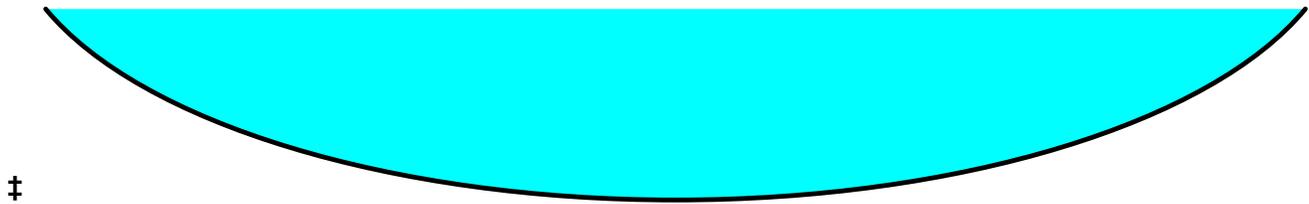
Summary for Reach 2R: discharge from culv

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 2.25" for Brunswick 2yr event
 Inflow = 1.40 cfs @ 12.18 hrs, Volume= 0.169 af
 Outflow = 1.02 cfs @ 12.35 hrs, Volume= 0.169 af, Atten= 27%, Lag= 10.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.25 fps, Min. Travel Time= 16.5 min
 Avg. Velocity = 0.05 fps, Avg. Travel Time= 76.0 min

Peak Storage= 1,010 cf @ 12.35 hrs
 Average Depth at Peak Storage= 0.58'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/
 Inlet Invert= 54.98', Outlet Invert= 52.70'



Summary for Reach SP-2: Study Point

Inflow Area = 1.664 ac, 46.54% Impervious, Inflow Depth = 1.27" for Brunswick 2yr event
 Inflow = 1.02 cfs @ 12.35 hrs, Volume= 0.176 af
 Outflow = 1.02 cfs @ 12.35 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.901 ac, 86.00% Impervious, Inflow Depth = 2.25" for Brunswick 2yr event
 Inflow = 2.00 cfs @ 12.14 hrs, Volume= 0.169 af
 Outflow = 1.40 cfs @ 12.18 hrs, Volume= 0.169 af, Atten= 30%, Lag= 2.2 min
 Primary = 1.40 cfs @ 12.18 hrs, Volume= 0.169 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.61' @ 12.36 hrs Surf.Area= 3,097 sf Storage= 719 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 7.6 min (806.2 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	55.10'	2,726 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
55.10	260	144.0	0	0	260
56.00	7,437	436.0	2,726	2,726	13,740

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 '/ Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.08 cfs @ 12.18 hrs HW=55.57' TW=55.50' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.08 cfs @ 1.27 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.43" for Brunswick 2yr event
 Inflow = 0.01 cfs @ 12.20 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 50.83' @ 24.60 hrs Surf.Area= 224 sf Storage= 75 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	50.00'	2,284 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
50.00	224	164.0	0.0	0	0	224
50.10	224	164.0	40.0	9	9	240
54.00	224	164.0	40.0	349	358	880
54.50	224	164.0	40.0	45	403	962
54.60	224	164.0	100.0	22	426	978
55.00	601	279.0	100.0	159	585	5,033
56.00	1,329	297.0	100.0	941	1,526	5,907
56.50	1,712	306.0	100.0	758	2,284	6,365

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.00'	2.300 in/hr Exfiltration over Surface area above 50.00' Excluded Surface area = 224 sf
#2	Primary	55.58'	12.0" Round Culvert

L= 44.0' CPP, square edge headwall, Ke= 0.500
 Inlet / Outlet Invert= 55.58' / 55.58' S= 0.0000 '/ Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=50.00' TW=55.58' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.452 ac, 100.00% Impervious, Inflow Depth = 2.77" for Brunswick 2yr event
 Inflow = 1.14 cfs @ 12.14 hrs, Volume= 0.104 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

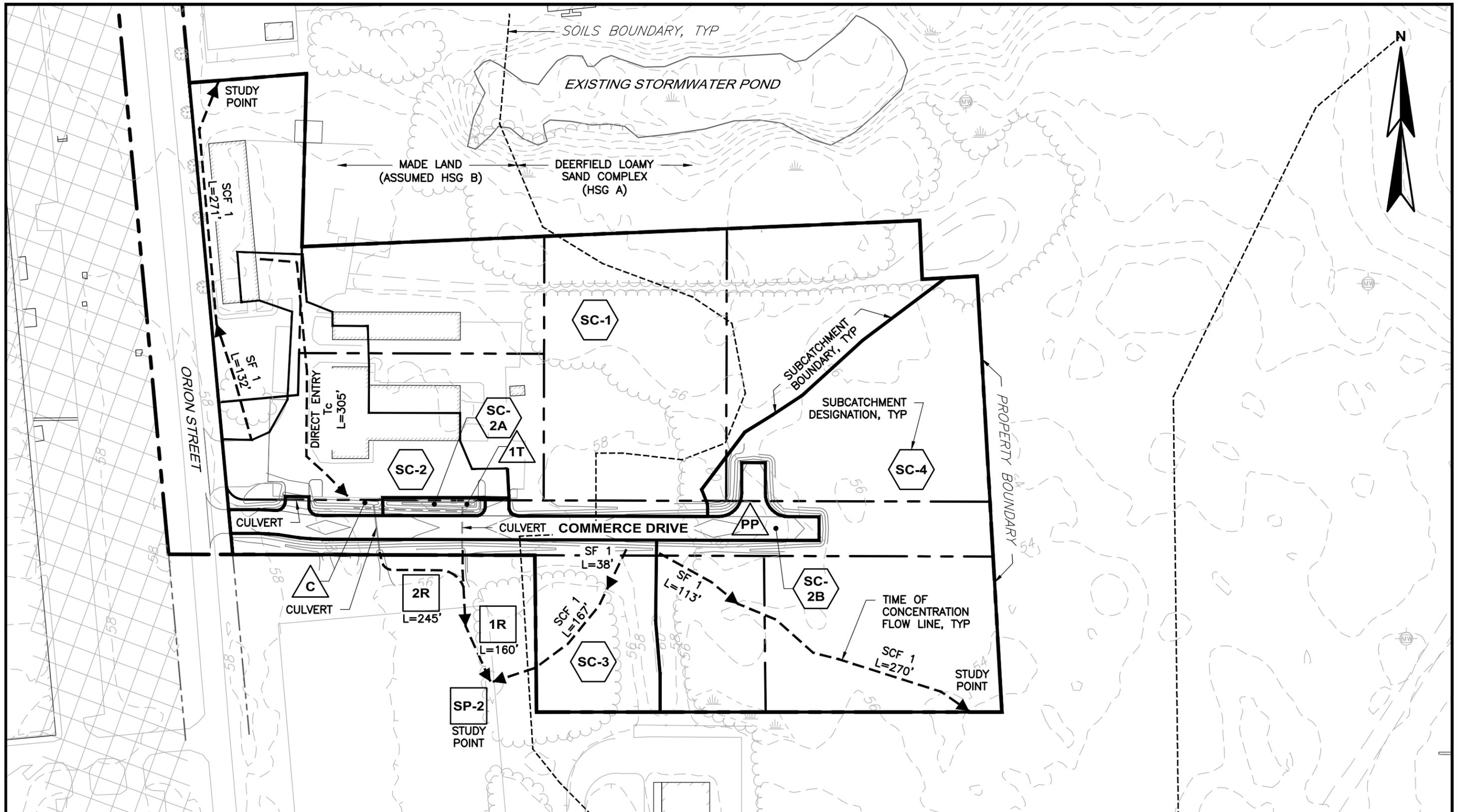
Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.38' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 4,541 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

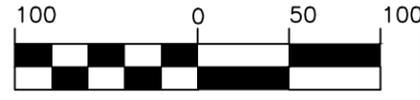
Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)



GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE

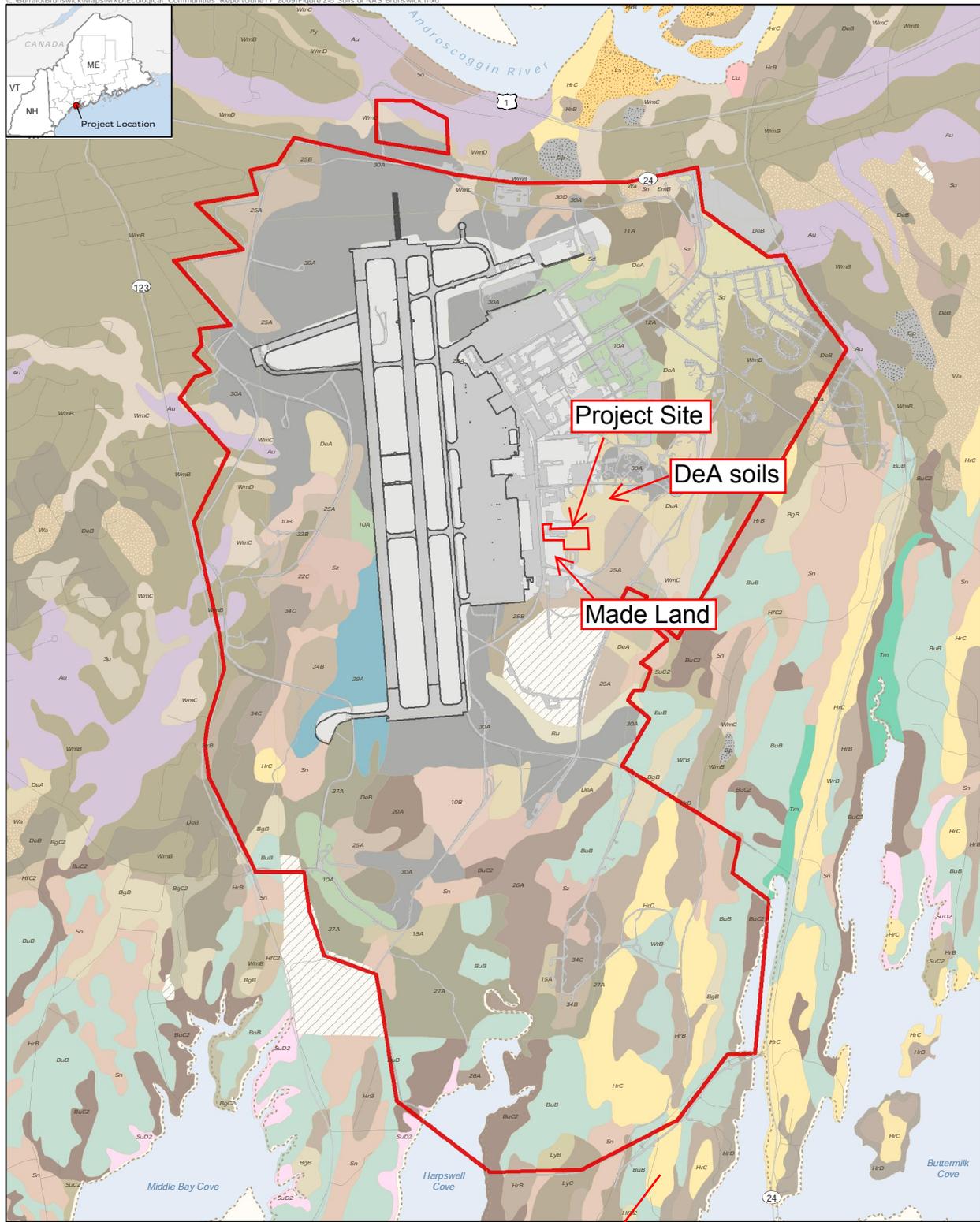
PROJ NO: 12218D DATE: JUNE 2015

WRIGHT-PIERCE 
Engineering a Better Environment

NO.	REVISIONS	APP'D
1		
2		
3		

FIGURE:
2 - 2

Soils Map of Brunswick Naval Air Station



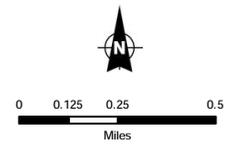
Legend				
Soil Type	25B	Adams loamy fine sand	BgC2	Belgrade very fine sandy loam
/// No Value	26A	Gouldsboro silt loam	BuB	Buxton silt loam
10A	27A	Lamoine silt loam	BuC2	Buxton silt loam
10B	28A	Urban land-Udorthents-Haplaquents association	Cu	Cut and fill land
11A	29A	Haplaquents-Scatic complex	DeA	Deerfield loamy sand
12A	30A	Udorthents-Adams complex	DeB	Deerfield loamy sand
15A	30D	Udorthents-Adams complex	EmB	Elmwood fine sandy loam
*20A	34B	Tunbridge fine sandy loam	Gp	Gravel pits
22B	34C	Tunbridge fine sandy loam	H1C2	Hartland very fine sandy loam
22C	Au	Au Gres loamy sand	H1D2	Hartland very fine sandy loam
25A	BqB	Belgrade very fine sandy loam	HrB	Hollis fine sandy loam
			HrC	Hollis fine sandy loam
			HrD	Hollis fine sandy loam
			*Ls	Limerick-Saco silt loams
			LyB	Lyman fine sandy loam
			LyC	Lyman fine sandy loam
			Py	Podunk fine sandy loam
			*Rd	Rumney fine sandy loam
			*Sn	Saugatuck loamy sand
			*So	Scatic silt loam
			*Sp	Sebago mucky peat
			SuC2	Suffield silt loam
			SuD2	Swifton silt loam
			Sz	Swanton fine sandy loam
			*Tm	Tidal marsh
			*Wa	Walpole fine sandy loam
			WmB	Windsor loamy sand
			WmC	Windsor loamy sand
			WmD	Windsor loamy sand
			WrB	Woodbridge fine sandy loam

Note: * Indicates Hydric Soil Types

Source: Normandeau Associates, 1998.

NAS Brunswick Property Boundary

Figure 2-5
Soils of NAS Brunswick
Brunswick, Maine



APPENDIX E

Section 411.5

**Inspection, Maintenance and Housekeeping Plan
&
Inspection-Maintenance Tasks Log**

APPENDIX E

Section 411.5 INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Brunswick Landing Subdivision – Phase II Midcoast Regional Redevelopment Authority Brunswick Landing Brunswick, Maine

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation control BMPs 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 Sediment Control BMPs manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised (BMPs) and/or the Maine Stormwater Best Management Practices Manual as published by the MDEP (“BMP Manual”).

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 Plan. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, material 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 disturbed 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, a notation shall be entered in the log describing the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request.

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 silt fence fabric or the 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 immediately 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. Erosion Control Blankets:

- These reinforced areas shall be inspected semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Close attention shall be paid to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- All applicable inspection and maintenance procedures recommended by the specific blanket manufacturer shall be reviewed by the inspector. These tasks shall be included in addition to the requirements of this plan.

C. 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.
- Barriers shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the barrier, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

D. 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).

E. 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.

F. 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.

After Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs 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:

- a. Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
 - b. 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. Winter Sanding: Pervious surfaces and pavement, whether asphalt, concrete or paving stones, have the potential to become impervious if not properly maintained. The following need to be planned for and be met:
- a. Sweep, vacuum and/or pressure wash pavement twice annually at a minimum.
 - b. Limit salt use for deicing and do not use sand.
 - c. Remove leaves and organic debris in the fall.
 - d. 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.
- C. Infiltration Trench: Preventive maintenance is vital for the long-term effectiveness of an infiltration system. Since infiltration is less conspicuous than most BMPs, it is easy to overlook during maintenance inspections. The following criteria apply to all infiltration systems:
- a. Fertilization of the area over the infiltration bed should be avoided unless absolutely necessary to establish vegetation.
 - a. Snow removed from any on-site or off-site areas may not be stored over an infiltration area.
 - b. Inspect the infiltration system several times in the first year of operation and at least annually thereafter. Conduct the inspections after large storms to check for surface ponding at the inlet that may indicate clogging. Water levels in the observation well should be recorded over several days after the storm to ensure that the system drains within 72 hours after filling.
 - c. Sediment must be removed from the system at least annually to prevent deterioration of system performance. The system must be rehabilitated or replaced if its performance is degraded to the point that applicable stormwater standards are not met.
 - d. If a grass buffer strip is used in conjunction with the infiltration BMP it should be inspected regularly. Growth should be vigorous and dense. Bare spots or eroded areas should be repaired and/or re-seeded or re-sodded. Watering and/or fertilization should be provided during the first few months after the strip is established, and may periodically be needed in times of drought. Grass filter strips should be mowed regularly to prevent the uncontrolled growth of briars and

weeds. Filter strips in residential or commercial areas will need to be mowed more frequently, but filter strip performance will be impaired if the grass is cut too short. Lawn clippings should be removed to prevent them from clogging the BMP.

- e. The observation well pipe should be used to measure the accumulation of sediment and to determine how quickly the system drains after a storm.
 - f. Groundwater should be analyzed quarterly for indicator parameters such as pH, specific conductance, dissolved oxygen, and chloride. Zinc has been found to be a stable heavy metal and should also be measured quarterly; it tends to appear anywhere from two to ten years after operation of large systems.
 - g. Inlet Maintenance: Remove any fallen leaves and other debris from the trench's surface inlet at least every fall after leaf drop and every spring after snow melt. If left in place, the trash and leaves will clog the trench inlet.
 - h. Rehabilitation: Clogging in a surface trench is most likely to occur near the top of the trench between the top layer of stone and the protective layer of filter fabric. Relieve this surface clogging by carefully removing the top layer of stone, removing the clogged filter fabric, installing new fabric, and replacing the top layer of stone. If the old stone is reused, it should be washed to remove any fine sediment prior to being placed back in the trench.
- D. Porous Pavement Preventive maintenance is vital for the long-term effectiveness of an infiltration system. Since infiltration is less conspicuous than most BMPs, it is easy to overlook during maintenance inspections.
- A. Check the surface of the porous pavement for accumulation of fines and debris.
 - B. Twice per year, vacuuming of the porous pavement surface with a truck mounted regenerative air or vacuum sweeper equipment.
 - C. Twice per year, observe the performance of the porous pavement during a rainfall event to see if the flow is assimilated into the porous pavement surface. If water assimilation into the porous pavement is not occurring and is flowing off the pavement, pressure wash and vacuum the surface of the pavement.

3. **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.

Housekeeping

The following general performance standards apply to the proposed project both during and after construction.

- A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials and equipment 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.

Project Construction Erosion Control BMPs Inspection Maintenance Tasks Log

Proposed Commerce Drive
Brunswick Landing
Brunswick, Maine
W-P 12218D

Midcoast Regional Redevelopment Authority

Inspector: _____

Date: _____

Maintenance Personnel: _____

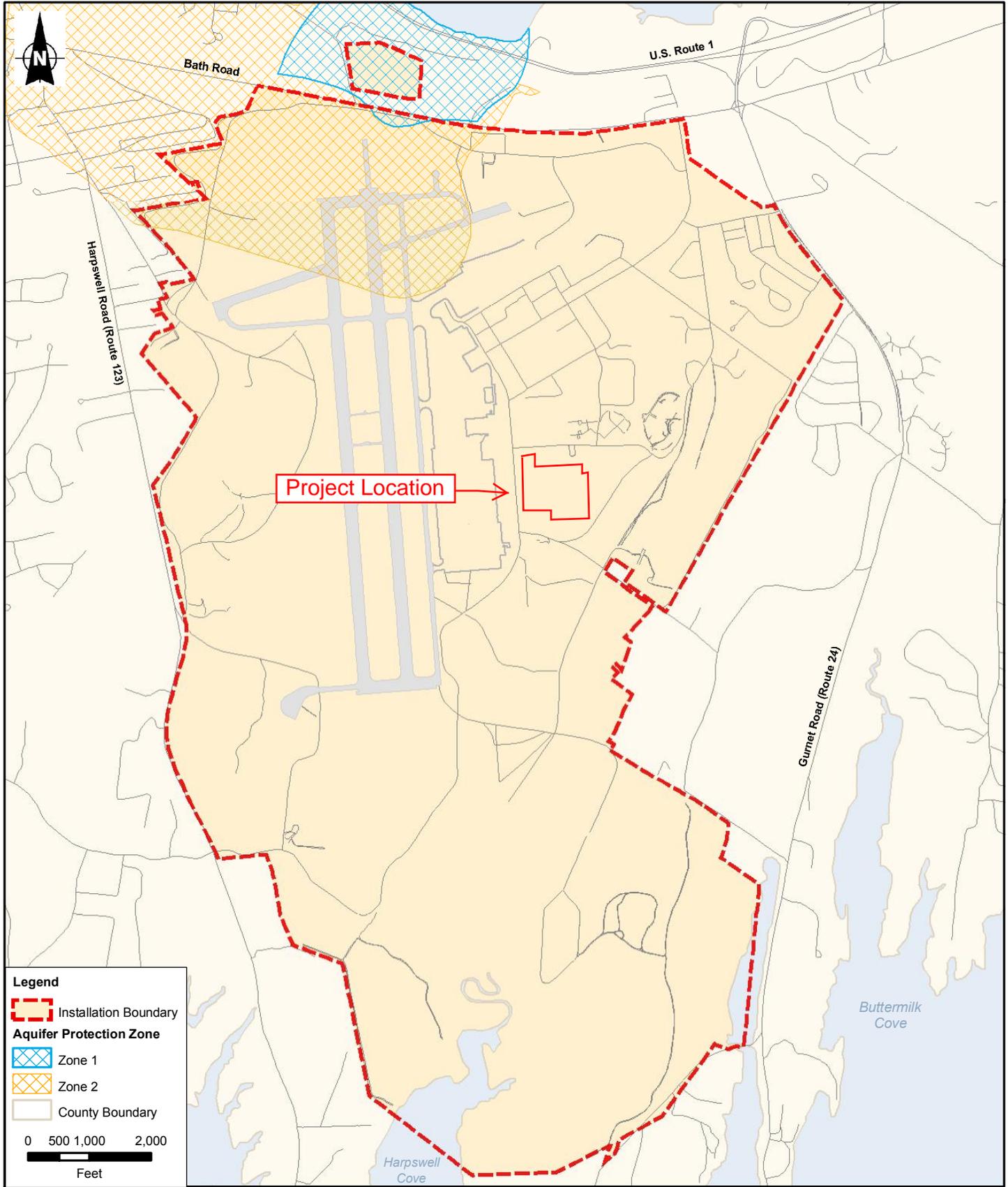
Erosion Control BMPs	Inspection		Maintenance	
	Date	Comments	Date	Corrective Action
Silt Fence/Hay Bales/Mulch				
Soil stockpiles				
Construction Site Entrance				
Cut/Fill Slopes Protection				
Vegetated/Riprap Ditches				
Stone Check Dams				
Culvert Inlet/Outlet Protection				
Road Sideslopes Protection				
Outfall Condition				
General Site Stability				
Riprap Condition				
Culvert Conditions				
Erosion Control Blankets				
Temporary Seeding & Mulch				

Sediment/Debris Disposal

Location of Sediment/Debris Accumulation	Location of Sediment/Debris Disposal	Date of Disposal

APPENDIX F

**Section 411.6
Groundwater – Aquifer Maps,
Bedrock Geology Map & Surficial Geology Map**



Source: Town of Brunswick 2009a.

Figure 3.11-1
Town of Brunswick Aquifer Protection Zones
NAS Brunswick, Maine

Brunswick Quadrangle, Maine

Compiled by

Craig D. Neil

Preliminary aquifer boundaries mapped by:

Daniel R. Locke

Digital cartography by:
Michael E. Foley

Robert G. Marvinney
State Geologist

Cartographic design and editing by:
Robert D. Tucker
Bennett J. Wilson, Jr.

Funding for the preparation of this map was provided in part by the
Maine Department of Environmental Protection.

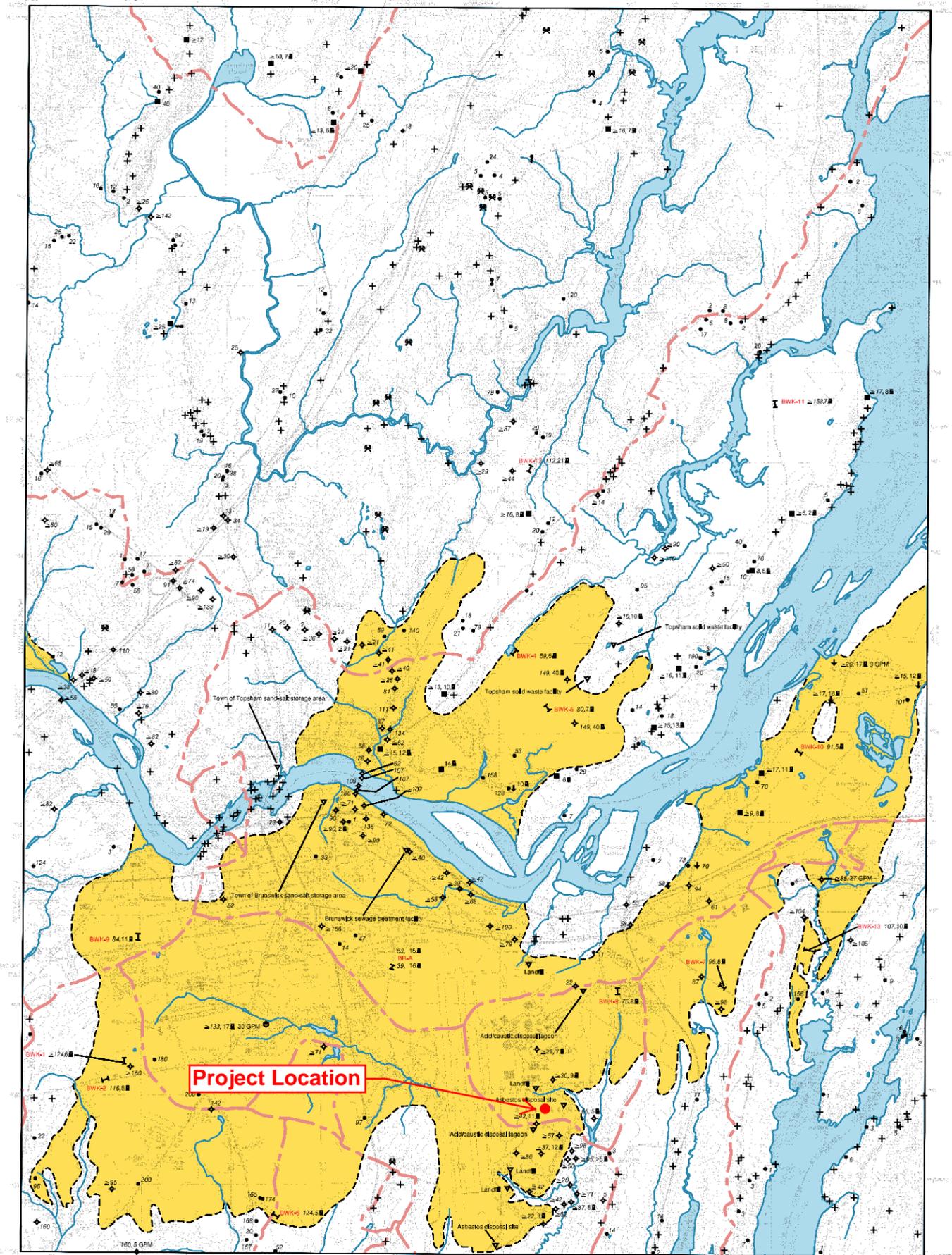


Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-287-2801 E-mail: mgs@maine.gov
Home page: http://www.maine.gov/doc/mgsc/mgsc.htm

Open-File No. 99-18
1999

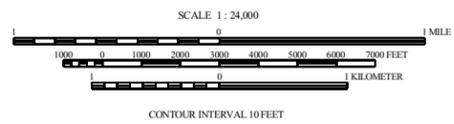
Significant Sand and Gravel Aquifers



Graphic boundaries modified from Williams, J. S., and Laroche, L. M. (1985). Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Umbagog, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine. Maine Geological Survey, Open-File Report 85-24, scale 1:50,000.

Well locations from U.S. Geological Survey, Maine State Department of Environmental Protection, and Maine Geological Survey field observations.

Source: Data for aquifer boundaries compiled by U.S. Geological Survey, Water Resources Division, and Maine Geological Survey, from the Maine Geological Survey, Brunswick, Maine.



Reprinted by permission of the U.S. Geological Survey, from the Maine Geological Survey, Open-File Report 85-24, scale 1:50,000.

Graphic boundaries, line styles, and symbols used on this map are for informational purposes only and do not constitute a warranty, either expressed or implied, by the U.S. Geological Survey.

SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

- Approximate boundary of surficial deposits with significant saturated thickness where potential groundwater yield is moderate to excellent.
- Surficial deposits with good to excellent potential groundwater yield (yields generally greater than 50 gallons per minute to a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and clayey silt. Yields are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.
- Surficial deposits with moderate to good potential groundwater yield (yields generally greater than 10 gallons per minute to a properly constructed well). Deposits consist primarily of glacial sand and gravel, but can include areas of sandy silt and clayey silt. Yields may exceed 50 gallons per minute in deposits that are highly connected with surficial water bodies, or in extensive deposits where subsurface data are available.

SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

- Areas with moderate to low or no potential groundwater yield (includes areas underlain by till, marine deposits, cotton deposits, alluvium, some thin glacial sand and gravel deposits, or bedrock). Yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

SEISMIC-LINE INFORMATION

Profiles for 12-channel seismic lines may be viewed at the Maine Geological Survey. Length of 12-channel seismic lines as shown on the map is to scale. All single-channel lines ranged from 80 to 300 feet long and are not shown to scale.

- 63 Depth to bedrock, in feet below land surface.
- 63 Depth to bedrock exceeds depth shown (based on calculations).
- 63 Depth to water level, in feet below land surface.
- MAP-7 121, 23 W Twelve-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.
- 69, 12 E Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line-identifier box refers to the northern end of the seismic line.

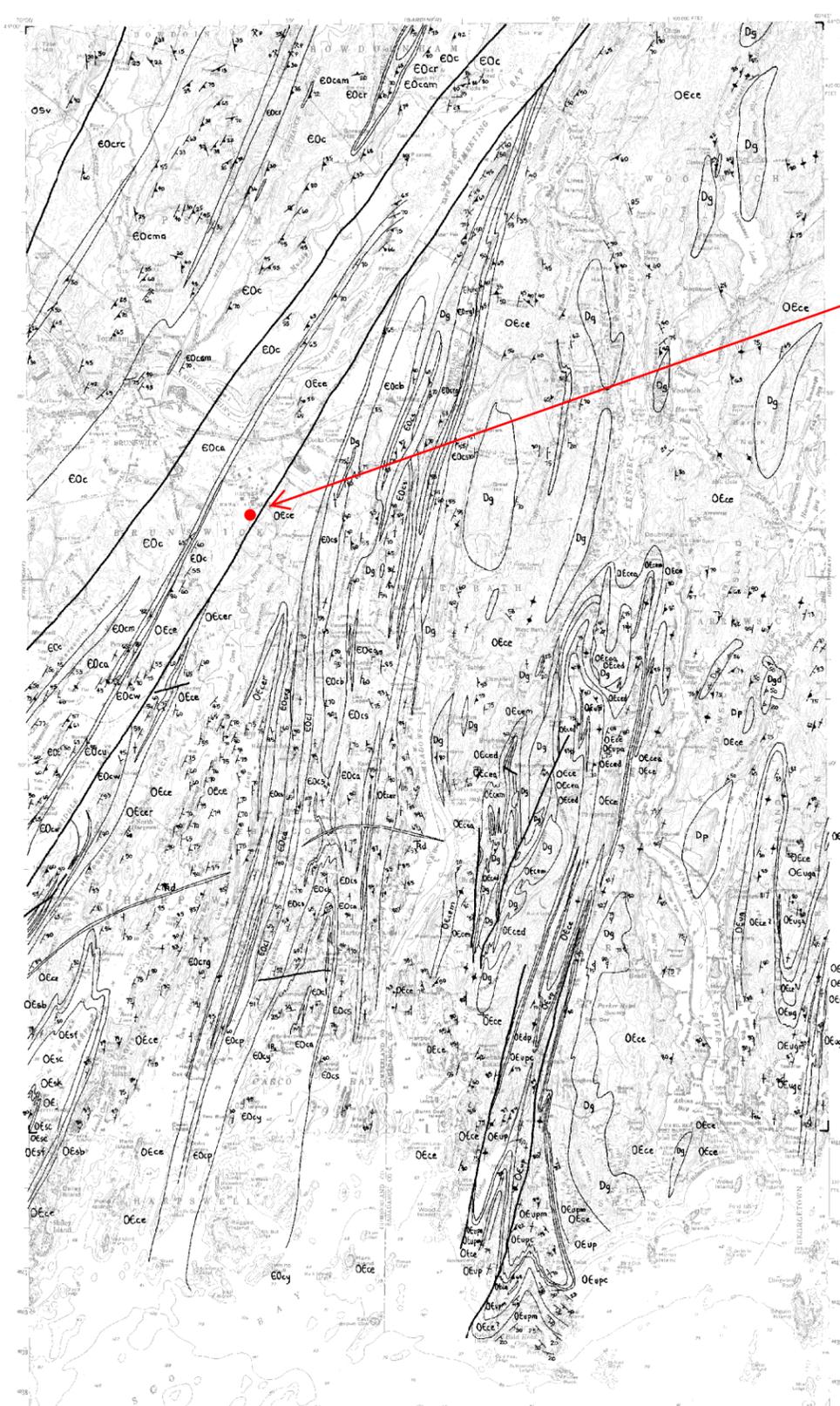
The 3-letter identifier for a line is an abbreviation for the topographic quadrangle. If the 3-letter identifier for the line is followed by a number (ex. MAP-7, MAP-4), the line is a 12-channel line. If the identifier is followed by a letter (ex. MAP-E, MAP-P), the line is a single-channel line. Twelve-channel seismic interpretations by C. D. Neil.

GEOLOGIC AND WELL INFORMATION

- 50 Depth to bedrock, in feet below land surface.
- 123 Position depth of bottom of sand and gravel to minimum depth to bedrock based on boring depth or refusal.
- 6 W Depth to water level in feet below land surface, observed in well, spring, test boring, pit or seismic line.
- X Gravel pit or embankment thickness in feet, ex. 5-12'
- Q Quarry
- 4 GPM Yield (flow) of well or spring in gallons per minute (GPM)
- ↓ Spring with general direction of flow
- Drilled overburden well
- Drilled well
- Observation well/project well if labeled; nonproject well if unlabeled
- ◇ Test boring (project boring if labeled; nonproject boring if unlabeled)
- ↓ Dry cop point
- Test pit
- Drilled bedrock well
- ▽ Potential point source of groundwater contamination
- +
- Surface-water drainage-basin boundary; surface-water divides generally correspond to groundwater divides. Horizontal direction of groundwater flow generally is away from divides and toward surface-water bodies.

OTHER SOURCES OF INFORMATION

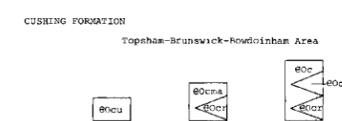
1. Topp, D. H., Williams, J. S., Tolman, A. L., and Prescott, G. C., Jr. 1985. Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Umbagog, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine. Maine Geological Survey, Open-File Report 85-24, 16 p.
2. Locke, D. B. 1999. Surficial water resources of the Bath quadrangle, Maine. Maine Geological Survey, Open-File Map 99-54.
3. Smith, G. W. 1977. Reconnaissance surficial geology of the Bath quadrangle, Maine. Maine Geological Survey, Open-File Map 77-58.
4. Corwell, W. B. 1987. Ground-water handbook for the state of Maine. Second Edition. Maine Geological Survey, Bulletin 79, 135 p.
5. Thompson, W. B. 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, 68 p. (out of print).
6. Kendall, D. L. 1987. Glaciers and glacial. A guide to Maine's landscape and geology. Down East Books, Chumley, Maine, 240 p.
7. Thompson, W. B., and Bous, H. W., Jr. 1985. Surficial geologic map of Maine. Maine Geological Survey, scale 1:50,000.



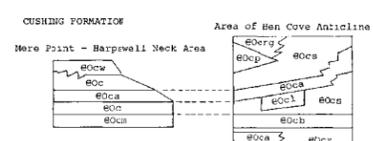
Project Location

EXPLANATION

- Late Triassic
- Diabase dike.
- E. Devonian
- Massive muscovite-biotite-garnet pegmatite.
 - Light gray fine- to medium-grained binary granite and quartz monzonite, locally with garnet. Locally includes pegmatite stringers. Massive to moderately foliated.
 - Medium gray, fine- to medium-grained, strongly foliated quartz diorite.
- NEW MEADOWS RIVER**
- Vassalboro Formation: Medium dark gray massive to thin bedded medium dark gray quartz-plagioclase-biotite granofels and subordinate calc-silicate granofels.
- JEWELL FORMATION**
- Rusty and non-rusty weathering muscovite-biotite-chlorite-garnet-quartz schist locally with chloritoid, andalusite, and staurolite; rare quartzite and thin bedded amphibolite beds.
- SPURWINK LIMESTONE**
- Gray, thin bedded fine-grained metalimestone with biotite-quartz phyllite interbeds and minor calcitic amphibolite.
- SCARBORO FORMATION**
- Rusty and non-rusty weathering light to medium brownish and purplish gray muscovite-biotite-garnet-chlorite-quartz schist with sparing staurolite and andalusite; rare quartzite beds.
- SPRING POINT FORMATION**
- Light gray, thin bedded to massive quartz-plagioclase-biotite gneiss locally with minor garnet and amphibolite.
 - Mostly thin-bedded to massive hornblende-garnet-plagioclase amphibolite and cumingtonite-anthophyllite-plagioclase-quartz amphibolite with minor garnet-rich granofels.
- CAPE ELIZABETH FORMATION**
- Thin-bedded to massive, light to medium gray quartz-plagioclase-biotite-garnet schist with variable interbeds or intervals of muscovite-biotite-garnet + sillimanite + staurolite schist. Includes 1 to 6 inch lime-silicate lenses and rare 3 to 4 inch bedded amphibolite lenses.
 - Rusty weathering muscovite-biotite-garnet-staurolite schist with sparing andalusite in staurolite-andalusite zone; abundant sillimanite in sillimanite zones.



- Richmond Corner Member: Heterogeneous association of a) quartz-plagioclase-biotite-garnet schist; b) reddish garnet-quartz-muscovite granofels (cotacule); c) member of thin interbedded amphibolite and calc-silicate or marble; and e) rusty-weathering muscovite-biotite-quartz-graphite schist.
- Mount Ararat Member: Characteristically thin bedded alternating dark gray hornblende-biotite granofels amphibolite and light gray quartz-plagioclase-biotite granofels.
- Rusty two-mica schist.
- Rusty quartz-plagioclase-biotite granofels and gneiss.
- Marble and amphibolite.



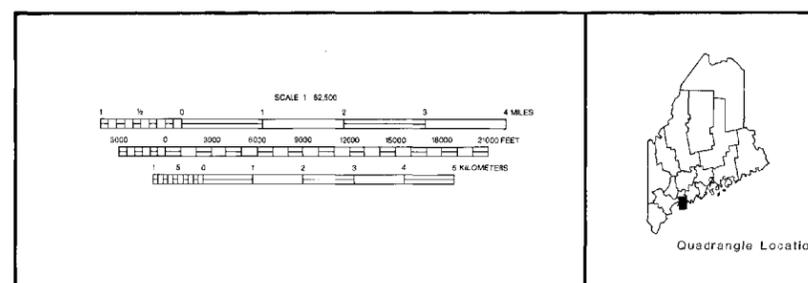
- Wilson Cove Member: Very rusty to slightly rusty weathering dark gray garnet-biotite schist, quartz-biotite-garnet granofels, hornblende and cumingtonite amphibolite.
- Light to light medium gray plagioclase-quartz-biotite + muscovite granofels and schist locally with relict crystal sill and euglenitic amphibolite; minor thin beds of green zoisite-rich calc-silicate granofels.
- Hornblende-biotite amphibolite with fine uniform gneissic foliation; amphibolite with interbeds of green zoisite-rich calc-silicate; thinly bedded alternations of phlogopite biotite schist, laboratorite-hornblende-cumingtonite-anthophyllite amphibolite, and calc-silicate granofels; coarse-grained white granoblastic marble.
- Meropoint Neck Member: Moderately to very rusty-weathering quartz-plagioclase-biotite-muscovite schist.
- Bethel Point Member: Very rusty-weathering quartz-plagioclase-biotite-muscovite schist with rare thin quartzite beds.
- Sebascodegan Island Member: Thinly interbedded association of quartz-plagioclase-biotite + garnet granofels; lime-silicate gneiss; and quartz-plagioclase-biotite-muscovite + sillimanite gneiss. Occasional relict euglenitic structure present in first lithology.
- Non-bedded, weakly foliated coarse-grained hornblende-biotite-andesine amphibolite.
- Sulfidic, rusty-weathering plagioclase-quartz-biotite gneiss with subordinate lime-silicate gneiss.
- Quartz-plagioclase-microcline-diopside-hornblende-clinzoisite gneiss.
- Yarmouth Island Member: Light gray plagioclase + quartz-cordierite-quartz-garnet-biotite gneiss locally with sillimanite and staurolite; minor calc-silicate gneiss.

- EAST OF NEW MEADOWS RIVER**
- FORMATIONAL ASSIGNMENT UNCERTAIN - Georgetown area***
- Heterogeneous association of thin units of a) amphibolite; b) quartz-garnet granofels (cotacule); c) very rusty-weathering graphitic schist; d) biotite-muscovite-quartz-garnet + sillimanite schist; and e) quartz-plagioclase-biotite-muscovite schist (cf. OEce).
 - Dark gray, evenly fine- to medium-grained amphibolite.
 - Thinly interbedded garnet-quartz granofels (cotacule) and dark medium gray quartz-plagioclase-biotite-garnet granofels. Some cotacule has dense flint-like texture.
 - Rusty muscovite + graphite + biotite schist.
 - Non to slightly rusty muscovite-biotite-garnet-andalusite or sillimanite + staurolite schist.
- FORMATIONAL ASSIGNMENT UNCERTAIN - Phippsburg area***
- Heterogeneous association of a) non to slightly rusty-weathering biotite-muscovite-sillimanite schist (similar to OEac); b) very rusty-weathering muscovite + graphite + biotite schist; c) very rusty-weathering amphibolite; d) quartz-plagioclase-muscovite-biotite schist (similar to OEce); e) garnet-biotite schist; and f) skarn-like calc-silicate rock.
 - Thinly interbedded dark gray quartz-plagioclase-biotite granofels and medium greenish gray calc-silicate granofels.
 - Amphibolite.
 - Non to slightly rusty muscovite-biotite-garnet schist locally with abundant andalusite or sillimanite and staurolite (similar to OEug). May be in part Cape Elizabeth, in part Scarboro equivalents.
- CAPE ELIZABETH FORMATION**
- Same as OEce west of New Meadows River, except extensively migmatized in most areas.
 - Interspersed hornblende amphibolite, coarse skarn-like calc-silicate, and marble.
 - Dark gray, generally massive but occasionally weakly thin bedded, evenly fine-textured biotite-quartz-plagioclase-sillimanite schist.
 - Non to somewhat rusty weathering muscovite-biotite-garnet + sillimanite-quartz schist.

* Relative stratigraphic relations of these rocks uncertain. They may include thinned equivalents of several of the Upper Casco Bay Group Formations.

SYMBOLS

- Contact
- Gradational contact
- High angle post-metamorphic fault
- Thrust fault (teeth on upper plate)
- Dip and strike of bedding
- Dip and strike of upright bedding (tops in direction of ball)
- Dip and strike of overturned bedding.
- Dip and strike of schistosity or gneissic foliation.
- Quarry
- p - pegmatite
- r - rock
- l - line



**RECONNAISSANCE
BEDROCK GEOLOGY
OF THE
BATH AND SMALL POINT
QUADRANGLES, MAINE**
BY
ARTHUR M. HUSSEY
1961
Maine Geological Survey
DEPARTMENT OF CONSERVATION
Augusta, Maine 04333
Walter A. Anderson, State Geologist
OPEN FILE NO. 81-32

Brunswick Quadrangle, Maine

Surficial geologic mapping by
Thomas K. Weddle

Digital cartography by
Susan S. Tolman

Robert G. Marvinsky
State Geologist

Cartographic design and editing by
Robert D. Tucker

Funding for the preparation of this map was provided in part by the U.S. Geological Survey
STATEMAP Program, Cooperative Agreement No. 00HQMG007.



Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-607-2801 E-mail: mgp@maine.gov
Home page: http://www.maine.gov/oc/mgs/mgs.htm

Open-File No. 01-484
2001

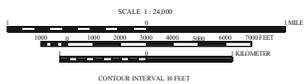
Surficial Geology



Project Location

SOURCES OF INFORMATION

Surficial geologic mapping by Thomas K. Weddle completed during the 2000-2001 field seasons. Profiles for data were provided by the U.S. Geological Survey STATEMAP Program.



Topographic base from U.S. Geological Survey 7.5-minute quadrangle maps, series 1:24,000, dated through 1989. U.S. Geological Survey topographic maps.

The use of liability, title, or deed government assurances in this map is for location purposes only and does not constitute any warranty for any present or potential effects or consequences.

- Artificial fill** - Includes landfill, highway and railroad embankments, and dredge spoil areas. These units are mapped only where they are recognizable using the contour lines on the map, or where they define the limits of wetland areas. Where artificial fill is present in virtually all developed areas of the quadrangle.
- Stream alluvium** - Gray to brown fine sand and silt with some gravel. Conglomerate flood plains along present streams and rivers. Extent of alluvium approximates areas of potential flooding.
- Freshwater wetlands** - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.
- Saltmarsh wetlands** - Peat, muck, silt, and fine sand. Coastal marsh, subject to tidal flooding. Thin, non-commercial peat layers are present atop a mineral substrate consisting of organic sands and muds.
- Folian deposits** - Pleistocene colluvial deposits composed of materials wind-blown in sand and dunes formed following the transverse regression. Found often as a blanket deposit, see this to show its map.
- Beached stream alluvium** - Pleistocene alluvium consisting of fluviolacustrine deposited sand and gravel, tongue-and-groove with coarse sand dunes and intertidal areas are representative of beached stream and coastal beach-dune environments formed during the marine regression.
- Regressive marine drifts** - Pleistocene marine drifts formed during regression of the sea due to isostatic emergence of the land. Very low-angle sand and silt foreset bedding is marked by rough cross-bedded sand deposited by beached streams which flow over the dunes in a proglacial channel. Turbidity may be marked with unmappped thin colluvial deposits.
- Marine shoreline** - Pleistocene beach and dune sands deposited during regressive phase of marine submergence. Beach morphology is poorly preserved, but sand and gravel are present along the ridge crest.
- Marine nearshore deposits** - Pleistocene gravel, sand, and mud deposited as a result of wave activity in nearshore or shallow-marine environments not associated with beach morphology.
- Presumpscot Formation** - Marine to laminated silt clay with rare depressions and occasional shaly horizons, which overlie peat and fill, and are interbedded with and overlie and underlies marine fan deposits, includes sand deposited as a result of subaqueous fans.

- Land moraine** - Thin ridges consisting of bedded sand and gravel interbedded with Presumpscot Formation silt clay and often filled with the top irregular faces of the moraine. Some moraines or groups of moraines have been assigned a unique geographic name listed below.
 - Formica - Onitance Road moraines 1 to 2
 - Penner - Meadow Road moraines 1 to 3
 - Formica - Woodville Road moraines
 - Penner - Fair Church moraine
- Subaqueous nearshore fans** - Thick sand and gravel accumulations formed at the mouth of a glacial channel along the retreating ice margin. The sand and gravel is interbedded with and overlain by Presumpscot Formation silt clay on the distal edges of the fans, and interbedded with and overlain by silt at their ice-contact faces. Some fans or groups of fans have been assigned a unique geographic name listed below.
 - Phillip - Brattle Pond fan
- Drift areas** - Areas with generally less than ten feet of drift covering bedrock. Till overlies bedrock on hillslopes and ridge crests. Pleistocene glacial silt clay are present in depressions, and nearshore deposits of silt and clay. Presumpscot Formation and bedrock on hillslopes and at the base of these slopes. Small rock outcrops and areas of numerous small outcrops are shown as solid gray areas.
- Contour between units** - dashed where inferred
- Station - oblique lines made at dot** - Number indicates azimuth (in degrees) of flow direction. Where two directions are observed in the same pattern, dots indicate oblique tracks which intersect.
- End moraine crests**
- Scarp**
- Ditch**
- Marine (land) locality** - See from natural exposure or surface core. Number is radiocarbon age estimate.
- Non-marine fossil locality** - may be from natural exposure or subsurface core. Number is radiocarbon age estimate.
- Dip-direction of facies line-bedding**
- Photo or other image locality** - Location of site shown and described to map legend.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the layers beneath rock as well (commonly called horizons, sand and gravel, or clay, which in the solid ledges (bedrock). Bedrock outcrops and areas of glacial bedrock outcrops are shown on the map, but contours of the bedrock are not distinguished (refer to bedrock geology maps). Most of the surficial materials are deposits formed by glacial and fluvial processes during the last stages of continental glaciation, which began about 25,000 years ago. The contents of the surficial deposits are the products of surficial geologic processes, such as erosion, deposition, or ice retreat from human activity, such as fill on other land-use/development features.

The map shows the spatial distribution of the different geologic features, deposits, and landforms as described in the map's caption. Features such as stream channels and moraines can be used to reconstruct the location and position of the glacier and its margin, especially as the ice retreats. Other ancient features include ridges and depressions of glacial lakes or the glacial sea, were long gone from the scene. This glacial geology history of the quadrangle is useful for the larger understanding of past events, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or site disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or topographic maps and geologic maps for anyone wanting to know what lies beneath the land surface. For example, these maps are used to assess later water supplies, or economically important deposits such as sand and gravel for aggregate or clay for brick factories. Land-use and development such as the location of residential and commercial or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, water main foundations, or siting new houses may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of other publications below.

OTHER SOURCES OF INFORMATION

1. Lock, D. B. and Weddle, T. K., 2001. Surficial materials of the Brunswick quadrangle, Maine. Maine Geological Survey, Open-File Map 01-484.
2. Neal, C. D., 1999. Significant sand and gravel aquifers of the Brunswick quadrangle, Maine. Maine Geological Survey, Open-File Map 99-16.
3. Thompson, W. B., 1978. Surficial geology handbook for central Maine. Maine Geological Survey, Open-File Map 78-16.
4. Thompson, W. B. and Farris, H. W., Jr., 1985. Surficial geology map of Maine. Maine Geological Survey, scale 1:240,000.
5. Thompson, W. B., Crockett, F. L., Breen, H. W., and Jackson, R. G., 1989. Glacial history of Maine and their relation to Late Pleistocene-interglacial central ice advances. In Anderson, W. B. and Breen, H. W., (eds.), Pleistocene of Maine. Maine Geological Survey, Bulletin, p. 34-67.

APPENDIX G

**Section 411.7
Erosion & Sedimentation Control Plan
&
Inspection-Maintenance Tasks Log**

APPENDIX G

Section 411.7 EROSION AND SEDIMENTATION CONTROL PLAN

Brunswick Landing Subdivision – Phase II Midcoast Regional Redevelopment Authority Brunswick Landing Brunswick, Maine

INTRODUCTION

This Erosion and Sedimentation Control Plan (E&S Plan) has been developed to provide a strategy to prevent unreasonable erosion of soil and sediment transport beyond the project site or into a protected natural resource. These strategies apply to the proposed development immediately prior to soil disturbing activities on the site and shall remain in place until the site is permanently stabilized.

The information presented in this E&S Plan is provided as an overview of the anticipated measures to be used on this site. In some instances, additional measures may be required due to unexpected conditions that arise during construction. Also, specific detail on the application of a recommended practice for an unexpected instance may not be covered in this E&S Plan. For additional detail on any of the erosion and sedimentation control measures discussed in this E&S Plan or for further recommendations of applicable practices, refer to the Maine Erosion and Sediment Control BMPs manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised (BMPs).

1.0 PLAN IMPLEMENTATION PHASES

Generally, the implementation of this plan occurs in three distinct phases as described in the following paragraphs:

1.1 Pre-construction Phase

Prior to the beginning of any construction, perimeter sediment barriers (i.e. silt fence, erosion control mix berm, etc...) shall be installed at, or just below, the limits of clearing or grubbing, and/or just above any adjacent property line or protected natural resource. Prior to any clearing or grubbing, a construction entrance shall be constructed at the intersection of the proposed access road with the existing roadway to avoid tracking of mud, dust and debris from the site.

1.2 Construction Phase

In areas undergoing actual construction, contractor shall only expose that amount of mineral soil necessary for progressive and efficient site construction. Any area that has been disturbed and is not “permanently stabilized” (as described by this E&S Plan) shall be considered “open.” Open areas shall be protected and stabilized with temporary erosion and sedimentation control measures as shown on the project plans and as described within this E&S Plan.

Preparation for winter stabilization applies to some disturbed areas that are open on or after September 15th of the construction season (refer to “Section 5-Winter Construction” of this E&S Plan). Any areas that remain open after November 1 or new soil disturbance that occurs after November 1, but before April 15, must be protected by additional measures as described in the

Winter Construction section of this E&S Plan. The recommendations outlined in the Winter Construction section of this E&S Plan shall supersede other conflicting recommendations.

1.3 Post-construction phase

Once the site has reached permanent stabilization, as defined herein, remove any temporary sediment control measures, such as silt fence, within 30 days. All sediment/debris that has accumulated during construction in the permanent stormwater management system, ditches, swales, paved surfaces, and/or any other location shall be removed and disposed of in an approved manner.

2.0 PERMANENT STABILIZATION

The strategies outlined in this E&S Plan shall be in effect until the site reaches permanent stabilization. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well established. If necessary, areas must be seeded and mulched again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. The following list defines permanent stabilization for applicable situations.

- 2.1 **Seeded Areas:** For seeded areas, permanent stabilization means a 90% cover of vigorous perennial growth with no evidence of washing or rilling of the topsoil.
- 2.2 **Sodded Areas:** For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.
- 2.3 **Permanent Mulch:** For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization if applied according to approved application rates and limitations.
- 2.4 **Riprap:** For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of well-graded gravel or approved geotextile to prevent soil movement from behind the riprap.
- 2.5 **Paved Areas:** For paved areas, permanent stabilization means the placement of compacted gravel subbase is completed.
- 2.6 **Ditches, channels, and swales:** For open channels, permanent stabilization means the channel is stabilized with a 90% cover of vigorous perennial growth, a well-graded riprap lining, or with another non-erosive lining such as specified. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

3.0 TEMPORARY EROSION AND SEDIMENTATION CONTROL BMPs

The placement/use of the following erosion and sedimentation control measures shall be in accordance with the DEP BMPs handbook.

- 3.1 **Sediment Barriers:** Prior to the beginning of any construction, sediment barriers (i.e. silt fence, erosion control mix berms, etc...) shall be installed across the slope(s), on the contour, at or just below the limits of clearing or grubbing, and/or just above any adjacent property line or watercourse to protect against construction related erosion. Sediment barriers shall be maintained

until all tributary open areas have been permanently stabilized. The following are recommended perimeter sediment barriers:

- **Silt fence:** Shall be installed per the detail on the plans. The effective height of the fence shall not exceed 36 inches. It is recommended that silt fence be removed by cutting the fence materials at ground level so as to avoid additional soil disturbance.
- **Staked hay bales:** Shall be installed per the detail on the plans. Bales shall be wire-bound or string-tied and these bindings must remain parallel with the ground surface during installation to prevent deterioration of the bindings. Bales shall be installed within a minimum four (4) inch deep trench line with ends of adjacent bales tightly butting against one another.
- **Erosion control mix berm:** Shall be installed per the detail on the plans. The mix shall consist primarily of organic material and contain a well-graded mixture of particle sizes. The mix must meet the most recent composition specifications published by the MDEP. No trenching is required for installation of this barrier.

3.2 Surface Stabilization: All disturbed areas that will not be worked for more than 7 days shall be protected and stabilized with mulch or other non-erodable cover. Areas located within 75 feet of a wetland or waterbody must be protected and stabilized within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first. Areas that have been seeded (temporary or permanent) shall be stabilized immediately. The following are recommended practices for surface stabilization:

- **Hay or straw Mulch:** Organic mulches including hay and straw need to be air-dried, free of undesirable seeds and coarse materials. Application rate shall be 2 bales (70-90 lbs) per 1000 square feet or 1.5 to 2 tons (90-100 bales) per acre. This type of mulch must be anchored with a tackifier amendment and/or via physical means (i.e. vehicle tracking, jute netting, etc.) to avoid displacement by wind or water.
- **Erosion control mix:** Erosion Control Mix can be manufactured on or off the site. It is composed primarily of shredded bark, stump grindings, composted bark, or other acceptable products based on a similar raw source. The mix must meet the most recent composition specifications published by the MDEP. The mix shall be placed evenly and must provide 100% soil coverage. Erosion control mix shall be applied such that the thickness on slopes 3:1 or less is 2 inches plus ½ inch per 20 feet of slope up to 100 feet. The thickness on slopes between 2:1 and 3:1 is 4 inches plus ½ inch per 20 feet of slope up to 100 feet. This shall not be used on slopes greater than 2:1.
- **Erosion control blankets:** Erosion Control Blankets are used on steep slopes (greater than 3H:1V) and also areas that will receive concentrated stormwater flows. Blankets aid in controlling erosion on disturbed soils and critical areas during the establishment period of vegetation. Various forms of erosion control blankets are commercially available, each with different advantages for different applications. The type of blanket to be used for individual applications shall be as indicated on the project plan set or via the use of an approved equivalent blanket. In all applications, the blanket manufacturer's specifications and installation methods shall be referenced and adhered to.

3.3 Soil Stockpiles: All topsoil shall be stockpiled for future use on the project at a stable location on-site. Structural measures, such as sediment barriers, may be warranted for additional sediment control of the stockpile areas. Stockpiles of soil or subsoil shall be mulched with hay or straw or with erosion control mix. This must be done within 24 hours of stocking and re-established prior to any rainfall. No soil stockpile is to be placed (even covered with hay or straw) within 75 feet from any protected natural resources.

3.4 Stabilized Construction Entrance/Exit: Prior to any clearing or grubbing, a stabilized construction entrance/exit shall be constructed wherever traffic will exit the construction site onto

a paved roadway in order to minimize the tracking of sediment and debris from the construction site onto public roadways. The entrances and adjacent roadway areas shall be periodically swept or washed to further minimize the tracking of mud, dust or debris from the construction area. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment trapping device. Stabilized construction exits shall be constructed in areas as specified and detailed on the plans.

3.5 Stone Check Dams: Stone check dams are generally temporary devices, which are constructed across a swale or drainage ditch. Their purpose is to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch. These devices will also trap small amounts of sediment generated in the ditch itself, however, they are not an effective sediment trapping device and should not be used as such. Stone check dams are typically constructed of 2"-3" crushed stone and stand 24 inches in height.

3.6 Storm Drain Inlet Protection: Storm drains are typically operational prior to permanent stabilization of tributary areas. In these instances hay bales, crushed stone barriers, and/or silt sacks shall be used within a catch basin or prior to a pipe entrance. This temporary protection will assist in the removal of sediment prior to entrance into a storm drainage system and the prevention of clogging and/or loss of capacity. These devices alone will not prevent all sediment from entering the stormwater system and should be used in conjunction with other devices to achieve desired sediment removal levels.

3.7 Dewatering: Water from construction dewatering will pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing and sediment discharges to a protected natural resource. Discharge is permitted within the filter basin locations prior to the installation of the filter media.

3.8 Dust Control: Dust control during construction shall be achieved by the use of a watering truck to periodically sprinkle the exposed roadway areas as necessary to reduce dust during the dry months. Applying other dust control products such as calcium chloride or other manufactured products are allowed if authorized by the proper local, state and/or federal regulating agencies. However, it is the contractor's ultimate responsibility to mitigate dust and soil loss from the site.

4.0 VEGETATIVE MEASURES

4.1 Temporary Vegetation: If any disturbed area of soil will be left bare for more than 7 days, or if construction is to be completed in phases over an extended duration, temporary seeding and mulching shall commence immediately following initial fine grading of the site. In sensitive areas (within 75 feet of protected natural resources) temporary mulch must be applied within 48 hours or prior to any storm event on all disturbed surfaces. It shall be maintained and reseeded, as necessary, to ensure good vegetative cover for the entire duration of construction. Seed will be selected from the following table (Table 1 - Temporary Seed Mixture) according to the time of year or via an approved equivalent method.

**TABLE 1
TEMPORARY SEED MIXTURE**

Seed	Lbs./Acre	Lbs./1000s.f.	Recommended Seeding Date
Winter Rye	112	2.6	8/15 thru 10/1
Oats	80	1.8	4/1 thru 7/1 8/15 thru 9/15
Annual Ryegrass	40	0.9	4/1 thru 7/1
Sudangrass	40	0.9	5/15 thru 8/15
Perennial	40	0.9	8/15 thru 9/15

Note:

Some tree and shrub species may be desirable for sites primarily covered with sand and gravel. These methods shall be approved by the appropriate regulatory authority prior to use.

4.2 Permanent Vegetation: Re-vegetation measures shall commence immediately upon completion of final grading of areas to be loamed and seeded. Re-vegetation measures shall consist of the following:

4.2.1 Seedbed Preparation

- Four (4) inches of loam will be spread over disturbed areas and smoothed to a uniform surface. Loam shall be free of subsoil, clay lumps, stones and other objects over 2" in any dimension, and without weeds, roots or other objectionable material.
- Soil tests shall be taken at the time of soil stripping to determine fertilization requirements. Soil tests shall be taken promptly as to not interfere with the 7-day limit on soil exposure (48-hours adjacent to a protected natural resource). Based upon test results, soil amendments shall be incorporated into the soil prior to final seeding. In lieu of soil tests, soil amendments may be applied as shown below in Table 2-Recommended Soil Amendments :

**TABLE 2
RECOMMENDED SOIL AMENDMENTS**

Item	Application Rate
10-20-20 Fertilizer (N-P205-K20 or equal)	18.4lbs./1,000 s.f.
Ground Limestone (50% calcium and magnesium oxide)	138-lbs./1,000 s.f.

- Work lime and fertilizer into the soil as nearly as practical to a depth of four (4) inches with proper equipment. Roll the area to firm the seedbed except on clay, silty soils or coarse sand.

4.2.2 Application of Seed

- **Seeding:** The seed mixture shown below in Table 3-Permanent Seed Mixture, shall be utilized for permanent seeding applications. Alternate seed mixtures

may be utilized as approved. Refer to Appendix A of the MDEP BMPs manual for additional seed mixture options.

**TABLE 3
PERMANENT SEED MIXTURE**

Seed Type	Application Rate
Creeping Red Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Red Top	0.05 lbs/1,000 s.f. (2 lbs/acre)
Tall Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Total:	0.97 lbs/1,000 s.f. (42 lbs/acre)

- **Hydroseeding:** Shall be conducted on prepared areas as described above. Hydroseeding shall not be done on slopes steeper than 2H:1V. Lime and fertilizer may be applied simultaneously with the seed. Recommended seeding rates must be increased by 10% when hydroseeding.
- **Surface Stabilization:** Mulching or other approved surface stabilization methods shall commence immediately after seed is applied. Refer to “Section 3.2-Surface Stabilization” of this plan for more information.

4.2.3. Sodding

Following seedbed preparation, sod can be applied in lieu of seeding in areas where immediate vegetation is most beneficial such as ditches, around stormwater drop inlets and areas of aesthetic value. Sod should be laid at right angles to the direction of flow starting at the lowest elevation. Sod should be rolled or tamped down to even out the joints once laid down. Where flow is prevalent the sod must be properly anchored down. Irrigate the sod immediately after installation. In most cases, sod can be best established between April 1 and November 15 of the construction year.

5.0 WINTER CONSTRUCTION

The winter construction period is from November 1 through April 15. If the construction site is not permanently stabilized by November 15 then the site needs to be protected with over-winter stabilization.

Winter excavation and earthwork shall be completed such that no more than 1 acre of the site is without stabilization at any one time. Limit the exposed area to those areas in which work is expected to be under taken during the proceeding 15 days and that can be mulched in one day prior to any snow/rain event. All areas shall be considered to be denuded until the subbase gravel is installed in roadway areas or the areas of future loam and seed have been loamed, seeded and mulched.

Any added measures, which may be necessary to control erosion/sedimentation from the site dependent upon the actual site and weather conditions, must be installed. In order to minimize areas without erosion control protection, continuation of earthwork operations on additional areas shall not begin until the exposed soil surface on the area being worked has been stabilized.

5.1 Winter Construction BMP Adjustments

- 1) **Sediments Barriers:** During frozen conditions, sediment barriers shall consist of erosion control mix berms as frozen soil prevents the proper installation of hay bales and silt fences.

- 2) **Mulching:** Between the dates of November 1 and April 15, all mulch shall be anchored by either mulch netting, asphalt emulsion chemical, or track or weed cellulose fiber. When the ground surface is not visible through the mulch then cover is sufficient. After November 1st, mulching and anchoring of all exposed soil shall occur at the end of each final grading workday.
- **Open Surfaces (flatter than 8%):** Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal accepted rate of 75-lbs./1,000 square feet or 1.5 tons/acre) and shall be properly anchored. Mulch shall not be spread on top of snow. The snow will be removed down to one-inch depth or less prior to application. After each day of final grading, the area will be properly stabilized with anchored hay or straw or erosion control matting. An area shall be considered to have been stabilized when exposed surfaces have been mulched with straw or hay at a rate of 150 lb. per 1,000 square feet (3 tons/acre) and adequately anchored such that the ground surface is not visible through the mulch.
 - **Open Slopes (8% or steeper) and Drainage Ways:** Slopes shall not be left exposed for any extended time of work suspension unless fully mulched and anchored with netting or erosion control blankets. Mulching shall be applied at a rate of 230-lbs/1,000 square feet on all slopes 8% or steeper. Mulch netting shall be used to anchor mulch applied in all drainage ways with a slope steeper than 3%, for slopes exposed to direct winds and for all other slopes steeper than 8%. Erosion control blankets shall be used in lieu of mulch in all drainage ways. Erosion control mix can be used as a substitute for erosion control blankets on slopes that do not exceed 2H:1V. In this case, the erosion control mix shall be spread out and not placed in a berm as when it is installed as a sedimentation barrier.
- 3) **Soil Stockpiles:** Stockpiles of soil or subsoil shall be mulched for over winter protection with hay or straw at twice the normal rate or at 150-lbs/1,000 square feet (3 tons per acre) or with a four-inch layer of wood waste erosion control mix. This will be done within 24 hours of stocking and re-established prior to any rainfall or snowfall. Any soil stockpile will not be placed (even if covered with hay or straw) within 100 feet from any natural resources.
- 4) **Natural Resources Protection:** Any areas within 100 feet from any protected natural resources, if not already stabilized with a minimum of 90% mature vegetation catch, shall be mulched by December 1 and anchored with plastic netting or protected with erosion control mats. During winter construction, a double line of sediment barriers (i.e. erosion control mix berms) will be placed between any natural resource and the disturbed area. Projects crossing the natural resource shall be protected a minimum distance of 100 feet on either side from the resource. Existing projects not stabilized by December 1 shall be protected with the second line of sediment barrier to ensure functionality during the spring thaw and rains.
- 5) **Seeding:** Between the dates of October 15 and April 1st, loam or seed will not be required. During periods of above freezing temperatures finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed and final graded with a uniform surface, then the area may be dormant seeded at a rate 3 times higher than specified for permanent seed and then mulched.

Dormant seeding may be selected to be placed prior to the placement of mulch and fabric netting anchored with staples. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seeded at an application rate of 5-lbs/1000 square feet. All areas seeded during the winter will be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 90% catch) shall be re-vegetated by replacing loam, seed and mulch. If dormant seeding is not used for the site, all disturbed areas shall be re-vegetated in the spring.

5.2 Overwinter Stabilization Timeframe

- 1) **Ditches and Channels:** All stone-lined ditches and channels must be constructed and stabilized on the site by November 15. All grass-lined ditches and channels must be constructed and stabilized by September 15. If a ditch or channel is not grass-lined by September 15, then one of the following actions must be taken to stabilize the ditch for late fall and winter:
 - **Install a sod lining in the ditch:** A ditch must be lined with properly installed sod by October 1. Proper installation includes the contractor pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, watering the sod to promote root growth into the disturbed soil, and anchoring the sod with jute or plastic mesh to prevent the sod strips from sloughing during flow conditions.
 - **Install a stone lining in the ditch:** A ditch must be lined with stone riprap by November 15. A registered professional engineer must be hired to determine the stone size and lining thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the ditch must be re-graded prior to placing the stone lining to prevent the stone lining from reducing the ditch's cross-sectional area.
- 2) **Disturbed Slopes:** All stone-covered slopes must be constructed and stabilized by November 15. All slopes to be vegetated must be seeded by September 15. The MDEP will consider any area having a grade greater than 15% (6.7H:1V) to be a slope. If a slope to be vegetated is not stabilized by September 1, then one of the following actions must be taken to stabilize the slope for late fall and winter:
 - **Stabilize the soil with temporary vegetation and erosion control blankets:** By October 1 the disturbed slope must be seeded with winter rye at a seeding rate of 3 pounds per 1,000 square feet, lightly mulched with hay or straw at 75 pounds per 1000 square feet, with erosion control blankets applied over the mulched slope. If the rye fails to grow at least three inches or cover at least 90% of the disturbed slope by November 1, the slope will be covered with a layer of erosion control mix or stone riprap as described in the standards described below.
 - **Stabilize the slope with sod:** By October 1 the disturbed slope must be stabilized with properly installed sod. Proper installation includes pinning the sod onto the slope with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. Slopes steeper than 33% (3H:1V) or having groundwater seeps on the slope face, may not use late-season sod installation for stabilization.

- **Stabilize the slope with erosion control mix:** A six-inch layer of erosion control mix must be spread over the entire slope by November 15. Prior to placing the erosion control mix, any snow accumulation on the disturbed slope must be removed. Slopes steeper than 50% (2H:1V) or having groundwater seeps on the slope face can not use erosion control mix to stabilize slopes.
 - **Stabilize the slope with stone riprap:** A layer of stone riprap can be placed on the slope by November 15. A registered professional engineer must be hired to determine the stone size and stone depth needed for stability and to design a filter layer for underneath the riprap.
- 3) **Other Disturbed Soils:** By September 15, all disturbed soils on areas having a slope flatter than 15% (6.7H:1V) must receive seed and mulch. If disturbed areas are not stabilized by this date, then one of the following actions must be taken to stabilize the soil for late fall and winter:
- **Stabilize the soil with temporary vegetation:** By October 1, seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1,000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1000 square feet, and anchor the mulch with plastic netting. Monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 90% of the disturbed soil before November 1, then mulch the area for over-winter protection as described in the following “Stabilize the soil with mulch” standard.
 - **Stabilize the soil with sod:** Stabilize the disturbed soil with properly installed sod by October 1. Proper installation includes pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.
 - **Stabilize the soil with mulch:** By November 15, mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, any snow accumulation on the disturbed area must be removed. Immediately after applying the mulch, anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

6.0 INSPECTION AND MAINTENANCE

Inspection and maintenance are required of all erosion and sedimentation control measures outlined in this plan. Refer to the Inspection, Maintenance, and Housekeeping Plan for this project (provided under separate cover) for an outline of the associated inspection and maintenance requirements.

APPENDIX H

**Section 411.8 & 411.9
Utilities Services**

June 29, 2015
W-P Project No. 12218D

Brunswick Sewer District
Attn: Leonard Blanchette, General Manager
10 Pine Tree Road
Brunswick, ME 04011

Subject: Brunswick Landing Subdivision - Phase II
Town of Brunswick Major Development Review, Final Plan Permit Application

Dear Mr. Blanchette:

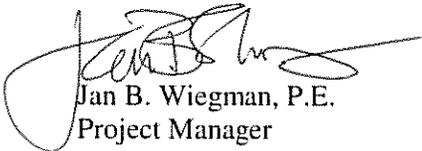
We are assisting Midcoast Regional Redevelopment Authority (“MRRA”) with a Major Development Review Final Plan (“MDR”) Permit Application to the Brunswick Planning Board. The development project proposed in this application includes the creation of a seven-lot commercial subdivision, to be known as “Brunswick Landing Subdivision – Phase II”, and the construction of an approximately 650-foot long, 26-foot wide private commercial roadway to be known as Commerce Drive that is intended to provide access to the proposed subdivision. Development will include the extension of the MRRA sewer system to serve four of the new lots. Three of the proposed lots are currently connected to the sewer system and include tenant spaces for New England Tent and Awning and Frosty’s Donuts. The use on the lots will be commercial and the lot sizes range from 0.75 acres to 2 acres in size. It is anticipated that sewer flows will be in line with normal commercial uses.

As part of the MDR permit application, we are required to submit a letter from the Sewer District clearly stating the Sewer District’s ability to accommodate wastewater disposal demand resulting from the proposed project.

Please let us know if you have any questions or require any additional materials to carry out your evaluation.

Very truly yours,

WRIGHT-PIERCE


Jan B. Wiegman, P.E.
Project Manager

JBW/

cc: Tom Brubaker – MRRA

Enclosure



Brunswick Sewer District

10 PINE TREE ROAD
BRUNSWICK, MAINE 04011
bsd@brunswicksewer.org
TELEPHONE (207) 729-0148



July 7, 2015

Jan B. Weigman, P.E.
Project Manager
Wright-Pierce
99 Main Street
Topsham, ME 04086

Re: Brunswick Landing Subdivision – Phase II

Dear Jan:

This letter is to acknowledge receipt of your request of June 29, 2015 for a confirmation of the District's willingness and capacity to serve the above referenced project.

I understand the developer proposes to construct a seven lot commercial subdivision at Brunswick Landing in Brunswick, Maine, and that three lots are already developed and connected to the sewer. I have reviewed the material provided and conclude that the **Brunswick Sewer District has willingness and capacity to serve the proposed project.**

Upon review of the Site Layout and Utility Plan provided, I have the following comments:

1. Project sanitary sewer service line will be privately owned and maintained in accordance with provisions of District Rules & Regulations.
2. All sewer-related construction will be performed to District standards.
3. All sanitary sewer construction will comply with provisions of the Maine State Plumbing Code.
4. Design and construction of project sanitary sewers will exclude all ground, surface, foundation drain, floor drain, and roof drain waters.
5. Horizontal clearance between utility infrastructures will be sufficient to allow future utility maintenance operations without disturbance to adjacent utility infrastructure.

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

BRUNSWICK SEWER DISTRICT

A handwritten signature in black ink, appearing to read "Rob Pontau". The signature is fluid and cursive, with the first name "Rob" and last name "Pontau" clearly distinguishable.

Robert A. Pontau Jr., PE
Assistant General Manager

CC: Tom Brubaker - MRRA

June 29, 2015
W-P Project No. 12218D

Brunswick & Topsham Water District
Attn: Craig Douglas, P.E., District Engineer
PO Box 489
Topsham, ME 04086

Subject: Brunswick Landing Subdivision - Phase II
Town of Brunswick Major Development Review, Final Plan Permit Application

Dear Mr. Douglas:

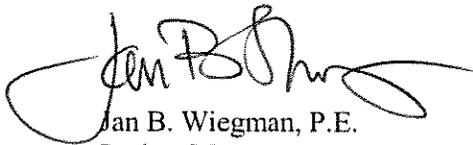
We are assisting Midcoast Regional Redevelopment Authority (“MRRA”) with a Major Development Review Final Plan (“MDR”) Permit Application to the Brunswick Planning Board. The development project proposed in this application includes the creation of a seven-lot commercial subdivision, to be known as “Brunswick Landing Subdivision – Phase II”, and the construction of an approximately 650-foot long, 26-foot wide private commercial roadway to be known as Commerce Drive that is intended to provide access to the proposed subdivision. Development will include the extension of the MRRA water distribution system to serve four of the new lots. Three of the proposed lots are currently connected to the water system and include tenant spaces for New England Tent and Awning and Frosty’s Donuts. The use on the lots will be commercial and the lot sizes range from 0.75 acres to 2 acres in size. It is anticipated that water demands will be in line with normal commercial uses.

It is proposed that the facility will tie into the BTWD through the existing Brunswick Landing water supply infrastructure.

As part of the MDR permit application, we are required to submit a letter from your department clearly stating the department’s ability to accommodate additional water supply demand resulting from the proposed project.

Please let us know if you have any questions or require any additional materials to carry out your evaluation.

Very truly yours,
WRIGHT-PIERCE


Jan B. Wiegman, P.E.
Project Manager

JBW/
cc: Tom Brubaker – MRRA

Enclosure



BRUNSWICK & TOPSHAM
WATER DISTRICT

PO Box 489
Topsham, Maine 04086
Telephone (207) 729-9956
Fax (207) 725-6470

Alan J. Frasier, PE
General Manager

Craig W. Douglas, PE
District Engineer

Daniel O. Knowles, CPA
Director of Finance and
Data Management Systems

William G. Alexander, Jr.
Operations Manager

August 17, 2015

Jan B.S. Wiegman PE
Wright-Pierce
99 Main Street
Topsham, ME 04086
Via email: jan.wiegman@wright-pierce.com

RE: Proposed Brunswick Landing Subdivision Phase II Project, Brunswick

Dear Mr. Wiegman:

This letter is to inform you that the District has the ability to serve the referenced project, and will provide service in accordance with Maine Public Utilities Commission and Brunswick & Topsham Water District Rules and Regulations.

Your previous correspondence acknowledge that the flow requirements of the proposed project are not known at this time, but generally anticipate that the requirements would be of a scale similar to "normal commercial uses". Given this, the District is capable of taking on this additional use. Also, it is not clear if this project obtains service from a private main. Please be advised we cannot ensure the reliability of the infrastructure beyond the connections made directly to our system. We will gladly discuss the options for service and main extensions when the project is ready to proceed.

Please keep us informed as this project progresses. If you have any questions, please call.

Yours truly,

Craig Douglas PE
District Engineer

Cc: Eric Gagnon

APPENDIX I

Section 411.10

Review Agencies Response Letters

June 19, 2015
W-P Project No. 12218D



Mr. Kirk F. Mahoney
Deputy State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, Maine 04333-0065

RECEIVED

JUL 02 2015

WRIGHT-PIERCE

Subject: Midcoast Regional Redevelopment Authority
Brunswick Landing Subdivision – Phase II
Brunswick Landing, Brunswick, Maine

Dear Mr. Mahoney:

Wright-Pierce, at the direction of Midcoast Regional Redevelopment Authority (“MRRA”), is preparing a Minor Revision application of an existing Maine Department of Environmental Protection (“DEP”) Site Location of Development (“SLOD”) Permit for a proposed 7-lot commercial subdivision at the former Naval Air Station Brunswick, now Brunswick Landing. The project site is located on the easterly side of Orion Street approximately 765 feet southerly from the intersection with Neptune Drive and approximately 550 northerly from the intersection with Purington Road. Access to the site will be provided by construction of a roadway (“Commerce Drive”) leading easterly from Orion Street.

The project will involve revising the existing SLOD permit which covers the overall facility. We would like to take this opportunity to solicit comments from the Maine Historic Preservation Commission regarding the potential impacts the project might have on cultural resources in the vicinity of the project. We are planning to submit the application for revision of the SLOD permit by the end of June 2015.

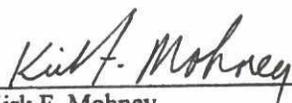
We are enclosing a location map and a conceptual site plan showing the proposed facility in relation to the greater Brunswick Landing property. Please let us know if you require any additional materials to properly carry out your evaluation of this site.

Very truly yours,

WRIGHT-PIERCE

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


Jan B. Wiegman, P.E.
Project Manager


Kirk F. Mohney,
Deputy State Historic Preservation Officer
Maine Historic Preservation Commission

6/30/15
Date

JBW/

Enclosures

cc: Steve Levesque – Midcoast Regional Redevelopment Authority



PAUL R. LePAGE
GOVERNOR

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

CHANDLER E. WOODCOCK
COMMISSIONER

October 19, 2012

Jan Wiegman, P.E.
Wright-Pierce
99 Main Street
Topsham, ME 04086

RE: Information Request, Anaerobic Digester/Energy Production Facility

Dear Jan:

Per your request received October 19 we have searched current Department records for known occurrences of Rare, Threatened, and Endangered species, designated Essential and Significant Wildlife Habitats, and fisheries habitat concerns within the vicinity of the proposed anaerobic digester/energy production facility at Brunswick Landing in Brunswick.

Our records indicate no occurrences of rare, threatened, or endangered animal species within the project area. Additionally, our department has not mapped any Essential or Significant Wildlife Habitats or Fisheries Habitats that would be directly impacted by your project.

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

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

Best regards,

A handwritten signature in black ink, appearing to read "Steve Walker", written over a horizontal line.

Steve Walker
Acting Environmental Review Coordinator

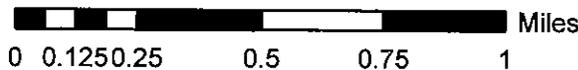


Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Brunswick Landing Anaerobic Digester (Version 1)



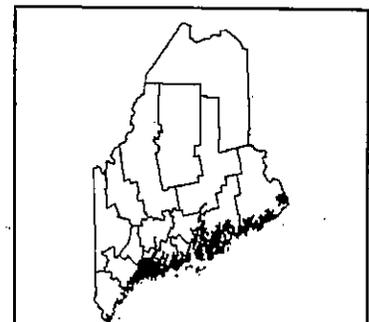
Maine Department of
Inland Fisheries and Wildlife



Projection: UTM, NAD83, Zone 19N

Date: 10/19/2012

	ProjectPoints		Deer Winter Area		Roseate Tern
	ProjectLines		LURC p-fw		Piping Plover/Least Tern
	ProjectPolys		Cooperative DWAs		Aquatic ETSc (2.5 mi review)
	ProjectSearchAreas		Seabird Nesting Islands		Rare Mussels (5 mi review)
			Shorebird Areas		A and B List Ponds
			Inland Waterfowl/Wading Bird		Arctic Charr Habitat
			Shoreland Zoning_lwwh		E. Brook Trout Joint Venture Subwatershed Classification
			Tidal Waterfowl/Wading Bird		Redfin Pickerel/Swamp Darter Habitats (buffer100ft)
			Significant Vernal Pools		Special Concern-occupied habitats(100ft buffer)
			Environmental Review Polygons		Wild Lake Trout Habitats





STATE OF MAINE
DEPARTMENT OF CONSERVATION
93 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0093

PAUL R. LEPAGE
GOVERNOR

WILLIAM H. BEARDSLEY
COMMISSIONER

October 19, 2012

Jan Wiegman
Wright-Pierce
99 Main Street
Topsham, ME 04086

Re: Rare and exemplary botanical features in proximity to: W-P Project #12600A, Village Green
Maine LLC, Anaerobic Digester, Brunswick, Maine

Dear Ms. Wiegman:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received October 18, 2012 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in Brunswick, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

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

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

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

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

Letter to Wright-Pierce
Comments RE: Anaerobic Digester, Brunswick
October 19, 2012
Page 2 of 2

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

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

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

Sincerely,



Don Cameron
Ecologist
Maine Natural Areas Program
207-287-8041
don.s.cameron@maine.gov

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the proposed W-P Project #12600A, Village Green Maine LLC, Anaerobic Digester, Brunswick, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
<i>Suaeda calceoliformis</i>	G5	S2	T	4	1899	Tidal wetland (non-forested, wetland)
<i>Carex vestita</i>	G5	S1	E	4	1999-08-05	Dry barrens (partly forested, upland)
<i>Cypripedium reginae</i>	G4	S3	T	38	1907-07-09	Forested wetland
<i>Aletris farinosa</i>	G5	SX	PE	1	1884	Dry barrens (partly forested, upland)
<i>Carex vestita</i>	G5	S1	E	1	1898-06-15	Dry barrens (partly forested, upland)
<i>Sassafras albidum</i>	G5	S2	SC	10	1906	Old field/roadside (non-forested, wetland or upland)
<i>Lonocera dioica</i>	G5	S2	E	4	1933-09	Dry barrens (partly forested, upland)
<i>Mikania scandens</i>	G5	SH	PE	1	1916-08	Dry barrens (partly forested, upland)
<i>Obelia siphilitica</i>	G5	SX	PE	2	1900	Non-tidal rivershore (non-forested, seasonally wet)
<i>Sparganium angustifolium</i>	G2G3	S2	SC	5	1921-09-17	Tidal wetland (non-forested, wetland)
<i>Lonocera dioica</i>	G5	S2	E	3	1912-06	Dry barrens (partly forested, upland)
Silver maple floodplain forest	GNR	S3		1	2005-06-23	Forested wetland
Pitch pine - heath barren	G3G5	S1		1	2002-09-26	Dry barrens (partly forested, upland)
<i>Agrostis calycina</i> var. <i>spongiosa</i>	G5T4	S3	SC	28	2008-08-29	Tidal wetland (non-forested, wetland)
<i>Agrostis calycina</i> var. <i>spongiosa</i>	G5T4	S3	SC	33	1992-07-30	Tidal wetland (non-forested, wetland)
<i>Cladonia parkeri</i>	G3	S3	SC	28	1990-09-25	Tidal wetland (non-forested, wetland)

Rare and Exemplary Botanical Features in the Project Vicinity

Documented within a four-mile radius of the proposed W-P Project #12600A, Village Green Maine LLC, Anaerobic Digester, Brunswick, Maine.

Feature Name	Global Rank	State Rank	State Status	EO Number	Last Seen	Habitat
Spartina saltmarsh						Tidal wetland (non-forested, wetland)
	G5	S3		48	2011-10-30	
Silver maple floodplain forest						Forested wetland
	GNR	S3		39	2011-07-07	

Print Date 10/19/2012; For more information visit our website <http://www.maine.gov/doc/nrimc/mnap> Page 3

STATE RARITY RANKS

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

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program.

GLOBAL RARITY RANKS

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

Note: **Global Ranks** are determined by NatureServe, for more information see <http://www.natureserve.org/explorer/ranking.htm>.

STATE LEGAL STATUS

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

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

NON-LEGAL STATUS

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

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

APPENDIX J

**Section 411.12
Traffic**

Executive Summary

The following Executive Summary is prepared for the reader's convenience, but is not intended to be a substitute for reading the full report.

The Naval Air Station in Brunswick is situated on approximately 3,220 acres in the town of Brunswick, Maine. The site is on the southerly side of Route 24 with the main access gate located on that route. In 2005, the BNAS was identified and approved for closure as part of the Base Closure and Realignment Act of 1990. The base currently includes an air strip, housing units, offices, and supporting uses for a Navy base.

As a result of the mandate for closure, a study is required for the facility. Part of this study is a review of transportation issues, and an evaluation of the potential redevelopment of the site. There are two Alternatives being considered associated with the reuse of the site. Alternative 1 (Reuse) is consistent with the *Brunswick Naval Air Station Master Reuse Plan*, and includes a mix of land uses. Alternative 1 is also expected to retain the existing air strip.

Alternative 2 (High Density) includes similar uses but increases the square footage and number of residential units. To accommodate the increase in square footage and number of units, the air strip is not proposed to be retained in Alternative 2. The purpose of this Traffic Impact Study is to evaluate the existing adjacent roadway network and to identify what mitigation may be necessary to accommodate the traffic associated with Alternatives 1 or 2.

As part of this report, the potential impacts for several phases were examined, in addition to the Alternatives. The Navy desires to quantify off-site mitigation for several phases, which include the development anticipated for 2016, 2021, and 2026, as well as 2031. As such, information and phased mitigation strategies are discussed in this report.

Based on the completion of the impact study, the following conclusions have been reached regarding the Naval Air Station and its potential impacts to local transportation infrastructure following redevelopment:

1. The study area requested to be reviewed by the client for this redevelopment included sixteen intersections in the immediate area. Should this redevelopment move forward, a review from the Town and MaineDOT will be required, which may result in an expanded study area and potential additional mitigation.
2. The phases are anticipated to generate the following peak hour trip ends, based on the *ITE Trip Generation Manual* during the PM peak hour of adjacent street traffic:

2016, Alternative 1: 883 PM peak hour trip ends

2016, Alternative 2: 1,503 PM peak hour trip ends

2021, Alternative 1: 2,120 PM peak hour trip ends

2021, Alternative 2: 3,467 PM peak hour trip ends

2026, Alternative 1: 3,933 PM peak hour trip ends

2026, Alternative 2: 6,516 PM peak hour trip ends

2031, Alternative 1: 6,473 PM peak hour trip ends

2031, Alternative 2: 10,589 PM peak hour trip ends

(Note: A trip end is either a trip in or out of the site. Therefore a single vehicle making a round trip would equal two trip ends). These volumes are after consideration was taken for 35% and 50% shared trips between the on-site uses during Alternative 1 and 2 respectively. In addition to the internal shared trips, a two percent reduction was taken for bus use and a one half percent reduction was taken for pedestrian / bicycle use.

3. The trips were assigned to the adjacent roadway network based on a 25-mile radius gravity model. The area was extended up to 30 miles where drivers had easy access to an Interstate highway. It is anticipated that over 90 percent of the traffic will enter / exit the site via a proposed Route 1 connector, which could significantly affect the capacity of Route 1.
4. Prior to performing the capacity analysis, local projects that have either just been completed or are in the design process were identified and are listed as follows:

Other Projects:

- Maine Street / Bath Road Project – Redesign of “rotary” area around the church; it is our understanding that as of the time of this report that a final concept and design have yet to take place
 - Route 24 (Bath Road Project) – Extending westbound receiving lanes to the west of the Merry Meeting Plaza intersection
 - Bath Road Project from Cook’s Corner to Old Bath Road – widen and drainage work to provide two travel lanes in each direction
 - Route 24 restriping – Restripe Gurnet Road between Cook’s Corner and just south of Forrestal Drive to provide for one northbound and two southbound travel lanes with a center-two-way-left turn lane between them which transitions into formal left turn lanes at the Cook’s Corner Mall / Cinema signalized intersection.
5. In addition to “other projects”, some anticipated access changes to / from the site were either provided by the applicant or assumed in performing the review and analysis. Those access changes are identified as follows:

Assumed Site Access Modifications:

- A full movement connector would be constructed directly from the site to Route 1. The need for this connection was confirmed in doing the capacity analysis. The five year projection (2016) shows that this connection will either be needed or significant redesign of Bath Road between Merry Meeting Plaza and Cooks Corner will be needed and the area may still operate at very low levels of service. Beyond the 2016 projection, the adjacent roadway network cannot feasibly handle the forecast traffic, even with significant improvements, and analysis without the connection yields meaningless results. This connector is critical to this project since over 90% of the site generated traffic is forecast to use this connector and Route 1. This connector is grade separated from Bath Road and the parallel train tracks along Bath Road.
- Relocate the Naval Air Station main gate access from the existing signalized location to the existing signalized intersection with Merry Meeting Plaza. This would also include the removal of the existing signal at the existing main gate access. For the purpose of this report, the following mitigation was utilized:
 - The exit from the site would include separate left/through and right exit lanes
 - A formal 175 foot long left turn lane on Bath Road
 - A formal 100 foot long right turn lane on Bath Road

This modification was assumed to be in place from the beginning, i.e. starting in 2016.

- Provide a new access drive from the site onto Bath Road approximately 1,300 feet east of the Bath Road / Jordan Avenue intersection. It is recommended that if possible, the site drive be located across from Jordan Avenue rather than 1,300 feet to the east. The driveway was presumably located at the proposed location to avoid impacting the air strip in Alternative 1, but it appears that it could be located across from Jordan Avenue in Alternative 2 since the air strip is proposed to be removed. For the purpose of this report, the following mitigation was utilized:
 - The exit from the site would include separate left and right exit lanes
 - A formal 100 foot long left turn lane on Bath Road
 - A formal 200 foot long right turn lane on Bath Road
 - The intersection is signalized, although consideration should also be given to a roundabout at this location

This modification was assumed to be in place beginning in 2026, but could be constructed anytime prior to then. It is recommend that it not be constructed after that time because the intersection at Merry Meeting Plaza would then start to experience low levels of service and queuing issues.

- The access to Forrestal Drive onto Route 24 would become one of the primary accesses to the site. Although a formal signal warrant analysis will be required before a signal can be installed, it appears from the volumes at this intersection

beginning in 2016 for both Alternatives 1 and 2 that signalization would not only be warranted, but necessary for the intersection to function, especially if the Route 1 connector is not constructed. If the Route 1 connector is constructed, signalization may be delayed until 2021. Capacity analysis of this intersection without signalization would yield unrealistic results. Therefore, signalization of the intersection was assumed beginning in 2016. Two modifications for this intersection that were not included in the capacity analysis, but are still recommended, are; 1) the construction of a southbound right turn lane on Route 24 for vehicles turning onto Forrestal Drive and 2) separate left/thru and right lanes exiting Forrestal Drive. Although these modifications do not appear to be needed from a level of service (LOS) perspective, they do appear to be needed to maintain operations of the intersection and to help reduce queue lengths on each of those approaches.

For the "No Action" scenario, 342 housing units near the intersection of Forrestal Drive and Route 24 were assumed to be fully occupied. Because Forrestal Drive is anticipated to be the primary access, it will operate at low levels of service due to the increased trip generation. A formal signal warrant would be required before a signal could be installed; however, it appears that the intersection would be approaching the criteria for considering signalization in this scenario.

- The existing signalized intersections of Bath Road at: Merry Meeting Plaza, Naval Air Station Main Gate, and the Cook's Corner Mall currently operate off of one controller. In relocating the main gate access to across from Merry Meeting Plaza and removing the main gate signal, each intersection would operate off its own controller.

6. A number of scenarios were considered for review as listed and described as follows:

- *No Build* – This includes the same trip generation to/from the site as was counted on August 28, 2008. The adjacent roadway traffic was seasonally adjusted to reflect the 30th highest hour of the year, which is typically used as the design hour volume.
- *No Action* – This scenario assumes that the base is closed and not re-occupied; however, the residential units located on the easterly side of the base, near the intersection with Forrestal Drive and Route 24, are fully occupied. This includes approximately 342 residential units.
- *2016 Alternative 1* – This is the year 2016 with the combination of uses identified in Section V and is forecast to generate 883 trip ends on the adjacent roadway network.
- *2016 Alternative 2* – This is the year 2016 with the combination of uses identified in Section V and is forecast to generate 1,503 trip ends on the adjacent roadway network.
- *2021 Alternative 1* – This is the year 2021 with the combination of uses identified in Section V and is forecast to generate 2,120 trip ends on the adjacent roadway network.

-
- *2021 Alternative 2* – This is the year 2021 with the combination of uses identified in Section V and is forecast to generate 3,467 trip ends on the adjacent roadway network.
 - *2026 Alternative 1* – This is the year 2026 with the combination of uses identified in Section V and is forecast to generate 3,933 trip ends on the adjacent roadway network.
 - *2026 Alternative 2* – This is the year 2026 with the combination of uses identified in Section V and is forecast to generate 6,516 trip ends on the adjacent roadway network.
 - *2031 Alternative 1* – This is the year 2031 with the combination of uses identified in Section V and is forecast to generate 6,473 trip ends on the adjacent roadway network.
 - *2031 Alternative 2* – This is the year 2031 with the combination of uses identified in Section V and is forecast to generate 10,589 trip ends on the adjacent roadway network.

Anticipated Mitigation in Addition to the “Other Projects” and “Assumed Site Access Modifications”:

2008 No Build

It is important to note that the mitigation identified in this scenario is due to existing design deficiencies, and that this mitigation could be needed regardless of if the Naval Air Station proceeds with Alternative 1 or 2. For instance, the roadway segment between Cook’s Corner and Merry Meeting Plaza currently does not operate well and is expected to operate very poorly in the future, regardless of the Naval Air Station moving forward with Alternative 1 or 2. This scenario does include the same trip generation to/from the site as was counted on August 28, 2008, with adjacent roadway traffic seasonally adjusted to the 30th highest hour.

- *All projects identified previously under “Other Roadway Projects” and “Assumed Site Access Modifications”*
- *Bath Road at Route 24 (Cook’s Corner)*

Extend the northbound dual left turn lanes from approximately 150 feet to approximately 250 feet. This will include the removal of some raised median.

- *Bath Road from Naval Air Station main gate to west of Merry Meeting Plaza*

Provide two eastbound and two westbound through lanes from the main gate to approx. 1,000 feet west of the Merry Meeting Plaza intersection. Some of this for the eastbound direction was accomplished recently as part of the other projects identified previously in this section.

-
- *Bath Road at Sills Drive (Route 123) / Federal Street*

Install a queue detector on Bath Road for the eastbound approach so that the queue of the eastbound traffic does not interfere with the functioning of the anticipated “rotary” area to the west of the intersection.

No Action

The difference between this scenario and the previous “2008 No Build” is the subtraction of the BNAS traffic from the adjacent roadway system and the addition of traffic from the residential units near the intersection of Forrestal Drive / Route 24. Because the base traffic has been removed, the “Assumed Site Access Modifications” no longer apply; however, the other modifications would still be relevant.

Five Year Projection (2016)

- *All previous mitigation identified in the “No Build” condition as well as those identified under “Other Roadway Projects” and “Assumed Site Access Modifications”.*
- *Bath Road at Sills Drive (Route 123) / Federal Street*

Extend the northbound left turn lane from approximately 150 feet to 350 feet

- *Route 24 at Forrestal Drive*

Signalize intersection

Provide for a southbound right turn lane on Route 24 for right turning vehicles into the site

Provide separate left/thru and right lanes on Forrestal Drive

Ten Year Projection (2021)

- *All previous mitigation identified – No additional mitigation identified*

Fifteen Year Projection (2026)

- *All previous mitigation identified – No additional mitigation identified*

Twenty Year Projection (2031)

- *All previous mitigation identified with the addition of:*

- *Bath Road / Route 24 (Cooks Corner)*

Extend the eastbound dual left turn lanes from approximately 300 feet to 375 feet.
(High Density Only)

- *Route 24 at Forrestal Drive*

Conversion of center two-way left turn lane on Route 24 to formal left turn lane and construction of raised median for access management

Additional Regional Mitigation for Alternatives 1 and 2

This study included the primary intersections in the immediate area of the Naval Air Station. The MaineDOT is currently pursuing a larger regional study to identify roadway impacts outside the immediate area which are expected to occur given the significant volume of traffic that the site is forecast to generate.

7. Based on a review of the latest available MaineDOT crash history of the previous three years, there are eight locations identified as high crash locations. Those locations are:
 - Gurnet Road at Entrance to Cooks Corner Mall / Cinema
 - Bath Road at Old Bath Road at Lowes Driveway
 - Bath Road at Tibbetts Drive
 - Cleaveland St. at Maine St. at Noble St.
 - Bath Road East at Maine St. at Upper Park Row
 - Gurnet Road from Bath Road to Cook Corner Mall
 - Bath Road from Tibbetts Drive to Thomas Point Road
 - Bath Road from Thomas Point Road to Gurnet Road
8. When the traffic generated by the redevelopment of the site exceeds that generated today, then a MaineDOT Traffic Movement Permit will be required. This document is not intended for that purpose.

2016 Trip Generation Summary – PM Peak Hour of Adjacent Street Traffic

District	Use	Alt. 1 - Reuse PM Peak Hr. of Adj. St.		Alt. 2 - High Density PM Peak Hr. of Adj. St.	
		Size (SF or Units)	Trip Ends	Size (SF or Units)	Trip Ends
Professional Office	Office	NA		NA	
	Civic and Cultural	NA		NA	
	Retail and Commercial	NA		NA	
Subtotal					
Business and Technology	Industry Warehouse and Storage	234,576	202	443,191	381
	Office	67,105	87	101,523	131
	Retail and Commercial	15,625	42	19,482	53
Subtotal			331 (161)		565 (274)
Community Mixed Use (Non-Residential)	Office	114,802	148	502,930	649
	Civic and Cultural	26,925	44	75,301	123
	Education Facility	19,149	49	49,741	126
	Retail and Commercial	129,353	351	250,439	679
Subtotal			592 (289)		1,577 (768)
Community Mixed Use (Residential)	Residential	364 Units	201	814 Units	435
Subtotal			201 (97)		435 (212)
Residential	Residential	144 Units	124	230 Units	204
Subtotal			124 (61)		204 (99)
Education	Office	12,500	35	33,750	76
	Education Facility	39,618	101	72,662	185
	Residential	65 Units	40	72 Units	45
Subtotal			176 (86)		306 (149)
Aviation	Airport	22,500 OPS	21	NA	
	Industry Warehouse and Storage	422,426	368	NA	
Subtotal			389 (189)		
Total			1,813 (883)		3,087 (1,502)

NA = Not Applicable

(XX) = Trip Generation after shared trips, bus, and pedestrian / bicycle deductions

2021 Trip Generation Summary – PM Peak Hour of Adjacent Street Traffic

District	Use	Alt. 1 - Reuse PM Peak Hr. of Adj. St.		Alt. 2 - High Density PM Peak Hr. of Adj. St.	
		Size (SF or Units)	Trip Ends	Size (SF or Units)	Trip Ends
Professional Office	Office	305,106	394	NA	
	Civic and Cultural	25,046	41	NA	
	Retail and Commercial	30,790	83	NA	
Subtotal			518 (252)		
Business and Technology	Industry Warehouse and Storage	559,007	481	1,059,495	911
	Office	159,260	205	251,308	324
	Retail and Commercial	36,305	98	48,704	132
Subtotal			784 (381)		1367 (667)
Community Mixed Use (Non-Residential)	Office	261,415	337	1,110,227	1432
	Civic and Cultural	63,909	105	183,605	301
	Education Facility	45,004	114	121,484	309
	Retail and Commercial	282,179	765	577,887	1566
Subtotal			1321 (643)		3608 (1757)
Community Mixed Use (Residential)	Residential	826 Units	455	1,954 Units	1039
Subtotal			455 (221)		1039 (506)
Residential	Residential	289 Units	248	504 Units	448
Subtotal			248 (121)		448 (219)
Education	Office	25,000	60	78,125	148
	Education Facility	79,235	201	161,847	411
	Residential	129 Units	80	148 Units	92
Subtotal			341 (165)		651 (318)
Aviation	Airport	30,000 OPS	25	NA	
	Office	14,592	38		
	Industry Warehouse and Storage	814,467	628	NA	
Subtotal			691 (337)		
Total			4,358 (2,120)		7,113 (3,467)

NA = Not Applicable

(XX) = Trip Generation after shared trips, bus, and pedestrian / bicycle deductions

2026 Trip Generation Summary – PM Peak Hour of Adjacent Street Traffic

District	Use	Alt. 1 - Reuse PM Peak Hr. of Adj. St.		Alt. 2 - High Density PM Peak Hr. of Adj. St.	
		Size (SF or Units)	Trip Ends	Size (SF or Units)	Trip Ends
Professional Office	Office	610,211	787	NA	
	Civic and Cultural	50,092	82	NA	
	Retail and Commercial	61,581	167	NA	
Subtotal			1036 (504)		
Business and Technology	Industry Warehouse and Storage	1,008,283	867	1,925,055	1656
	Office	284,513	367	492,615	635
	Retail and Commercial	61,586	167	97,409	264
Subtotal			1401 (681)		2555 (1244)
Community Mixed Use (Non-Residential)	Office	420,472	542	1,632,060	2105
	Civic and Cultural	114,208	187	348,625	572
	Education Facility	78,536	200	231,498	588
	Retail and Commercial	399,543	1083	962,933	2610
Subtotal			2012 (980)		5875 (2864)
Community Mixed Use (Residential)	Residential	1798 Units	1007	4958 Units	2736
Subtotal			1007 (490)		2736 (1334)
Residential	Residential	430 Units	369	1648 Units	1258
Subtotal			369 (179)		1258 (613)
Education	Office	25,000	60	131,251	224
	Education Facility	79,235	201	244,460	621
	Residential	129 Units	80	166 Units	103
Subtotal			341 (165)		948 (461)
Aviation	Airport	37,800 OPS	31	NA	
	Office	72,959	140	NA	
	Industry Warehouse and Storage	1,819,402	1747	NA	
Subtotal			1918 (936)		
Total			8,084 (3,933)		13,372 (6,516)

NA = Not Applicable

(XX) = Trip Generation after shared trips, bus, and pedestrian / bicycle deductions

2031 Trip Generation Summary – PM Peak Hour of Adjacent Street Traffic

District	Use	Alt. 1 - Reuse PM Peak Hr. of Adj. St.		Alt. 2 - High Density PM Peak Hr. of Adj. St.	
		Size (SF or Units)	Trip Ends	Size (SF or Units)	Trip Ends
Professional Office	Office	1,220,422	1574	NA	
	Civic and Cultural	100,184	164	NA	
	Retail and Commercial	123,162	334	NA	
Subtotal			2072 (1010)		NA
Business and Technology	Industry Warehouse and Storage	1,906,837	1640	3,656,175	3144
	Office	535,019	690	975,230	1258
	Retail and Commercial	112,147	304	194,817	528
Subtotal			2634 (1284)		4930 (2404)
Community Mixed Use (Non-Residential)	Office	738,586	953	2,675,727	3452
	Civic and Cultural	214,805	352	678,665	1113
	Education Facility	145,601	370	451,524	1147
	Retail and Commercial	634,270	1719	1,733,027	4697
Subtotal			3394 (1653)		10409 (5072)
Community Mixed Use (Residential)	Residential	2456 Units	1310	6827 Units	3563
Subtotal			1310 (639)		3563 (1736)
Residential	Residential	573 Units	491	1439 Units	1298
Subtotal			491 (239)		1298 (633)
Education	Office	25,000	60	237,501	360
	Education Facility	79,235	201	409,684	1040
	Residential	129 Units	80	203 Units	126
Subtotal			341 (165)		1526 (744)
Aviation	Airport	45,500 OPS	37	NA	
	Office	145,918	188	NA	
	Industry Warehouse and Storage	2,693,584	2817	NA	
Subtotal			3042 (1483)		
Total			13,284 (6,473)		21,726 (10,589)

NA = Not Applicable

(XX) = Trip Generation after shared trips, bus, and pedestrian / bicycle deductions

For the “No Action” scenario, the trips were assigned to the local roadway network based on existing traffic patterns rather than a gravity model. This was done because the residential trips would be expected to be more similar to existing local traffic patterns than following a regional demand pattern. All of the “No Action” trips were considered to enter and exit via the Forrestal Drive / Route 24 intersection.

A summary of the trip assignment to each of the access roads is summarized as follows:

Directional Volumes at Select Portals – PM Peak Hour

Portal	No Build		No Action		2016*				2021				2026				2031			
	Enter	Exit	Enter	Exit	Alt 1		Alt 2		Alt 1		Alt 2		Alt 1		Alt 2		Alt 1		Alt 2	
					Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Route 123	224	203	-	-	5	7	8	5	14	20	23	31	23	35	26	57	38	56	79	99
Bath Road	109	588	-	-	65 (267)	92 (413)	117 (382)	159 (538)	143	209	257	341	234	370	474	551	384	614	743	969
Route 24	79	54	183	99	33 (75)	54 (116)	53 (234)	91 (330)	86	124	151	205	143	231	260	303	223	401	411	538
Route 1 Connector	NA	NA	-	-	240	383	432	618	567	957	1040	1442	1018	1880	2127	2711	1577	3181	3222	4532
Total	412	845	183	99	343	536	610	873	810	1310	1471	2019	1418	2516	2887	3622	2222	4252	4455	6138

* (XX) = Without Route 1 Connector
 XX = With Route 1 Connector
 Alternative 1 = Reuse
 Alternative 2 = High Density

Most of the proposed development is anticipated in the northeast quadrant of the site. For that reason, although there are numerous accesses to the site, most of the traffic entering and leaving the site is expected to use the accesses nearest their respective quadrant. In addition, most of the existing off-site development is also concentrated near the northeast quadrant, further supporting the assumption that most of the site traffic will use the accesses nearest that quadrant.

Total Trip Assignment: 5-Year Reuse Scenario

Figure No. 9

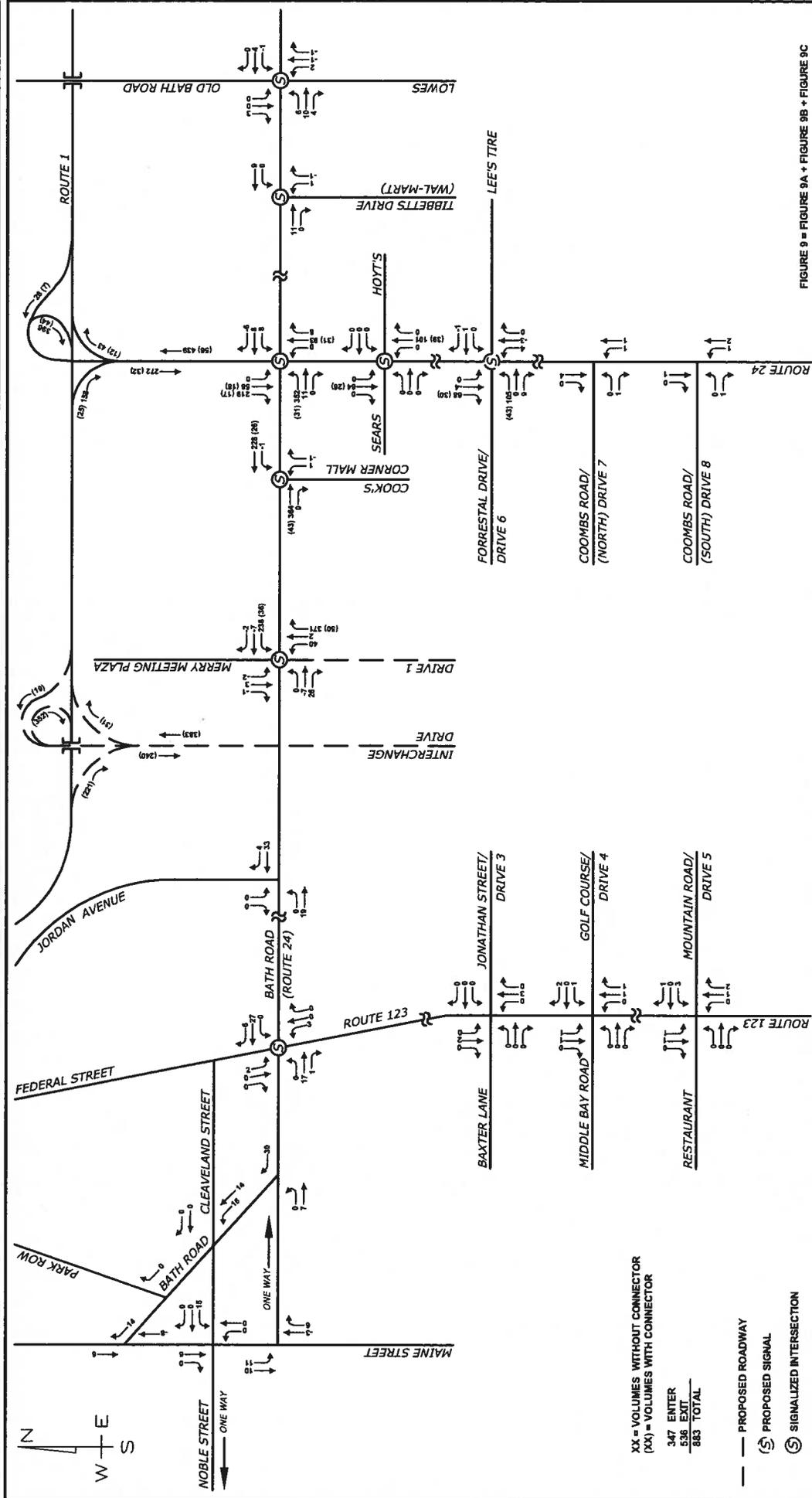


FIGURE 9 = FIGURE 9A + FIGURE 9B + FIGURE 9C

REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

Total Trip Assignment: 10-Year Reuse Scenario

Figure No. 11

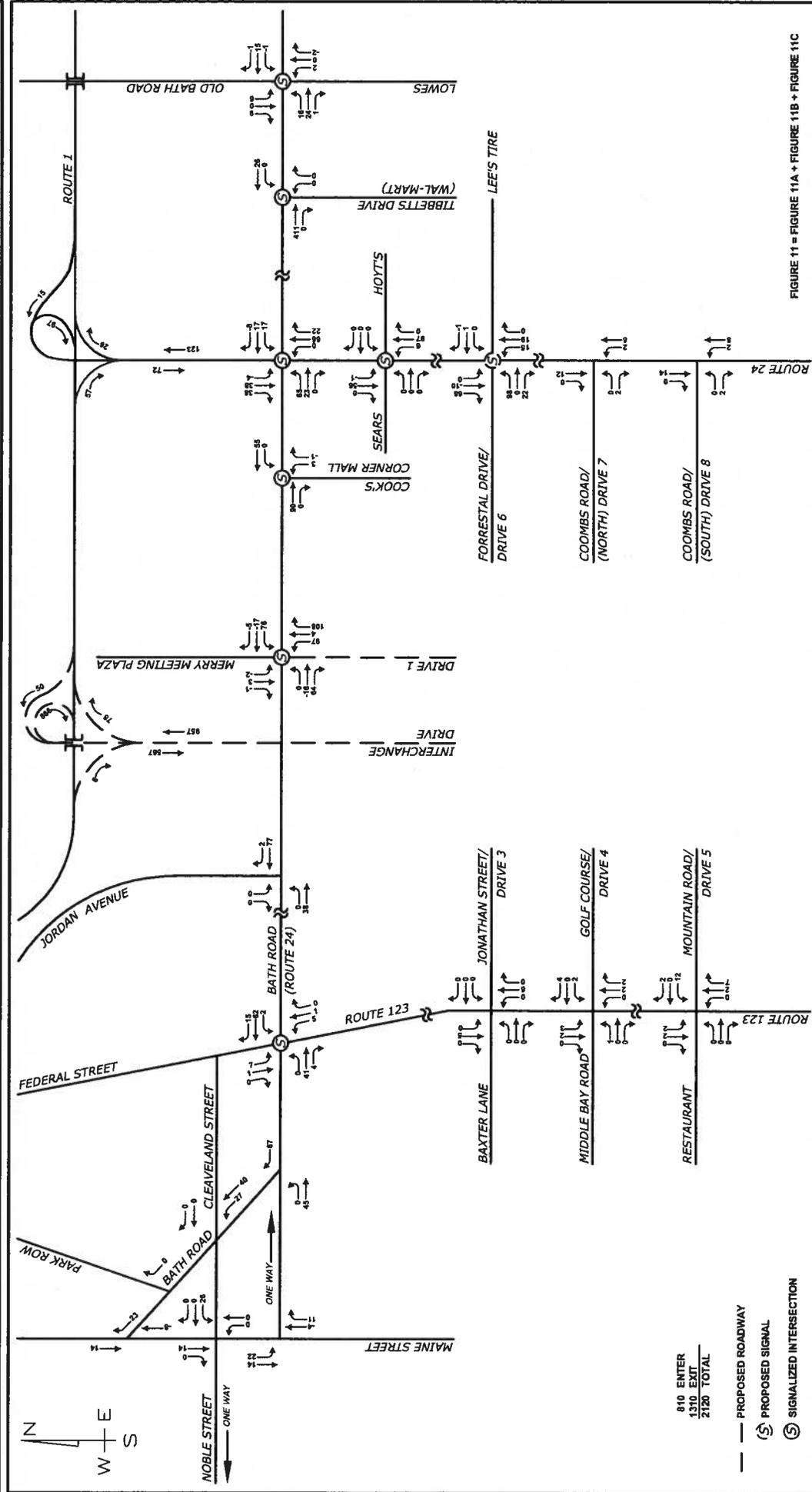


FIGURE 11 = FIGURE 11A + FIGURE 11B + FIGURE 11C

REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

Total Trip Assignment: 15-Year Reuse Scenario

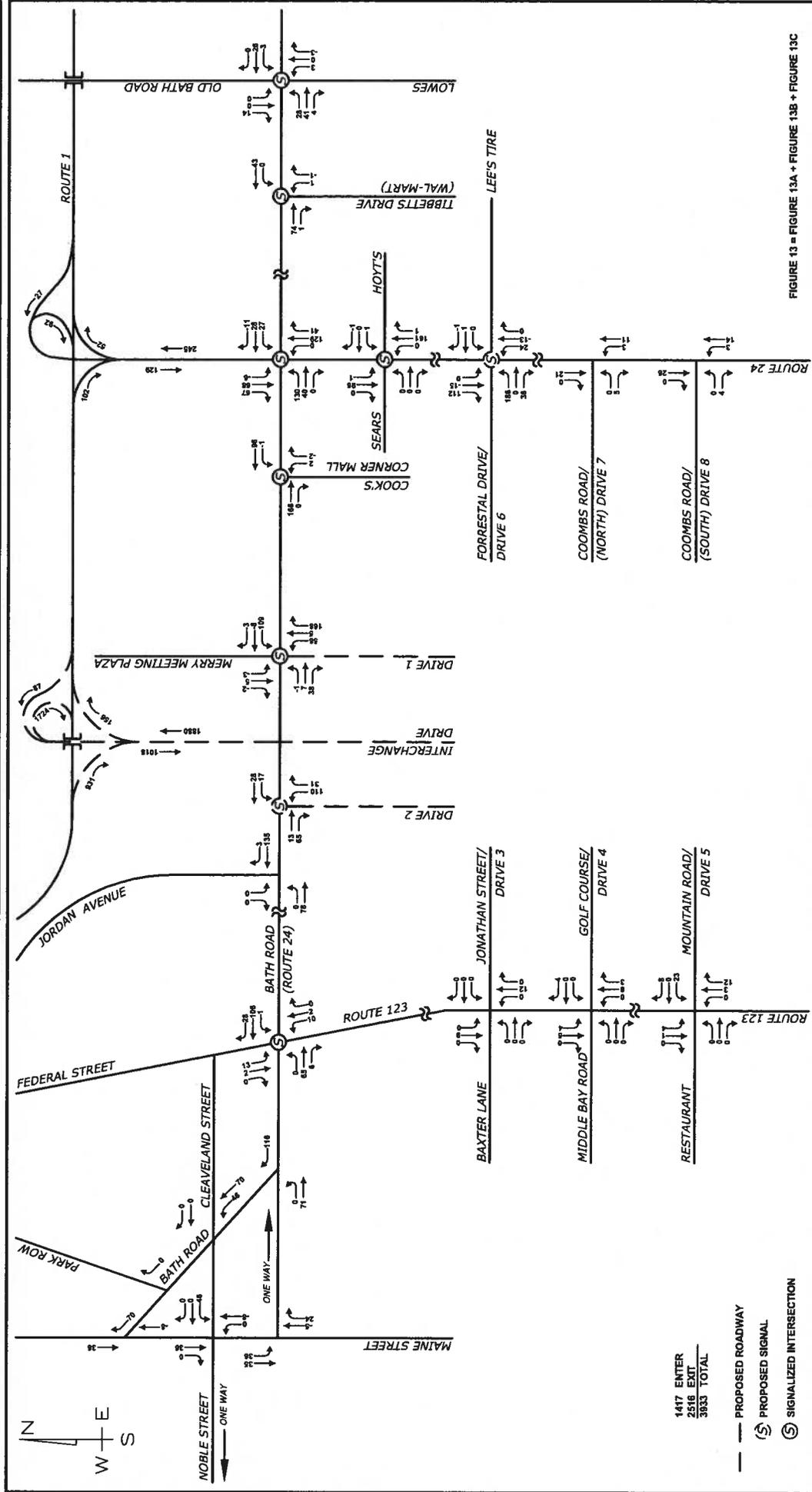


FIGURE 13 = FIGURE 13A + FIGURE 13B + FIGURE 13C

REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

Total Trip Assignment: 20-Year Reuse Scenario

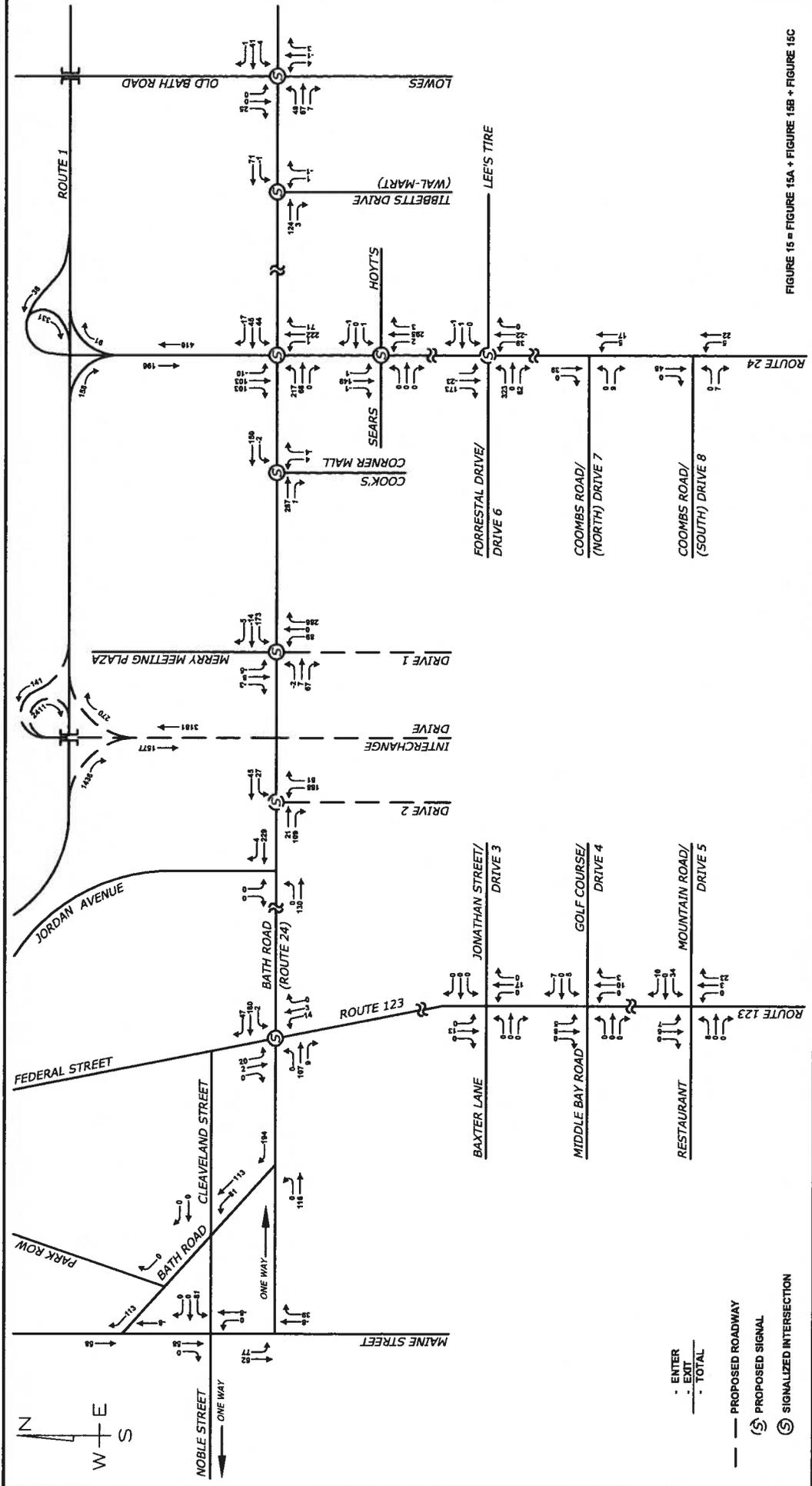
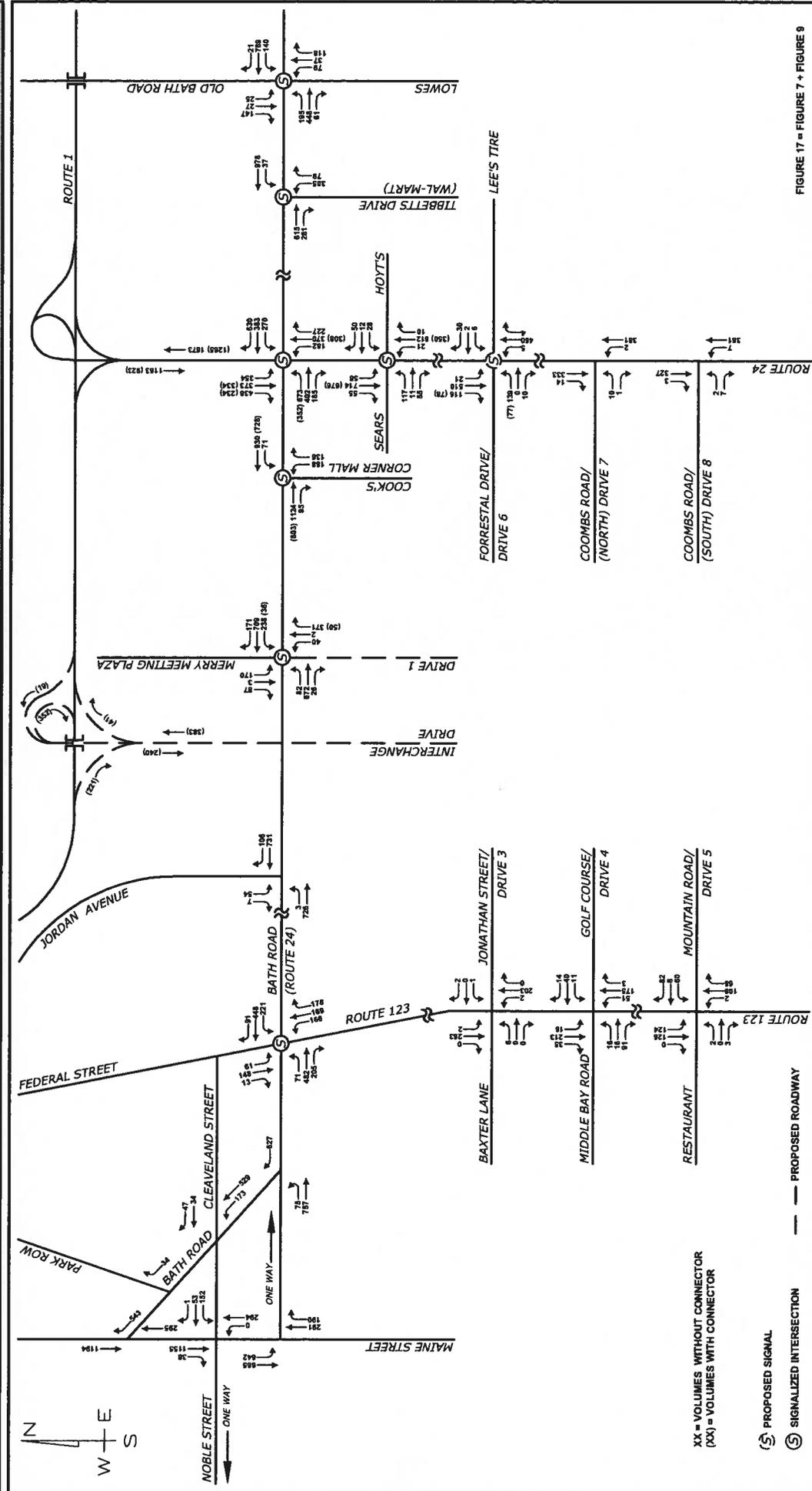


FIGURE 15 = FIGURE 15A + FIGURE 15B + FIGURE 15C

REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

Design Hour Volumes - 5-Year (2016) Reuse Scenario - PM Peak Hour



REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

Design Hour Volumes - 10-Year (2021) Reuse Scenario - PM Peak Hour

Figure No. 19

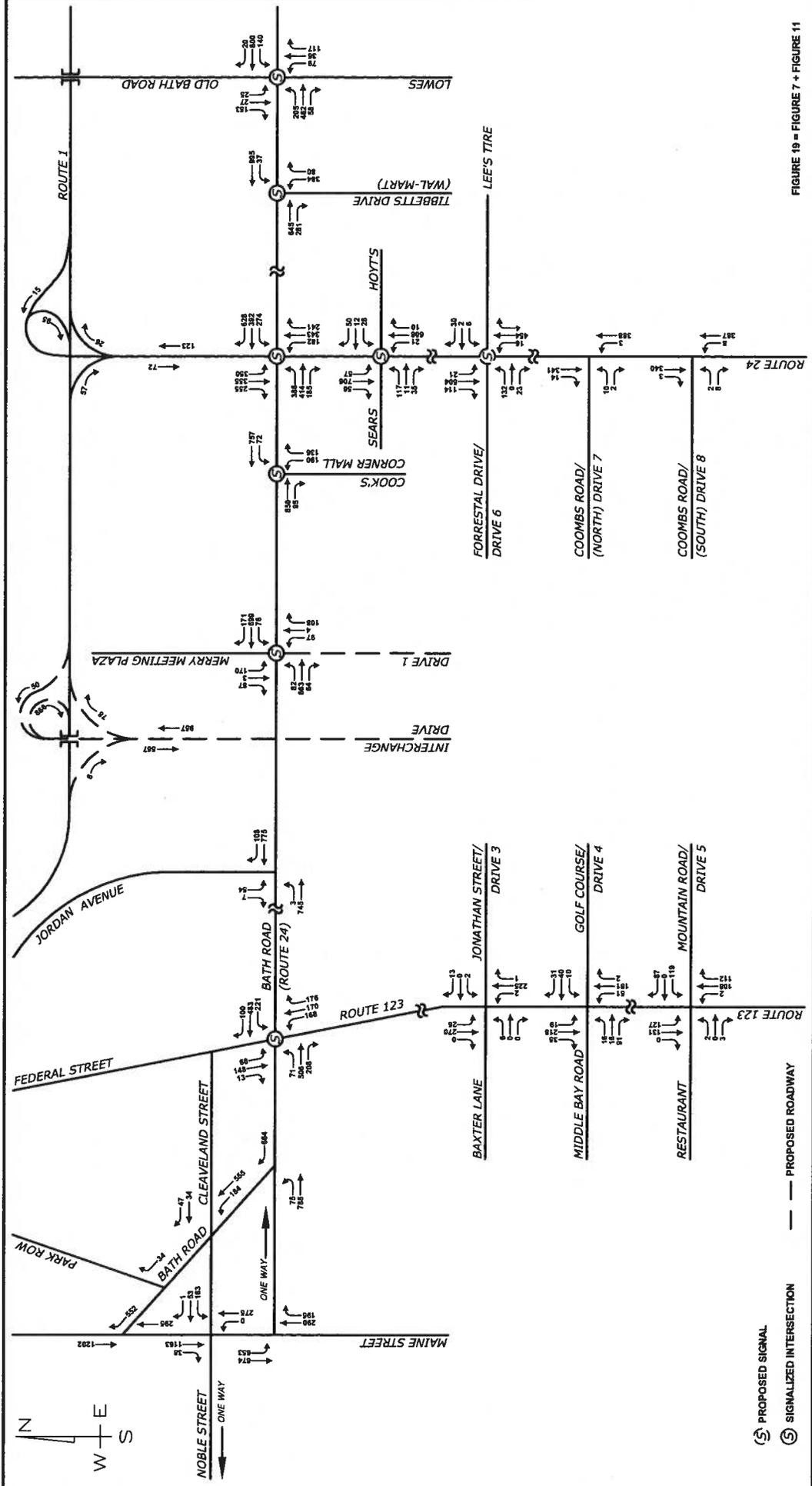


FIGURE 19 - FIGURE 7 + FIGURE 11

REDEVELOPMENT FOR NAVAL AIR STATION, BRUNSWICK, MAINE JUNE 2009

**JOINDER TO ROAD AND COMMON FACILITIES
MAINTENANCE AGREEMENT**

This Joinder (“Joinder”) to Road and Common Facilities Maintenance Agreement is made as of this 6th day of March, 2014 (the “Effective Date” of this Joinder) by the FAMILY FOCUS, a Maine registered not-for-profit organization (charter number - 19860094ND) whose notice address is 2 Davenport Circle, Bath, Maine (the “Additional Property Owner”) and the MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY, a body corporate and politic and a public instrumentality of the State of Maine (“MRRA”).

1. Family Focus hereby joins in, and becomes a party to, and a Property Owner under, that certain Road Maintenance and Common Facilities Agreement among MRRA and certain other parties dated as of July 26, 2013, with respect to certain real property located within the former Naval Air Station Brunswick (“NASB”), in the Town of Brunswick, County of Cumberland, in the State of Maine as recorded in the Cumberland County Registry of Deeds at Book 30884, Page 170, and all amendments to date thereto (the “Agreement”). Capitalized terms used herein and not otherwise defined shall have the meaning provided in the Agreement. The Property owned by the Property Owner that is subject to the Agreement as a result of this Joinder is described on Exhibit A attached hereto.
2. As of the date hereof, the total interior square footage of the improvements within the Property is 11,471 square feet (building 21 - 4,975 square feet and building 26 - 6,496 square feet).
3. MRRA hereby consents to the Additional Property Owner joining in and becoming a party to the Agreement.
4. The Additional Property represents and warrants that the person whose signature appears below for the Additional Property is duly authorized to execute and deliver this Joinder, and that this Joinder is a binding agreement of the Additional Property enforceable in accordance with its terms.
5. This Joinder, together with the Agreement, contains the entire agreement between the parties hereto and is intended to be an integration of all prior agreements, conditions or undertakings between the parties hereto.
6. This document shall be recorded in the Cumberland County Registry of Deeds.

IN WITNESS WHEREOF, this Joinder to Road Maintenance and Common Facilities Agreement is executed by the undersigned as of the date first set forth above.

PROPERTY OWNER:

Family Focus

By: *Robert Parlin*
Name: Robert Parlin
Title: Executive Director

MIDCOAST REGIONAL
REDEVELOPMENT AUTHORITY

By: *Steven H. Levesque*
Name: Steven H. Levesque
Title: Executive Director

STATE OF MAINE
COUNTY OF CUMBERLAND, ss

March 6, 2014

Personally appeared the above named, Robert Parlin, Executive Director of Family Focus, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the Town of Brunswick.

Before me,

Lori L. Locke 3/6/14
Notary Public/Attorney at Law

SEAL

LORI L. LOCKE
Notary Public, Maine
My Commission Expires January 31, 2018

EXHIBIT A TO JOINDER
DESCRIPTION OF THE PROPERTY

Being all that property located in the Town of Brunswick, Cumberland County, Maine and more fully described in the following Deed:

Quitclaim Deed with Covenant from the United States of America to Family Focus dated February 26, 2014 and recorded in the Cumberland County Registry of Deeds in Book 31353, Page 1.

Received
Recorded Register of Deeds
Apr 10, 2014 12:29:52P
Cumberland County
Pamela E. Lovley

APPENDIX K

Section 411.21

Title, Right or Interest

APPENDIX K

**Section 411.21
TITLE, RIGHT OR INTEREST**

**Brunswick Landing Subdivision – Phase II
Midcoast Regional Redevelopment Authority
Brunswick Landing
Brunswick, Maine**

Title, Right or Interest

The project site is a portion of property owned by the Midcoast Regional Redevelopment Authority (MRRA), see the following reference deeds dated and recorded in Cumberland County Registry of Deeds:

- dated March 28, 2011, recorded in Book 28607, Page 1 (204 pages), Airport Parcel 1;
- dated September 30, 2011, recorded in Book 29004, Page 173 (133 pages), Sewage Pump House utility easement;
- dated September 20, 2012, recorded in Book 30069, Page 1 (185 pages), parcel EDC-47;
- dated March 5, 2014, recorded in Book 31376, Page 1 (268 pages), parcel EDC-27;
- dated September 29, 2014, recorded in Book 31836, Page 103 (156 pages), parcel EDC-12;
- dated _____, 2015, not yet recorded, parcels EDC-43A, EDC-43B, EDC-43C, EDC-43D, and EDC-49; and
- dated September 30, 2011, unrecorded “Agreement for the Purchase of Real Property between the USA and MRRA”.

Attached hereto are pertinent pages of the above deeds.

Reference Deed copies

- **Book 28607, Page 1 – Airport Parcel 1**

Doc#: 16297 Bk:28607 Pg: 1

QUITCLAIM DEED

THIS INDENTURE (“Quitclaim Deed”) is made the 28 day of March, 2011 between **United States of America**, acting by and through the Secretary of the Navy, Base Closure Program Management Office Northeast, Philadelphia, PA, hereinafter referred to as “GOVERNMENT,” and the **Midcoast Regional Redevelopment Authority**, a body politic and corporate and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., hereinafter referred to as “GRANTEE.” It is based upon the following facts:

Recitals

A. Pursuant to provisions of the Federal Property and Administrative Services Act of 1949, and approved June 30, 1949, (63 Stat. 377), as amended, and 49 U.S.C. Sections 47151-47153 (formally known as the Surplus Property Act of 1944 [58 Stat. 765], as amended), a delegation from the Administrator of General Services to the Secretary of Defense and subsequent delegation to the Secretary of the Navy, the Secretary of the Navy may convey surplus property at a closing installation to public bodies when a public purpose is served pursuant to the provisions of 40 U.S.C. § 484(e) (3) (H), as implemented by 41 CFR Part 101-47.304-9, and under the power and authority provided by Section 2905(b)(4) of the Defense Base Closure and Realignment Act of 1990 (P.L. 101-510) as amended, and the implementing regulations of the Department of Defense (32 CFR Part 174); and

B. The GRANTEE, by application dated January 26, 2011 requested a “Public Benefit Conveyance” (“PBC”) of a surplus portion of the Naval Air Station, Brunswick Maine, containing approximately 992.1 acres in size, as depicted on the drawing titled “Existing Airport Layout Plan”, updated November 18, 2010, attached hereto and made a part hereof as **Exhibit “A”**, and

C. The Grantee’s application was approved by the Federal Aviation Administration on January 29, 2011 and accepted by the Department of the Navy on February 7, 2011 and is attached hereto and made a part hereof as **Exhibit “B”**, and

D. The GOVERNMENT has determined approximately 714.53 acres as suitable for transfer, hereinafter referred to as “Airport Parcel 1”, and the remaining property will be conveyed by separate deeds.

NOW THEREFORE, by the acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, its successors and assigns, agrees that the transfer of all the Property transferred by this Quitclaim Deed is accepted subject to the following terms, restrictions, reservations, covenants, and conditions set forth below, which shall run with the land, provided

Airport Parcel 1 – Public Benefit Conveyance

1

that the Property, both real and personal, transferred hereby may be successively transferred only with the proviso that any such subsequent transferee assumes all of the obligations upon the GRANTEE by the provisions of this Quitclaim Deed with respect to the property being transferred.

IN CONSIDERATION OF THE FOREGOING, of the terms and conditions set forth below and of other good and valuable consideration (the receipt and adequacy of which, as consideration, the parties hereto both acknowledge), the parties hereto, intending to be legally bound hereby, have agreed to, and do hereby, effectuate the conveyance set forth below.

Conveyance Language

GOVERNMENT does hereby, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions, and restrictions expressly contained herein, grant, sell, convey, remise, release, and quitclaim unto GRANTEE, its heirs, successors, and assigns, without any warranty express or implied as to the quantity or quality of GOVERNMENT's title (except such warranties as are specifically set forth herein required by 42 U.S.C. § 9620(h)(3), or otherwise required by law), all right, title, and interest in and to that certain real property (collectively, "PROPERTY"), including, but not limited to, the underlying estate, buildings, structures, and improvements, including but not limited to utilities and utility distribution systems, and personal property located or installed thereon, which the GOVERNMENT has in and to Airport Parcel 1, consisting of 714.53 acres of land, more fully described in the legal description attached to this Quitclaim Deed and incorporated herein as **Exhibit "C"**.

**PERTINENT
PARCEL
AIRPORT
PARCEL 1**

TOGETHER WITH all the right, title and interest of the GOVERNMENT in and to those seven (7) certain easements for the establishment, maintenance, operation and use of a safety area or compatible use zone, consisting of approximately 34.39 acres of land, more fully described and attached to this Quitclaim Deed and incorporated herein as **Exhibit "D"**.

FURTHER, TOGETHER WITH all and singular the ways, waters, water-courses, driveways, rights, hereditaments and appurtenances, whatsoever thereunto belonging, or in any way appertaining, and the reversions and remainders, rents, issues and profits thereof, and any interest the Government has in water rights and mineral rights, and all the estate, right, title, interest, property, claim and demand whatsoever of GOVERNMENT, in law, equity, or otherwise howsoever, of, in, and to the same and every part thereof, and

TO HAVE AND TO HOLD the said lots or pieces of ground above described, the hereditaments and premises hereby granted, or mentioned and intended so to be, with the appurtenances, unto the said GRANTEE, its heirs, its successors, and its assigns, and subject to the reservations, restrictions, and conditions set forth in this instrument, to and for the only proper use and behoof of the said GRANTEE, its heirs, its successors, and its assigns forever.

- Book 29004, Page 173 – Sewage Pump House, utility easement

Doc#: 50397 Bk:29004 Pg: 173

QUITCLAIM DEED

THIS INDENTURE ("Quitclaim Deed") is made the 30th day of September, 2011 between **United States of America**, acting by and through the Secretary of the Navy, Base Closure Program Management Office Northeast, Philadelphia, PA, hereinafter referred to as "GOVERNMENT," and the **Midcoast Regional Redevelopment Authority**, a body politic and corporate and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., hereinafter referred to as "GRANTEE." It is based upon the following facts:

Recitals

WHEREAS, the Secretary of the Navy is authorized to convey surplus property at a closing installation to the recognized Local Redevelopment Authority for economic development purposes pursuant to Section 2905(b)(4) of the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160) as amended, and the implementing regulations of the Department of Defense (32 CFR Part 174); and

WHEREAS, GRANTEE, by application dated April 6, 2010 requested an economic development conveyance ("EDC") of surplus portions of the former Naval Air Station, Brunswick Maine, consisting of a total of 1098 acres, more or less, hereinafter referred to as the "EDC Property"; and

WHEREAS, the GOVERNMENT and the GRANTEE have agreed that the EDC Property, comprised of several individual parcels of land, with improvements, and related personal property thereon, collectively referred to as the "Individual Parcels" will be conveyed to the GRANTEE by separate deeds of the Individual Parcels as they are determined suitable for transfer; and

WHEREAS, an agreement ("Purchase Agreement") for the purchase of the EDC Property, therein described was executed by the GOVERNMENT and GRANTEE on September 30, 2011; and

WHEREAS, the GOVERNMENT and the GRANTEE have agreed that at the EDC Initial Closing the GOVERNMENT will convey to the GRANTEE approximately 249.37 acres of land by four Quitclaim Deeds consisting of several Individual Parcels, identified as the Phase I Main Base EDC Parcels; Phase II Main Base EDC Housing Parcels, Phase III McKeen Street Parcel, and Phase IV EDC Utility Parcels; and

WHEREAS, this Quitclaim Deed constitutes Phase IV of the Initial Closing, consisting of 15 non-contiguous parcels, also sometimes referred to herein as the Utility Parcels containing

EDC – Phase IV – Utility Parcels

1

0.39 acres of land, more or less, hereinafter referred to as the "PROPERTY".

NOW THEREFORE, in consideration of the foregoing, of the terms and conditions set forth below, and of the terms and conditions set forth in the Purchase Agreement, including the total purchase price in the amount of Ten Million, Six Hundred Thousand Dollars (\$10,600,000.00) for the EDC Property, in the form of (i) Cash Deposit in the amount of \$25,000.00, the receipt of which is hereby acknowledged; (ii) Purchase Money Promissory Note in the amount of Three Million Dollars \$3,000,000.00; and (iii) the balance to be paid through Government Participation in Gross Real Estate Proceeds, the receipt and adequacy of which, as consideration, the parties hereto both acknowledge; and the parties hereto, intending to be legally bound hereby, have agreed to, and do hereby, effectuate the conveyance set forth below.

By the acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, successors and assigns, agrees that the transfer of all the Property transferred by this Quitclaim Deed is accepted subject to the following terms, restrictions, reservations, covenants, and conditions set forth below, which shall run with the land, in perpetuity. The terms, reservations, restrictions, covenants, and conditions contained in this Quitclaim Deed shall be expressly referenced in any deed or other legal instrument by which the GRANTEE divests itself of the fee simple title or any other lesser estate in the Property or any portion thereof with the proviso that any such subsequent transferee assumes all of the obligations upon the GRANTEE by the provisions of this Quitclaim Deed with respect to the property being transferred.

The failure of the GOVERNMENT to insist in any one or more instances upon complete performance of any of the terms, covenants, conditions, reservations or restrictions in this Quitclaim Deed shall not be construed as a waiver or relinquishment of the future performance of any such terms, covenants, conditions, reservations or restrictions and the obligations of the GRANTEE, its successors and assigns, with respect to such future performance shall continue in full force and effect.

Conveyance Language

GOVERNMENT does hereby, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions, and restrictions expressly contained herein, grant, sell, convey, remise, release, and quitclaim unto GRANTEE, its heirs, successors, and assigns, without any warranty express or implied as to the quantity or quality of GOVERNMENT's title (except such warranties as are specifically set forth herein, required by 42 U.S.C. § 9620(h)(3), or otherwise required by law), all right, title, and interest in that certain real property (collectively, the "PROPERTY"), including, but not limited to the underlying estate, buildings, structures, and improvements, including but not limited to utilities, utility distribution systems and components, and personal property situated or installed thereon, which the GOVERNMENT has in and to the Property, consisting of approximately 0.39 acres of land, more fully described in the legal descriptions attached to this Quitclaim Deed and incorporated herein as **Exhibit "A"**.

TOGETHER WITH all and singular the ways, waters, water-courses, driveways, rights,

**PERTINENT
PARCEL
SEWAGE PUMP
HOUSE
(1 OF SEVERAL
PARCELS)**

• **Book 30069, Page 1 – Parcel EDC-47**

Doc#: 62663 Bk:30069 Pg: 1

QUITCLAIM DEED

THIS INDENTURE ("Quitclaim Deed") is made the 20th day of September, 2012 between **United States of America**, acting through the Secretary of the Navy, and by the Naval Facilities Engineering Command, Base Closure Program Management Office Northeast, Philadelphia, PA, hereinafter referred to as "GOVERNMENT," and the **Midcoast Regional Redevelopment Authority**, a body politic and corporate and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., hereinafter referred to as "GRANTEE." It is based upon the following facts:

Recitals

WHEREAS, the Secretary of the Navy is authorized to convey surplus property at a closing installation to the recognized Local Redevelopment Authority for economic development purposes pursuant to Section 2905(b)(4) of the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160) as amended, and the implementing regulations of the Department of Defense (32 CFR Part 174); and

WHEREAS, GRANTEE, by application dated April 6, 2010 requested an economic development conveyance ("EDC") of surplus portions of the former Naval Air Station, Brunswick Maine, consisting of a total of 1098 acres, more or less, hereinafter referred to as the "EDC Property"; and

WHEREAS, the GOVERNMENT and the GRANTEE have agreed that the EDC Property, comprised of several individual parcels of land, with improvements, and related personal property thereon, collectively referred to as the "Individual Parcels" will be conveyed to the GRANTEE by separate deeds of the Individual Parcels as they are determined suitable for transfer; and

WHEREAS, an agreement ("Purchase Agreement") for the purchase of the EDC Property therein described was executed by the GOVERNMENT and GRANTEE on September 30, 2011; and

WHEREAS, the GOVERNMENT conveyed to the GRANTEE several Individual Parcels, recorded in the Cumberland County Registry of Deeds, and identified as the Phase I Main Base EDC Parcels dated September 30, 2011 consisting of 36.75 acres of land at Book 29003, Page 3-166; Phase II Main Base EDC Housing Parcels dated September 30, 2011 consisting of 142.13 acres of land at Book 29003, Page 167-346; Phase III McKeen Street Parcel dated September 30, 2011 consisting of 70.2 acres of land at Book 29004, Page 1-172; and Phase IV EDC Utility Parcels dated September 30, 2011 consisting of 0.39 acres of land at Book 29004, Page 173-304; and Phase V Topsham Housing Parcels dated November 3, 2011 consisting of 46.5 acres of land recorded in the Sagadahoc County Registry of Deeds at Book

EDC – Phase IX Main Base Parcels

1

3335, Page 1; and Phase VI Main Base EDC Parcels dated March 14, 2012 consisting of 112.23 acres of land recorded in Cumberland County Registry of Deeds at Book 29437, Page 1-128; and Phase VII Main Base EDC Parcels dated June 27, 2012 consisting of 211.36 acres of land recorded in Cumberland County Registry of Deeds at Book 29754, Page 1-180; and Phase VIII Topsham Military Triangle EDC dated September 20, 2012 consisting of 12.71 acres of land; and

WHEREAS, this Quitclaim Deed constitutes Phase IX, consisting of nine non-contiguous parcels of land, also sometimes referred to herein as subparcels EDC-13, EDC-16, EDC-18, EDC-19, EDC-21, EDC-22, EDC-23, EDC-25 and EDC-47 containing 89.94 acres of land, more or less, hereinafter referred to as the "PROPERTY".

NOW THEREFORE, in consideration of the foregoing, of the terms and conditions set forth below, and of the terms and conditions set forth in the Purchase Agreement, including a total purchase price in the amount of Ten Million, Six Hundred Thousand Dollars (\$10,600,000.00) for the EDC Property, the receipt and adequacy of which, as consideration, the parties hereto both acknowledge; and the parties hereto, intending to be legally bound hereby, have agreed to, and do hereby, effectuate the conveyance set forth below.

By the acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, its successors and assigns, agrees that the transfer of all the Property transferred by this Quitclaim Deed is accepted subject to the following terms, restrictions, reservations, covenants, and conditions set forth below, which shall run with the land, in perpetuity. The terms, reservations, restrictions, covenants, and conditions contained in this Quitclaim Deed shall be expressly referenced in any deed or other legal instrument by which the GRANTEE divests itself of either the fee simple title or any other lesser estate in the Property or any portion thereof with the proviso that any such subsequent transferee assumes all of the obligations upon the GRANTEE by the provisions of this Quitclaim Deed with respect to the property being transferred.

The failure of the GOVERNMENT to insist in any one or more instances upon complete performance of any of the terms, covenants, conditions, reservations or restrictions in this Quitclaim Deed shall not be construed as a waiver or relinquishment of the future performance of any such terms, covenants, conditions, reservations or restrictions and the obligations of the GRANTEE, its successors and assigns, with respect to such future performance shall continue in full force and effect.

Conveyance Language

GOVERNMENT does hereby, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions, and restrictions expressly contained herein, grant, sell, convey, remise, release, and quitclaim unto GRANTEE, its heirs, successors, and assigns, without any warranty express or implied as to the quantity or quality of GOVERNMENT's title (except such warranties as are specifically set forth herein, required by 42 U.S.C. § 9620(h)(3), or otherwise required by law), all right, title, and interest in

**PERTINENT
PARCEL
EDC-47**

• Book 31376, Page 1 – Parcel EDC-27

Doc#: 9636 Bk:31376 Pg: 1

QUITCLAIM DEED

THIS INDENTURE ("Quitclaim Deed") is made the 5th day of March, 2014 between **United States of America**, acting through the Secretary of the Navy, and by the Naval Facilities Engineering Command, Base Closure Program Management Office East, Philadelphia, PA, hereinafter referred to as "GOVERNMENT," and the **Midcoast Regional Redevelopment Authority**, a body politic and corporate and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., hereinafter referred to as "GRANTEE." It is based upon the following facts:

Recitals

WHEREAS, the Secretary of the Navy is authorized to convey surplus property at a closing installation to the recognized Local Redevelopment Authority for economic development purposes pursuant to Section 2905(b)(4) of the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160) as amended, and the implementing regulations of the Department of Defense (32 CFR Part 174); and

WHEREAS, GRANTEE, by application dated April 6, 2010 requested an economic development conveyance ("EDC") of surplus portions of the former Naval Air Station Brunswick, Brunswick, Maine ("NAS Brunswick"), consisting of a total of 1098 acres, more or less, hereinafter referred to as the "EDC Property"; and

WHEREAS, the GOVERNMENT and the GRANTEE have agreed that the EDC Property, comprised of several individual parcels of land, with improvements, and related personal property thereon, collectively referred to as the "Individual Parcels" will be conveyed to the GRANTEE by separate deeds of the Individual Parcels as they are determined suitable for transfer; and

WHEREAS, an agreement ("Purchase Agreement") for the purchase of the EDC Property therein described was executed by the GOVERNMENT and GRANTEE on September 30, 2011; and

WHEREAS, the GOVERNMENT conveyed to the GRANTEE several individual Parcels, recorded in the Cumberland County Registry of Deeds, and identified as the Phase I Main Base EDC Parcels dated September 30, 2011 consisting of 36.75 acres of land at Book 29003, Page 3-166; and Phase II Main Base EDC Housing Parcels dated September 30, 2011 consisting of 142.13 acres of land at Book 29003, Page 167-346; and Phase III McKeen Street Parcel dated September 30, 2011 consisting of 70.2 acres of land at Book 29004, Page 1-172; Phase IV EDC Utility Parcels dated September 30, 2011 consisting of 0.39 acres of land at Book 29004, Page 173-304; and Phase V Topsham Housing Parcels dated November 3, 2011 consisting of 46.5 acres of land recorded in the Sagadahoc County Registry of Deeds at Book

EDC – Phase X Main Base Parcels

1

3335, Page 1; and Phase VI Main Base EDC Parcels dated March 14, 2012 consisting of 112.23 acres of land recorded in Cumberland County Registry of Deeds at Book 29437, Page 1-128; and Phase VII Main Base EDC Parcels dated June 27, 2012 consisting of 211.36 acres of land recorded in Cumberland County Registry of Deeds at Book 29754, Page 1-180; and Phase VIII Topsham Military Triangle EDC dated September 20, 2012 consisting of 12.71 acres of land recorded in the Sagadahoc County Registry of Deeds at Book 3438, Page 32; and Phase IX Main Base EDC Parcels dated September 20, 2012 consisting of 89.94 acres of land recorded in Cumberland County Registry of Deeds at Book 30069, Page 1-185; and

**PERTINENT
PARCEL
EDC-27**

WHEREAS, this Quitclaim Deed constitutes Phase X, consisting of seven non-contiguous parcels of land, also sometimes referred to herein as subparcels EDC-15, EDC-27, EDC-28, EDC-34, EDC-35, EDC-45 and EDC-46 containing 22.37 acres of land, more or less, hereinafter referred to as the "PROPERTY".

NOW THEREFORE, in consideration of the foregoing, of the terms and conditions set forth below, and of the terms and conditions set forth in the Purchase Agreement, including a total purchase price in the amount of Ten Million, Six Hundred Thousand Dollars (\$10,600,000.00) for the EDC Property, the receipt and adequacy of which, as consideration, the parties hereto both acknowledge; and the parties hereto, intending to be legally bound hereby, have agreed to, and do hereby, effectuate the conveyance set forth below.

By the acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, its successors and assigns, agrees that the transfer of all the Property transferred by this Quitclaim Deed is accepted subject to the following terms, restrictions, reservations, covenants, and conditions set forth below, which shall run with the land, in perpetuity. The terms, reservations, restrictions, covenants, and conditions contained in this Quitclaim Deed shall be expressly referenced in any deed or other legal instrument by which the GRANTEE divests itself of either the fee simple title or any other lesser estate in the Property or any portion thereof with the proviso that any such subsequent transferee assumes all of the obligations upon the GRANTEE by the provisions of this Quitclaim Deed with respect to the property being transferred.

The failure of the GOVERNMENT to insist in any one or more instances upon complete performance of any of the terms, covenants, conditions, reservations or restrictions in this Quitclaim Deed shall not be construed as a waiver or relinquishment of the future performance of any such terms, covenants, conditions, reservations or restrictions and the obligations of the GRANTEE, its successors and assigns, with respect to such future performance shall continue in full force and effect.

Conveyance Language

GOVERNMENT does hereby, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions, and restrictions expressly contained herein, grant, sell, convey, remise, release, and quitclaim unto GRANTEE, its heirs, successors, and assigns, without any warranty express or implied as to the quantity or

• Book 31836, Page 1 – Parcel EDC-12

Doc#: 48915 Bk:31836 Pg: 103

QUITCLAIM DEED

THIS INDENTURE ("Quitclaim Deed") is made the 29th day of September, 2014 between **United States of America**, acting through the Secretary of the Navy, and by the Naval Facilities Engineering Command, Base Closure Program Management Office East, Philadelphia, PA, hereinafter referred to as "GOVERNMENT," and the **Midcoast Regional Redevelopment Authority**, a body politic and corporate and a public instrumentality of the State of Maine organized under Title 5, Maine Revised Statutes Annotated, Section 13083-G, et seq., hereinafter referred to as "GRANTEE." It is based upon the following facts:

Recitals

WHEREAS, the Secretary of the Navy is authorized to convey surplus property at a closing installation to the recognized Local Redevelopment Authority for economic development purposes pursuant to Section 2905(b)(4) of the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160) as amended, and the implementing regulations of the Department of Defense (32 CFR Part 174); and

WHEREAS, GRANTEE, by application dated April 6, 2010 requested an economic development conveyance ("EDC") of surplus portions of the former Naval Air Station Brunswick, Brunswick, Maine ("NAS Brunswick"), consisting of a total of 1098 acres, more or less, hereinafter referred to as the "EDC Property"; and

WHEREAS, the GOVERNMENT and the GRANTEE have agreed that the EDC Property, comprised of several individual parcels of land, with improvements, and related personal property thereon, collectively referred to as the "Individual Parcels" will be conveyed to the GRANTEE by separate deeds of the Individual Parcels as they are determined suitable for transfer; and

WHEREAS, an agreement ("Purchase Agreement") for the purchase of the EDC Property therein described was executed by the GOVERNMENT and GRANTEE on September 30, 2011; and

WHEREAS, the GOVERNMENT conveyed to the GRANTEE several Individual Parcels, recorded in the Cumberland County Registry of Deeds, and identified as the Phase I Main Base EDC Parcels dated September 30, 2011 consisting of 36.75 acres of land at Book 29003, Page 3-166; and Phase II Main Base EDC Housing Parcels dated September 30, 2011 consisting of 142.13 acres of land at Book 29003, Page 167-346; and Phase III McKeen Street Parcel dated September 30, 2011 consisting of 70.2 acres of land at Book 29004, Page 1-172; Phase IV EDC Utility Parcels dated September 30, 2011 consisting of 0.39 acres of land at Book 29004, Page 173-304; and Phase V Topsham Housing Parcels dated November 3, 2011 consisting of 46.5 acres of land recorded in the Sagadahoc County Registry of Deeds at Book

EDC – Phase XI Main Base Parcels

1

3335, Page 1; and Phase VI Main Base EDC Parcels dated March 14, 2012 consisting of 112.23 acres of land recorded in Cumberland County Registry of Deeds at Book 29437, Page 1-128; and Phase VII Main Base EDC Parcels dated June 27, 2012 consisting of 211.34 acres of land recorded in Cumberland County Registry of Deeds at Book 29754, Page 1-180; and Phase VIII Topsham Military Triangle EDC dated September 20, 2012 consisting of 12.71 acres of land recorded in the Sagadahoc County Registry of Deeds at Book 3438, Page 32; and Phase IX Main Base EDC Parcels dated September 20, 2012 consisting of 89.94 acres of land recorded in Cumberland County Registry of Deeds at Book 30069, Page 1-185; and Phase X Main Base EDC Parcels dated March 5, 2014 consisting of 22.37 acres of land recorded in Cumberland County Registry of Deeds at Book 31376, Page 1-268.

**PERTINENT
PARCEL
EDC-12**

WHEREAS, this Quitclaim Deed constitutes Phase XI, consisting of four non-contiguous parcels of land, also sometimes referred to herein as subparcels EDC-12, EDC-24, EDC-37 and EDC-48 containing 21.23 acres of land, more or less, hereinafter referred to as the "PROPERTY".

NOW THEREFORE, in consideration of the foregoing, of the terms and conditions set forth below, and of the terms and conditions set forth in the Purchase Agreement, including a total purchase price in the amount of Ten Million, Six Hundred Thousand Dollars (\$10,600,000.00) for the EDC Property, the receipt and adequacy of which, as consideration, the parties hereto both acknowledge; and the parties hereto, intending to be legally bound hereby, have agreed to, and do hereby, effectuate the conveyance set forth below.

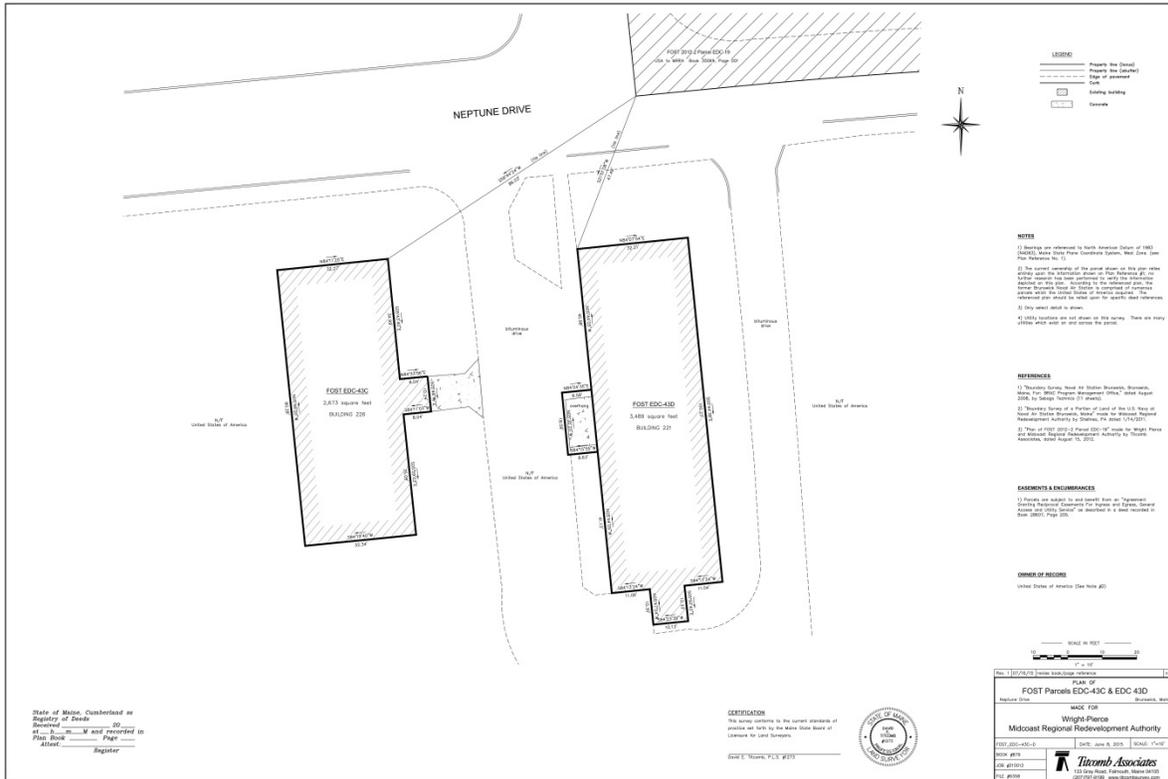
By the acceptance of this Quitclaim Deed or any rights hereunder, the GRANTEE, for itself, its successors and assigns, agrees that the transfer of all the Property transferred by this Quitclaim Deed is accepted subject to the following terms, restrictions, reservations, covenants, and conditions set forth below, which shall run with the land, in perpetuity. The terms, reservations, restrictions, covenants, and conditions contained in this Quitclaim Deed shall be expressly referenced in any deed or other legal instrument by which the GRANTEE divests itself of either the fee simple title or any other lesser estate in the PROPERTY or any portion thereof with the proviso that any such subsequent transferee assumes all of the obligations upon the GRANTEE by the provisions of this Quitclaim Deed with respect to the property being transferred.

The failure of the GOVERNMENT to insist in any one or more instances upon complete performance of any of the terms, covenants, conditions, reservations or restrictions in this Quitclaim Deed shall not be construed as a waiver or relinquishment of the future performance of any such terms, covenants, conditions, reservations or restrictions and the obligations of the GRANTEE, its successors and assigns, with respect to such future performance shall continue in full force and effect.

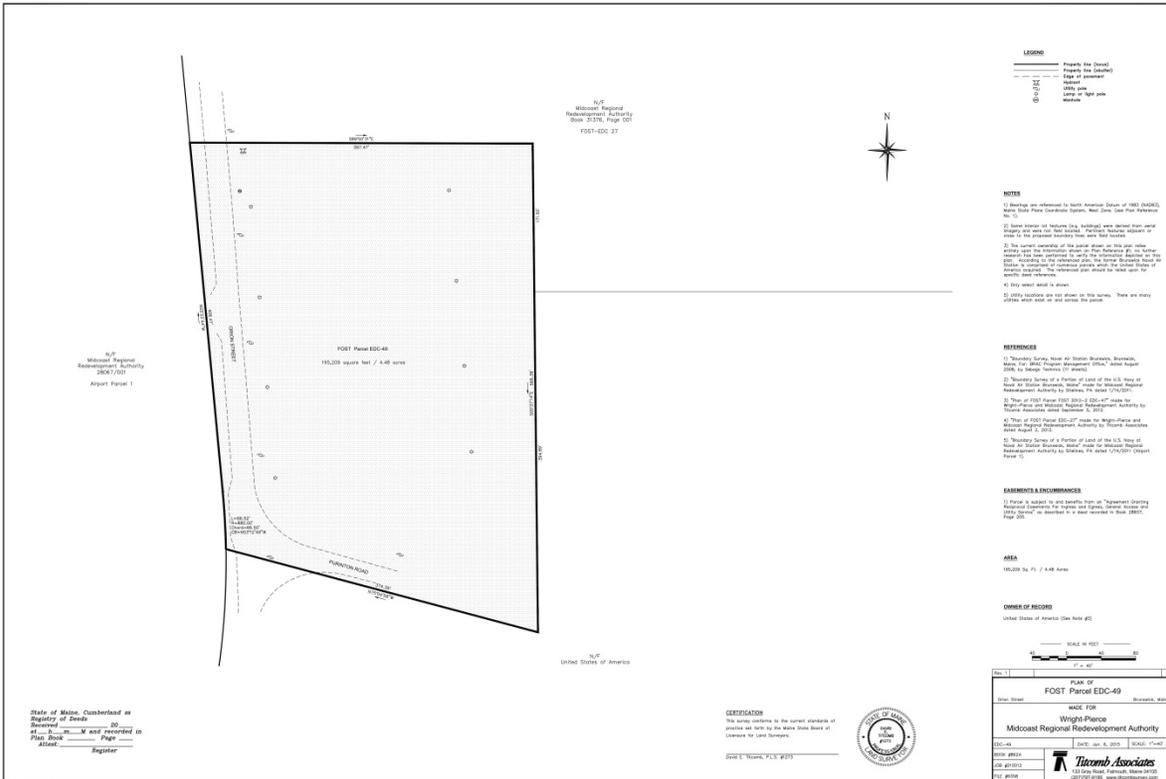
Conveyance Language

GOVERNMENT does hereby, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions, and restrictions

• **Building - EDC-43-C & D**



• Parcel - EDC-49

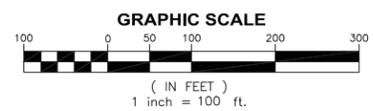


APPENDIX L

Project Plans



SEE DRAWING 1 OF 2 FOR PLANNING BOARD SIGNATURE BLOCK & CONDITIONS OF APPROVAL, SURVEYOR'S CERTIFICATION, LEGEND, NOTES, PLAN REFERENCES & SETBACK DIMENSION TABLE



NO.	DATE	DESCRIPTION

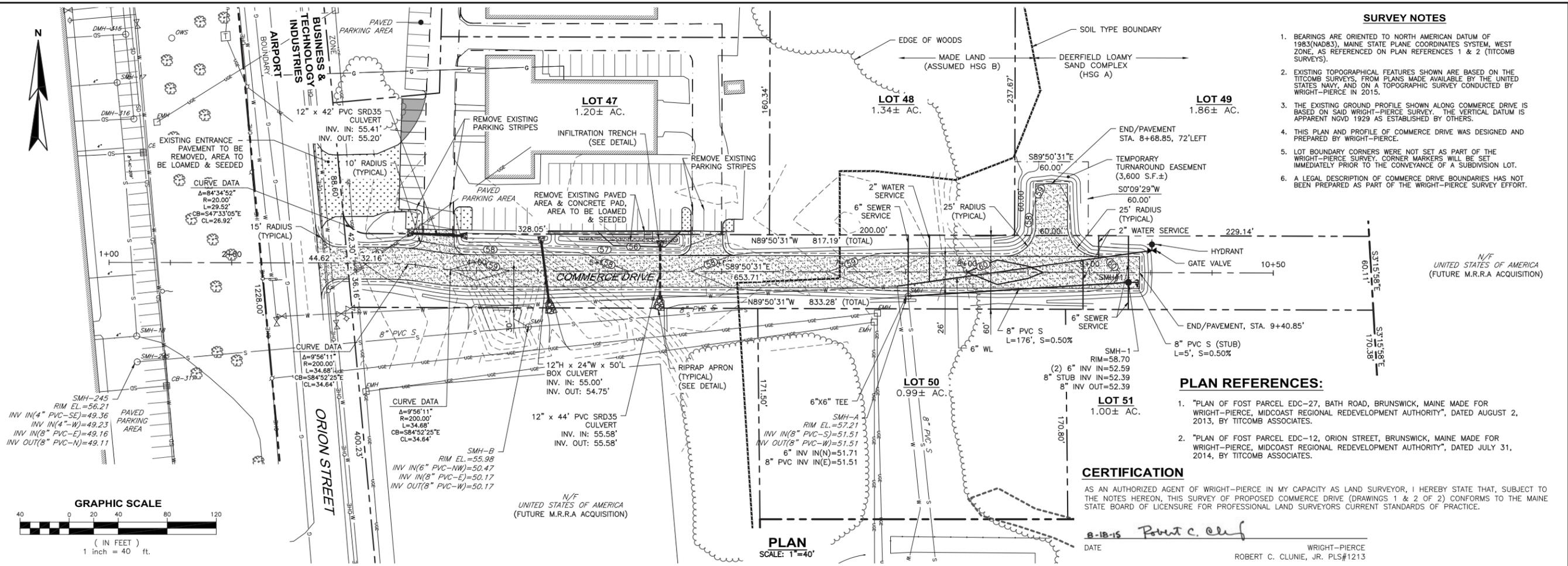
DESIGNED BY: JBW/RCC
CAD: RFB
CHECKED BY: RCC
DATE: 8-18-15
APPROVED BY: JBW
DATE: 8-18-15
PROJECT NO: 12218D



WRIGHT-PIERCE
Engineering a Better Environment
Offices Throughout New England
888.621.8156 | www.wright-pierce.com

SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE
MIDCOAST REGIONAL REDEVELOPMENT AUTHORITY
2 PEGASUS STREET, SUITE 1, UNIT 200 - BRUNSWICK, MAINE 04011
SUBDIVISION PLAN - SHEET 1

DRAWING
2 OF 2



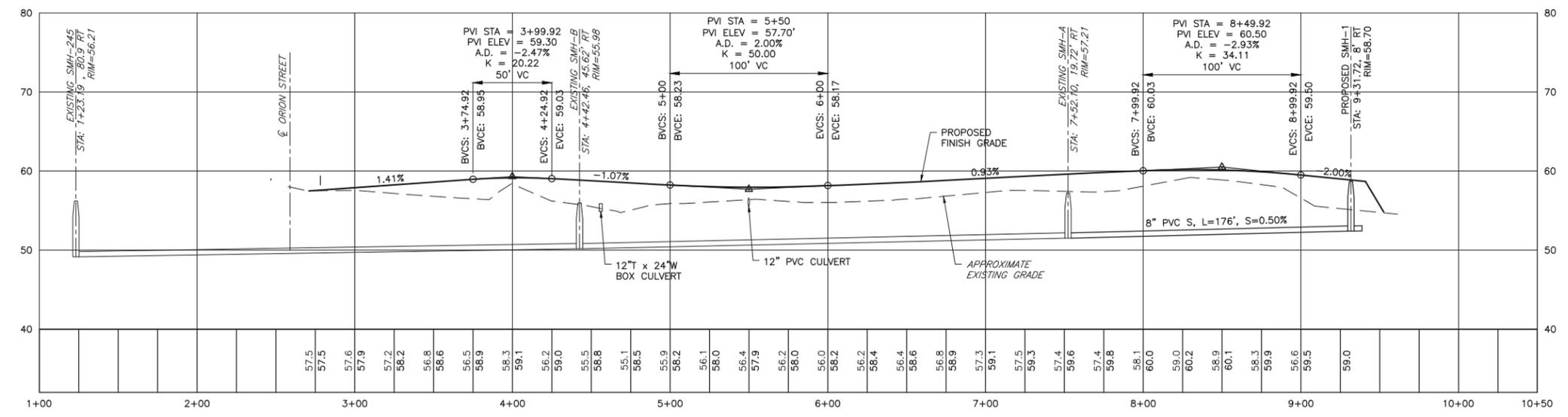
- SURVEY NOTES**
- BEARINGS ARE ORIENTED TO NORTH AMERICAN DATUM OF 1983 (NAD83). MAINE STATE PLANE COORDINATES SYSTEM, WEST ZONE, AS REFERENCED ON PLAN REFERENCES 1 & 2 (TITCOMB SURVEYS).
 - EXISTING TOPOGRAPHICAL FEATURES SHOWN ARE BASED ON THE TITCOMB SURVEYS, FROM PLANS MADE AVAILABLE BY THE UNITED STATES NAVY, AND ON A TOPOGRAPHIC SURVEY CONDUCTED BY WRIGHT-PIERCE IN 2015.
 - THE EXISTING GROUND PROFILE SHOWN ALONG COMMERCE DRIVE IS BASED ON SAID WRIGHT-PIERCE SURVEY. THE VERTICAL DATUM IS APPARENT NOVD 1929 AS ESTABLISHED BY OTHERS.
 - THIS PLAN AND PROFILE OF COMMERCE DRIVE WAS DESIGNED AND PREPARED BY WRIGHT-PIERCE.
 - LOT BOUNDARY CORNERS WERE NOT SET AS PART OF THE WRIGHT-PIERCE SURVEY. CORNER MARKERS WILL BE SET IMMEDIATELY PRIOR TO THE CONVEYANCE OF A SUBDIVISION LOT.
 - A LEGAL DESCRIPTION OF COMMERCE DRIVE BOUNDARIES HAS NOT BEEN PREPARED AS PART OF THE WRIGHT-PIERCE SURVEY EFFORT.

DESIGNED BY: JWB
CD: RCC
CHECKED BY: JWB
DATE: 8-18-15
APPROVED BY: JWB
DATE: 8-18-15
PROJECT NO.: 12218D

WRIGHT-PIERCE
 Engineering a Better Environment
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STATE OF MAINE
 PROFESSIONAL LAND SURVEYOR
 ROBERT C. CLUNIE, JR.
 No. 1213

STATE OF MAINE
 PROFESSIONAL LAND SURVEYOR
 JAN WIEGMAN
 No. 582



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 888.621.8156

SUBDIVISION PLAN - PHASE II
 BRUNSWICK LANDING SUBDIVISION
 BRUNSWICK, CUMBERLAND COUNTY, MAINE

ROAD PLAN & PROFILE

DRAWING C-1

EROSION AND SEDIMENTATION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE "MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES", MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION DATED MARCH 2003.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES", MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, DATED MARCH 2003.

1. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE MAINTAINED IN AN UNTREATED OR UNVEGETATED CONDITION FOR THE MINIMUM TIME REQUIRED. IN GENERAL, AREAS TO BE VEGETATED SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL.

2. SEDIMENT BARRIERS (SILT FENCE, STONE CHECK DAMS, ETC.) SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF UPGRADE DRAINAGE AREAS.

3. INSTALL SILT FENCE AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE WILL REMAIN IN PLACE PER NOTE #5.

4. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED.

NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS.

6. IF FINAL SEEDING AND SODDING IS NOT EXPECTED PRIOR TO THE ANTICIPATED DATE OF THE FIRST KILLING FROST, USE TEMPORARY ANNUAL RYEGRASS SEEDING AND MULCHING ON ROUGH GRADED SUBSOIL TO PROTECT THE SITE AND DELAY PERMANENT LOAMING, FINE GRADING, AND SEEDING OR SODDING UNTIL SPRING.

7. WHEN FEASIBLE, TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINISH GRADED SHALL BE COMPLETED 30 DAYS PRIOR TO THE FIRST KILLING FROST.

8. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.

9. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND REVEGETATED.

10. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.

11. STABILIZATION SCHEDULE BEFORE WINTER:

SEPTEMBER 15 ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL MATTING AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND MULCHED.

OCTOBER 1 ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR EROSION CONTROL BLANKET.

NOVEMBER 15 ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.

DECEMBER 1 ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER-WINTER.

EROSION CONTROL - WINTER CONSTRUCTION

WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15

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

1. EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.

2. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

3. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.

4. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.

7. THE APPLICATION OF MULCH TO FINE GRADED AREAS WILL BE STABILIZED AS FOLLOWS:

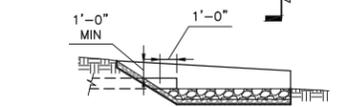
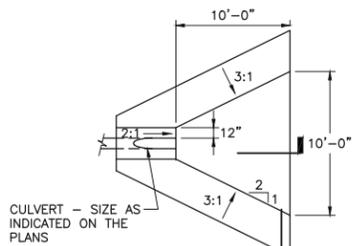
A) BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.

B) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.

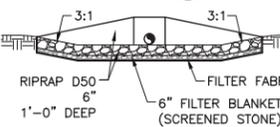
C) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

8. AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.

9. DURING WINTER CONSTRUCTION PERIODS ALL SNOW SHALL BE REMOVED FROM AREAS OF MULCHING PRIOR TO PLACEMENT.



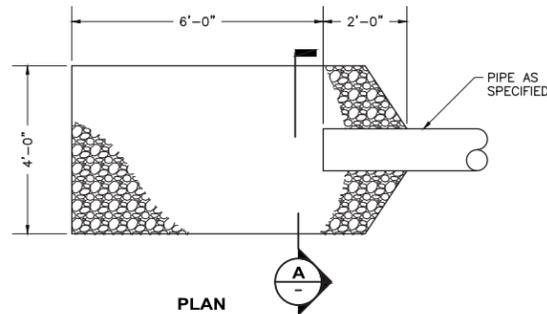
SECTION 1
SCALE: NTS



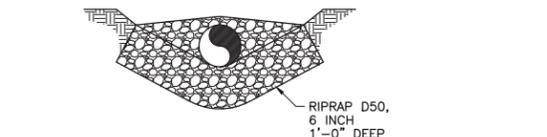
SECTION 2
SCALE: NTS

RIPRAP APRON AT ALL CULVERT OUTLETS

SCALE: NTS



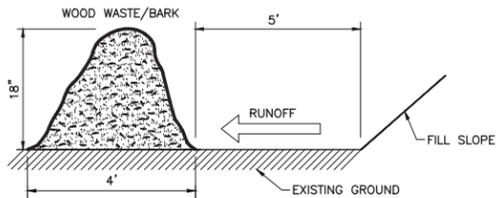
PLAN



SECTION A

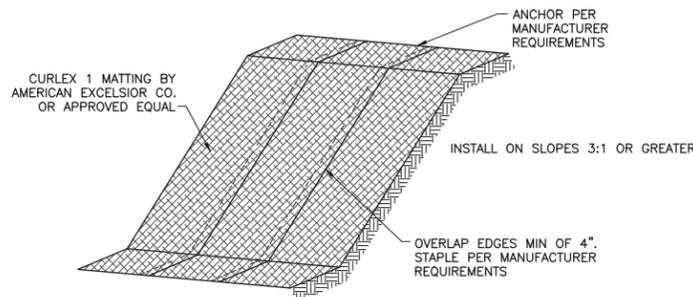
STONE INLET APRON

SCALE: NTS



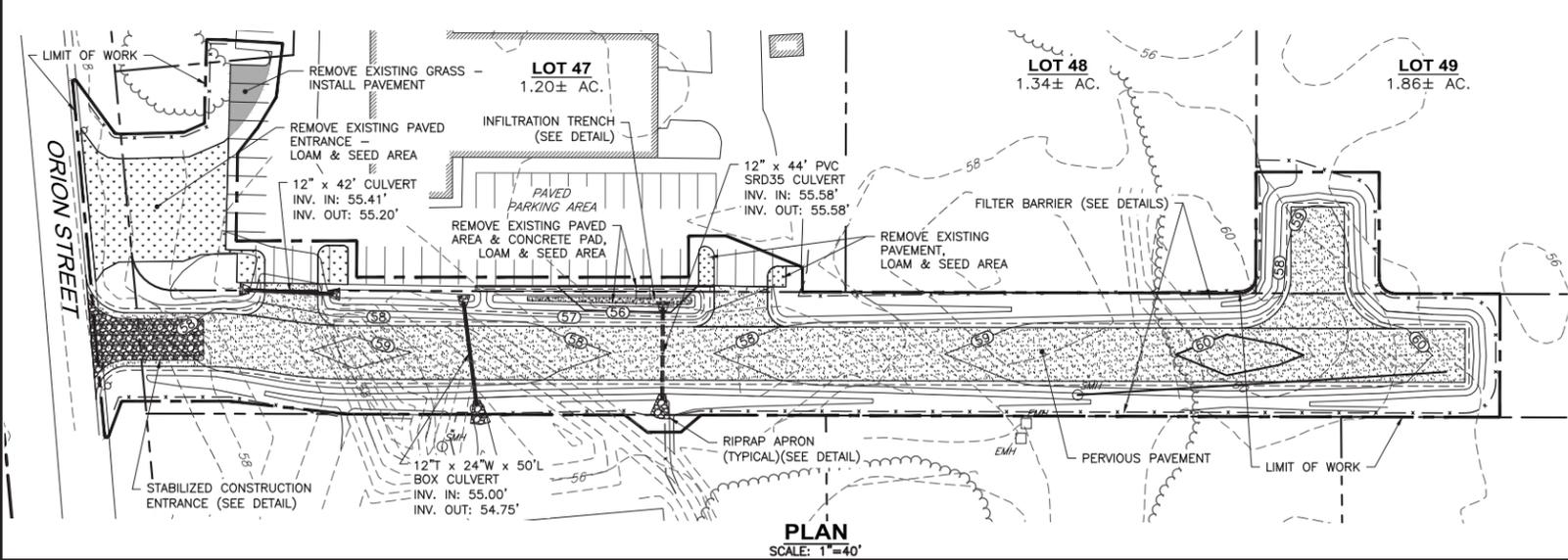
EROSION CONTROL MIX BERM

SCALE: NTS



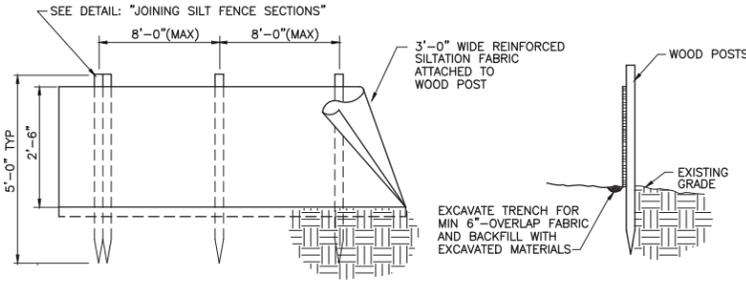
EROSION CONTROL MATTING - SLOPES

SCALE: NTS



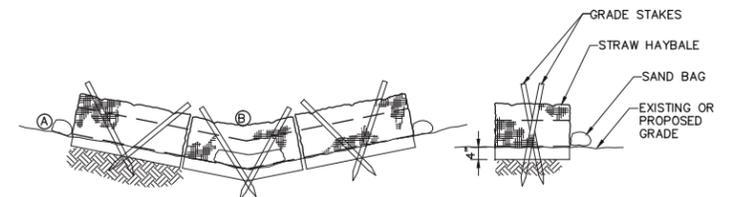
PLAN

SCALE: 1"=40'



SILT FENCE INSTALLATION DETAIL

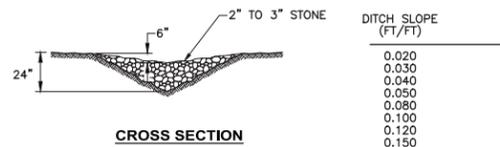
SCALE: NTS



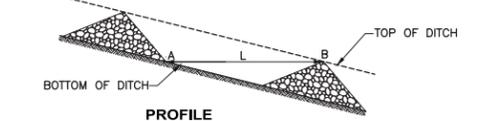
STRAW HAY BALE CHECK DAM

SCALE: NTS

EROSION CHECK TO BE STRAW HAYBALES SECURED TO THE GROUND WITH TWO 4' LONG GRADE STAKES FOR EACH BALE. SAND BAG AS REQUIRED, PLACE SUFFICIENT BALES TO ESTABLISH ELEVATIONS AT (A) AT LEAST 6 INCHES ABOVE OVERFLOW AT (B)



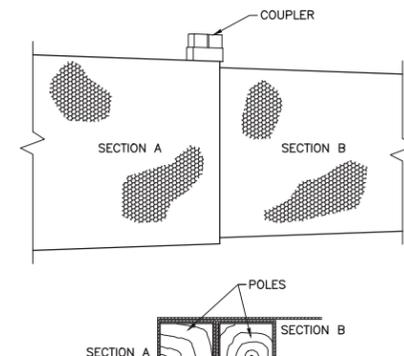
CROSS SECTION



PROFILE

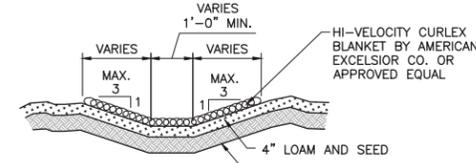
STONE CHECK DAM DETAIL

SCALE: NTS



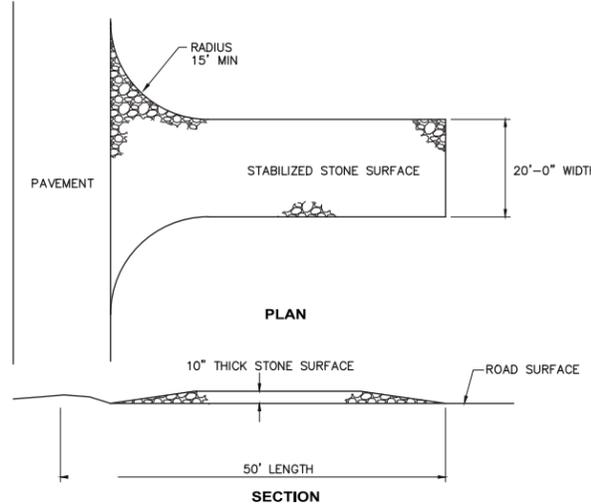
JOINING SILT FENCE SECTIONS

SCALE: NTS



VEGETATED SWALE DETAIL

SCALE: NTS



PLAN

SECTION

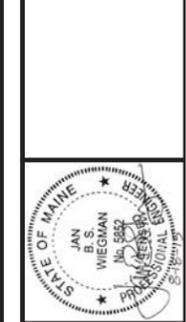
(TEMPORARY, TO BE REMOVED PRIOR TO FINAL SITE PAVING)

STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

NO.	DATE	APP'D.	REVISIONS

DESIGNED BY: JWB	CAD: RFB	CHECKED BY: JWB	DATE: 8-18-15	APPROVED BY: JWB	DATE: 8-18-15	PROJECT NO: 12218D
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SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE
EROSION & SEDIMENTATION CONTROL PLAN & DETAILS



September 17, 2015
W-P Project No. 12218D

Mr. Jared Woolston
Planner
Department of Planning and Development
85 Union Street
Brunswick, ME 04011

Subject: Revised Final Submission - Subdivision Plan
Brunswick Landing Subdivision – Phase 2
Midcoast Regional Redevelopment Authority (MRRA)

Dear Mr. Woolston:

Please find attached, revised exhibits to the Final Subdivision Application for the Brunswick Landing Subdivision, Phase 2, hereinafter referred to as "Phase 2". The revised material addresses comments raised during the Staff Review process and comments from the Maine DEP raised during their review of the stormwater management system.

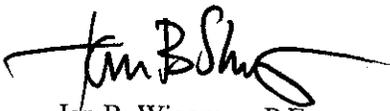
Included with this submission are revised roadway plans that show the additional grading at the end of Commerce Way to accommodate the fire hydrant, revised pre and post development stormwater plans showing the additional tables and boring locations that DEP had requested, revised details for the infiltration trench and roadway cross section showing the water table depths and some revised stormwater management plan information that addressed some area discrepancies between the pre and post development models.

Two borings with wells were installed on September 11th and the water elevations were read on September 15th. Based on the information from the wells we did adjust the detail for the infiltration trench to a shallower section that accommodates the stormwater treatment volume for the watershed and maintains the 3' separation with the water table. In putting the pre and post development area table together we noticed that there were some minor discrepancies between the pre and post areas which were corrected and the model revised. As a result the table summarizing the pre and post development runoff rates in the Stormwater Management Report needed to be revised and we have included the page with the revised table as well as the revised HydroCad modelling output information.

If you have any questions, please let me know.

Very truly yours,

WRIGHT-PIERCE



Jan B. Wiegman, P.E.
Project Manager

Mr. Jared Woolston
September 17, 2015
Page 2 of 2



JBW/
Enclosure

cc: Bob Rocheleau - MRRA



East Coast Explorations

16 Maple Street
Hallowell, Maine 04347

Telephone: (207) 623-4358
Fax: 1-(775) 307-9002

SHEET 1 OF 1
DATE 9-11-15
HOLE NO. B-1
LINE & STA. _____
OFFSET _____
SURF. ELEV. _____

TO Wright Pierce
PROJECT NAME Orion / Commerce
REPORT SENT TO Michael Michaud
SAMPLES SENT TO Michael Michaud
ADDRESS 99 Main Street Topsham, ME
LOCATION Brunswick Landing, Maine
PROJ. NO. _____
OUR JOB NO. J 15-07

GROUND WATER OBSERVATIONS		AUGERS	SAMPLER	CORE BAR.	Date	Time
At <u>Well</u> Installed after drilling	Type	2 1/4"	split spoon			
At _____ after _____ Hours	Size I.D.	2 1/4"	2"			
	Hammer Wt.		140lbs	BIT		
	Hammer Fall	30"	30"			

START COMPLETE
TOTAL HRS.: 1
BORING FOREMAN Christopher Palmer
INSPECTOR Michael Michaud
SOILS ENGR.

LOCATION OF BORING: See map attached for locations

DEPTH	Casing Blows per foot	Sample Depths From - To	TYPE	Blows per 6" on Sampler			Moisture Density of Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, type of soil, etc. Rock-color, type condition, hardness, Drilling time, seams and etc.	SAMPLE		
				From	To					#	Pen.	Rec.
				0-6	6-12	12-18						
		0-3'						Drillers observations				
		3-6'						3' Light brown F-M-C Sand trace of gravel.....				
								6' Light brown fine Sand.....				
								Light brown Silty, moist Fine Sand.				
		BOB @ 12'						NO Samples taken- Drillers observations.				
								1" Well Installed. BOB @ 12'				
								NO Refusal				

GROUND SURFACE TO 12' USED 2 1/4" AUGERS: THEN Installed 1" PVC well.

Sample Type D=Dry C=Cored W=Washed UP=Undisturbed Piston TP=Test Pit A=Auger V=Vane Test UT=Undisturbed Thinwall	Proportions Used trace 0 to 10% little 10 to 20% some 20 to 35% and 35 to 50%	140 lb Wt. x 30" fall on 2" OD Sampler		SUMMARY Earth Boring <u>12'</u> Rock Coring <u>none</u> Samples <u>None taken</u> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 5px;">HOLE NO. B-1</div>
		Cohesionless Density 0-10 Loose 10-30 Med. Dense 30-50 Dense 50+ Very Dense	Cohesive Consistency 0-4 Soft 30 + Hard 4-8 M/Stiff 8-15 Stiff 15-30 V-Stiff	



East Coast Explorations

16 Maple Street
Hallowell, Maine 04347

Telephone: (207) 623-4358
Fax: 1-(775) 307-9002

SHEET 1 OF 1
DATE 9-11-15
HOLE NO. B-2
LINE & STA. _____
OFFSET _____
SURF. ELEV. _____

TO <u>Wright Pierce</u>	ADDRESS <u>99 Main Street Topsham, ME</u>
PROJECT NAME <u>Orion / Commerce</u>	LOCATION <u>Brunswick Landing, Maine</u>
REPORT SENT TO <u>Michael Michaud</u>	PROJ. NO. _____
SAMPLES SENT TO <u>Michael Michaud</u>	OUR JOB NO. <u>J 15-07</u>

GROUND WATER OBSERVATIONS At <u>Well</u> Installed after drilling At _____ after _____ Hours	Type	AUGERS 2 1/4"	SAMPLER split spoon	CORE BAR.	Date	Time
	Size I.D.	2 1/4"	2"		START COMPLETE	
	Hammer Wt.		140lbs	BIT	TOTAL HRS.: 1	
	Hammer Fall	30"	30"		BORING FOREMAN <u>Christopher Palmer</u> INSPECTOR <u>Michael Michaud</u> SOILS ENGR.	

LOCATION OF BORING: See map attached for locations

DEPTH	Casing Blows per foot	Sample Depths From - To	TYPE	Blows per 6" on Sampler			Moisture Density of Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, type of soil, etc. Rock-color, type condition, hardness, Drilling time, seams and etc.	SAMPLE		
				From	To					#	Pen.	Rec.
				0-6	6-12	12-18						
		0-1'						1'	Drillers observations			
									Brown Silty sand			
									Topsoil.....			
									Light brown fine Sand			
		BOB @ 12'							NO Samples taken- Drillers observations.			
									1" Well Installed. BOB @ 12'			
									NO Refusal			

GROUND SURFACE TO 12' USED 2 1/4" AUGERS: THEN Installed 1" PVC well.

Sample Type D=Dry C=Cored W=Washed UP=Undisturbed Piston TP=Test Pit A=Auger V=Vane Test UT=Undisturbed Thinwall	Proportions Used trace 0 to 10% little 10 to 20% some 20 to 35% and 35 to 50%	140 lb Wt. x 30" fall on 2" OD Sampler		SUMMARY Earth Boring <u>12'</u> Rock Coring <u>none</u> Samples <u>None taken</u>
		Cohesionless Density 0-10 Loose 10-30 Med. Dense 30-50 Dense 50 + Very Dense	Cohesive Consistency 0-4 Soft 30 + Hard 4-8 M/Stiff 8-15 Stiff 15-30 V-Stiff	

STORMWATER MANAGEMENT PLAN

PROPOSED COMMERCE DRIVE

Brunswick Landing Subdivision – Phase II
Midcoast Regional Redevelopment Authority
Brunswick Landing
Brunswick, Maine
REVISED SEPTEMBER 17, 2015

1.1 INTRODUCTION

This Stormwater Management Plan has been prepared to address the stormwater runoff impacts for both stormwater quantity and stormwater quality associated with the installation of the proposed roadway.

2.1 EXISTING CONDITIONS

The 53,728-square foot (1.23 acres) area proposed for development is situated on the easterly side of existing Orion Street, and consists of:

- 500 square feet of existing bituminous pavement;
- 13,023 square feet of existing woods; and
- 40,205 square feet of grass land, for a total area of
- 53,728 square feet.

The project area is located at or very near the top of its watershed with stormwater sheeting off the site via overland flow to the north, east and south onto lands owned by the United States Government (“USA”). The flows headed in the northerly direction eventually make their way via a shallow swale to an existing Stormwater Pond which retains and releases runoff to an existing drainage course that runs southwesterly to Mare Brook. It appears that a large portion of the surface runoff does not extend much beyond the project boundaries; rather, the runoff is retained in the small surface undulations and eventually infiltrates into the underlying soils. There is no apparent outlet for stormwater flowing in this direction.

According to Chapter 502, “Appendix B, Urban Impaired Streams”, Mare Brook is an urban impaired stream, and therefore, the proposed project is required to meet the “Urban Impaired

Stream Standard” of Chapter 500, “Section 4. Stormwater Standards”. Reference is made to “13. Urban Impaired Stream Submissions” of this application.

2.1.1 Land Cover

See “2.1 Existing Conditions”, above.

2.1.2 Site Topography

The topography of the site is relatively flat with intermittent and shallow undulations. A shallow, broad swale directs surface runoff from a portion of the paved parking areas and from a portion of the buildings on land located northerly of the site to land of the USA abutting the site to the south. The wooded, easterly portion of the site slopes down gently to the east and runoff eventually reaches the existing stormwater pond located northeasterly of the site.

2.1.3 Surface Water Features

There are no streams on or adjacent to the developed portion of the site. The site is not tributary to any lakes that are impaired or threatened by phosphorous. The site is located within the watershed of Mare Brook, an Urban Impaired Stream.

2.1.4 Soils

As discussed in “11. Soils”, of this application, the soils located at the project site can be classified as Hydrologic Soil Group “A” and “B”.

3.1 PROPOSED CONDITIONS

Development of the site as proposed will involve grading and filling the area of the proposed roadway to achieve the desired profile. In the wooded area, the trees will be cut and the stumps removed. In order to reduce the flow of runoff from a portion of the adjacent paved area into the area of the site reserved for the Infiltration Trench, curb will be installed along the edge of the paved area. The curb will channel the runoff from the existing parking area down to the exiting

low spot in the pavement, where it will be directed into a culvert crossing under the roadway. The outflows from the culvert will be released into the existing broad swale and will follow the swale onto land of the USA as it does in the existing condition.

The roadway and the two driveway connections will be “paved” with porous pavement which will absorb the rain falling on its surface, allow the rain to pass through layers of gravel and a stone filter layer and infiltrate into the soil beneath. The gravel reservoir course will have the capacity to retain the amount of runoff generated by the 25-year, 24-hour storm event in addition to treating the 1-inch of runoff for water quality treatment purposes.

The proposed Infiltration Trench to be installed in the ditch line between the roadway and the existing paved area to the north, will afford treatment of the runoff from the grassed ditch and will help meet the required level of treatment of the project’s developed area. The water passing through the Infiltration Trench will be treated by the layers of gravel and stone in the trench prior to being released into the soils below. The Infiltration Trench will also have the capacity to store the amount of runoff generated by the 25-year, 24-hour storm event in addition to treating the 1-inch of runoff for water quality treatment purposes

Development of the roadway project as proposed will result in:

- 20,930 square feet of new porous pavement w/ shoulders, installed;
- 10,257 square feet of retained woods;
- 224 square feet of Infiltration Trench, installed; and
- 22,317 square feet of grass, installed, for a total area of
- 53,728 square feet.

The applicant proposes to meet the Urban Impaired Stream standard by obtaining “credits” for reducing on-site and off-site pre-development impervious stormwater sources in accordance with “Section 3 A. Mitigation through compensation fees or projects” of Chapter 501, Stormwater Management Compensation Fees and Mitigation Credit. See “13, Urban Impaired Stream Submissions” of this application.

3.1.1 Alteration to Land Cover

Several areas of off-site pavement will be replaced with vegetation, the pavement width of the access road will be expanded into areas that are currently grass, and areas of grass will be converted to landscaped areas and/or impervious facility features.

3.1.2 Downstream Waterbodies

Surface runoff from the development is tributary to Mere Brook located approximately 6,000 feet southerly of the project site.

4.1 REGULATORY REQUIREMENTS

4.1.1 Town of Brunswick

The proposed project will require Development Review approval by the Town of Brunswick Planning Board. According to the Town of Brunswick Zoning Ordinance, "Subsection 411.5, Storm Water Management" of "Section 411, Review Standards", "...The proposed development shall satisfy the recommended storm water quality standards described in Storm Water Management for Maine: Best Management Practices, published by the State of Maine Department of Environmental Protection, November, 1995, as amended."

4.1.2 Maine Department of Environmental Protection (MDEP)

The MDEP Rules Chapter 500 describes stormwater management requirements for new development and redevelopment projects which involve modification to an existing Site Location of Development Permit (SLODP). These rules describe performance standards divided into five major categories: Basic Standards, General Standards, Phosphorous Standards, Urban Impaired Stream Standards and Flooding Standards.

- A. Basic Standards: As a modification of an existing SLODP, the proposed project must meet the Basic Standards.

- B. General Standards: As a modification of an existing SLODP, the proposed project must meet the General Standards.
- C. Phosphorous Standards: A project is subject to the phosphorous standards when it is in the watershed of a lake most at risk as identified in Chapter 502. The project is not in the watershed of a lake that is identified as being Most at Risk in Chapter 502 and therefore the project is not subject to the Phosphorous Standards.
- D. Urban Impaired Stream Standard: The proposed project is located in the direct watershed of Mare Brook, an urban impaired stream. As a modification of an existing SLODP, the proposed project must meet the Urban Impaired Stream Standard.
- E. Flooding Standard: As a modification of an existing SLODP, the proposed project must meet the Flooding Standard.

4.2 WATER QUALITY TREATMENT

4.2.1 General Considerations

Stormwater quality treatment for the project will be provided by the infiltration of runoff into the underlying soils at the site. Infiltration of the runoff will be accomplished by the installation of an Infiltration Trench that will collect and treat runoff from an isolated grassed landscaped area adjacent to the roadway and by the use of Porous Pavement for all new project paved areas.

For the purposes of determining the extent of required post-development stormwater quality treatment, the proposed roadway can be considered as the “linear portion” of the project and as such is eligible for an exception from the General Standards as provided in “Section 4.B.(3)(c), A linear portion of a project”, which states: “...*For a linear portion of a project, runoff volume control may be reduced to no less than 75% of the volume from the impervious area and no less*

than 50% of the developed area that is impervious or landscaped, or the runoff volume to each treatment measure described in Section 4(B)(2) above may be reduced by 25%.”

The location of the proposed Infiltration Trench and the extent of Porous Pavement are shown on the attached Project Plan Set. The details, design and specifications for the proposed infiltration BMPs are also shown on the attached Project Plan Set.

4.2.2 BMP Design Considerations

The Infiltration Trench was designed and sized in accordance with “Chapter 6, Infiltration BMPs” and “Section 6.2.2 Infiltration Trench”, of MDEP Volume III. BMP Technical Design Manual:

1. Treatment Volume - *Infiltration systems must be designed to retain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped developed area and infiltrate this volume into the ground. The Linear Portion of a Project exception provides for a reduction in the volume of runoff that needs to be treated;*
2. Stone Porosity – *A porosity value of 0.4 shall be used in the design of stone reservoirs for infiltration practices; and*
3. Separation From Seasonal High Water Table - *The bottom of the infiltration system, including any stone layer or other material below the depth of any manufactured components of the system, must be at least three feet above the elevation of the seasonal high water table.*

The Porous Pavement BMP was designed and sized in accordance with “Section 7.7, Manmade Pervious Surfaces”, of MDEP Volume III. BMP Technical Design Manual:

1. Treatment Volume - *To meet the General Standards requirements (1 inch infiltration), a minimum storage capacity within the filter layer or subbase and base is needed to allow the direct entry of one inch or more and to meet the Flooding Standards requirements, the road design needs to provide a minimum storage*

capacity for the direct entry of the rain precipitation from a 24-hour, 25-year storm (5 +inches);

2. *Filter Layer - A filter layer providing pretreatment before infiltration to groundwater needs to be included in the road design and can be part of the subbase and base. The media must be a mineral soil with between 4 and 7% fines (passing #200 sieve) and should be a minimum of 8 inches thick.; and*
3. *Separation From Seasonal High Water Table - At a minimum, one foot separation is needed below the road subbase and above the groundwater table.*

4.2.3 Required and Proposed Project Stormwater Runoff Treatment

As it applies to the project's proposed roadway, the exception from the General Standards provides that for a linear portion of a project, runoff volume control may be reduced to no less than 75% of the volume from the impervious area and no less than 50% of the developed area that is impervious or landscaped, or the runoff volume to each treatment measure may be reduced by 25%.

The project must also meet the applicable Urban Impaired Stream Standards. See "13. Urban Impaired Stream Submissions" of this application.

The following **Table 1** shows the calculations used for sizing the Infiltration Trench and the extent of Pervious Pavement, the comparison between the required and the provided water quality treatment volumes of the BMPs and the required and provided water quality treatment percentages.

As can be seen in **Table 1**, both the proposed Infiltration Trench and the Pervious Pavement BMPs exceed the minimums for providing the required water quality storage volumes and treatment percentages. By incorporating the BMPs into the project's stormwater management system, the required standard of 50% treatment of the project's developed area is exceeded by achieving 53% treatment and the required standard of 75% treatment of the project's impervious areas is exceeded by achieving 100% treatment.

4.3 RUNOFF ANALYSIS

This section has been prepared to outline the proposed changes to the stormwater runoff peak flow rates as a result of the development.

4.3.1 Modeling Technique

The computer program HydroCAD, which is based on SCS TR-20 and TR-55 methodology, was used to analyze pre-development and post-development conditions. The 24-hour SCS Type III storm distribution for the 2, 10, and 25-year storm frequencies were used for this analysis. The corresponding rainfall amounts for these storms are 3.0", 4.7" and 5.5" respectively.

Reference is made to the HydroCAD calculation sheets attached hereto for the pre-development and post-development conditions.

Land use cover, watershed delineations, flow paths and hydrologic soils data were obtained using the following sources of information:

1. Existing topography from Navy records and on-the-ground surveys conducted by Titcomb Associates and Wright-Pierce personnel;
2. Aerial photography; and
3. The description of the soils as presented in "11. Soils" of this application.

The study area involved in the Runoff Analysis includes the proposed road right of way and the undeveloped seven proposed subdivision lots, covering approximately 9.1 acres.

4.3.2 Study Points

There are three common study points (SPs) identified for this project for both the pre-development conditions and the post-development conditions. SP 1, being the output of SC-1 (Subcatchment 1), is at the northerly property line of land of the applicant situated approximately 450 feet northerly of the proposed roadway and about 300 feet westerly of the eventual runoff destination, the existing BNAS stormwater pond. SP 2, located in a low spot on land of the USA situated approximately 150 feet southerly of the roadway, summarizes runoff rates from SC-2 and SC-3. SP-3 summarizes the output of SC-4 and is located approximately 230 feet southeasterly of the roadway at the southeasterly corner of land of the applicant.

Reference is made to the pre and post development drainage plans accompanying this application in Appendix F.

4.3.3 Pre-Development

The pre-development model represents the site in the current conditions. The project study area was broken down into four subcatchments, SC-1, SC-2, SC-3 and SC-4.

Reference is made to the HydroCAD diagram and calculation sheets and the pre-development drainage plan included in Appendix F for the pre-development condition.

4.3.4 Post-Development

The post-development model conditions reflect the construction of the proposed roadway and the stormwater BMPs. Within the post-development drainage model the project site is divided into six subcatchments; SC-1, SC-2, SC-2A, SC-2B, SC-3 and SC-4. The post-development model maintains the locations and designations of the three pre-development Study Points, SC-1, SP-2 and SC-4..

Reference is made to the HydroCAD diagram and calculation sheets and the post-development drainage plan included in Appendix F for the post-development condition.

In general terms, the entire roadway will be surfaced with Pervious Pavement and the Infiltration Trench will be installed in the portion of the roadway ditch located between the roadway and the existing paved area. The two BMPs will provide water quality treatment as well as water quantity control such that the post-development runoff flow rates at each of the Study Points is equal to or less than the flow rates in the pre-development condition.

4.3.5 Comparison of Peak Flow Rates

Table 2, below, summarizes the results of the stormwater runoff calculations at the three Study Points for the 2, 10 and 25 year storm events for the project.

REVISED TABLE 2
Table 2 Stormwater Peak Flow Rates Summary
Pre-Development vs Post-Development

Study Point	2-Year Storm (3.0")			10-Year Storm (4.7")			25-Year Storm (5.5")		
	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)
SC-1	0.95	0.97	+0.02*	3.60	3.69	+0.09*	5.12	5.25	+0.13*
SP-2	1.89	1.01	-0.88	3.85	1.85	-2.00	4.82	2.29	-2.53
SC-4	0.00	0.00	NC	0.00	0.00	NC	0.02	0.02	NC

*See Section 4.3.6 below

4.3.6 Request for Waiver of the Flooding Standard

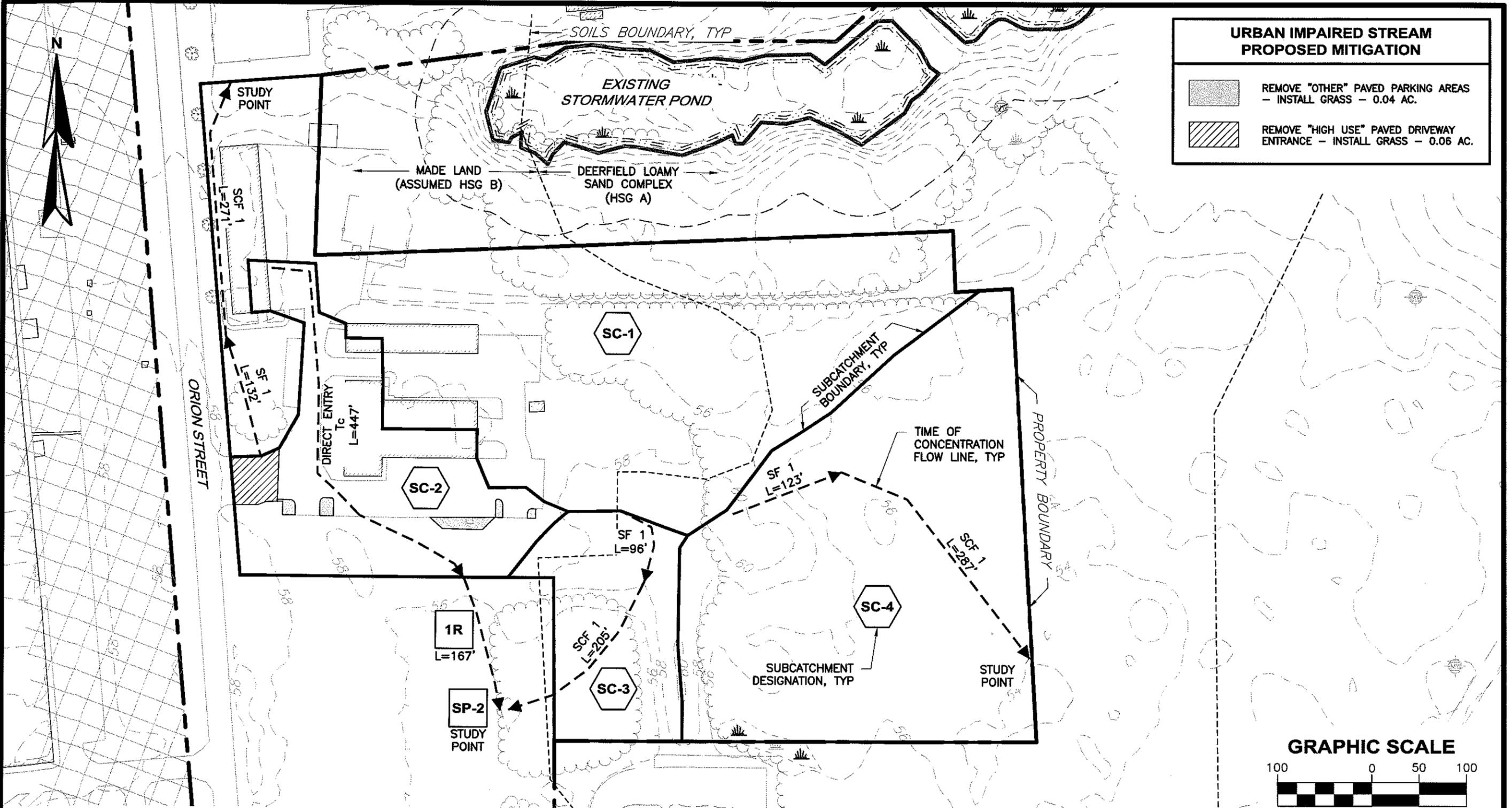
The applicant requests a waiver for the instances of insignificant increases (<0.2 cfs) in peak flow rates from the project site as shown in Table 2.

5.1 CONCLUSIONS

By incorporating the proposed BMPs presented in this report into the stormwater runoff management system, by keeping the amount of existing impervious surfaces to the minimum necessary, and if the request for waiver of the Flooding Standard is granted, runoff from the proposed facility will receive treatment/control that meets the applicable General and Flooding Standards of Chapter 500, Stormwater Management.

5.2 MAINTENANCE & PROTECTION OF STORMWATER SYSTEM

Long-term responsibilities for maintenance and protection of the project's stormwater drainage system, stormwater treatment systems, the road, paved areas and permanent erosion control measures will be assumed by the applicant. A Maintenance Plan has been developed for the project and the components of the plan are detailed in "14. Basic Standards" of this application.

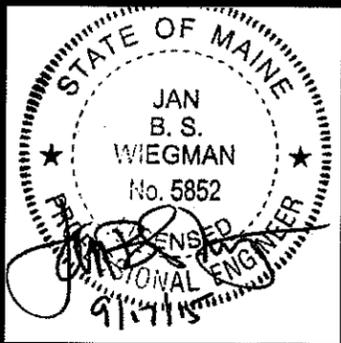


URBAN IMPAIRED STREAM PROPOSED MITIGATION

- REMOVE "OTHER" PAVED PARKING AREAS - INSTALL GRASS - 0.04 AC.
- REMOVE "HIGH USE" PAVED DRIVEWAY ENTRANCE - INSTALL GRASS - 0.06 AC.

PREDEVELOPMENT LAND USE AREAS SUMMARY

SUB-CATCHMENT	AREA (SF)	PAVED/ROOF AREA (SF)	GRASS AREA (SF)	WOODED AREA (SF)
SC-1	175,897	50,924	58,419	66,554
SC-2	57,792	34,440	23,352	0
SC-3	33,022	0	20,986	12,036
SC-4	132,375	0	7,609	124,766
TOTALS	399,086	85,364	110,366	203,356



SUBDIVISION PLAN
 BRUNSWICK LANDING SUBDIVISION - PHASE II
 BRUNSWICK LANDING
 BRUNSWICK, CUMBERLAND COUNTY, MAINE
 PROJ NO: 12218D DATE: JUNE 2015

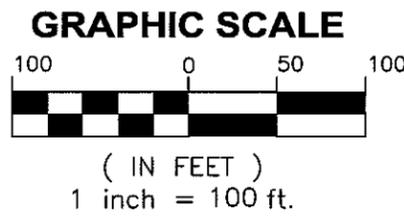
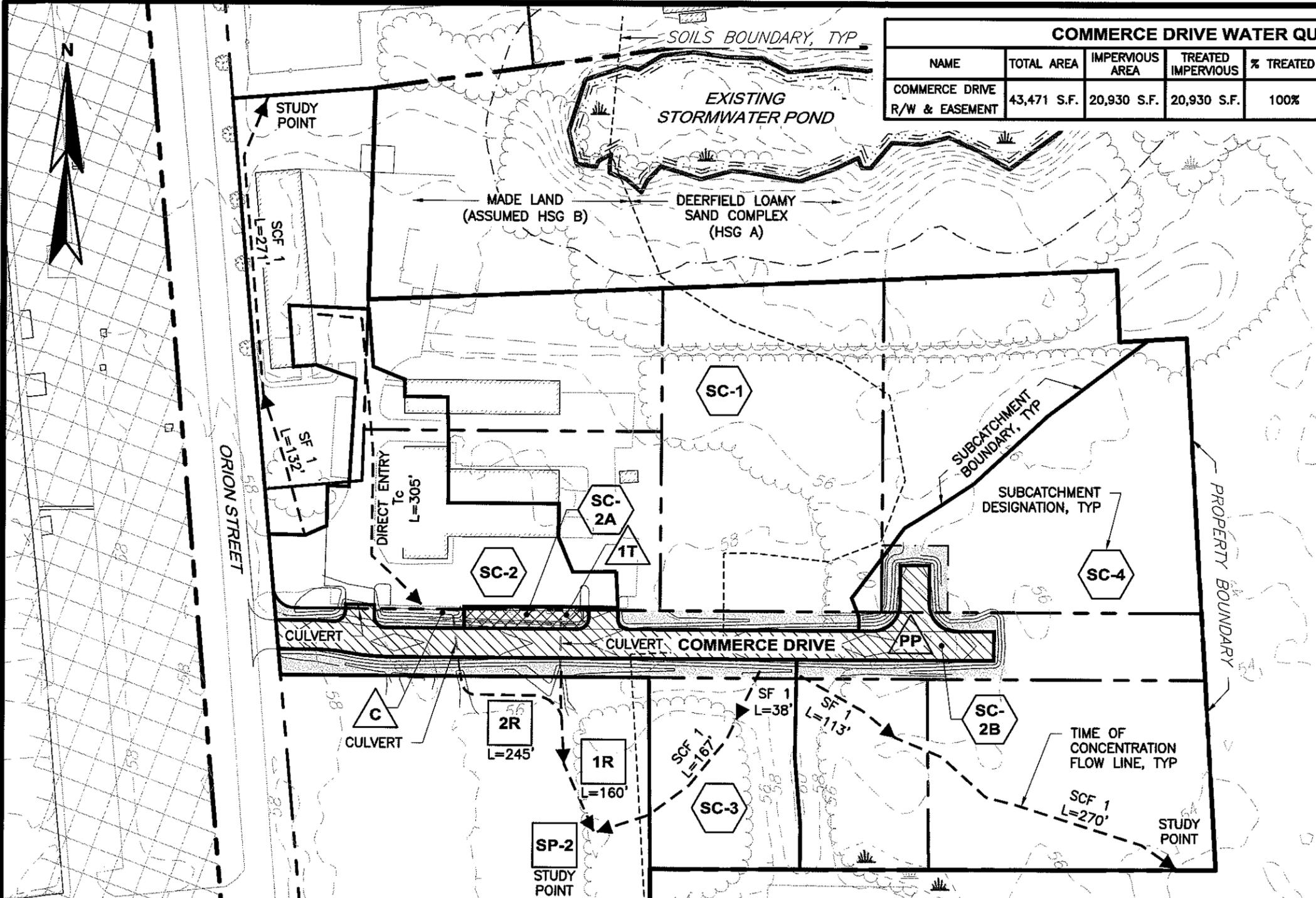


NO.	REVISIONS	APP'D	DATE
1	PREDEVELOPMENT LAND USE AREAS SUMMARY & URBAN IMPAIRED STREAM PROPOSED MITIGATION	JBW	9-17-15
2			
3			

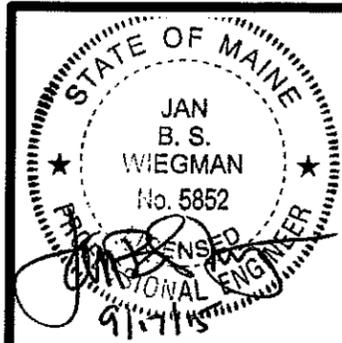
COMMERCE DRIVE WATER QUALITY TREATMENT SUMMARY								
NAME	TOTAL AREA	IMPERVIOUS AREA	TREATED IMPERVIOUS	% TREATED	DEVELOPED AREA	TREATED DEVELOPED	% TREATED	TREATMENT STRUCTURES
COMMERCE DRIVE R/W & EASEMENT	43,471 S.F.	20,930 S.F.	20,930 S.F.	100%	43,471 S.F.	22,878 S.F.	53%	PERVIOUS PAVE./INFILTRATION & INFILTRATION TRENCH

PROPOSED IMPROVEMENTS & ASSOCIATED WATER QUALITY TREATMENT

- INSTALL GRASS - UNTREATED - 0.47 AC.
- INSTALL POROUS PAVEMENT - TREATED - 0.45 AC.
- INSTALL GRASS & INFILTRATION TRENCH - TREATED - 0.04 AC.



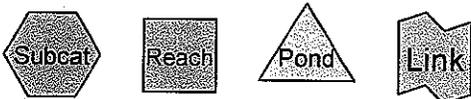
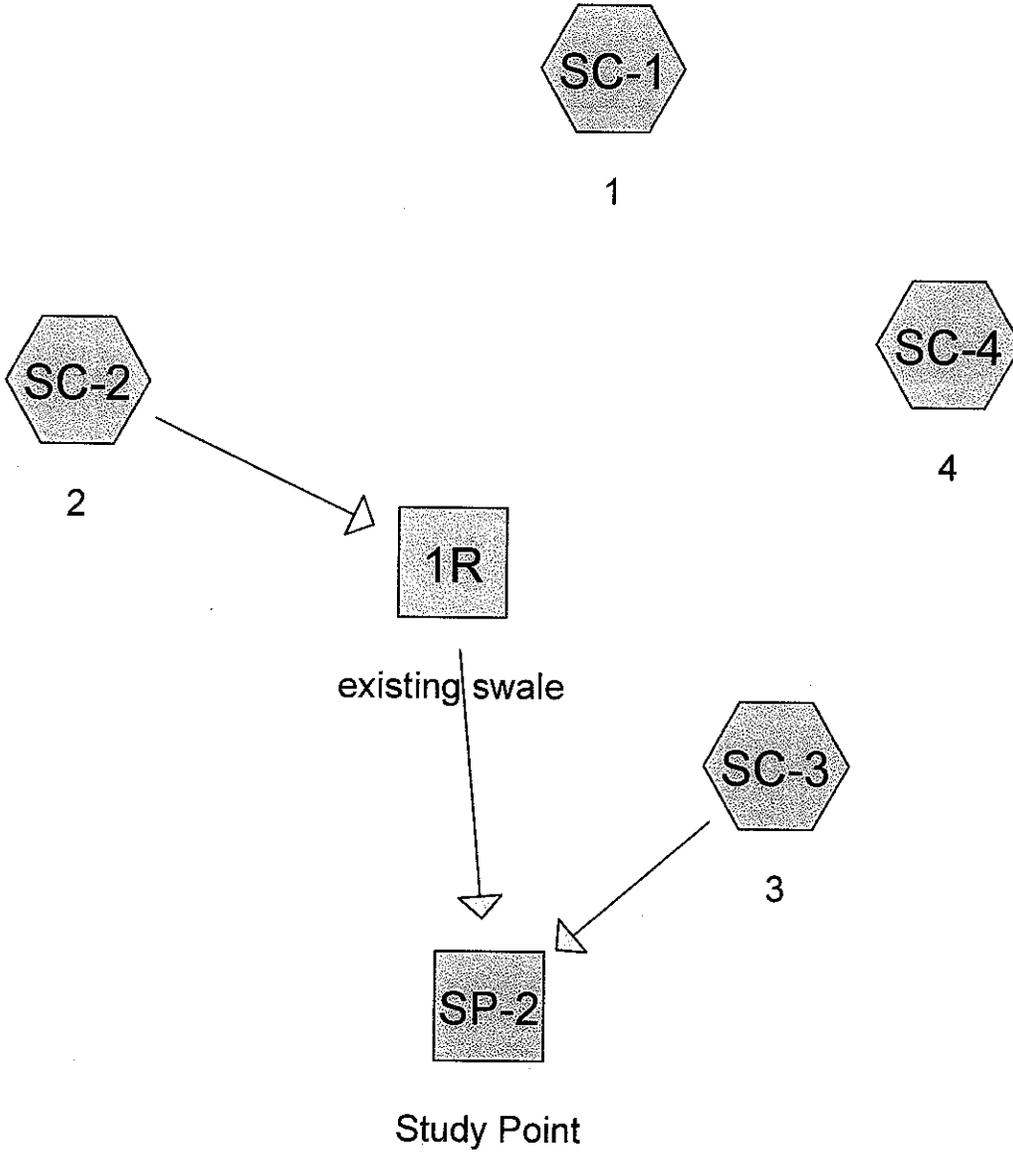
POSTDEVELOPMENT LAND USE AREAS SUMMARY					
SUB-CATCHMENT	AREA (SF)	PAVED/ROOF AREA (SF)	GRASS AREA (SF)	WOODED AREA (SF)	TREATMENT STRUCTURE
SC-1	180,387	50,924	62,909	66,554	NONE
SC-2	40,147	33,735	6,412	0	NONE
SC-2A	2,070	0	2,070	0	INFILTRATION TRENCH
SC-2B	20,930	20,930	0	0	POROUS PAVE./INFILTRATION
SC-3	30,736	0	18,700	12,036	NONE
SC-4	124,816	0	14,012	110,804	NONE
TOTALS	399,086	105,589	104,103	189,394	



SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE
PROJ NO: 12218D DATE: JUNE 2015



NO.	REVISIONS	APP'D	DATE
1	POST LAND USE AREAS SUMMARY & PROPOSED WATER QUALITY TREATMENT SUMMARIES	JBW	9-17-15
2			
3			



12218D Commerce Drive PRE Brunswick REVISED

Prepared by Wright-Pierce

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.597	39	>75% Grass cover, Good, HSG A (SC-3, SC-4)
1.937	61	>75% Grass cover, Good, HSG B (SC-1, SC-2, SC-3)
0.498	98	Bldgs, HSG B (SC-1, SC-2)
0.301	96	Gravel surface, HSG B (SC-1)
1.161	98	Paved area, HSG B (SC-1, SC-2)
3.705	30	Woods, Good, HSG A (SC-1, SC-4)
0.964	55	Woods, Good, HSG B (SC-1, SC-3)
9.162	54	TOTAL AREA

Summary for Subcatchment SC-1: 1

Runoff = 3.60 cfs @ 12.42 hrs, Volume= 0.467 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	58,419	61	>75% Grass cover, Good, HSG B
	175,897	64	Weighted Average
	138,099		78.51% Pervious Area
	37,798		21.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402				Unpaved Kv= 16.1 fps Total

Summary for Subcatchment SC-2: 2

Runoff = 3.89 cfs @ 12.14 hrs, Volume= 0.321 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.11 cfs @ 12.70 hrs, Volume= 0.028 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1 Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 24.04 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
124,766	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,375	31	Weighted Average
132,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1 Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
30.4	410	Total			

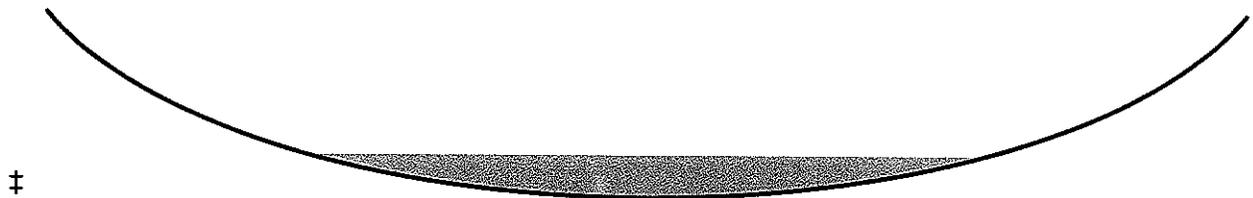
Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 2.90" for Brunswick 10 yr event
 Inflow = 3.89 cfs @ 12.14 hrs, Volume= 0.321 af
 Outflow = 3.85 cfs @ 12.16 hrs, Volume= 0.321 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 4.7 min

Peak Storage= 366 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area =	2.085 ac, 37.92% Impervious, Inflow Depth = 2.01" for Brunswick 10 yr event
Inflow =	3.85 cfs @ 12.16 hrs, Volume= 0.349 af
Outflow =	3.85 cfs @ 12.16 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Subcatchment SC-1: 1

Runoff = 5.12 cfs @ 12.41 hrs, Volume= 0.644 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	58,419	61	>75% Grass cover, Good, HSG B
	175,897	64	Weighted Average
	138,099		78.51% Pervious Area
	37,798		21.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402				Unpaved Kv= 16.1 fps
					Total

Summary for Subcatchment SC-2: 2

Runoff = 4.84 cfs @ 12.14 hrs, Volume= 0.401 af, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.23 cfs @ 12.63 hrs, Volume= 0.046 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1 Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.02 cfs @ 17.22 hrs, Volume= 0.012 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
124,766	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,375	31	Weighted Average
132,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1 Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
30.4	410	Total			

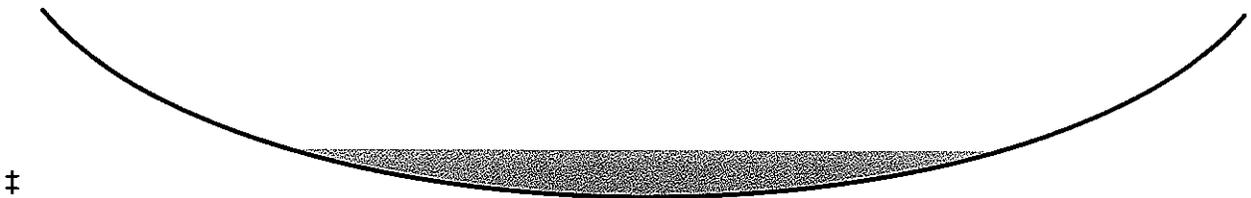
Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 3.63" for Brunswick 25 yr event
 Inflow = 4.84 cfs @ 12.14 hrs, Volume= 0.401 af
 Outflow = 4.79 cfs @ 12.16 hrs, Volume= 0.401 af, Atten= 1%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.87 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 4.5 min

Peak Storage= 427 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area =	2.085 ac, 37.92% Impervious, Inflow Depth = 2.57"	for Brunswick 25 yr event
Inflow =	4.82 cfs @ 12.16 hrs, Volume=	0.447 af
Outflow =	4.82 cfs @ 12.16 hrs, Volume=	0.447 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Subcatchment SC-1: 1

Runoff = 0.95 cfs @ 12.50 hrs, Volume= 0.158 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
	36,604	30	Woods, Good, HSG A
	29,950	55	Woods, Good, HSG B
	13,126	96	Gravel surface, HSG B
	58,419	61	>75% Grass cover, Good, HSG B
	175,897	64	Weighted Average
	138,099		78.51% Pervious Area
	37,798		21.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
					Grass: Dense n= 0.240 P2= 3.00"
2.8	270	0.0100	1.61		Shallow Concentrated Flow, SCF 1
					Unpaved Kv= 16.1 fps
27.1	402	Total			

Summary for Subcatchment SC-2: 2

Runoff = 1.93 cfs @ 12.15 hrs, Volume= 0.160 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	25,728	98	Paved area, HSG B
*	8,712	98	Bldgs, HSG B
	23,352	61	>75% Grass cover, Good, HSG B
	57,792	83	Weighted Average
	23,352		40.41% Pervious Area
	34,440		59.59% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.00 cfs @ 15.66 hrs, Volume= 0.003 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
12,036	55	Woods, Good, HSG B
18,375	39	>75% Grass cover, Good, HSG A
2,611	61	>75% Grass cover, Good, HSG B
33,022	47	Weighted Average
33,022		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.9	96	0.0100	0.06		Sheet Flow, SF 1 Grass: Bermuda n= 0.410 P2= 3.00"
4.7	205	0.0214	0.73		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
33.6	301	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
124,766	30	Woods, Good, HSG A
7,609	39	>75% Grass cover, Good, HSG A
132,375	31	Weighted Average
132,375		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	123	0.0600	0.12		Sheet Flow, SF 1 Woods: Light underbrush n= 0.400 P2= 3.00"
13.5	287	0.0050	0.35		Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
30.4	410	Total			

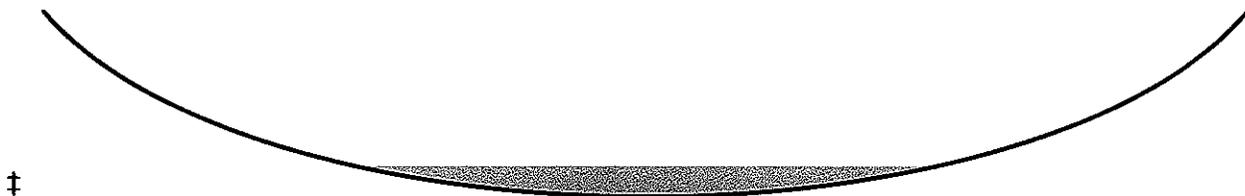
Summary for Reach 1R: existing swale

Inflow Area = 1.327 ac, 59.59% Impervious, Inflow Depth = 1.45" for Brunswick 2yr event
 Inflow = 1.93 cfs @ 12.15 hrs, Volume= 0.160 af
 Outflow = 1.89 cfs @ 12.17 hrs, Volume= 0.160 af, Atten= 2%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.40 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 5.5 min

Peak Storage= 224 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 92.94 cfs

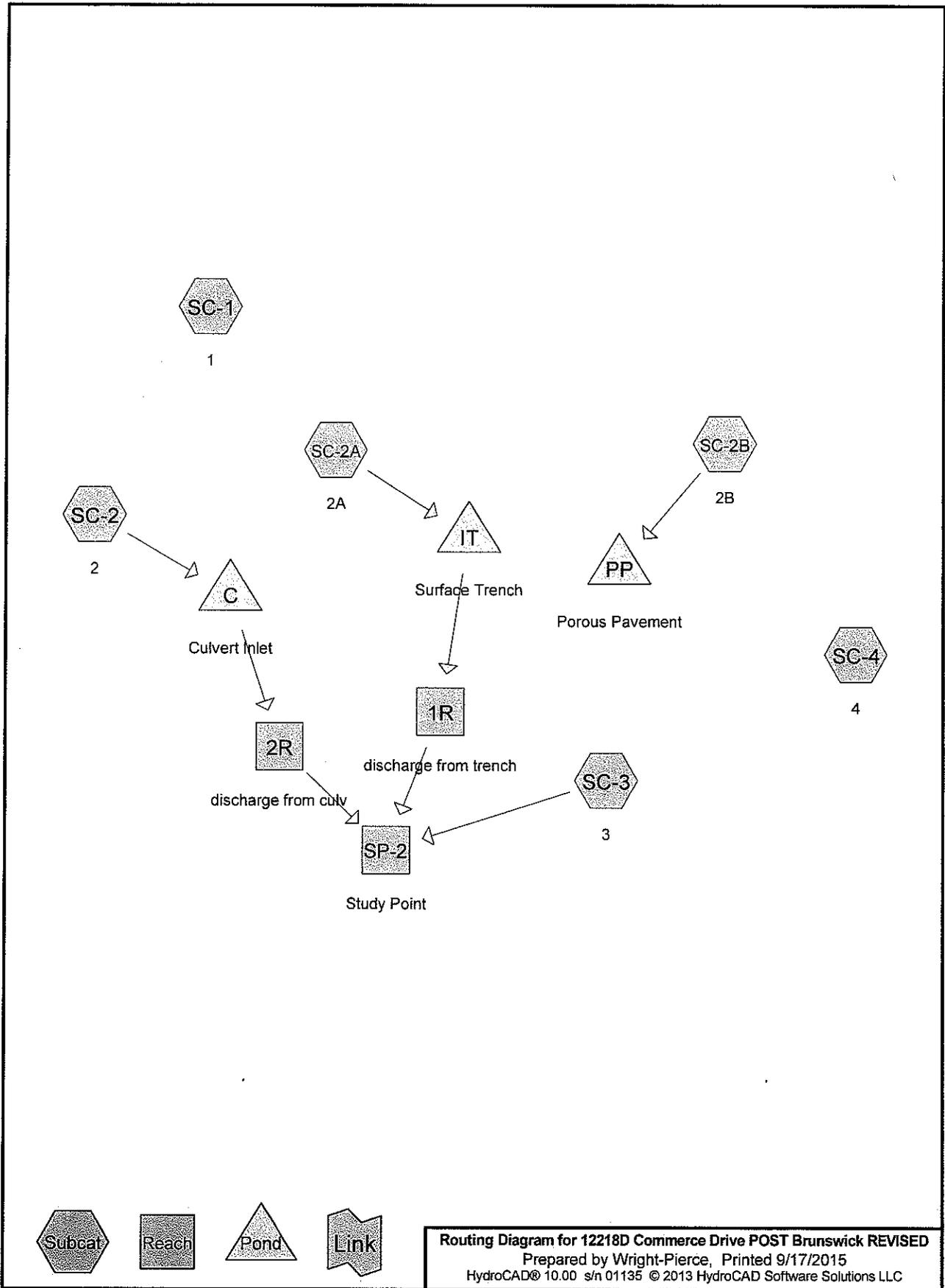
20.00' x 1.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 167.0' Slope= 0.0122 '/'
Inlet Invert= 54.70', Outlet Invert= 52.66'



Summary for Reach SP-2: Study Point

Inflow Area =	2.085 ac, 37.92% Impervious, Inflow Depth = 0.94" for Brunswick 2yr event
Inflow =	1.89 cfs @ 12.17 hrs, Volume= 0.163 af
Outflow =	1.89 cfs @ 12.17 hrs, Volume= 0.163 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs



Routing Diagram for 12218D Commerce Drive POST Brunswick REVISED
 Prepared by Wright-Pierce, Printed 9/17/2015
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.402	39	>75% Grass cover, Good, HSG A (SC-3, SC-4)
1.508	61	>75% Grass cover, Good, HSG B (SC-1, SC-2)
0.498	98	Bldgs, HSG B (SC-1, SC-2)
0.301	96	Gravel surface, HSG B (SC-1)
0.570	98	Paved area, HSG B (SC-1)
0.567	98	Paved parking, HSG B (SC-2)
3.384	30	Woods, Good, HSG A (SC-1, SC-4)
0.964	55	Woods, Good, HSG B (SC-1, SC-3)
0.480	61	new >75% Grass cover, Good, HSG B (SC-1, SC-2A, SC-3, SC-4)
0.008	98	new Paved parking, HSG B (SC-2)
0.480	98	new Paved roads, HSG B (SC-2B)
9.162	58	TOTAL AREA

Summary for Subcatchment SC-1: 1

Runoff = 3.69 cfs @ 12.42 hrs, Volume= 0.479 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
*	36,604	30	Woods, Good, HSG A
*	29,950	55	Woods, Good, HSG B
*	13,126	96	Gravel surface, HSG B
*	59,274	61	>75% Grass cover, Good, HSG B
*	3,635	61	new >75% Grass cover, Good, HSG B
	180,387	64	Weighted Average
	142,589		79.05% Pervious Area
	37,798		20.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 3.38 cfs @ 12.14 hrs, Volume= 0.292 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
	24,682	98	Paved parking, HSG B
*	8,712	98	Bldgs, HSG B
*	341	98	new Paved parking, HSG B
	6,412	61	>75% Grass cover, Good, HSG B
	40,147	92	Weighted Average
	6,412		15.97% Pervious Area
	33,735		84.03% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.05 cfs @ 12.16 hrs, Volume= 0.005 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
* 2,070	61	new >75% Grass cover, Good, HSG B
2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 1.91 cfs @ 12.14 hrs, Volume= 0.179 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
* 20,930	98	new Paved roads, HSG B
20,930		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.23 cfs @ 12.34 hrs, Volume= 0.037 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

Area (sf)	CN	Description
10,880	39	>75% Grass cover, Good, HSG A
12,036	55	Woods, Good, HSG B
* 7,820	61	new >75% Grass cover, Good, HSG B
30,736	51	Weighted Average
30,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
					Grass: Bermuda n= 0.410 P2= 3.00"
3.8	167	0.0214	0.73		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
16.2	205	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 23.31 hrs, Volume= 0.002 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 10 yr Rainfall=4.70"

	Area (sf)	CN	Description
*	110,804	30	Woods, Good, HSG A
*	6,614	39	>75% Grass cover, Good, HSG A
*	7,398	61	new >75% Grass cover, Good, HSG B
	124,816	32	Weighted Average
	124,816		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
					Woods: Light underbrush n= 0.400 P2= 3.00"
10.8	270	0.0070	0.42		Shallow Concentrated Flow, SCF 1
					Woodland Kv= 5.0 fps
32.7	383	Total			

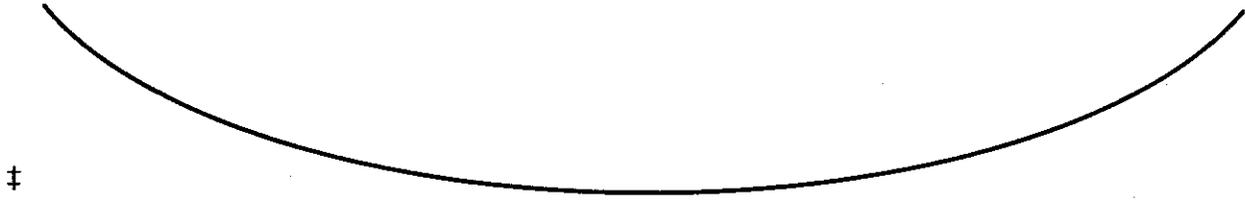
Summary for Reach 1R: discharge from trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.00" for Brunswick 10 yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 163.15 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
 Length= 160.0' Slope= 0.0149 '/'
 Inlet Invert= 55.08', Outlet Invert= 52.70'



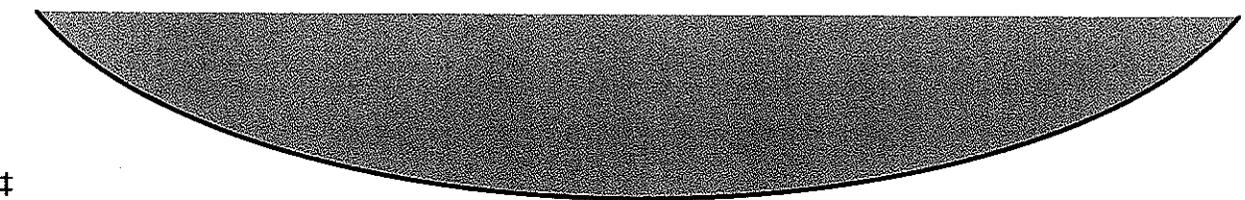
Summary for Reach 2R: discharge from culv

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 3.80" for Brunswick 10 yr event
 Inflow = 2.15 cfs @ 12.17 hrs, Volume= 0.292 af
 Outflow = 1.61 cfs @ 12.35 hrs, Volume= 0.292 af, Atten= 25%, Lag= 10.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.27 fps, Min. Travel Time= 15.0 min
 Avg. Velocity = 0.06 fps, Avg. Travel Time= 65.3 min

Peak Storage= 1,451 cf @ 12.35 hrs
 Average Depth at Peak Storage= 0.76'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/'
 Inlet Invert= 54.98', Outlet Invert= 52.70'



Summary for Reach SP-2: Study Point

Inflow Area = 1.675 ac, 46.24% Impervious, Inflow Depth = 2.35" for Brunswick 10 yr event
 Inflow = 1.85 cfs @ 12.35 hrs, Volume= 0.328 af
 Outflow = 1.85 cfs @ 12.35 hrs, Volume= 0.328 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 3.80" for Brunswick 10 yr event
 Inflow = 3.38 cfs @ 12.14 hrs, Volume= 0.292 af
 Outflow = 2.15 cfs @ 12.17 hrs, Volume= 0.292 af, Atten= 36%, Lag= 2.2 min
 Primary = 2.15 cfs @ 12.17 hrs, Volume= 0.292 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.80' @ 12.37 hrs Surf.Area= 5,036 sf Storage= 1,511 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 9.6 min (798.0 - 788.4)

Volume #1	Invert 55.10'	Avail.Storage 2,726 cf	Storage Description Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
55.10	260	144.0	0	0	260	
56.00	7,437	436.0	2,726	2,726	13,740	

Device #1	Routing Primary	Invert 55.00'	Outlet Devices
			24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.61 cfs @ 12.17 hrs HW=55.74' TW=55.65' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.61 cfs @ 1.46 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 1.19" for Brunswick 10 yr event
 Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.005 af
 Outflow = 0.01 cfs @ 12.96 hrs, Volume= 0.005 af, Atten= 82%, Lag= 48.2 min
 Discarded = 0.01 cfs @ 12.96 hrs, Volume= 0.005 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 54.42' @ 12.96 hrs Surf.Area= 72 sf Storage= 64 cf

Plug-Flow detention time= 74.7 min calculated for 0.005 af (100% of inflow)
 Center-of-Mass det. time= 74.7 min (955.3 - 880.6)

Volume #1	Invert 52.20'	Avail.Storage 1,043 cf	Storage Description Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.20	72	44.0	0.0	0	0	72
52.30	72	44.0	40.0	3	3	76
53.00	72	44.0	40.0	20	23	107
54.00	72	44.0	40.0	29	52	151
55.20	72	44.0	40.0	35	86	204
55.30	72	44.0	100.0	7	94	208
56.00	939	221.0	100.0	297	390	3,942
56.50	1,712	306.0	100.0	653	1,043	7,509

Device #1	Routing Discarded	Invert 52.20'	Outlet Devices
			2.300 in/hr Exfiltration over Wetted area from 51.70' - 55.20' Excluded Wetted area = 0 sf Phase-In= 0.01'
Device #2	Routing Primary	Invert 55.30'	Outlet Devices
			12.0" Round Culvert

L= 44.0' CPP, projecting, no headwall, Ke= 0.900
 Inlet / Outlet Invert= 55.30' / 55.08' S= 0.0050 '/ Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 12.96 hrs HW=54.42' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.20' TW=55.08' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.480 ac, 100.00% Impervious, Inflow Depth = 4.46" for Brunswick 10 yr event
 Inflow = 1.91 cfs @ 12.14 hrs, Volume= 0.179 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.77' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 7,785 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Summary for Subcatchment SC-1: 1

Runoff = 5.25 cfs @ 12.41 hrs, Volume= 0.661 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
*	36,604	30	Woods, Good, HSG A
*	29,950	55	Woods, Good, HSG B
*	13,126	96	Gravel surface, HSG B
*	59,274	61	>75% Grass cover, Good, HSG B
*	3,635	61	new >75% Grass cover, Good, HSG B
	180,387	64	Weighted Average
	142,589		79.05% Pervious Area
	37,798		20.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 4.03 cfs @ 12.14 hrs, Volume= 0.352 af, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
	24,682	98	Paved parking, HSG B
*	8,712	98	Bldgs, HSG B
*	341	98	new Paved parking, HSG B
	6,412	61	>75% Grass cover, Good, HSG B
	40,147	92	Weighted Average
	6,412		15.97% Pervious Area
	33,735		84.03% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.08 cfs @ 12.16 hrs, Volume= 0.007 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
* 2,070	61	new >75% Grass cover, Good, HSG B
2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 2.24 cfs @ 12.14 hrs, Volume= 0.211 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
* 20,930	98	new Paved roads, HSG B
20,930		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.44 cfs @ 12.29 hrs, Volume= 0.057 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

Area (sf)	CN	Description
10,880	39	>75% Grass cover, Good, HSG A
12,036	55	Woods, Good, HSG B
* 7,820	61	new >75% Grass cover, Good, HSG B
30,736	51	Weighted Average
30,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
3.8	167	0.0214	0.73		Grass: Bermuda n= 0.410 P2= 3.00" Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
16.2	205	Total			

Summary for Subcatchment SC-4: 4

Runoff = 0.02 cfs @ 15.87 hrs, Volume= 0.017 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 25 yr Rainfall=5.50"

	Area (sf)	CN	Description
*	110,804	30	Woods, Good, HSG A
*	6,614	39	>75% Grass cover, Good, HSG A
*	7,398	61	new >75% Grass cover, Good, HSG B
	124,816	32	Weighted Average
	124,816		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
10.8	270	0.0070	0.42		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SCF 1 Woodland Kv= 5.0 fps
32.7	383	Total			

Summary for Reach 1R: discharge from trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.04" for Brunswick 25 yr event
 Inflow = 0.01 cfs @ 12.71 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 12.83 hrs, Volume= 0.000 af, Atten= 24%, Lag= 7.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.38 fps, Min. Travel Time= 7.0 min
 Avg. Velocity = 0.38 fps, Avg. Travel Time= 7.0 min

Peak Storage= 2 cf @ 12.83 hrs
 Average Depth at Peak Storage= 0.01'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 163.15 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
 Length= 160.0' Slope= 0.0149 '
 Inlet Invert= 55.08', Outlet Invert= 52.70'



‡

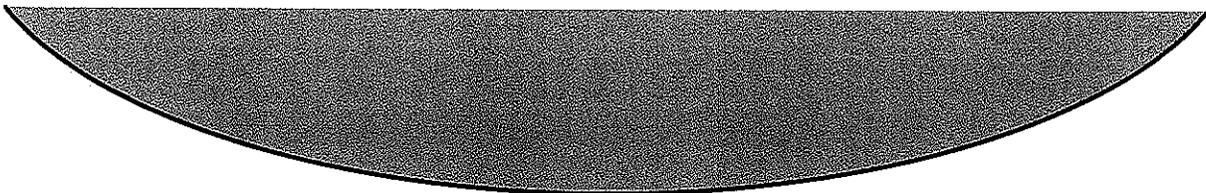
Summary for Reach 2R: discharge from culv

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 4.58" for Brunswick 25 yr event
 Inflow = 2.46 cfs @ 12.17 hrs, Volume= 0.352 af
 Outflow = 1.86 cfs @ 12.36 hrs, Volume= 0.352 af, Atten= 24%, Lag= 11.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.28 fps, Min. Travel Time= 14.7 min
 Avg. Velocity = 0.07 fps, Avg. Travel Time= 61.8 min

Peak Storage= 1,634 cf @ 12.36 hrs
 Average Depth at Peak Storage= 0.83'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/'
 Inlet Invert= 54.98', Outlet Invert= 52.70'



‡

Summary for Reach SP-2: Study Point

Inflow Area = 1.675 ac, 46.24% Impervious, Inflow Depth = 2.93" for Brunswick 25 yr event
 Inflow = 2.29 cfs @ 12.32 hrs, Volume= 0.409 af
 Outflow = 2.29 cfs @ 12.32 hrs, Volume= 0.409 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 4.58" for Brunswick 25 yr event
 Inflow = 4.03 cfs @ 12.14 hrs, Volume= 0.352 af
 Outflow = 2.46 cfs @ 12.17 hrs, Volume= 0.352 af, Atten= 39%, Lag= 2.1 min
 Primary = 2.46 cfs @ 12.17 hrs, Volume= 0.352 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.88' @ 12.38 hrs Surf.Area= 5,961 sf Storage= 1,951 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 10.5 min (794.0 - 783.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	55.10'	2,726 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
55.10	260	144.0	0	0	260
56.00	7,437	436.0	2,726	2,726	13,740

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 ' / Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.81 cfs @ 12.17 hrs HW=55.80' TW=55.72' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.81 cfs @ 1.50 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 1.68" for Brunswick 25 yr event
 Inflow = 0.08 cfs @ 12.16 hrs, Volume= 0.007 af
 Outflow = 0.02 cfs @ 12.71 hrs, Volume= 0.007 af, Atten= 78%, Lag= 32.9 min
 Discarded = 0.01 cfs @ 12.50 hrs, Volume= 0.006 af
 Primary = 0.01 cfs @ 12.71 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.34' @ 12.71 hrs Surf.Area= 96 sf Storage= 97 cf

Plug-Flow detention time= 93.9 min calculated for 0.007 af (100% of inflow)
 Center-of-Mass det. time= 93.8 min (963.3 - 869.5)

Volume	Invert	Avail.Storage	Storage Description			
#1	52.20'	1,043 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.20	72	44.0	0.0	0	0	72
52.30	72	44.0	40.0	3	3	76
53.00	72	44.0	40.0	20	23	107
54.00	72	44.0	40.0	29	52	151
55.20	72	44.0	40.0	35	86	204
55.30	72	44.0	100.0	7	94	208
56.00	939	221.0	100.0	297	390	3,942
56.50	1,712	306.0	100.0	653	1,043	7,509

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.20'	2.300 in/hr Exfiltration over Wetted area from 51.70' - 55.20' Excluded Wetted area = 0 sf Phase-In= 0.01'
#2	Primary	55.30'	12.0" Round Culvert

L= 44.0' CPP, projecting, no headwall, Ke= 0.900
 Inlet / Outlet Invert= 55.30' / 55.08' S= 0.0050 ' / Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 12.50 hrs HW=55.26' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.01 cfs @ 12.71 hrs HW=55.34' TW=55.09' (Dynamic Tailwater)
 ↑2=Culvert (Barrel Controls 0.01 cfs @ 0.78 fps)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.480 ac, 100.00% Impervious, Inflow Depth = 5.26" for Brunswick 25 yr event
 Inflow = 2.24 cfs @ 12.14 hrs, Volume= 0.211 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.93' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 9,179 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)

Summary for Subcatchment SC-1: 1

Runoff = 0.97 cfs @ 12.50 hrs, Volume= 0.162 af, Depth= 0.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
*	24,838	98	Paved area, HSG B
*	12,960	98	Bldgs, HSG B
*	36,604	30	Woods, Good, HSG A
*	29,950	55	Woods, Good, HSG B
*	13,126	96	Gravel surface, HSG B
*	59,274	61	>75% Grass cover, Good, HSG B
*	3,635	61	new >75% Grass cover, Good, HSG B
	180,387	64	Weighted Average
	142,589		79.05% Pervious Area
	37,798		20.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	132	0.0100	0.09		Sheet Flow, SF 1
2.8	270	0.0100	1.61		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SCF 1
27.1	402	Total			Unpaved Kv= 16.1 fps

Summary for Subcatchment SC-2: 2

Runoff = 1.98 cfs @ 12.14 hrs, Volume= 0.166 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

	Area (sf)	CN	Description
	24,682	98	Paved parking, HSG B
*	8,712	98	Bldgs, HSG B
*	341	98	new Paved parking, HSG B
	6,412	61	>75% Grass cover, Good, HSG B
	40,147	92	Weighted Average
	6,412		15.97% Pervious Area
	33,735		84.03% Impervious Area

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

Summary for Subcatchment SC-2A: 2A

Runoff = 0.01 cfs @ 12.22 hrs, Volume= 0.001 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
* 2,070	61	new >75% Grass cover, Good, HSG B
2,070		100.00% Pervious Area

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

Summary for Subcatchment SC-2B: 2B

Runoff = 1.21 cfs @ 12.14 hrs, Volume= 0.111 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
* 20,930	98	new Paved roads, HSG B
20,930		100.00% Impervious Area

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

Summary for Subcatchment SC-3: 3

Runoff = 0.01 cfs @ 13.76 hrs, Volume= 0.006 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
10,880	39	>75% Grass cover, Good, HSG A
12,036	55	Woods, Good, HSG B
* 7,820	61	new >75% Grass cover, Good, HSG B
30,736	51	Weighted Average
30,736		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	38	0.0130	0.05		Sheet Flow, SF 1
3.8	167	0.0214	0.73		Grass: Bermuda n= 0.410 P2= 3.00" Shallow Concentrated Flow, SCF 1
16.2	205	Total			Woodland Kv= 5.0 fps

Summary for Subcatchment SC-4: 4

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Type III 24-hr Brunswick 2yr Rainfall=3.00"

Area (sf)	CN	Description
* 110,804	30	Woods, Good, HSG A
* 6,614	39	>75% Grass cover, Good, HSG A
* 7,398	61	new >75% Grass cover, Good, HSG B
124,816	32	Weighted Average
124,816		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	113	0.0265	0.09		Sheet Flow, SF 1
10.8	270	0.0070	0.42		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SCF 1
32.7	383	Total			Woodland Kv= 5.0 fps

Summary for Reach 1R: discharge from trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.00" for Brunswick 2yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity= 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 1.50' Flow Area= 20.0 sf, Capacity= 163.15 cfs

20.00' x 1.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
 Length= 160.0' Slope= 0.0149 '
 Inlet Invert= 55.08', Outlet Invert= 52.70'



‡

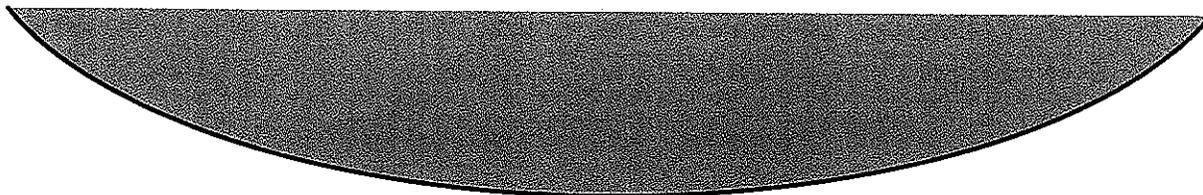
Summary for Reach 2R: discharge from culv

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 2.16" for Brunswick 2yr event
 Inflow = 1.38 cfs @ 12.18 hrs, Volume= 0.166 af
 Outflow = 1.01 cfs @ 12.35 hrs, Volume= 0.166 af, Atten= 27%, Lag= 10.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Max. Velocity= 0.25 fps, Min. Travel Time= 16.5 min
 Avg. Velocity = 0.05 fps, Avg. Travel Time= 76.5 min

Peak Storage= 1,000 cf @ 12.35 hrs
 Average Depth at Peak Storage= 0.58'
 Bank-Full Depth= 0.50' Flow Area= 3.3 sf, Capacity= 0.76 cfs

10.00' x 0.50' deep Parabolic Channel, n= 0.300
 Length= 245.0' Slope= 0.0093 '/
 Inlet Invert= 54.98', Outlet Invert= 52.70'



‡

Summary for Reach SP-2: Study Point

Inflow Area = 1.675 ac, 46.24% Impervious, Inflow Depth = 1.24" for Brunswick 2yr event
 Inflow = 1.01 cfs @ 12.35 hrs, Volume= 0.172 af
 Outflow = 1.01 cfs @ 12.35 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs

Summary for Pond C: Culvert Inlet

Inflow Area = 0.922 ac, 84.03% Impervious, Inflow Depth = 2.16" for Brunswick 2yr event
 Inflow = 1.98 cfs @ 12.14 hrs, Volume= 0.166 af
 Outflow = 1.38 cfs @ 12.18 hrs, Volume= 0.166 af, Atten= 30%, Lag= 2.2 min
 Primary = 1.38 cfs @ 12.18 hrs, Volume= 0.166 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.60' @ 12.36 hrs Surf.Area= 3,060 sf Storage= 706 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 7.5 min (811.4 - 803.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	55.10'	2,726 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
55.10	260	144.0	0	0	260	
56.00	7,437	436.0	2,726	2,726	13,740	

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	24.0" W x 12.0" H Box Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.75' S= 0.0050 ' / ' Cc= 0.900 n= 0.013, Flow Area= 2.00 sf

Primary OutFlow Max=1.07 cfs @ 12.18 hrs HW=55.56' TW=55.49' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 1.07 cfs @ 1.27 fps)

Summary for Pond IT: Surface Trench

Inflow Area = 0.048 ac, 0.00% Impervious, Inflow Depth = 0.37" for Brunswick 2yr event
 Inflow = 0.01 cfs @ 12.22 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 12.65 hrs, Volume= 0.001 af, Atten= 54%, Lag= 25.7 min
 Discarded = 0.00 cfs @ 12.65 hrs, Volume= 0.001 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 52.45' @ 12.65 hrs Surf.Area= 72 sf Storage= 7 cf

Plug-Flow detention time= 8.4 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 8.4 min (935.7 - 927.3)

Volume	Invert	Avail.Storage	Storage Description			
#1	52.20'	1,043 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
52.20	72	44.0	0.0	0	0	72
52.30	72	44.0	40.0	3	3	76
53.00	72	44.0	40.0	20	23	107
54.00	72	44.0	40.0	29	52	151
55.20	72	44.0	40.0	35	86	204
55.30	72	44.0	100.0	7	94	208
56.00	939	221.0	100.0	297	390	3,942
56.50	1,712	306.0	100.0	653	1,043	7,509

Device	Routing	Invert	Outlet Devices
#1	Discarded	52.20'	2.300 in/hr Exfiltration over Wetted area from 51.70' - 55.20' Excluded Wetted area = 0 sf Phase-In= 0.01'
#2	Primary	55.30'	12.0" Round Culvert

L= 44.0' CPP, projecting, no headwall, Ke= 0.900
 Inlet / Outlet Invert= 55.30' / 55.08' S= 0.0050 '/ Cc= 0.900
 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 12.65 hrs HW=52.45' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=52.20' TW=55.08' (Dynamic Tailwater)
 ↑2=Culvert (Controls 0.00 cfs)

Summary for Pond PP: Porous Pavement

Inflow Area = 0.480 ac, 100.00% Impervious, Inflow Depth = 2.77" for Brunswick 2yr event
 Inflow = 1.21 cfs @ 12.14 hrs, Volume= 0.111 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

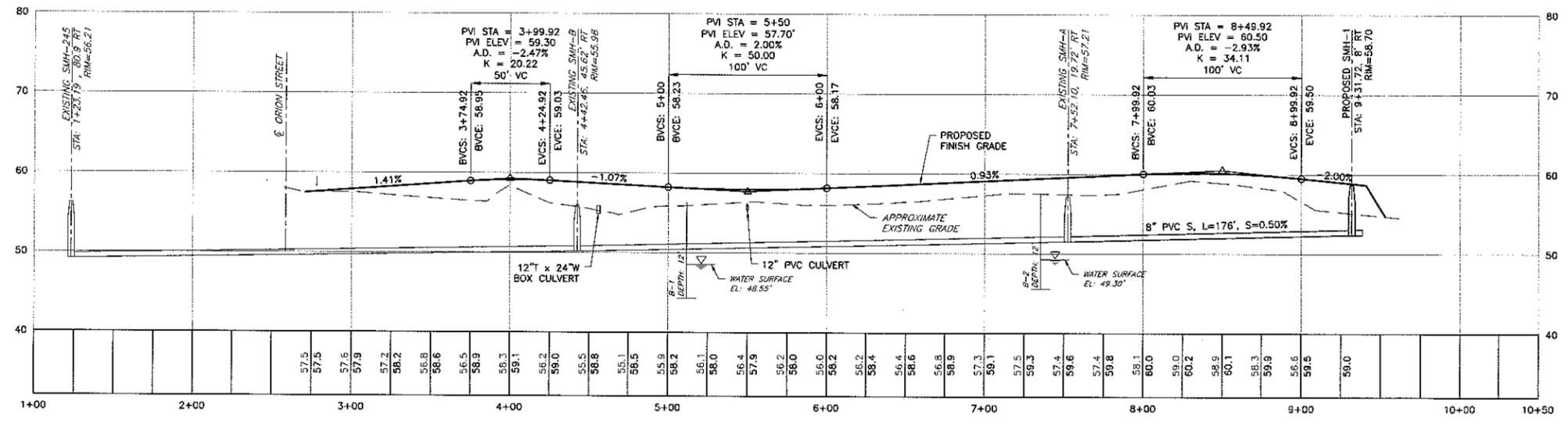
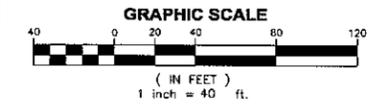
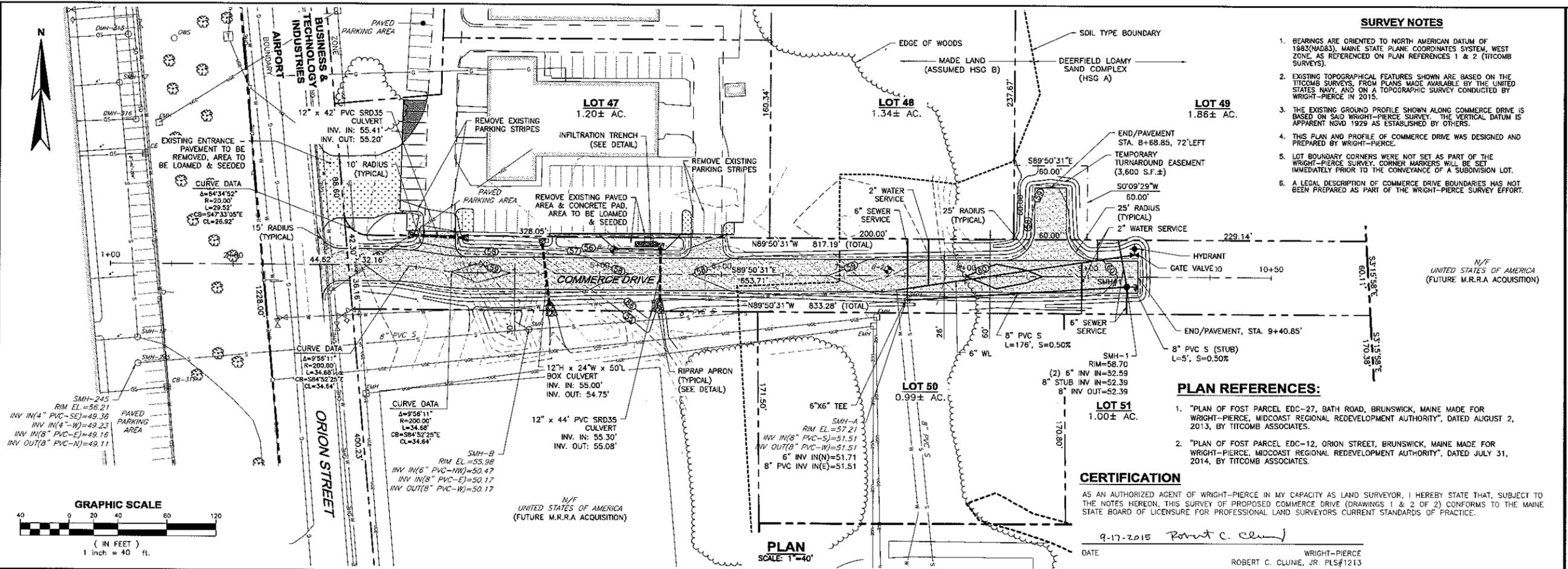
Routing by Dyn-Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
 Peak Elev= 55.41' @ 24.60 hrs Surf.Area= 20,804 sf Storage= 4,828 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	54.83'	18,724 cf	28.00'W x 743.00'L x 2.25'H Prismatic 46,809 cf Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	54.83'	2.300 in/hr Exfiltration over Surface area above 54.83' Excluded Surface area = 20,804 sf

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=54.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.00 cfs)



ISSUED FOR PERMITTING

DESIGNED BY: JWB
 CAD COORD: RCC
 CHECKED BY: JWB
 DATE: 8-18-15
 APPROVED BY: JWB
 DATE: 8-18-15
 PROJECT NO: 12218D

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SUBDIVISION PLAN
 BRUNSWICK LANDING SUBDIVISION - PHASE II
 BRUNSWICK LANDING
 BRUNSWICK, CUMBERLAND COUNTY, MAINE

DRAWING
 C-1

ROAD PLAN & PROFILE

EROSION AND SEDIMENTATION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE "MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES", MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION DATED MARCH 2003.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES", MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, DATED MARCH 2003.

1. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE MAINTAINED IN AN UNVEGETATED OR UNVEGETATED CONDITION FOR THE MINIMUM TIME REQUIRED. IN GENERAL, AREAS TO BE VEGETATED SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL.
2. SEDIMENT BARRIERS (SILT FENCE, STONE CHECK DAMS, ETC.) SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF UPGRADIENT DRAINAGE AREAS.
3. INSTALL SILT FENCE AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE WILL REMAIN IN PLACE PER NOTE #5.
4. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UP-SLOPE ARE PERMANENTLY STABILIZED.

NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS.

6. IF FINAL SEEDING AND SODDING IS NOT EXPECTED PRIOR TO THE ANTICIPATED DATE OF THE FIRST KILLING FROST, USE TEMPORARY ANNUAL RYEGRASS SEEDING AND MULCHING ON ROUGH GRADED SUBSOIL TO PROTECT THE SITE AND DELAY PERMANENT LOAMING, FINE GRADING, AND SEEDING OR SODDING UNTIL SPRING.
7. WHEN FEASIBLE, TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINISH GRADED SHALL BE COMPLETED 30 DAYS PRIOR TO THE FIRST KILLING FROST.

8. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
9. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND REVEGETATED.

10. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
11. STABILIZATION SCHEDULE BEFORE WINTER:

- SEPTEMBER 15 ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL MATTING AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND MULCHED.
- OCTOBER 1 ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR EROSION CONTROL BLANKET.
- NOVEMBER 15 ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
- DECEMBER 1 ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER-WINTER.

EROSION CONTROL - WINTER CONSTRUCTION

WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15
WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

1. EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.

CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

4. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.

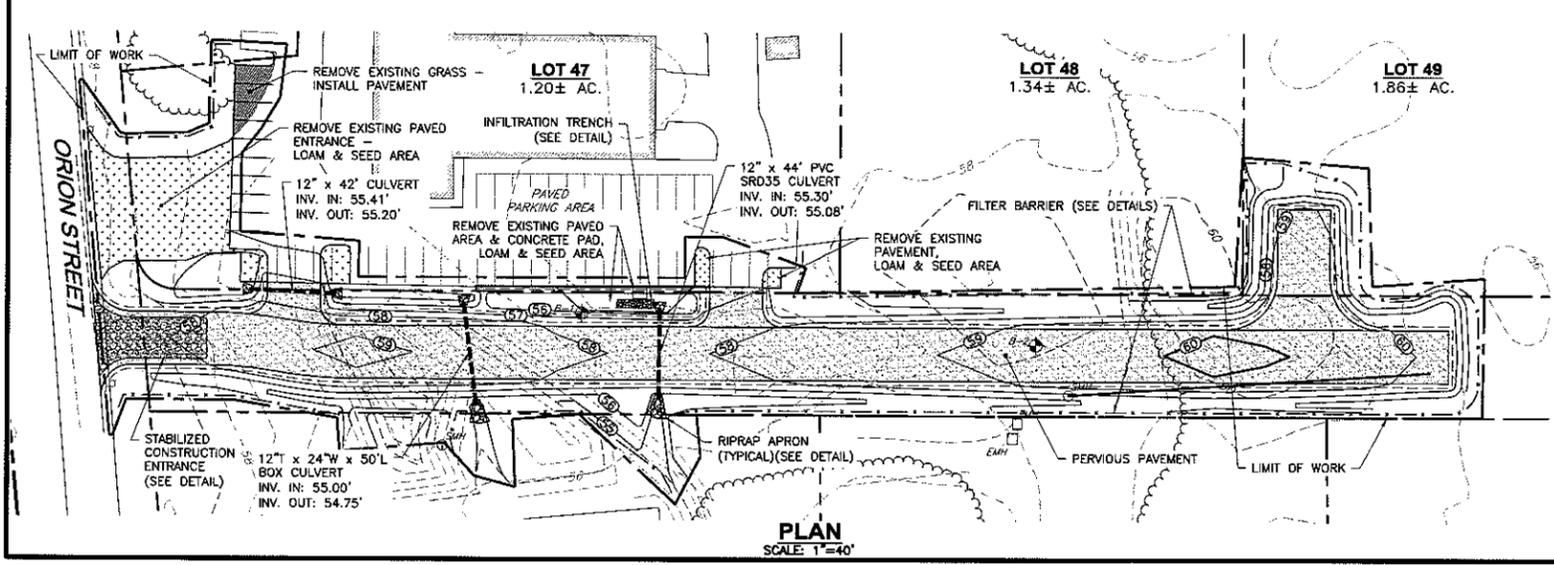
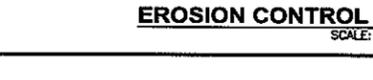
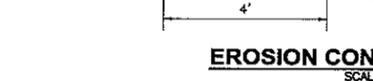
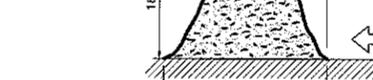
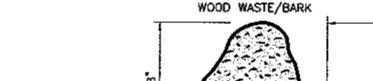
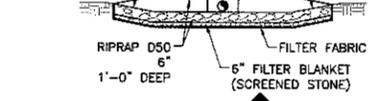
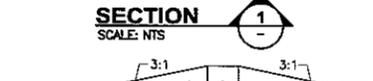
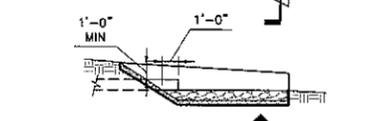
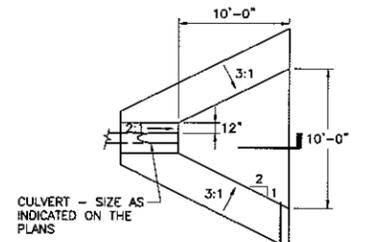
6. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 15, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 15 AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.

7. THE APPLICATION OF MULCH TO FINE GRADED AREAS WILL BE STABILIZED AS FOLLOWS:

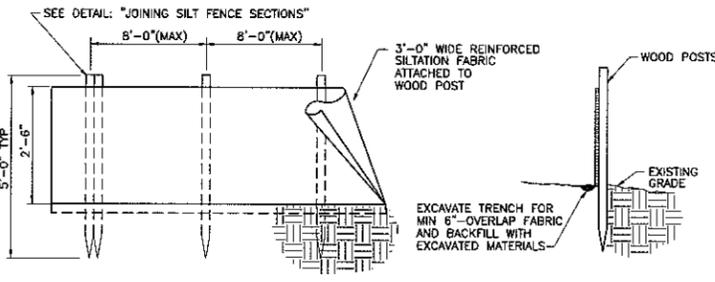
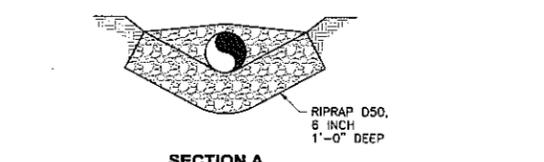
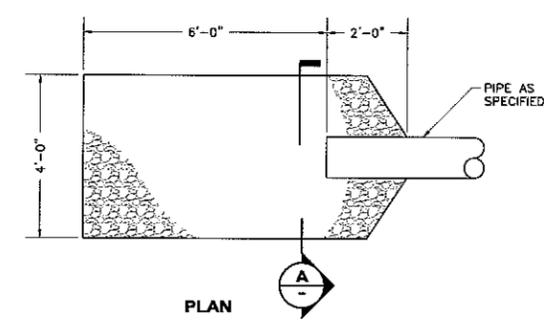
- A) BETWEEN THE DATES OF NOVEMBER 15 AND APRIL 15 ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.
- B) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
- C) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 15, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

8. AFTER NOVEMBER 15 THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.

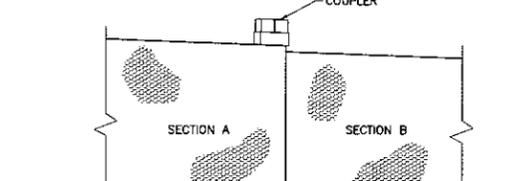
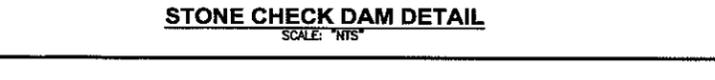
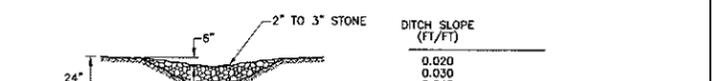
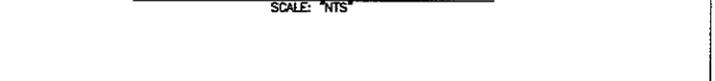
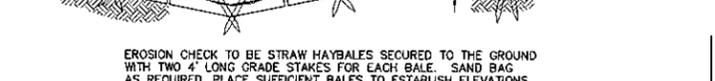
9. DURING WINTER CONSTRUCTION PERIODS ALL SNOW SHALL BE REMOVED FROM AREAS OF MULCHING PRIOR TO PLACEMENT.



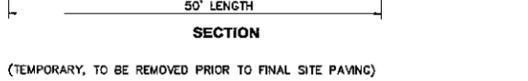
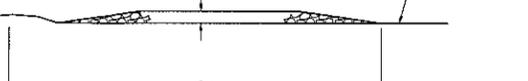
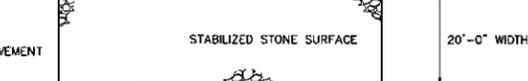
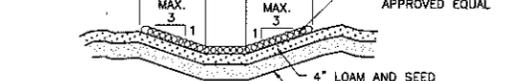
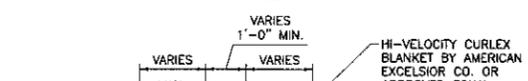
RIPRAP APRON AT ALL CULVERT OUTLETS
SCALE: NTS



SILT FENCE INSTALLATION DETAIL
SCALE: NTS

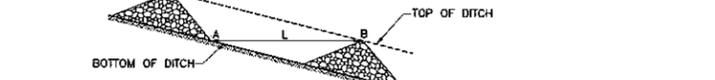
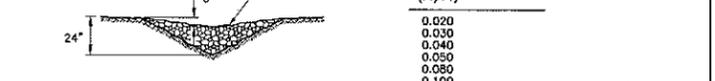


JOINING SILT FENCE SECTIONS
SCALE: NTS

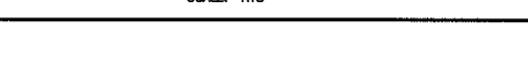
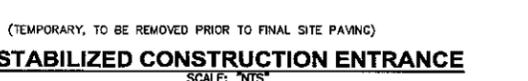
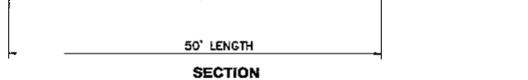
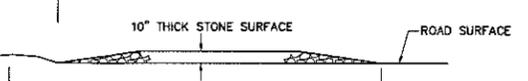
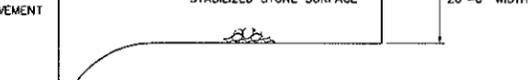


EROSION CHECK TO BE STRAW HAYBALES SECURED TO THE GROUND WITH TWO 4' LONG GRADE STAKES FOR EACH BALE. SAND BAG AS REQUIRED, PLACE SUFFICIENT BALES TO ESTABLISH ELEVATIONS AT (A) AT LEAST 6 INCHES ABOVE OVERFLOW AT (B)

STRAW HAY BALE CHECK DAM
SCALE: NTS



STABILIZED CONSTRUCTION ENTRANCE
SCALE: NTS



NO.	ISSUED FOR PERMITTING	DATE
1	INFILTRATION TRENCH, LIMIT OF WORK	8-15
2		8-15

DESIGNED BY	JWB
CAD CORP.	RCC
CAD RPB	
CHECKED BY	JWB
DATE	8-18-15
APPROVED BY	JWB
DATE	8-18-15
PROJECT NO.	12218D

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SUBDIVISION PLAN
BRUNSWICK LANDING SUBDIVISION - PHASE II
BRUNSWICK LANDING
BRUNSWICK, CUMBERLAND COUNTY, MAINE
EROSION & SEDIMENTATION CONTROL PLAN & DETAILS

**BRUNSWICK PLANNING BOARD
MEETING MINUTES
JULY 7, 2015**

MEMBERS PRESENT: Chair Charlie Frizzle, Vice Chair Margaret Wilson, Bill Dana, Jeremy Evans, Dale King and Richard Visser

STAFF PRESENT: Director of Planning and Development, Anna Breinich

A meeting of the Brunswick Planning Board was held on Tuesday, July 7, 2015, in the Meeting Room, 2nd floor, 85 Union Street. Chair Charlie Frizzle called the meeting to order at 7:00 P.M.

Case # 15-028: Wood Pond Village Subdivision, Phase II Reapproval: The Planning Board will review and take action on an application for reapproval of the Wood Pond Village Phase II (Lots 17-25) Subdivision, originally approved as a phased subdivision on March 20, 1995. The application was submitted by Coastal Building and Investments, LLC, as stipulated in a consent agreement, dated 7/22/2010, between the Town of Brunswick and the developer, requiring subdivision reapproval by 7/15/2015. The subdivision abuts Ledgewood Road and is located in the Farm and Forest 1 (FF1) Zoning District. Assessor's Map 23, Lot 44.

Anna Breinich introduced the application for a reapproval of the Woodpond Phase II Subdivision and stated that this is part of the compliance agreement between the Town of Brunswick and the developer at the time of approval. Anna said that the consent agreement stated that the applicant needed to go through reapproval for Phase II, Lots 17-25. Anna stated that other parts for the consent agreement are in the works.

Charlie Frizzle asked if staff has reviewed the Zoning Ordinance for changes within the subdivision zone. Anna Breinich replied that that they have and there are no zoning changes. Margaret Wilson asked if any of the houses in Phase I have been built. Charlie replied that some have. Margaret asked Anna to update the Map and Lot numbers as they currently stand.

Chair Charlie Frizzle opened the meeting to public comment.

David Martalla, asked to view a copy of the plan. Anna Breinich provided David with a copy of the affected area.

Chair Charlie Frizzle closed the public comment period.

MOTION BY BILL DANA THAT THE WOOD POND VILLAGE SUBDIVISION PHASE II APPROVAL IS EXTENDED UNTIL JULY 15, 2020 WITH THE FOLLOWING CONDITION:

1. All agreed upon conditions of the July 22, 2010 Consent Agreement between the Town of Brunswick and Robert Cole, developer, now a principal of Coastal Building and Investments, LLC, shall be completed as stipulated. Should the 2010 agreement be revised and accepted by both parties, those agreed upon conditions shall then apply.

SECONDED BY MARGARET WILSON, APPROVED UNANIMOUSLY.

2. Zoning Ordinance Rewrite Committee Update

No update given at this time.

3. Approval of Minutes

MOTION BY MARGARET WILSON TO APPROVE THE MINUTES OF APRIL 14, 2015. MOTION SECONDED BY BILL DANA, APPROVED UNANIMOUSLY AMONG THOSE PRESENT.

MOTION BY RICHARD VISSER TO APPROVE THE MINUTES OF AND MAY 12, 2015. MOTION SECONDED BY MARGARET WILSON, APPROVED UNANIMOUSLY AMONG THOSE PRESENT.

4. Other

No other business.

Adjourn

This meeting was adjourned at 7:16 P.M.

Respectfully Submitted,

Tonya Jenusaitis

Recording Secretary

**BRUNSWICK PLANNING BOARD
MEETING MINUTES
JULY 14, 2015**

MEMBERS PRESENT: Chair Charlie Frizzle, Vice Chair Margaret Wilson, Bill Dana, Soxna Dice, Jeremy Evans, Dale King and Richard Visser

STAFF PRESENT: Director of Planning and Development, Anna Breinich

A meeting of the Brunswick Planning Board was held on Tuesday, July 14, 2015, in the Meeting Room, 2nd floor, 85 Union Street. Chair Charlie Frizzle called the meeting to order at 7:00 P.M.

Case # 15-006: Avita Assisted Living Facility: The Planning Board will hold a **Public Hearing** and then review and take action on a Final Major Plan Review application submitted by the Sandy River Company, for construction of a single story 47,703 sf assisted living facility, two parking areas totaling 65 spaces, and associated site improvements on two lots totaling 13.64 acres; the site has not yet been addressed, but will have access off of Admiral Fitch Avenue, in the Community Mixed Use Zoning District, and proposed to be within the Common Development Plan boundary. Assessor's Map 40, Lots 50 & 82.

Anna Breinich introduced the application for the construction of a single story assisted living facility to be located in Brunswick Landing and reviewed the project summary.

Daniel Maguire, representative for Sandy River Company, stated that Sandy Ricer has been in business for roughly 30 years and have built approximately 15 facilities from the ground up since 1983. Daniel stated that Sandy River Company, in partner with Northbridge Company have, come together over the past 4 years to build similar facilities and they are currently building a facility in Wells, Maine. Daniel stated that they have bids out to contractors and hope to make a decision on this soon. Daniel said that the name Avita is Italian for "for life", and stated that they believe people dealing with memory loss deserve quality of life.

Will Conway of Sebago Technics, stated that there have been only small changes to the plan since sketch review and reviewed the current site plan. Will stated that the entrance to the facility is important and reviewed the parking, traffic flow and provided a brief description of the front landscaping. Will reviewed the 3 courtyard designs and landscaping and stated that there is a secured perimeter fencing that ties into the building surrounding the 3 courtyards. Will reviewed a rendering of the proposed building and noted that the design has received MRRA Design approval.

Margaret Wilson stated that she was concerned as they do not have a bike rack and noted that many people bike in this area and it is possible that staff may bike in as well. Will Conway stated that they would be happy to put in a bike rack and asked that it be a Condition of Approval.

Chair Charlie frizzle opened the meeting to public hearing. No public comment was made and the public hearing was closed.

MOTION BY DALE KING THAT THE MAJOR DEVELOPMENT REVIEW FINAL SITE PLAN APPLICATION IS DEEMED COMPLETE. MOTION SECONDED BY BILL DANA, APPROVED UNANIMOUSLY.

MOTION BY RICHARD VISSER THAT THE BOARD WAIVES THE FOLLOWING REQUIREMENTS:

1. Section 412.2.B.8 Profile, cross-section dimensions, curve radii of existing streets.
2. Section 412.2.B.16 Class A High Intensity Soil Survey.
3. Section 412.2.B.17 Location of trees over 10” in diameter.

MOTION SECONDED BY BILL DANA, APPROVED UNANIMOUSLY.

MOTION BY BILL DANA THAT THE MAJOR DEVELOPMENT FINAL SITE PLAN APPLICATION IS APPROVED WITH THE FOLLOWING CONDITIONS:

1. That the Board’s review and approval does hereby refer to these findings of fact, the plans and materials submitted by the applicant and the written and oral comments of the applicant, its representatives, reviewing officials, and members of the public as reflected in the public record. Any changes to the approved plan not called for in these conditions of approval or otherwise approved by the Director of Planning and Development as a minor modification shall require a review and approval in accordance with the Brunswick Zoning Ordinance.
2. That prior to the issuance of a building permit that the municipal solid waste fee of \$7,105.00 is paid to the Town.
3. That prior to the issuance of a building permit, a determination by the Recreation Commission that the project complies with standards set forth in Section 519 of the Brunswick Zoning Ordinance.
4. That prior to the issuance of a building permit, the applicant provides documentation of financial capacity to complete the project, to the satisfaction of the Director of Planning and Development.
5. That prior to the issuance of a Certificate of Occupancy, the applicant shall have the storm water design consultant review and inspect the final as-built storm water improvements and the consultant will submit a statement to the Director of Planning and Development indicating that all storm water management improvements have been satisfactorily installed in accordance with the approved design.
6. That prior to the issuance of a Certificate of Occupancy, that adequate bicycle parking be provided onsite.

MOTION SECONDED BY MARGARET WILSON, APPROVED UNANIMOUSLY.

2. Case # 15-029: Moody Road Subdivision, Phase II Reapproval: The Planning Board will review and take action on an application for the reapproval of the 6-lot residential subdivision, Moody Road Subdivision, Phase II, submitted by Harold & Barbara Sandelin in partnership with Joseph Klocek to subdivide 14.72 acres into six (6) single-family residential lots on Manwaring Way (Assessor’s Map 14, Lot 13) in the Farm and Forest 1 (FF1) District and Aquifer Protection 2 Zone.

Anna Breinich introduced the application for reapproval of a 6-lot residential subdivision. Anna said that this application was approved by the Planning Board in October 13, 2009, but expired on October 14, 2014 per subdivision requirements; the applicant is seeking reapproval of the original plan and noted that there are no changes to the plan and there have been no Zoning Ordinance changes in this zone.

Curt Neufeld, of Sitelines PA, reviewed the project and provided an aerial view of the lots. Curt showed the open space block, lot layout and roadway. Curt noted that the notes have been added to the plan and pointed out that there are lots located outside of the fire hydrant district; this indication has been added to the plan. Curt reviewed the profile of the roadway and slope of the profile. Curt clarified that a portion of the roadway (slope of greater than 8%) will not be gravel, but will be reclaimed surface. Soxna Dice clarified that the conservation land was part of the original approval and Anna replied that it was part of the original approval.

Chair Charlie Frizzle opened the meeting to public hearing. No public comment was made and the public hearing was closed.

MOTION BY MARGARET WILSON THAT THE MAJOR DEVELOPMENT FINAL SITE PLAN APPLICATION IS APPROVED WITH THE FOLLOWING CONDITIONS:

1. That the Board's review and approval does hereby refer to these findings of fact, the plans and materials submitted by the applicant and the written and oral comments of the applicant, its representatives, reviewing officials, and members of the public as reflected in the public record. Any changes to the approved plan not called for in these conditions of approval or otherwise approved by the Director of Planning and Development as a minor modification shall require a review and approval in accordance with the Brunswick Zoning Ordinance.
2. That prior to the issuance of a building permit that the municipal solid waste fee of \$7,105.00 is paid to the Town.
3. That prior to the issuance of a building permit, a determination by the Recreation Commission that the project complies with standards set forth in Section 519 of the Brunswick Zoning Ordinance.
4. That prior to the issuance of a building permit, the applicant provides documentation of financial capacity to complete the project, to the satisfaction of the Director of Planning and Development.
5. That prior to the issuance of a Certificate of Occupancy, the applicant shall have the storm water design consultant review and inspect the final as-built storm water improvements and the consultant will submit a statement to the Director of Planning and Development indicating that all storm water management improvements have been satisfactorily installed in accordance with the approved design.
6. That prior to the issuance of a Certificate of Occupancy, that adequate bicycle parking be provided onsite.

MOTION SECONDED BY SOXNA DICE, APPROVED UNANIMOUSLY.

3. Case # 15-027: Spruce Meadow Subdivision: The Planning Board will review and take action on a Sketch Plan Major Development Review Subdivision Application submitted by William Moore, for a proposed 33-lot open space residential subdivision. **(Original Assessor's Map 13, Lot 34) in the Mixed Use 5 (MU5) Zoning District.**

Anna Breinich reviewed the application for a proposed 33-lot subdivision into a 32- residential lot subdivision. Anna pointed out that many Planning Board members attended the site walk of the proposed area on July 7th jointly with the Conservation Commission and noted that after the site walk, the Conservation Commission has recommended that the open space property stay in the hands of a homeowners association and not be taken on by the Town. Anna said that the Recreation Commission will be reviewing the proposed trails on 7/15/15.

Curt Neufeld, of Sitelies PA, said that the applicant proposes that the road be given to the Town once completed. Curt said that the DEP permit is in the process of being amended and residents will have private well and septic. Curt reviewed the layout and the open space tree growth land and said that if the Recreation Commission and the Conservation Commission do not embrace the open space as a public space, the reality of a parking lot off Durham Road and maintenance of trails by a homeowners association is very slim. Curt said that this project is proposed to be developed in 3 phases. Curt noted that they are still working on the well / septic systems, but pointed out that most of the lots drain towards the perimeter. Curt pointed out that this development is near the public transportation corridor and will be an asset to the Town.

Charlie Frizzle asked if lots 1, 33, 21 and 22 will meet the requirements of a 50 foot buffer from Old Portland Road. Curt replied that they had not discussed this and Charlie pointed out that the buffer was part of the original business approval. Curt replied that they would like to revisit this and suggested with a residential home, they could have a 25 foot buffer as the lots are narrow. Anna said that this may only effect lots 1 and 33 and suggested that they revisit the building envelope to see if the applicant can make things fit; lot 21 has the open space and lot 22 has the drainage. Bill Dana pointed out that lots 33 and 21 are constrained by wetlands as well and will limit the development of the houses.

Chair Charlie Frizzle opened the meeting to public comment. No public comment was made and the public comment period was closed

MOTION THAT THE BILL DANA TO DEEM THE MAJOR DEVELOPMENT SKETCH PLAN APPLICATION COMPLETE. MOTION SECONDED BY DALE KING, APPROVED UNANIMOUSLY.

MOTION BY DALE KING TO APPROVE THE MAJOR DEVELOPMENT SKETCH PLAN DALE. MOTION SECONDED BY SOXNA DICE, APPROVED UNANIMOUSLY.

4. Zoning Ordinance Rewrite Committee (ZORC) Update

Anna Breinich stated that ZORC will be presenting an update at the next Town Council meeting and hope to have Draft 2 for public review ready by the end of next week.

5. Approval of Minutes

No minutes were reviewed at this meeting.

6. Other

No other business.

Adjourn

This meeting was adjourned at 8:09 P.M.

Respectfully Submitted,

Tonya Jenusaitis

Recording Secretary

**BRUNSWICK PLANNING BOARD
MEETING MINUTES
AUGUST 4, 2015**

MEMBERS PRESENT: Chair Charlie Frizzle, Bill Dana, Soxna Dice, Jeremy Evans, and Richard Visser

STAFF PRESENT: Director of Planning and Development, Anna Breinich

A meeting of the Brunswick Planning Board was held on Tuesday, August 4, 2015, in Town Council Chambers, 85 Union Street. Chair Charlie Frizzle called the meeting to order at 7:00 P.M.

1. Case #15-034 Grace Reformed Baptist Church Special Permit: The Planning Board will hold a **Public Hearing**, then review and take action regarding a **Special Permit** application submitted by Micah Renihan, on behalf of the Northern New England District, Council of Assemblies of God, requesting approval to reestablish a church in the existing structures onsite as a use by Special Permit. The property is located at 34 Grover Lane, in the **Country Residential 1 (CR1) Zoning District. (Assessor's Map 41, Lot 23A).**

Anna Breinich introduced the Special Permit application to reestablish the existing structure at 34 Grover Lane for a religious institution as it is unknown when the current owner, Northern New England District, Council of Assemblies of God, reestablish the institution for this purpose as no Special Permit was granted. Anna stated that the applicant plans to comply with all applicable codes and regulations and that the structure is compatible with the proposed use. Anna and noted that no additional changes to the site are proposed at this time, but may occur in the future after the structural survey is conducted. Anna said that one staff request is that the new owners continue to work with the Parks and Recreation Department to maintain the shared parking arrangement that was in effect with the previous owners and the Town for bike path users.

Micah Renihan, Pastor of Grace Reformed Baptist Church, said that they are under contract to purchase this structure with the condition that they are granted this Special Permit; will come back to the Planning Board for development review in the future to make any changes to the structure. Charlie Frizzle asked the applicant if they are willing to continue the shared parking agreement and Micah replied that they are more than happy to resume or recreate an agreement if one cannot be found and are very open to discussion. Richard Visser asked for clarification on the number of cars / people if they anticipated. Micah replied that it would be 40-70 people on Sunday, not cars and noted that they have 61 parking spaces.

Chair Charlie Frizzle opened the meeting to public hearing. No public comments were made, and the public hearing was closed.

MOTION BY JEREMY EVANS THAT THE SPECIAL PERMIT APPLICATION BE DEEMED COMPLETE. MOTION SECONDED BY SOXNA DICE, APPROVED UNANIMOUSLY.

MOTION BILL DANA TO APPROVE THE SPECIAL PERMIT WITH THE FOLLOWING CONDITION:

1. That the Board's review and approval does hereby refer to these findings of fact, the plans and materials submitted by the applicant and the written and oral comments of the applicant, their representatives, reviewing officials, and members of the public as reflected in the public record. Any changes to the approved plan not called for in these conditions of approval or otherwise approved by the Director of Planning and Development as a minor modification shall require a review and approval in accordance with the Brunswick Zoning Ordinance.

MOTION SECONDED BY RICHARD VISSER, APPROVED UNANIMOUSLY.

2. Case #15-033 Rose Douglas Village Sketch Plan: The Planning Board will review and take action regarding a **Major Development Review Sketch Plan** application submitted by Robert and Judith Muller to develop a 14-unit open space residential subdivision at 207 Hacker Road and adjacent undeveloped lots totally 47.56 acres, in the **Farm and Forest 1 (FF1) Zoning District. (Assessor's Map 7, Lots 36-41.**

Anna Breinich reviewed the project summary and stated that this project was before the Board in November 2014 for a pre-application workshop with a similar design. Anna reviewed the review requirements for Sketch Plan development.

Kevin Clark of Sitelines, PA, reviewed a PowerPoint Presentation on the Rose Douglas Village Subdivision. Charlie Frizzle suggested that the applicant may want to review Section 511.3 in the Brunswick Zoning Ordinance regarding road interconnectiveness for the final plan and noted that the Fire Department, at the Staff Review Committee Meeting, suggested an access way between the proposed road and the 2 Echo Community. Kevin replied that they have spoken with the Fire Department and are willing to create an access road; this is being discussed. With regard to fire protection, Charlie stated that the Board will require that a statement be placed into the deeds of the development that they are beyond water access for the Fire Department if the applicant does nothing further in regards to fire protection. Kevin replied that they are discussing protection options. Soxna Dice asked if there was any further information on the power purchase. Robert Muller replied that he has spoken to Revision Energy and PPA's are becoming more common in Maine, but that he does not have any more information. Robert reviewed how the PPA would work. Bill Dana pointed out that the plan before the Board in November 2014 had a proposed access road to the 2 Echo Community. Robert replied that he has spoken with the 2 Echo Community Association, but that he has not heard back from them. Richard Visser asked about John Foster's concern with the steep grade on the proposed road and asked if there were any options being considered. Kevin replied that they have reviewed the preliminary plan and feel that they can do a design within 8% grade. Charlie pointed out that this is also something that the 2 Echo Community should be considering; connecting these neighborhoods makes sense. Anna Breinich recommended that the applicant explain the purpose of the use of this land identified on the plan as being retained by the owner. Kevin replied that they will address this in the final plan. Anna also suggested that the applicant go back to the Conservation Commission and the Parks and Recreation Commission in regards to the proposed conservation lands.

Chair Charlie Frizzle opened the meeting to public comment.

Jean Konzal, resident of 2 Echo community (127 Echo Road), said that she would need to have continued discussions regarding the access road, but does see the significance in terms of emergency vehicles; she is concerned of the other vehicular traffic that would occur. Charlie Frizzle noted that in the past, the Fire Department has made accommodations to have a gated road so that only emergency personnel would have access. Jean stated that she did not understand the waivers the applicant is asking for and what that means in terms of her community. Charlie replied that the applicant has stated that the proposed development is located on soil that is suitable for development, but that the applicant will still have to conduct a test pit for their septic systems and do not have to be part of sketch plan approval. Jean asked about the profile changes and Charlie replied that the applicant is not proposing any changes on Hacker Road and do not need the profile, cross sections, curve radii of existing streets. Jean asked for clarification on the red dotted lines that Kevin Clark had in his presentation that looked as though they were going into 2 Echo. Kevin replied that the red dots represent existing trails within the conservation area. Jean asked how close the new houses will be and Kevin replied that the closest to the roadway would be 50 feet. Jean stated that she is concerned about the noise and lights from the traffic in the circle and Kevin replied that the applicant has followed the ordinance. Charlie replied that the houses are well back from the property line. Charlie explained the subdivision plan process and what will come next. Robert Muller replied that the major change from the original plan is density; they originally proposed upwards of 20 houses and are now proposing 14 houses. Robert said that they have officially completed the wetland delineation and that the configuration has changed to create a village within a village as the houses are meant to interact with each other.

Jilda Izzo, resident of 227 hacker road, stated that her biggest concern is the area proposed to be retained by the owner with no explanation of future plans. Jilda said that there is a lot that is located next to her land that is no longer being developed; she is concerned as she does not know what that land will be used for. Jilda asked who monitors and maintains the PPA and asked where the PPA house will be located. Jilda asked about the impact on the land and how long it takes to build 14 homes that have to buy energy from a PPA. Jilda noted that in the meeting with the Planning Board in November 2014, the Board had stated that there were problems with the wetlands and suggested that the developer stay in contact with the neighbors; there has been no conversation or attempt to keep in touch with neighbors. Jilda is concerned about the number of cars and traffic on Hacker Road and about the timber cutting debris in the area that occurred a few years ago. Jilda asked what happens if the plan changes again and said that she is concerned about the follow-thru. Jilda reiterated that she is most concerned about not being able to identify land that was previously going to be developed. With regards to access to Hacker Road, Charlie Frizzle replied that the applicant will need to have an opening permit to put in the street and will have to meet the Town requirements. Charlie said that the applicant is entitled to do what he wishes on his property as long as it is within the Zoning Ordinance, but that it would be nice to know what the future plans, if any, are. Soxna Dice asked Jilda if she was concerned that the applicant may want, at some point, to subdivide the piece of land with frontage on Hacker Road. Jilda replied that she is concerned that the applicant may add another road on the side to access and subdivide the land in the back. Anna Breinich replied that the applicant has the right to say that the land is for future development, but noted that there are density limits. Anna said that her concerns at this time is how ownership is going to be handled. Kevin Clark replied that they will clarify ownership before they come back with the final plan and noted that the back portion is

conservation land. Robert Muller replied that they had communicated with the residents of 2 Echo up until the last Planning Board meeting where he stated that he would contact them if anything drastic changed; no drastic changes have been made and again reiterated that they have reduced density. With regards to the land being retained by the owner, Robert said that they have not yet addressed ownership. Robert noted that there will be no home for the PPA. Anna asked if the applicant was still considering a shared out building in the common area. Robert replied that this is still being considered, but he does not know who will maintain and manage the building.

Werner Wellman, resident of 227 Hacker Road, said it would help if the plan highlighted what the applicant is retaining. Charlie Frizzle reiterated that the applicant has not yet determined what he is going to retain. Robert Muller explained the conservation area and explained the areas where ownership and easement will be. Robert explained how he will have access to the back land; he does not know how the access will be off the loop road and whether it will be a walkway or driveway. Warner asked how many septic systems there will be and where will they be located. Robert stated that they do not know the final number but it will be less than 10. Warner pointed out that if a septic system is placed near his property it will run down into his well. Charlie stated that when the engineering is done for the septic system, if it is determined that it will run onto his property, the applicant would not be allowed to place a septic system at this location.

Chair Charlie Frizzle closed the public comment period.

MOTION BY BILL DANA THAT THE BOARD DEEMS THE APPLICATION COMPLETE. MOTION SECONDED BY SOXNA DICE, APPROVED UNANIMOUSLY.

MOTION RICHARD VISSER THAT THE BOARD APPROVES THE SKETCH PLAN. MOTION SECONDED BY JEREMY EVANS, APPROVED UNANIMOUSLY.

3. Zoning Ordinance Rewrite Committee (ZORC) Update

Anna Breinich stated that the Zoning Ordinance Draft II is available for review and on the website.

4. Approval of Minutes

No minutes were reviewed at this meeting.

5. Other Business

Anna Breinich said that the September 10th meeting will have a full agenda and confirmed a quorum will be in attendance.

Adjourn

This meeting was adjourned at 8:20 P.M.

Respectfully Submitted,

Tonya Jenusaitis
Recording Secretary