

*City of Biddeford*

**Planning Board**

**August 18, 2021 6:00 PM City Hall**

**Council Chambers & via ZOOM**

**<https://biddeford.zoom.us/j/99581418548?pwd=VUViekN0NDF6TEZ3SmF5eFRVUXM4UT09>**

- 1. PLEDGE OF ALLEGIANCE**
- 2. DECLARATION OF QUORUM/VOTING MEMBERS**
- 3. ADJUSTMENTS TO THE AGENDA**
- 4. PLANNER'S BUSINESS**
- 5. CONSENT AGENDA**
  - 5.A. Approval of Planning Board Meeting Minutes from August 4, 2021  
[PB Minutes 080421-DRAFT.pdf](#)
- 6. UNFINISHED BUSINESS**
- 7. NEW BUSINESS**
  - 7.A. 2021.24 Preliminary & Final Approval for a Subdivision Application to create 3 lots (2 new lots) for Pine Point Heights, LLC at 253-255 Hill Street (Tax Map 29, Lot 73) in the R-2 Zone.  
[1 Board Report - 253 Hill St Final Subdivision.pdf](#)  
[2 Draft FOF for 253 Hill Street.pdf](#)  
[3 Application Packet 7-9-21.pdf](#)  
[4 Final Subdivision Plan, PinePoint Heights, LLC dated 4-21-21 Latest Update 7-30-21.pdf](#)  
[5 Response from Gadbois to email of 7-27-21 to Planner.pdf](#)
  - 7.B. 2021.41 Consideration of the REAPPROVAL of the Site Plan and Conditional Use permit to create 14 storage units for Dempsey, LLC (formerly Landmatters, LLC) at 23 Marcel Avenue (Tax Map 74, Lots 102 & 11) in the Industrial 2 (I-2) Zone. The project has not changed since the original 2019 approval.  
[1 Dempsey Landmatters Board Report 081821.pdf](#)  
[2 Dempsey Landmatters Draft FOF.pdf](#)  
[3 resubmit dempsey Cvr Ltr 081121 T Gillis.pdf](#)  
[4 Letter from Applicant to Planner dated 7-23-21.pdf](#)  
[5 Application.pdf](#)  
[6 Dempsey Drive Site Plans BH2M Rev 092019.pdf](#)  
[7 Dempsey Drive Stormwater Report 9-20-2019.pdf](#)  
[8 Army Corp permit Land Matters LLC.pdf](#)  
[9 Land Matters LLC SW & NRPA Approval 10-3-19.pdf](#)  
[10 Cost estimate as of 5-9-19.pdf](#)  
[11 DEMPSEY ELEV D SIZE.pdf](#)  
[12 Landmatters Notice of Decision 110619.pdf](#)  
[13 Recorded Plan.pdf](#)
- 8. OTHER BUSINESS**
- 9. ADJOURN**

**The Board reserves the right to halt official business at 9:30 p.m. Items not heard at tonight's meeting shall be rescheduled to the next meeting of the Board. All materials pertaining to items on the agenda are available for public review at the Biddeford Planning Department, second floor, Biddeford City Hall during normal business hours.**





## CITY OF BIDDEFORD

### Planning and Development Department

Greg Tansley, A.I.C.P.  
City Planner  
205 Main Street  
P.O. Box 586  
Biddeford, ME 04005  
(207) 282-7119 or (207) 284-9115  
[Greg.Tansley@biddefordmaine.org](mailto:Greg.Tansley@biddefordmaine.org)

### Planning Board Meeting Minutes (DRAFT)

**Date:** August 4, 2021  
**Time:** 6:00 PM  
**Location:** City Hall Council Chambers & REMOTE ACCESS MEETING (1MRSA § 403-A permits public proceedings through remote access during the declaration of state of emergency due to COVID-19).

1. Declaration of Quorum/Voting Members  
Quorum Present: Bill Southwick (Chair), Roch Anger, Bruce Benway, Sean Tarpey, Spiros Droggitis, Alexa Plotkin (Alternate), Michael Cantara (Alternate)  
Chair Southwick opened the meeting at 6:00 PM  
Pledge of Allegiance
2. Adjustments to the Agenda
3. Planner's Business
  - Planner Tansley mentioned 2 zoning amendments that will be discussed
    - a) Odor Control
    - b) Mobile Food Vendor Courts
4. Consent Agenda
  4. A. Approval of Planning Board Meeting Minutes from July 21, 2021  
MOTIONS: 6:02 PM  
Benway-Motion- Motion to approve the Consent Agenda for July 21, 2021.  
Cantara-Second  
Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous, 4-0 (Angers, Benway, Tarpey & Droggitis)
5. Unfinished Business
6. New Business
  6. A. 2021.37 Public Hearing, Discussion & Ratification of the Remote Public Meeting Policy
    - Planner Tansley talked about the item and the purpose for it being on the Planning Board agenda.
    - The Board discussed the policy, clarifying the reasons and procedure if one cannot attend the meeting in person.
    - Chairman Southwick opened the Public Hearing, no comments from the public.

**MOTIONS: 6:10 PM**

**Benway-Motion-** To Ratify the Remote Public Meeting Policy for use by the Planning Board.

**Angers-Second**

Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous Approval 4-0 (Angers, Benway, Tarpey & Droggitis)

**6. B. 2021.36 Discussion and Schedule a Public Hearing - Article VI (Performance Standards), Section 30 (Extractive Industry), Section 9.I. - Amendment to allow the extractive industries to begin operations at 6 AM so long as they can demonstrate they will remain compliant with the City's Noise Ordinance.**

- Planner Tansley talked about the item, saying that the earliest it could go to a Public Hearing would be September 1, 2021.
- The Board discussed the item, talking about decibel meters, the Noise Ordinance and Extraction Industries.
- Planner Tansley discussed the Noise Ordinance as it is now.
- The Board talked about requiring the applicant to provide proof that their business does not exceed approved decibel levels when applying for this waiver.
- Notification of abutters was discussed for the Public Hearing.
- The Board would like to entertain a violation policy of this portion of the ordinance.

**MOTIONS: 6:48 PM**

**Benway-Motion-** To hold a Public Hearing to amend the Noise Ordinance on September 1, 2021

**Angers-Second**

Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous, 4-0 (Angers, Benway, Tarpey, & Droggitis)

**6. C. 2021.35 Discussion and/or Schedule a Public Hearing for an amendment to the General Development-1 (GD-1) to remove residential density limits for all structures (new, altered, and existing) in the GD-1 Shoreland Zone.**

- Planner Tansley talked about the proposed changes to the zone
- The Board discussed such proposed changes and impact felt by the Saco River Corridor Commission.

**MOTIONS: 7:01**

**Benway-Motion-** to hold a Public Hearing as early as September 1, 2021 to amend the GD-1 Shoreland Zone to remove residential density limits for all structures.

**Angers-Second**

Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous, 4-0 (Angers, Benway, Tarpey, & Droggitis)

**7. Other Business**

**7. A. Review Comprehensive Plan Schedule and Process**

- Planner Tansley talked about sending out the paper survey to all households.
- The plan to get the Comp Plan done and approved before the council transition
- A draft of the survey to go to PEPAC by the end of the week.
- Abigail is to share the survey results with the Planning Board

- There will need to be an increase in meetings in order to get the Comp Plan completed.
- Planner Tansley to give the Planning Board members windows of time for the extra hours needed.
- The charrette is to result in formation of the Comp Plan.

**7. B. Discussion and/or Schedule a Public Hearing for an amendment to the ordinance for Mobile Food Vendor Courts**

- Planner Tansley talked about the outdated vendor ordinance and the need to bring the ordinance more up to date.
- The Board discussed the standards to be considered and the fact that it will be a site plan review process.
- A Public Hearing as early as September 1, 2021 is necessary in order to amend the portions of the ordinance.

**MOTIONS: 7:39 PM**

**Benway-Motion-** to hold a Public Hearing as early as September 1, 2021 to amend the ordinance for Mobile Food Vendor Courts.

**Cantara-Second**

**Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous, 4-0 (Angers, Benway, Tarpey, & Droggitis)**

**7. C. Discussion for an item upcoming in the future to amend the Odor Control Ordinance**

- Planner Tansley talked about the possibility of amending the Odor Control Ordinance from just Marijuana businesses but to all business.
- He told the Board that if we are to hold the Public Hearing on September 1, 2021, we have to have public information and notices out by August 18, 2021.

**8. Adjourn**

**MOTIONS: 7:42**

**Benway-Motion-To adjourn**

**Angers-Second**

**Chair Southwick-Roll Call for Vote-Motion Passed, Unanimous, 4-0 (Angers, Benway, Tarpey, & Droggitis)**

**Meeting adjourned at 7:43 PM**

\_\_\_\_\_  
Planning Board Chair/Vice Chair

\_\_\_\_\_  
Date

These minutes are summary and are not intended to be verbatim. Archived meetings are viewable on the City's website: [www.biddefordmaine.org](http://www.biddefordmaine.org).

PLANNING BOARD  
REPORT

August 11, 2021

Biddeford Planning Board  
Greg Tansley, City Planner  
City of Biddeford  
205 Main Street  
Biddeford, Maine 04005

Application: 253-255 Hill Street – Pine Point Heights, LLC  
(Tax Map 29 Lot 73)

**Subdivision Plan Review**

Review Status: New preliminary/final application.

Board members and Mr. Tansley,

The following application information has been provided for review:

1. Application form dated 7/6/2021.
2. Cover letter and submittal application information prepared by Matthew Chamberlain, Pine Point Heights, LLC, and includes: Letter size copy of proposed Subdivision Plan, 5/14 – 6/1/21 email correspondence with Department of Public Works, and property deed.
3. Response to Comments to City Planner's 7/27/2021 Letter. Letter dated 8/1/2021 from Paul Gadbois PE, PLS, Re: 253-255 Hill Street.
4. Plan entitled: *Final Subdivision Plan, Pine Point Heights, LLC, 253-255 Hill Street, Biddeford, Maine*. Rev. Date: 7/30/2021. Prepared by Paul P. Gadbois.

With review of the above information and the Land Development Regulations, I offer the following comments on compliance with the City's ordinances.

**PROJECT DESCRIPTION**

The project site, located in the Residential-2 Zone, includes an existing two-family building on a 16,570 SF lot fronting Hill Street, along with Rtiz and Hubert Streets. The applicant is seeking approval to create two additional lots behind the existing building and convert it from a duplex to a single family.

**COMPLETENESS REVIEW**

The application is before the Planning Board as required by Chapter 66 (Subdivisions) subject to Subdivision review and approval. Per the City's Subdivision ordinance (66-26), all applications have a three tier approval process beginning with a Sketch plan review.

The applicant has prepared and submitted information that is adequate for a preliminary and final subdivision review and is complete with consideration of waiving items listed under *Waiver Requests* below.

## **REVIEW PROCESS**

The Planning Board reviewed the application as a Sketch Plan review at their May 5<sup>th</sup> meeting. Per Section 66-33 Review of major and minor subdivision plans, the Planning Board review and approve simultaneous preliminary and final plan approvals. The applicant has submitted a combined application.

## **COMPLIANCE WITH THE CITY'S ORDINANCES**

When considering the review at this point, it is intended by the process to be general in nature. The applicant should take the opportunity to introduce the project and the Board should ask questions and provide feedback. The following are comments that the Board and the applicant considered at their sketch plan discussion and updated in red:

1. Street trees along Ritz Street. On the plan (faintly depicted) and from aerial images, it is evident that there are three fairly mature trees along the property/ROW line along Ritz Street. The applicant should elaborate on the status of these trees as it relates to future driveway access. Any tree removals within the ROW will need approval by Public Works. It appears the Public Works Department is satisfied with the proximity of the future driveway and the existing tree. See email correspondence with Public Works. The existing tree's location, however, does not allow for the proposed driveway to conform to the required 15-foot setback. The latest plan proposes removal of the tree.
2. Driveway access. The final plan will need to depict proposed driveway locations for the new lots. A 15-foot setback from the adjacent property line is required and Public Works may have comments on the location as it relates to traffic and utilities. The revised plan depicts a proposed driveway that conforms to the setback.
3. The Police Department with regards to E-911 compliance should be contacted to confirm addressing for the new lots. This is likely not an issue but should be addressed prior to the issuance of a building permit.
4. Additional street trees may be required by the Board per Sec. 66-77. This may be an item the Board may want to discuss. There was interest from some board members to have pictures of the site submitted in lieu of a site walk and that, along with replacement of any street trees that were in need to come down, additional street trees and landscaping be proposed. The revised plan includes new street trees proposed along Hubert Street and one new small street tree under the overhead lines on Ritz Street to replace an existing tree that is in conflict with the proposed driveway.

The Board and applicant may want to consider small street trees under the overhead lines along Hill Street. The proposed Dogwood and Sugar Maples are not particularly road salt tolerant and should be substituted for species that are. Red Oak, Red Maple and Japanese Tree Lilac (small flowering tree) are street trees that have better road salt tolerance. The proposed Cockspur Hawthorn is a smaller canopy tree which should be utilized under the powerlines and not in areas where there is an opportunity for larger canopy trees. If this species is used, a thornless (*inermis*) variety should be specified.

5. The final plan should include dimensions on the setbacks shown, metes and bounds (appears to be missing on Hubert St.), all waivers granted, conditions of approval, and recording and approval signatory blocks. Metes and bounds along Hubert Street have been depicted on the plan.

#### ADDITIONAL COMMENTS

6. Sec. 66-52 (f) calls for lot numbers to use City map/lot conventions.
7. Date associated with stamp on plan should be updated for finalized plan for signatures prior to recording.

#### **WAIVER REQUESTS**

The application indicates a waiver request for a traffic study. With review of Chapter 66, it appears that such a study is required only at the discretion of the Board per Sec. 66-38(a). The following appears to be application related requirements where some information has not been provided and that may need to be waived if the Board accepts the application:

1. Sec. 66-35(d)(6) Statement of financial capability
2. Sec. 66-35(d)(8) Statement of technical capability
3. Sec. 66-35(d)(10) Review by police and fire departments
4. Sec. 66-47 (a) final plan not presented prior to preliminary plan approval.

#### **CONCLUSION**

The scope of the application is limited in nature and the submission, considering the comments above, appears to be adequate for simultaneously review of preliminary and final plans. **For suggested motions see Planning Board Packet Summary.**

Feel free to contact me with questions.

Best regards,



Christopher Di Matteo  
City of Biddeford Contract Planner.

PLANNING BOARD REPORT NO. 2  
**253-255 HILL ST – PINE POINT HEIGHTS LLC**  
AUGUST 11, 2021  
PAGE 4 OF 4

cdimatteo@longmeadowpla.com  
207.604.4245

**FINDINGS OF FACT AND CONCLUSIONS OF LAW**  
**3- LOT SUBDIVISION REVIEW**  
**AT 253 -255 HILL STREET**

Pursuant to the provisions of the City of Biddeford Code of Ordinances Chapter 66 the Biddeford Planning Board has considered the application of **Pine Point Heights, LLC** including supportive data, public hearing testimony and related materials contained in the record. Based on Public Comment and Staff's review and recommendation, the Planning Board makes the following Findings of Fact and Conclusions of Law:

**Findings of Fact:**

|     |                                                                                                                                                                                                                                                               |                                                                                             |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1.  | Applicant and Owner                                                                                                                                                                                                                                           | Matthew Chamberlain<br>Pine Point Heights, LLC<br>762 Main Street, South Portland, ME 04106 |
| 3.  | Agent:                                                                                                                                                                                                                                                        | None                                                                                        |
| 4.  | Surveyor:                                                                                                                                                                                                                                                     | Paul Gadbois PE, PLS Professional Land<br>Surveyor (#2104)<br>P.O. Box 327, Saco, ME 04072  |
| 4.  | Project Location:                                                                                                                                                                                                                                             | 253-255 Hill Street<br>Biddeford, ME 04005                                                  |
| 5.  | Project Tax Map #/Lot #:                                                                                                                                                                                                                                      | Tax Map 29 Lot 73                                                                           |
| 6.  | Lot Size:                                                                                                                                                                                                                                                     | 0.41 AC +/-                                                                                 |
| 7.  | Existing Zoning:                                                                                                                                                                                                                                              | R-2                                                                                         |
| 8.  | Overlay Zoning:                                                                                                                                                                                                                                               | None                                                                                        |
| 10. | Existing Use:                                                                                                                                                                                                                                                 | Residential Duplex                                                                          |
| 11. | Proposed Use:                                                                                                                                                                                                                                                 | Three (3) Single Family Lots                                                                |
| 12. | Floodplain Status:                                                                                                                                                                                                                                            | None                                                                                        |
| 13. | Approvals Required:                                                                                                                                                                                                                                           | Subdivision Plan                                                                            |
| 14. | Uses in the Vicinity:                                                                                                                                                                                                                                         | Residential                                                                                 |
| 15. | Dimensional Requirements:                                                                                                                                                                                                                                     |                                                                                             |
|     | Min. Setback from Major R.O.W:<br>25 FT/ Other R.O.W: 15 FT                                                                                                                                                                                                   | Min. Lot Size: 4,500 SF/ Unit                                                               |
|     | Minimum Side/Rear Setback: 5 FT                                                                                                                                                                                                                               | Maximum Height: 3 stories / 35 FT                                                           |
| 16. | Waivers Needed:                                                                                                                                                                                                                                               |                                                                                             |
|     | a. Sec. 66-35(d)(6) Statement of financial capability<br>b. Sec. 66-35(d)(8) Statement of technical capability<br>c. Sec. 66-35(d)(10) Review by police and fire departments<br>d. Sec.66-47 (a) final plan not presented prior to preliminary plan approval. |                                                                                             |
| 17. | Waivers Granted:                                                                                                                                                                                                                                              | a. Sec. 66-35(d)(6) Statement of financial<br>capability                                    |



|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                      |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | b. Sec. 66-35(d)(8) Statement of technical capability<br>c. Sec. 66-35(d)(10) Review by police and fire departments<br>d. Sec.66-47 (a) final plan not presented prior to preliminary plan approval. |
| 18. | Variances Needed for Approval:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | None.                                                                                                                                                                                                |
| 19. | Other Approvals Required:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Building Permits from the Biddeford Code Enforcement Office.                                                                                                                                         |
| 20. | Other Permits Obtained:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | None.                                                                                                                                                                                                |
| 21. | Other Non-City Permits Required:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | None                                                                                                                                                                                                 |
| 22. | LDR Attachment A: Fees Paid:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Yes                                                                                                                                                                                                  |
| 23. | Application Materials Submitted:<br>1. Application form dated 7/6/2021.<br>2. Cover letter and submittal application information prepared by Matthew Chamberlain, Pine Point Heights, LLC, and includes: Letter size copy of proposed Subdivision Plan, 5/14 – 6/1/21 email correspondence with Department of Public Works, and property deed.<br>3. Response to Comments to City Planner’s 7/27/2021 Letter. Letter dated 8/1/2021 from Paul Gadbois PE, PLS, Re: 253-255 Hill Street.<br>4. Plan entitled: <i>Final Subdivision Plan, Pine Point Heights, LLC, 253-255 Hill Street, Biddeford, Maine</i> . Rev. Date: 7/30/2021. Prepared by Paul P. Gadbois. |                                                                                                                                                                                                      |
| 24. | Planning Board Review History:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                      |
|     | A. Conceptual Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Meeting on May 5, 2021                                                                                                                                                                               |
|     | B. Final Review                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Meeting on August 18, 2021                                                                                                                                                                           |

### **Conclusions of Law:**

The Planning Board concludes based on the application information submitted, peer-review and staff reports prepared and testimony provided at their meetings, the application conforms to the following provisions:

A. Section 66-39 (below) applicable standard and requirements of Chapter 66 of the City’s subdivision ordinance:

1. The project will not result in undue water or air pollution.
2. The project has sufficient water available for the reasonably foreseeable needs of the subdivision;

3. The project will not cause an unreasonable burden on an existing water supply, if one is utilized;
4. The project will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy, condition may result;
5. The project will not cause unreasonable highway or public road congestion or unsafe conditions with respect to use of the highways or public roads existing or proposed;
6. The project will provide for adequate sewage waste disposal;
7. The project will not cause unreasonable burden on the ability of the municipality to disposal of solid waste and sewage if municipal services are to be utilized;
8. The project will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas or public rights for physical or visual access to the shoreline. Environmentally sensitive areas, including but not limited to wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers will be maintained and preserved to the maximum extent;
9. The project is in conformance with a duly adopted subdivision regulation or ordinance, Comprehensive Plan, development plan, or land use plan, if any.
10. The subdivider has adequate financial and technical capacity to meet the above stated standards;
11. Whenever situated, in whole or in part, within 250 feet of any lake, pond, river or tidal waters, the project will not adversely affect the quality of that body of water, or unreasonably affect the shoreline of that body of water, as indicated on the City of Biddeford, Official Zoning Map and referenced in the City's Comprehensive Plan;
12. The project will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water;
13. The project is not in a flood prone area;
14. The project will not unreasonably obstruct abutting properties or structures access to direct sunlight;
15. If any portion of the site has been identified as containing historic or archaeological resources, the development shall include appropriate measures for protecting these resources, including but not limited to modification of the proposed design of the site, timing of construction, and limiting the extent of construction.

**Determination:**

Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the application with the following conditions:

**Conditions of Approval:**

1. **Prior to any ground disturbance or issuance of any permits:**
  - a. All outstanding review comments shall be addressed to the satisfaction of the City Planner.

- Date



Pine Point Heights LLC

Proposal for a 3 lot subdivision at 253-255 Hill St Biddeford

Cover Letter

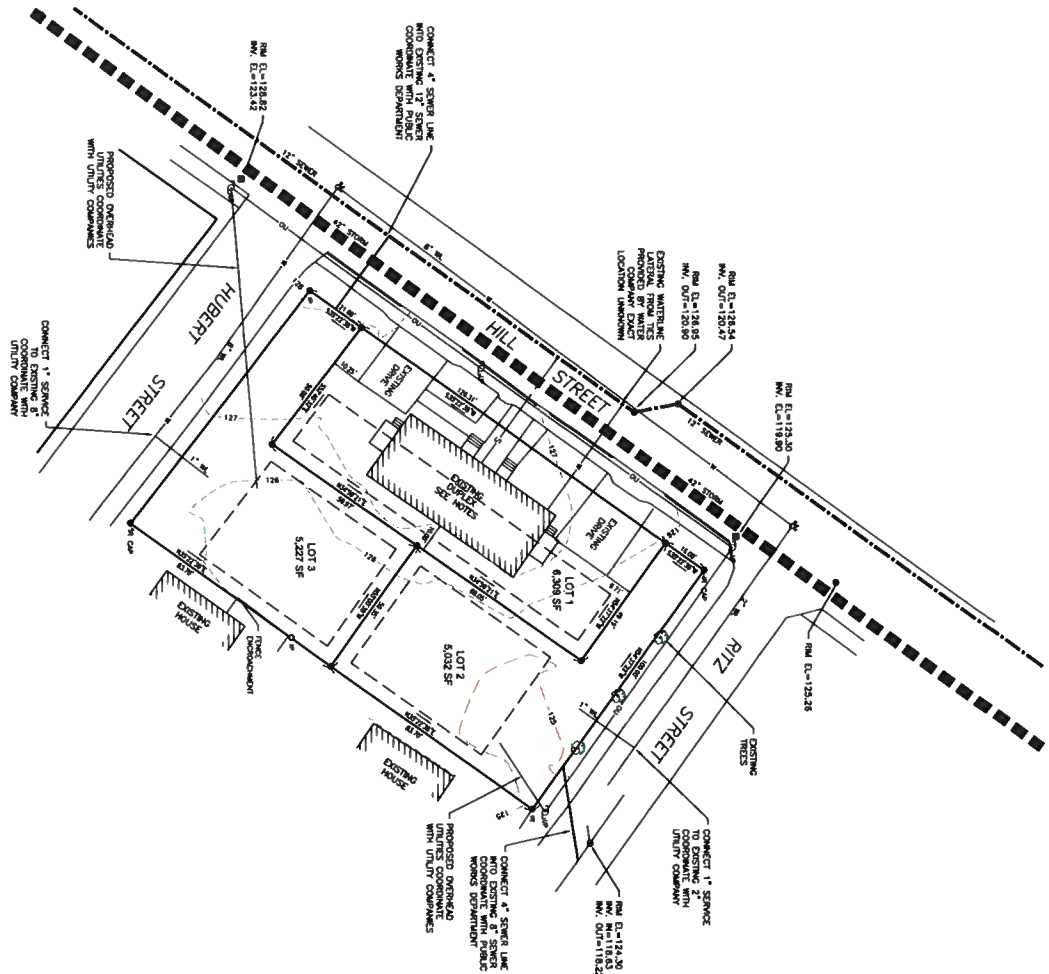
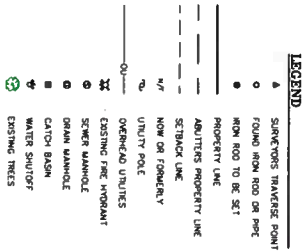
To the Biddeford Planning Board and related parties;

I am requesting preliminary and Final approval for the proposed 3 lot subdivision at 253-255 Hill St. It is currently a duplex on 16570 sf lot in the R-2 zone. The zone allows for 4500sf lots with 45 feet of road front. The project will create 3 single family homes intown for home ownership without adding any new infrastructure and only using what is currently there. At the last meeting the only notable comment was about the tree that may block the driveway for lot 2. After meeting with Public Works, Public Works didn't feel the tree was a problem and gave me permission to trim branches as necessary.

Sincerely

Matthew Chamberlain

Pine Point Heights LLC



Paul P. Dobson 06-18-2021  
PAUL P. DOBSON, P.E. 2102 DATE

STATE OF MAINE  
PAUL

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS SURVEY CONFORMS TO THE  
MAINE BOARD OF LICENSING FOR PROFESSIONAL LAND SURVEYORS RULES AND  
REGULATIONS, WITH THE EXCEPTION THAT NO SURVEY REPORT WAS WRITTEN.

PAID P. GADSDEN, PLS 2106 DATE 06-18-2021

**APPROVAL**  
**CITY OF BIDDEFORD**  
**PLANNING BOARD**

**PAUL P. GADBOIS**  
ENGINEERING SURVEYING  
LAND PLANNING  
P.O. BOX 327, SACO, MAINE 04072  
(207) 283-3960

**FINAL SUBDIVISION PLAN**  
PINEPOINT HEIGHTS LLC  
253-255 HILL STREET  
BIDDEFORD, MAINE

**RECORD OWNER**  
PINE POINT HEIGHTS LLC  
762 MAIN STREET  
SOUTH PORTLAND, ME 04106

|                  |             |                                             |
|------------------|-------------|---------------------------------------------|
| DRAWN: P.P.G.    | REVISIONS:  |                                             |
| CHECKED: P.P.G.  |             |                                             |
| SCALE: 1" = 20'  |             |                                             |
| FIELD BOOK:      |             |                                             |
| DATE: 04-12-2021 |             |                                             |
| JOB NO. 1788-21  | 2. 08-18-21 | CHANGED RECORD NUMBER                       |
| SHEET 1 OF 1     | 1. 08-18-21 | ADDED "BROWN" AND "BAYON CAY" CATEGORIES TO |

**CITY OF BIDDEFORD, MAINE**  
**PLANNING BOARD**  
P.O. Box 586, 205 Main Street Biddeford, Maine 04005  
207-284-9115

**APPLICATION FORM**

**Type of Application:**

- |                                                  |                                                 |                                      |
|--------------------------------------------------|-------------------------------------------------|--------------------------------------|
| <input type="checkbox"/> Shoreland Zoning Permit | <input type="checkbox"/> Site Plan Review       | <input type="checkbox"/> Extraction  |
| <input type="checkbox"/> Conditional Use Permit  | <input checked="" type="checkbox"/> Subdivision | <input type="checkbox"/> Private Way |
| <input type="checkbox"/> Other: _____            |                                                 |                                      |

**Applicant Information:**

Applicant's Name: Pine Point Heights LLC  
Applicant's Mailing Address: 762 Main St So Portland Me 04106  
Applicant's Telephone: 207 450 7653

What is Applicant's legal interest in the property?

- ☒ Owner    ☐ Potential Buyer with Contract    ☐ Lease/Rental Agreement

Owner's Name: Same  
Owner's Address: \_\_\_\_\_  
Owner's Telephone: \_\_\_\_\_

Agent's Name: \_\_\_\_\_  
Agent's Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_

Engineer/Surveyor: Paul Gadbois  
Engineer/Surveyor's Address: Po Box 327 Saco Me  
Telephone: 207 283-3980

**Project Location and Lot Information:**

Street Address: 253-255 Hill St  
Tax Map: 29 Lot: 73  
Current Zoning: R-2 Shoreland Zoning: NO

Size of lot: 641 ☒ acres ☐ s.f. Lot Frontage: 364 ft

Existing Use of Property: Duplex

Property currently serviced by:

|                                                  |                                         |
|--------------------------------------------------|-----------------------------------------|
| <input checked="" type="checkbox"/> City Road    | <input type="checkbox"/> Private Road   |
| <input checked="" type="checkbox"/> Public Sewer | <input type="checkbox"/> Septic System  |
| <input checked="" type="checkbox"/> Public Water | <input type="checkbox"/> Private Well   |
| <input checked="" type="checkbox"/> Public Trash | <input type="checkbox"/> Private Hauler |

Slope Conditions in Area of Construction (if applicable):

☒ Flat (0-3 % slope) ☐ Rolling (3-8% slope) ☐ Hilly (8-15% slope) ☐ Steep (15% + slope)

Are there any wetlands or waterbodies on the site? ☐ Yes ☒ No If yes, attach information

Do you plan to bring fill onto the lot? ☐ Yes ☒ No If yes, attach information

**Description of proposed use of property:**

Project/Proposed Use Description: Convert duplex into a single family house + create 2 more house lots

Property to be serviced by:

|                                                  |                                         |
|--------------------------------------------------|-----------------------------------------|
| <input checked="" type="checkbox"/> City Road    | <input type="checkbox"/> Private Road   |
| <input checked="" type="checkbox"/> Public Sewer | <input type="checkbox"/> Septic System  |
| <input checked="" type="checkbox"/> Public Water | <input type="checkbox"/> Private Well   |
| <input checked="" type="checkbox"/> Public Trash | <input type="checkbox"/> Private Hauler |

Is this project part of a larger project? ☐ Yes ☒ No

☐ If in a Shoreland Zone:

Percent of residential lot coverage (Max. 20%): \_\_\_\_\_

Percent of structure expansion (Max. 30%): \_\_\_\_\_

☒ If Subdivision Review, number of lots proposed: 3

☐ If a Private Way is proposed, number of lots served: \_\_\_\_\_

☐ If Site Plan Review, you must provide the following information:

Total new square feet footprint of structures: \_\_\_\_\_

Total new square feet paving/parking: \_\_\_\_\_

Waiver Requests (attach details):

1. Traffic
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Attachments:**

A. Letters of Approval

- ☐ Fire Department - Contact Chief or Deputy Chief - 282-9986
- ☒ Ability to Serve for Water Service – Maine Water - 282-1543
- ☒ Ability to Serve for Sewer Service- Engineering Dept (Sewer) - Tom Milligan 284-9118
- ☐ Police Department - E-911 Road Name Designation - Contact Joanne Fisk - 282-5127

B. Letter to Planning Board describing project, waiver requests, proposed improvements, addressing permit requirements, etc.

C. Photographs of site.

D. Architectural renderings/drawings of proposed buildings, as required.

E. Engineered Plans, as required.



**Fees (due at time of application):**

Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

**Required Signatures:**

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and it's attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting this application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

☐ Project proposed to have 1 acre or more of site disturbance:

**-Project may need to apply for a Maine Construction General Permit and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.**

**Signature of applicant:**

*Matthew Chamberlin*

Date: 7/6/2024

**Signature of owner of property:**

*Matthew Chamberlin*

Date: 7/6/2024

**IF PLAN APPROVAL IS ANTICIPATED, PROVIDE 2 FULL SIZE MYLARS & 2 FULL SIZE PAPER COPIES FOR BOARD SIGNATURE (AS APPLICABLE).  
CHECK WITH PLANNING STAFF FOR CLARIFICATION.**

# **CHECKLIST FOR SITE PLAN REQUIREMENTS**

**YES**   **NO**

- |                                     |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Be on sheet size of 24 by 36 inches.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | The scale of said plan shall be not less than one inch equals 50 feet and shall be indicated on the plat by use of a bar scale.                                                                                                                                                                                                                                                                                                                                         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | The plan shall bear the date, title, north point.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/>            | <input type="checkbox"/>            | The plan shall contain a location or vicinity sketch (suggested scale one inch equals 800 feet).                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | The plan shall contain the name and address of the developer and applicant.                                                                                                                                                                                                                                                                                                                                                                                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | All appropriate dimensional requirements.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Existing and proposed easements.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Plan of the site showing existing watercourses and water bodies, seasonal wet areas.                                                                                                                                                                                                                                                                                                                                                                                    |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Plan of the site showing soil type and location of test borings.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Location of all existing and proposed utilities.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Topographic contours (every five percent for zero to three percent slope; or every two feet for steeper areas).                                                                                                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Plan should include preservation and supplementation of existing dominant vegetation.                                                                                                                                                                                                                                                                                                                                                                                   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Plan shall indicate which features are to be retained and which are to be removed or altered.                                                                                                                                                                                                                                                                                                                                                                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Location of stone walls, graveyards, fences, stands of trees, and other important unique natural areas and site features, including but not limited to floodplains, deer wintering areas, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, sand and gravel aquifers, and historic and/or archaeological resources, together with description of such features. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Plan view of all buildings with their use, size, location, and first-floor elevation in respect to grade.                                                                                                                                                                                                                                                                                                                                                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Standard elevation view of existing and proposed buildings or structures on-site.                                                                                                                                                                                                                                                                                                                                                                                       |

YES   NO

- ☒ ☐ Outline of any buildings located within 200 feet of such existing or proposed buildings or structures indicating their shape, size, location, heights and volume.
- ☒ ☐ Existing use of abutting properties shall be identified with approximate location of any structures thereon including access roads.
- ☒ ☐ Location, width, curbing, and paving of access ways, egress ways, and streets within the site for both pedestrian and vehicular use.
- ☒ ☐ The location of off-street parking and loading spaces with a layout of the parking indicated.
- ☒ ☐ The size and proposed location of water mains and sanitary sewerage facilities will all necessary engineering data.
- ☒ ☐ The size and location of all other existing and proposed public service connections including, without limitation, gas lines, power lines, telephone lines, and fire alarm connections and locations, indicating whether above or below ground.
- ☐ ☒ The type, nature, and composition of all solid, liquid, and gaseous waste, industrial or otherwise, and the location, type, and design criteria of the storage and disposal facilities dealing with such waste.
- ☐ ☒ A landscape plan and open space areas indicating grade change, vegetation to be preserved, new plantings used to stabilize areas of cut and fill, screening; plus size, location, purpose and type of vegetation.
- ☐ ☒ A drainage plan including location, elevation, layout of catch basins and other surface and subsurface drainage features.
- ☐ ☒ Location, size and design of proposed signs and other advertising or instructional devices.
- ☒ ☐ Existing and proposed contours and finished grade elevations as well as the type, extent, and location of existing and proposed landscaping and open space areas which will be retained.
- ☐ ☒ Location and type of lighting for outdoor facilities.
- ☐ ☒ Lines of existing and proposed abutting streets showing width.
- ☒ ☐ Surveyed property lines showing their bearing and distances and monument locations.
- ☐ ☒ If subdivision is involved, the lines and names of all proposed streets, lanes, ways, or easements intended to be dedicated for public or private use.

YES   NO

- |                                     |                                     |                                                                                                                                       |
|-------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Provide copies of any covenants or restrictions that are intended to cover all or part of the land area to be developed.              |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Indicate limits of the wetland areas on the property.                                                                                 |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Delineate existing zoning boundaries within 1,000 feet of the site.                                                                   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Stamp and signature of either a Maine licensed land surveyor, professional engineer, or architect responsible for said plan.          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Any other exhibits or data deemed necessary by the Planning Board to evaluate the proposed development for site plan review purposes. |

**Fees (due at time of application):**

Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

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By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
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**Signature of applicant:**

Matthew Chamberlin

Date: 7/6/2024

**Signature of owner of property:**

Matthew Chamberlin

Date: 7/6/2024

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CHECK WITH PLANNING STAFF FOR CLARIFICATION.**



Matthew Chamberlain &lt;mgchamberlain48@gmail.com&gt;

---

**FW: Site Walk on Ritz Ave**

1 message

---

Jewett, Dylan <Dylan.Jewett@biddefordmaine.org>  
To: "mgchamberlain48@gmail.com" <mgchamberlain48@gmail.com>

Tue, Jun 1, 2021 at 3:21 PM

Please see below emails.

Thank You for your Patience!

Dylan

**From:** Demers, Jeff  
**Sent:** Tuesday, June 1, 2021 3:20 PM  
**To:** Jewett, Dylan <Dylan.Jewett@Biddefordmaine.org>  
**Subject:** RE: Site Walk on Ritz Ave

Dylan:

Please have him clean up the tree per you remarks.

Respectfully,

**Jeff Demers**

**Director Public Works Waste Water Dept.**

371 Hill Street

Biddeford, Maine 04005

Tele # (207) 282-1579

Fax # (207) 282-8325

[jdemers@biddefordmaine.org](mailto:jdemers@biddefordmaine.org)

---

**From:** Jewett, Dylan <Dylan.Jewett@Biddefordmaine.org>  
**Sent:** Wednesday, May 12, 2021 11:10 AM  
**To:** Demers, Jeff <Jeff.Demers@Biddefordmaine.org>  
**Subject:** Site Walk on Ritz Ave

Joe Lovejoy and I have done a walkthrough with Matthew Chamberlain on the proposed lot on Ritz Ave. He asked us to look at the trees after someone on the planning board expressed concern. From what Joe and I can see with the setback of the driveway and the curb cut, the trees will be close but still able to stay. There is a cluster of trees there and I explained to Matthew that he could cut some of the small tree from the cluster that will likely die and limb up. While we were looking at the tree we notice that some of the limbs were in CMP's air space. Matthew was going to contact CMP to have them trim back for safety.

I think after doing the site walk it is in my opinion that the tree can be limbed and cleaned up without removing.

Please see attachments and get back to me so I can email Matthew if you would like me to see this out.

Dylan Jewett

Operations Manager

Public Works

City of Biddeford

Tel:207-282-1579

Fax:207-286-9395

*The contents of this e-mail message and any attachments are confidential and are intended solely for addressee. The information may also be legally privileged. This transmission is sent in trust, for the sole purpose of delivery to the intended recipient. If you have received this transmission in error, any use, reproduction or dissemination of this transmission is strictly prohibited. If you are not the intended recipient, please immediately notify the sender by reply e-mail or phone and delete this message and its attachments, if any.*

*Under Maine law, documents - including e-mails - in the possession of public officials or city employees about government business may be classified as public records. There are very few exceptions. As a result, please be advised that what is written in an e-mail could be released to the public and/or the media if requested.*

Space above for recording information

## WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS that HERSEY ENTERPRISES, LLC, a Maine limited liability company with a principal place of business in Biddeford, County of York and State of Maine, for consideration paid, grants to PINE POINT HEIGHTS, LLC, a Maine limited liability company with a mailing address of 762 Main Street, South Portland, ME 04106, with Warranty Covenants, the following described real estate situated in the City of Biddeford, County of York, and State of Maine:

SEE EXHIBIT "A" ATTACHED HERETO AND  
INCORPORATED HEREIN BY REFERENCE

Being the same premises conveyed to Grantor herein by deed of Michael H.L. Hersey, dated November 27, 2018 and recorded in the York County Registry of Deeds in Book 17852, Page 16.

IN WITNESS WHEREOF, said Hersey Enterprises, LLC caused this instrument to be signed in its company name by Michael Hersey, its Member, thereunto duly authorized, this 15<sup>th</sup> day of April 2021.

Signed, sealed and delivered  
in the presence of

Hersey Enterprises, LLC

By: Michael Hersey  
Its: Member

April 15 2021

State of Maine  
County of York, ss

Personally appeared Michael Hersey, in his capacity as the Member of Hersey Enterprises, LLC, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of Hersey Enterprises, LLC.

Before me,

Notary Public/Attorney at Law

Print Name: Paul D. Weinstein

My Commission Expires:

2p78 Weinstein, Lovells Ordway  
431 Main St.  
Saco, ME 04072

Book 5295

Maine R.E. Transfer Tax Paid



## EXHIBIT A

Certain lots or parcels of land, said lots being numbered fifty-five (55), fifty-six (56), and fifty-seven (57) on plan of Circus Field, owned by John William Ritz, County of York and State of Maine, which plan was made by Libby and Dow, Engineers; said plan being dated July 17, 1947, and recorded in said Registry in Plan Book 14, Page 21. Said premises are conveyed with the buildings and improvements thereon.









PAUL P. GADBOIS PE, PLS

RECEIVED  
8-3-21

Civil Engineering, Surveying, Land Planning  
Structural Engineering, DEP Permitting

P.O. Box 327  
Saco, ME 04072  
Phone & Fax (207) 283-3980  
Email: pgadbois53@gmail.com

August 1, 2021

Matthew Chamberlain  
Pine Point Heights LLC  
762 Main Street  
South Portland, ME 04106

Re: 253-255 Hill Street.

Dear Matthew:

The following is my response to the Email dated July 27, from City Planner.

1. I believe that the best solution is to remove the existing tree and plant a new 2" Kousa Dogwood. The tree is beginning to show signs of deterioration of the outer bark which is the trees protection layer. See attached photo.
2. I have added the proposed 15-foot access drives. The drives are located 15 feet from the property lines.
3. Applicant will reach out to E-911 coordinator.
4. I have added three new 2" caliper street trees along Hubert.
5. Added missing metes and bounds along Hubert.

Very truly yours,

Paul P. Gadbois, P.E., P.L.S.

**From:** Fisk, JoAnne <joanne.fisk@biddefordmaine.org>  
**Sent:** Friday, July 30, 2021 8:29 AM  
**To:** Tansley, Greg  
**Cc:** mgchamberlain48@gmail.com  
**Subject:** FW: 253-255 Hill Street Submission  
**Attachments:** 1788-SRV 06-18-21 (1).pdf

Greg,

In reviewing what Mr. Chamberlain has submitted there is no need for anything other than actual house numbers on the Hill Street submission.

JoAnne Fisk

**From:** Matthew Chamberlain <mgchamberlain48@gmail.com>  
**Sent:** Thursday, July 29, 2021 4:30 PM  
**To:** Fisk, JoAnne <joanne.fisk@biddefordmaine.org>  
**Subject:** Fwd: 253-255 Hill Street Submission

Here is the email from Greg and attached is the 3 lot subdivision. Please feel free to call me at 450-7653 if you have questions. Thank you

Matthew Chamberlain

----- Forwarded message -----

**From:** Tansley, Greg <Greg.Tansley@biddefordmaine.org>  
**Date:** Tue, Jul 27, 2021 at 1:39 PM  
**Subject:** 253-255 Hill Street Submission  
**To:** Matthew Chamberlain <mgchamberlain48@gmail.com>  
**Cc:** Whitten, Nan <Nan.Whitten@biddefordmaine.org>

Hi Michael,

In reviewing the submission it appears to be incomplete. Without completing a full review of the checklist, we note the following from the April 29 Board Report that have not been addressed:

*1. Street trees along Ritz Street. On the plan (faintly depicted) and from aerial images, it is evident that there are three fairly mature trees along the property/ROW line along Ritz Street. The applicant should elaborate on the status of these trees as it relates to future driveway access. Any tree removals within the ROW will need approval by Public Works. Although the email exchange with DPW appears to indicate the trees would not need to be removed to get in a driveway, I think a driveway waiver may be required to allow it located less than the width of the driveway to the property line to do so. As such, the trees in question can only remain IF a waiver is granted. The question needs to be asked of DPW*

*whether or not they will support a waiver to allow the driveway to be less than the width of the driveway from the abutting property line.*

*2. Driveway access. The final plan will need to depict proposed driveway locations for the new lots. A 15-foot setback from the adjacent property line is required and Public Works may have comments on the location as it relates to traffic and utilities. The plan presented does not include proposed driveway locations. Also see #1 above.*

*3. The Police Department with regards to E-911 compliance should be contacted to confirm addressing for the new lots. Confirmation has not been submitted. Please confirm E-911 Addressing.*

*4. Additional street trees may be required by the Board per Sec. 66-77. This may be an item the Board may want to discuss. There was some interest from Board members in seeing replacing lost street trees or adding new streets trees. To be discussed. Have you explored adding some street trees to Hubert Street?*

*5. The final plan should include dimensions on the setbacks shown, metes and bounds (appears to be missing on Hubert St.), all waivers granted, conditions of approval, and recording and approval signatory blocks. Metes and bounds along Hubert Street are not shown.*

We also need ten copies of the final plan for board review in 24" x 36" format. The plans should be amended based on what is provided above. We will provide final comments in a future Board Report.

Once we have a complete application we will schedule for the next available Planning Board Meeting. Based on timing, it may not be scheduled until August 18 or September 1.

Respectfully,

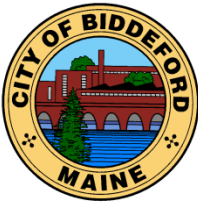
Greg

---

Greg Tansley, AICP

City Planner

PO Box 586



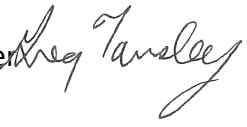
## CITY OF BIDDEFORD

### Planning and Development Department

Greg D. Tansley, A.I.C.P.  
City Planner  
205 Main Street  
P.O. Box 586  
Biddeford, ME 04005  
(207) 282-7119 or (207) 284-9115  
[Greg.Tansley@biddefordmaine.org](mailto:Greg.Tansley@biddefordmaine.org)

### PLANNING BOARD REPORT

TO: William Southwick, Chair & the Biddeford Planning Board

FROM: Greg Tansley, AICP, City Planner 

DATE: August 12, 2021

RE: 2021.41 Site Plan Review/Conditional Use Permit REAPPROVAL for Dempsey, LLC (Landmatters, LLC) to construct 14 storage units located at 23 Marcel Avenue (Tax Map 74, Lot 10-2 and 11) in the I-2 zone.

MEETING DATE: August 18, 2021 @ 6:00 PM

#### 1. INTRODUCTION

After considerable review the Planning Board approved this project in November 2019. In the Winter/Spring of 2020 COVID-19 hit. The applicant was unable to move the project to construction due to the pandemic and the approval expired before it could be extended. Had the applicant requested an extension to the approval before it expired the City Planner would have likely extended the approval as an administrative amendment due to prevailing circumstances and that nothing in the Ordinances has changed that would have impacted the design and approval.

The applicant has received all necessary Maine DEP and Army Corps permitting (included in the packet). They have now resubmitted the previously approved plans and are requesting it be re-approved as it was presented and approved in November 2019.

There is one slight issue that we have worked through with the applicant. The applicant no longer has a relationship with the original design engineering firm (BH2M) and has instead enlisted the services of Rick Licht, P.E. to represent him at the Planning Board Meeting.

The City Planner has spoken with BH2M Engineers and they are comfortable with the plan being presented with their title block and stamps for re-approval. They have made it quite clear, and the City Planner agrees, that if there were to be any changes needed to the plan those changes could not be made and presented with their title block and

stamps included. In other words, if changes are needed a new plan would need to be presented from an engineer other than BH2M.

That said, nothing has changed in the Ordinance that would impact the design of this project based on the City Planner's review. The City Planner recommends that if the Planning Board re-approves the project it grants the same waivers as before and approves the application and plans "as presented" with the same conditions of approval attached to the approval as were attached in November 2019.

#### PROJECT DATA/INFORMATION

Note: **HIGHLIGHTED** information is pending.

|     | <b><i>SUBJECT</i></b>                | <b><i>DATA/INFORMATION</i></b>                                                                           |
|-----|--------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1.  | Applicant:                           | Dempsey, LLC (Landmatters, LLC)<br>PO Box 468<br>Old Orchard Beach, ME<br>207-331-2865                   |
| 2.  | Owner of Property:                   | Dempsey, LLC (Landmatters, LLC)<br>PO Box 468<br>Old Orchard Beach, ME<br>207-331-2865                   |
| 3.  | Agent:                               | Frederic (Rick) Licht, PE, LSE<br>Licht Environmental Design, LLC<br>35 Fran Circle<br>Gray, Maine 04039 |
| 4.  | Engineer:                            | BH2M Engineers<br>28 State Street<br>Gorham, ME 04038                                                    |
| 5.  | Surveyor:                            | Corner Post Land Survey, LLC<br>600 Main Street<br>Springvale, ME<br>207-324-2119                        |
| 6.  | Project Location:                    | 23 Marcel Avenue                                                                                         |
| 7.  | Project Tax Map #/Lot #:             | Tax Map 74, Lot 11 and Tax Map 74, Lot 10-2                                                              |
| 8.  | Existing Zoning:                     | I-2                                                                                                      |
| 9.  | Overlay Zoning:                      | None                                                                                                     |
| 10. | Existing Use:                        | Single-family Residential, Vacant                                                                        |
| 11. | Proposed Use:                        | 14-Units of commercial storage space with unknown tenants                                                |
| 12. | City Approvals Required:             | Site Plan Review/Conditional Use Permit                                                                  |
| 13. | Uses in the Vicinity:                | Industrial, Airport, Residential                                                                         |
| 14. | Parcel Size:                         | 3.4 Acres and 30,928 SF (50 Landry Street)                                                               |
| 15. | Number of Lots/Units in Subdivision: | N/A – Commercial Units                                                                                   |

|     |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16. | Minimum Lot Size Required:<br>Provided:                   | None<br>None                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 17. | Frontage Required:<br>Provided:                           | 50 feet.<br>More than 50 feet                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 18. | Front Setback Required:<br>Provided:                      | 40 feet (Landry Street)<br>50 feet                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 19. | Side Setbacks Required:<br>Provided:                      | 25 feet from non-IN Zones<br>25 feet from non-IN Zones                                                                                                                                                                                                                                                                                                                                                                                                            |
| 20. | Rear Setback Requires:<br>Provided:                       | 25 feet from non-IN Zones<br>25 feet from non-IN Zones                                                                                                                                                                                                                                                                                                                                                                                                            |
| 21. | Height Requirements:<br>Provided:                         | Maximum 6 stories, 60 feet<br>Less than 6 stories, 60 feet                                                                                                                                                                                                                                                                                                                                                                                                        |
| 22. | Water Supply:                                             | Maine Water (Public)                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 23. | Sewerage Disposal:                                        | City of Biddeford                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 24. | Solid Waste Disposal:                                     | Private Hauler                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 25. | Fire Protection:                                          | City of Biddeford                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 26. | Floodplain Status:                                        | None                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 27. | Wetland/Surface Water Impacts:                            | 8,316 SF Freshwater Wetlands Fill                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 28. | Soil Study Provided:                                      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 29. | Parking Spaces Required:                                  | Assuming the use is "Building materials storage and sales" the parking requirement is 1 space per 500 square feet = 69 spaces.                                                                                                                                                                                                                                                                                                                                    |
| 30. | Parking Spaces Provided (total):<br># Handicapped Spaces: | 69<br>4                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 31. | Ownership of Road:                                        | Marcel Avenue and Landry Street are City Streets                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 32. | Impervious Surface Area:                                  | 2.01 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 33. | Total Disturbed Area:                                     | 3.03 acres developed                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 34. | Estimated Site Development Costs:                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 35. | Financial Capacity Letter:                                | Previously submitted.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 36. | Waivers Needed:                                           | <ol style="list-style-type: none"> <li>1. LDR, Article VI, Section 26.F – cut/fill slopes within 10' of a property line and steeper than 3:1;</li> <li>2. LDR, Article VI, Section 49, 5 &amp; 10 – screen parking from adjacent residential properties and public roads;</li> <li>3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;</li> <li>4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving.</li> </ol> |
| 37. | Waivers Granted:                                          | <ol style="list-style-type: none"> <li>1. LDR, Article VI, Section 26.F – cut/fill slopes within 10' of a property line and steeper than 3:1;</li> </ol>                                                                                                                                                                                                                                                                                                          |



|     |                                                                  |                                                                                                                                                                                                                                                                                 |
|-----|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                  | 2. LDR, Article VI, Section 49, 5 & 10 – screen parking from adjacent residential properties and public roads;<br>3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;<br>4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving. |
| 38. | Variances Needed for Approval:                                   | None                                                                                                                                                                                                                                                                            |
| 39. | Other Permits Obtained:                                          | N/A                                                                                                                                                                                                                                                                             |
| 40. | Other Non-City Permits Required:                                 | Maine DEP Stormwater<br>Maine DEP NRPA<br>Army Corps of Engineers.                                                                                                                                                                                                              |
| 41. | Covenants, By-laws, Restrictions Required by the Planning Board: | None                                                                                                                                                                                                                                                                            |
| 40. | LDR Attachment A: Fees Paid:                                     | Yes                                                                                                                                                                                                                                                                             |
| 41. | Planning Board Review History:<br>Final Plan REAPPROVAL:         | August 18, 2021                                                                                                                                                                                                                                                                 |

### EXISTING CONDITIONS

The proposed property is now vacant (previously contained a single-family home). Although located in an I-2 Zone, the lot(s) is at the beginning of Marcel Avenue which is primarily residential.



2. PROJECT PROPOSAL

See attached application package materials for more information.

3. STAFF REVIEW

- A. ZONING: The proposed use (Contractor Storage/Storage) is a Conditional (C) in the I-2 Zone.
- B. REVIEW STANDARDS: Site Plan Review (Article XI), Conditional Uses (Article VII), Performance Standards (Article VI).
- C. WAIVERS: The applicant has requested the following waivers:
  - 1. LDR, Article VI, Section 26.F – cut/fill slopes within 10' of a property line and steeper than 3:1;
  - 2. LDR, Article VI, Section 49, 5 & 10 – screen parking from adjacent residential properties and public roads;
  - 3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;
  - 4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving.
- D. OUTSTANDING ITEMS TO BE ADDRESSED PRIOR TO FINAL APPROVAL:

None.

4. STAFF RECOMMENDATION

WAIVERS:

Recommend considering the applicant's requests for the following waivers:

- 1. LDR, Article VI, Section 26.F – cut/fill slopes within 10' of a property line and steeper than 3:1;
  - 2:1 slopes are used to minimize impacts to wetlands as well as fit the project into the site. Staff have no issue with allowing 2:1 slopes given they will be stabilized and recommend this waiver be granted.
- 2. LDR, Article VI, Section 49, 5 & 10 – screen parking from adjacent residential properties and public roads;
  - Applicant proposes to leave the vegetation in its natural state as a buffer between it and the neighboring properties to the south. They do propose adding 16 arborvitaes to buffer the closest residential use on Marcel Avenue and staff have no issue with granting this waiver.
- 3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;

- There is a small (2 foot +/-) strip along the northern access road that would be paved as part of the driveway. Staff are of the opinion that this is inconsequential since stormwater is being managed adequately within the site and have no issue with granting the waiver.
- 4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving.
  - This standard often does not apply since it is designed to represent a ration of building footprint to paving. Staff recommend removing this standard in a future updates of the Ordinance, but for now recommend it be waived.

#### APPROVAL CONSIDERATION:

If the Board approves the project, Staff recommends doing so with the following Conditions of Approval attached which are the same as those attached to the previous approval:

1. **Prior to any ground disturbance or issuance of any permits:**
  - a. A pre-construction meeting with the contractor needs to be held with the Engineering Department to discuss inspection requirements.
  - b. A stormwater mitigation fee of \$21,750.00 shall be paid to the Planning Department.
  - c. An Erosion and Sedimentation Control Performance Guarantee (acceptable to the Planning Department) in an amount to be determined by the City shall be submitted to the Planning Department.
  - d. Salt Management Plan to be provided for review and approval by the Planning Department.
2. **Prior to issuance of any occupancy permits:**
  - a. A compliance inspection needs to occur by the Engineering Department to determine that all site improvements as shown on the submitted plan were constructed in accordance with the approved plans.
  - b. A performance guarantee (acceptable to the Engineering Department) in the amount of 150% of any remaining site improvements shall be submitted to the Planning Department. Amount to be determined based on City inspections and the recommendation of the City Engineer.
3. Conditional Use Permit approval for this project is limited to the following:
  - Air transportation dependent use
  - Contractor's storage yard
4. Outside storage and/or display is prohibited.
5. Snow storage (temporary or otherwise) is prohibited from stormwater management facilities.
6. Best management practices shall be adhered to during all ground disturbance operations.
7. All erosion and sediment control measures need to be installed. Applicant shall notify the Engineering Department once installed so that Staff may inspect said installation, as necessary.

8. Copies of the maintenance logs for the stormwater facilities shall be submitted to the City for each calendar year no later than January 15<sup>th</sup> of the following year. If the Engineering Department does not receive these copies within 30 days after the deadline, the applicant may be required to return to the Planning Board for further review.
9. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc., prior to commencing business, unless authority issuing said permit allows for such actions.
10. Once completed, as-built drawings of the site shall be provided to the Planning Department.
11. Upon completion of the work the project engineer shall certify that the project has been completed as per the approved plans or shall note any deviations from the approved plans.
12. Standard Conditions of Approval apply.

5. NEXT STEPS/SUGGESTED ACTIONS

- Listen to any public comment and consider REAPPROVING the Site Plan and Conditional Use Permit as presented.
- See the Board Packet Summary for suggested motions.

**FINDINGS OF FACT AND CONCLUSIONS OF LAW  
SITE PLAN AND CONDITIONAL USE PERMIT**

Pursuant to the provisions of the City of Biddeford Land Development Regulations, Articles XI (Site Plan Review) and VII (Conditional Uses) the Biddeford Planning Board has considered the application of Dempsey, LLC (Landmatters, LLC) including supportive data, public hearing testimony and related materials contained in the record. Based on Public Comment and Staff's review and recommendation, the Planning Board makes the following Findings of Fact and Conclusions of Law:

**Findings of Fact:**

|     | <b><i>SUBJECT</i></b>                | <b><i>DATA/INFORMATION</i></b>                                                                           |
|-----|--------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1.  | Applicant:                           | Dempsey, LLC (Landmatters, LLC)<br>PO Box 468<br>Old Orchard Beach, ME<br>207-331-2865                   |
| 2.  | Owner of Property:                   | Dempsey, LLC (Landmatters, LLC)<br>PO Box 468<br>Old Orchard Beach, ME<br>207-331-2865                   |
| 3.  | Agent:                               | Frederic (Rick) Licht, PE, LSE<br>Licht Environmental Design, LLC<br>35 Fran Circle<br>Gray, Maine 04039 |
| 4.  | Engineer:                            | BH2M Engineers<br>28 State Street<br>Gorham, ME 04038                                                    |
| 5.  | Surveyor:                            | Corner Post Land Survey, LLC<br>600 Main Street<br>Springvale, ME<br>207-324-2119                        |
| 6.  | Project Location:                    | 23 Marcel Avenue                                                                                         |
| 7.  | Project Tax Map #/Lot #:             | Tax Map 74, Lot 11 and Tax Map 74, Lot 10-2                                                              |
| 8.  | Existing Zoning:                     | I-2                                                                                                      |
| 9.  | Overlay Zoning:                      | None                                                                                                     |
| 10. | Existing Use:                        | Single-family Residential, Vacant                                                                        |
| 11. | Proposed Use:                        | 14-Units of commercial storage space with unknown tenants                                                |
| 12. | City Approvals Required:             | Site Plan Review/Conditional Use Permit                                                                  |
| 13. | Uses in the Vicinity:                | Industrial, Airport, Residential                                                                         |
| 14. | Parcel Size:                         | 3.4 Acres and 30,928 SF (50 Landry Street)                                                               |
| 15. | Number of Lots/Units in Subdivision: | N/A – Commercial Units                                                                                   |



|     |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16. | Minimum Lot Size Required:<br>Provided:                   | None<br>None                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 17. | Frontage Required:<br>Provided:                           | 50 feet.<br>More than 50 feet                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 18. | Front Setback Required:<br>Provided:                      | 40 feet (Landry Street)<br>50 feet                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 19. | Side Setbacks Required:<br>Provided:                      | 25 feet from non-IN Zones<br>25 feet from non-IN Zones                                                                                                                                                                                                                                                                                                                                                                                                            |
| 20. | Rear Setback Requires:<br>Provided:                       | 25 feet from non-IN Zones<br>25 feet from non-IN Zones                                                                                                                                                                                                                                                                                                                                                                                                            |
| 21. | Height Requirements:<br>Provided:                         | Maximum 6 stories, 60 feet<br>Less than 6 stories, 60 feet                                                                                                                                                                                                                                                                                                                                                                                                        |
| 22. | Water Supply:                                             | Maine Water (Public)                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 23. | Sewerage Disposal:                                        | City of Biddeford                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 24. | Solid Waste Disposal:                                     | Private Hauler                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 25. | Fire Protection:                                          | City of Biddeford                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 26. | Floodplain Status:                                        | None                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 27. | Wetland/Surface Water Impacts:                            | 8,316 SF Freshwater Wetlands Fill                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 28. | Soil Study Provided:                                      | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 29. | Parking Spaces Required:                                  | Assuming the use is “Building materials storage and sales” the parking requirement is 1 space per 500 square feet = 69 spaces.                                                                                                                                                                                                                                                                                                                                    |
| 30. | Parking Spaces Provided (total):<br># Handicapped Spaces: | 69<br>4                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 31. | Ownership of Road:                                        | Marcel Avenue and Landry Street are City Streets                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 32. | Impervious Surface Area:                                  | 2.01 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 33. | Total Disturbed Area:                                     | 3.03 acres developed                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 34. | Estimated Site Development Costs:                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 35. | Financial Capacity Letter:                                | Previously submitted.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 36. | Waivers Needed:                                           | <ol style="list-style-type: none"> <li>1. LDR, Article VI, Section 26.F – cut/fill slopes within 10’ of a property line and steeper than 3:1;</li> <li>2. LDR, Article VI, Section 49, 5 &amp; 10 – screen parking from adjacent residential properties and public roads;</li> <li>3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;</li> <li>4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving.</li> </ol> |
| 37. | Waivers Granted:                                          | <ol style="list-style-type: none"> <li>1. LDR, Article VI, Section 26.F – cut/fill slopes within 10’ of a property line and steeper than 3:1;</li> </ol>                                                                                                                                                                                                                                                                                                          |

|     |                                                                  |                                                                                                                                                                                                                                                                                 |
|-----|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                  | 2. LDR, Article VI, Section 49, 5 & 10 – screen parking from adjacent residential properties and public roads;<br>3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;<br>4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving. |
| 38. | Variances Needed for Approval:                                   | None                                                                                                                                                                                                                                                                            |
| 39. | Other Permits Obtained:                                          | N/A                                                                                                                                                                                                                                                                             |
| 40. | Other Non-City Permits Required:                                 | Maine DEP Stormwater<br>Maine DEP NRPA<br>Army Corps of Engineers.                                                                                                                                                                                                              |
| 41. | Covenants, By-laws, Restrictions Required by the Planning Board: | None                                                                                                                                                                                                                                                                            |
| 40. | LDR Attachment A: Fees Paid:                                     | Yes                                                                                                                                                                                                                                                                             |
| 41. | Planning Board Review History:<br>Final Plan REAPPROVAL:         | August 18, 2021                                                                                                                                                                                                                                                                 |

**Conclusions of Law:**

1. The proposed use meets specific requirements set forth in this ordinance and would be in compliance with applicable state or federal laws;
2. The proposed use would not create fire safety hazards by providing adequate access to the site, or to the buildings on the site, for emergency vehicles and would not create hazards through the storage of chemicals and wastes;
3. The proposed exterior lighting, where allowed, would not create hazards to motorists traveling on adjacent public streets or is adequate for the safety of occupants or users of the site or would not damage the value and diminish the usability of adjacent properties;
4. The provisions for buffers and on-site landscaping provide adequate protection to neighboring properties from detrimental or unsightly features of the development;
5. The proposed use would not have a significant, detrimental effect on the use and peaceful enjoyment of abutting property as the result of noise, vibrations, fumes, odor, dust, glare, hours of operation, or other causes;
6. The provisions for vehicular loading and unloading and parking and for vehicular and pedestrian circulation on the site and onto adjacent public streets would not create hazards to public safety or traffic congestion;
7. The proposed use would generate a volume of traffic that can reasonably be accommodated by the existing road network, or would not create unreasonable traffic hazards or would not exacerbate an existing traffic hazard, or would not create unreasonable traffic congestion;
8. The proposed use would not have a significant, detrimental effect on the value of adjacent properties, which could be avoided by reasonable modification of the proposal;

9. The proposed use would not have an adverse impact on the privacy of the residents of the immediate area (within 500 feet) which could be avoided by reasonable modification of the proposal;
10. The proposed use would be in compliance with Biddeford's comprehensive plan;
11. The proposed use would not have an adverse impact on the immediate neighborhood or the community relative to architectural design, scale, bulk and building height, identity and historical character, or visual integrity, which could be avoided by reasonable modification of the proposal;
12. The design of the site would not result in significant flood hazards or flood damage or would be in conformance with applicable flood hazard protection requirements;
13. Adequate provision has been made for disposal of wastewater or solid waste or for the prevention of ground or surface water contamination;
14. Adequate provision has been made to control erosion or sedimentation;
15. Adequate provision has been made to handle stormwater runoff or other drainage problems on the site; and the proposed development will not unduly burden off-site surface water systems;
16. The proposed water supply would meet the demands of the proposed project (and for fire protection purposes, if applicable);
17. Adequate provision has been made for the transportation, storage, and disposal of hazardous substances and materials as defined by state law;
18. The proposed use would not have an adverse impact on scenic vistas, historic sites, archeological resources, or on significant wildlife habitat or wetland areas and water bodies, which could be avoided by reasonable modification of the proposal; and
19. When located in the Shoreland Zone, the proposed use would meet the purposes of Shoreland Zoning as identified in Article XIV, Section 1 (Purposes) of this ordinance.

**Determination:**

Based on the evidence available and the conclusions above, the Biddeford Planning Board approves the Site Plan Review application of Dempsey, LLC (Landmatters, LLC) for the proposed project summarized above, located at Map 74, Lot 11 and Lot 10-2, City of Biddeford Tax Maps, in accordance with the submitted application, supporting data, representations made, other related materials on file, and the following Conditions of Approval:

1. **Prior to any ground disturbance or issuance of any permits:**
  - a. **A pre-construction meeting with the contractor needs to be held with the Engineering Department to discuss inspection requirements.**
  - b. **A stormwater mitigation fee of \$21,750.00 shall be paid to the Planning Department.**

- c. **An Erosion and Sedimentation Control Performance Guarantee (acceptable to the Planning Department) in an amount to be determined by the City shall be submitted to the Planning Department.**
  - d. **Salt Management Plan to be provided for review and approval by the Planning Department.**
2. **Prior to issuance of any occupancy permits:**
  - a. **A compliance inspection needs to occur by the Engineering Department to determine that all site improvements as shown on the submitted plan were constructed in accordance with the approved plans.**
  - b. **A performance guarantee (acceptable to the Engineering Department) in the amount of 150% of any remaining site improvements shall be submitted to the Planning Department. Amount to be determined based on City inspections and the recommendation of the City Engineer.**
3. **Conditional Use Permit approval for this project is limited to the following:**
  - **Air transportation dependent use**
  - **Contractor's storage yard**
4. **Outside storage and/or display is prohibited.**
5. **Snow storage (temporary or otherwise) is prohibited from stormwater management facilities.**
6. **Best management practices shall be adhered to during all ground disturbance operations.**
7. **All erosion and sediment control measures need to be installed. Applicant shall notify the Engineering Department once installed so that Staff may inspect said installation, as necessary.**
8. **Copies of the maintenance logs for the stormwater facilities shall be submitted to the City for each calendar year no later than January 15<sup>th</sup> of the following year. If the Engineering Department does not receive these copies within 30 days after the deadline, the applicant may be required to return to the Planning Board for further review.**
9. **The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc., prior to commencing business, unless authority issuing said permit allows for such actions.**
10. **Once completed, as-built drawings of the site shall be provided to the Planning Department.**
11. **Upon completion of the work the project engineer shall certify that the project has been completed as per the approved plans or shall note any deviations from the approved plans.**
12. **Standard Conditions of Approval apply.**

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Planning Board Chairman

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Date

Greg Tansley AICP  
City of Biddeford Planning Department  
Biddeford ME 04005

August 11. 2021

Dear Greg;

Attached you will find a check in the amount of \$2,775 to cover the fee's in accordance with your request to supplement the June 18th Submittal for Dempsey Drive reapproval.

As you are aware on June 18th I submitted, at your request, a new application, ten sets of the already approved plans (City approval NOD # November 12 2019), a deed from Belanger estate to Dempsey LLC which shows my rights in owner ship and interest.

I have also retained Rick Licht PE, LSE to represent me for any Engineering services I may require and will not be using BH2M as shown on the application submitted on the 18th.

I emailed the final plan set and building elevations to you this morning, Let me know if you need anything else.

I look forward to next weeks meeting so we can get this project back on track.

Respectfully Submitted,

Dempsey LLC,  
Thomas Gillis



Greg Tansley AICP  
City of Biddeford Planning Department  
Biddeford ME 04005

July 23, 2021

Dear Greg;

Attached you will find supplemental material you requested to add to my June 18th Submittal for the Dempsey Drive reapproval.

One June 18th I submitted, at your request, a new application, ten sets of the already approved plans (City approval NOD # November 12 2019), a deed from Belanger estate to Dempsey LLC which shows my rights in owner ship and interest.

According to the Notice of Decision, the approval "shall be valid for one year from date of said approval" it further states "If a building permit/occupancy permit has not been issued, the said approval shall become automatically null and void."

I would like to remind you that from the end of March 2020 we were in a world wide global pandemic and the zoom meetings to move this project forward sometimes took weeks and even months to schedule and complete. In fact on October 14, 2020 I was working with your office to make application for a conditional use permit. I point this out to show I was actively involved in moving this project forward and had no intention of abandoning it.

I had anticipated being on the agenda for the Biddeford planning board on July 21 as I had provided everything requested by you for that meeting on June 18th. And according to our meeting last Monday you stated you were preparing to place me on the agenda except for a communication with the previous engineers BH2M.

Somehow, according to a conversation had by yourself, Cris Johnson and me on Monday July 19, you had received misinformation from BH2M, You claimed that the plans were not mine to use and BH2M refused to let me use them.

You pulled my submission off the agenda with out reaching out to me for confirmation of this statement. You allowed me to find out on my own that my submittal had been removed and never informed me of this even though you assured me on June 18th I would be place on the July 7th or worse case July 21st meeting.

Monday when Cris Johnson asked you if you had consulted counsel about the ownership of the Dempsey plans, your response was: *"I don't have permission or authorization to consult the town attorney."..... "I'm letting you know what we were told."*

This delay caused by your misinterpretation of what BH2M stated has caused me harm and costly damages.

In accordance with your email of July 20th. I am now submitting 2 new sets of plans, copies of the June 18th application duly notarized, the original drainage report and a cost estimate on the town's form as well as a deed showing right, title and interest.

I am completely baffled as to why you need a copy of the original drainage report as this project is currently approved (#.L-28330-TB-A-N and L-28330-NB-B-N ) by the Maine Department of Environmental Protection for the previously approved plan. I have also included this approval and a copy of the Army Corp of engineers. Both of these approvals are still valid and remain intact. Although you did not ask for them,I included them anyway

Your request for an additional set of ten plans is also a concern. The 10 copies that I delivered on June 18 were the exact ones approved by the town and provided to me from BH2M if scale of these plans was an issue in the original approval it should have been brought up then. As you know from BH2M's Email (also attached) any alteration of these plans would void the engineers seal, so these plans must be approved as they where in November of 2019.

Since the original submittal was completed on June 18, I ask that this re approval be placed on the first Meeting of the board in August as you are interfering with the completion of this project.

Also in your email you questioned my ability to carry this project forward without BH2M involved, all you had to do is ask me. Besides having over 45 years of Engineering, surveying and construction background and also having worked for the largest private engineering company in the world (Lewis Berger) as well a the City of Manchester NH Highway department. I was also co owner of Gillis Engineering in Manchester for over 20 years.

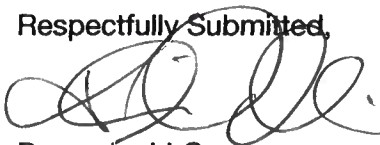
In fact I personally have already established both horizontal and vertical control on the project and begun layout of the buildings within acceptable standards. If something I feel something is outside my expertise I will hire someone duly qualified. Questioning my abilities seems to hold a bit of prejudice toward me.

I would also like to note that after consulting legal I was advised that all waivers granted on this project do not expire with the previous November approval and are still valid.

I would hope the mistake you made by not seeking proper legal advice from you City's council before pulling my application from the agenda will not continue to hinder the reapproval of this project. I feel it is a good project for the City and in accordance with the long term goals of the airports interest.

Although I feel this previously approved project could be reapproved in an administrative fashion just by putting it before the board for a vote as nothing has changed since the original approval. I am complying with your wishes to resubmit everything I do not understand why you keep closing the gate on Dempsey Drive and Dempsey LLC's ability to move forward.

Respectfully Submitted,



Dempsey LLC,  
Thomas Gillis

**CITY OF BIDDEFORD, MAINE**  
**PLANNING BOARD**  
P.O. Box 586, 205 Main Street Biddeford, Maine 04005  
207-284-9115

**APPLICATION FORM**

**Type of Application:**

- ☐ Shoreland Zoning Permit      ☒ Site Plan Review      ☐ Extraction  
☐ Conditional Use Permit      ☐ Subdivision      ☐ Private Way  
☒ Other: Resubmission of Approved SITE PLAN (ATTACHED)

**Applicant Information:**

Applicant's Name: DEMPSEY LLC / THOMAS GILLIS  
Applicant's Mailing Address: P.O. Box 468 OOB ME 04064  
Applicant's Telephone: 207-331-2865

What is Applicant's legal interest in the property?

- ☒ Owner      ☐ Potential Buyer with Contract      ☐ Lease/Rental Agreement

Owner's Name: Dempsey LLC c/o Thomas Gillis  
Owner's Address: P.O. Box 468 - OOB ME 04064  
Owner's Telephone: 207-331-2865

Agent's Name: THOMAS GILLIS  
Agent's Address: P.O. Box 468 OOB ME 04064  
Telephone: 207-331-2865

Engineer/Surveyor: Steve Blake PE# 11695 BH2M  
Engineer/Surveyor's Address: 28 State St Gorham Maine 04038  
Telephone: 207-839-2771

**Project Location and Lot Information:**

Street Address: 23 Marcel Avenue  
Tax Map: 74 Lot: 11 MAP 74 LOT 10-2  
Current Zoning: I-2 Shoreland Zoning: \_\_\_\_\_

Size of lot: 4.17 ☒ acres ☐ s.f. Lot Frontage: 269.42

Existing Use of Property: Single Family House

Property currently serviced by:

☒ City Road

☐ Private Road

☒ Public Sewer

☐ Septic System

☒ Public Water

☐ Private Well

☒ Public Trash

☐ Private Hauler

Slope Conditions in Area of Construction (if applicable):

☒ Flat (0-3 % slope) ☐ Rolling (3-8% slope) ☐ Hilly (8-15% slope) ☐ Steep (15% + slope)

Are there any wetlands or waterbodies on the site? ☒ Yes ☐ No If yes, attach information

Do you plan to bring fill onto the lot? ☒ Yes ☐ No If yes, attach information

**Description of proposed use of property:**

Project/Proposed Use Description: 14 Storage Units.  
SITE will be served by an internal drive from  
LAUDRY STREET. Minimal wetlands impact  
TEIR 1 permit (Approved) Fill Required for Project

Property to be serviced by:

☒ City Road

☐ Private Road

☒ Public Sewer

☐ Septic System

☒ Public Water

☐ Private Well

☐ Public Trash

☒ Private Hauler

Is this project part of a larger project? ☐ Yes ☒ No

☐ If in a Shoreland Zone:

Percent of residential lot coverage (Max. 20%): \_\_\_\_\_

Percent of structure expansion (Max. 30%): \_\_\_\_\_

☐ If Subdivision Review, number of lots proposed: \_\_\_\_\_☐ If a Private Way is proposed, number of lots served: \_\_\_\_\_☐ If Site Plan Review, you must provide the following information:Total new square feet footprint of structures: 31,800 s.f.Total new square feet paving/parking: 61,531 s.f.

## Waiver Requests (attach details):

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Attachments:**

## A. Letters of Approval

- ☒ Fire Department - Contact Chief or Deputy Chief - 282-9986
- ☒ Ability to Serve for Water Service – Maine Water - 282-1543
- ☒ Ability to Serve for Sewer Service- Engineering Dept (Sewer) - Tom Milligan 284-9118
- ☒ Police Department - E-911 Road Name Designation - Contact Joanne Fisk - 282-5127

B. Letter to Planning Board describing project, waiver requests, proposed improvements, addressing permit requirements, etc.

C. Photographs of site.

D. Architectural renderings/drawings of proposed buildings, as required.

E. Engineered Plans, as required.



**Fees (due at time of application):**

Refer to "Attachment A Fees and Charges" of the Land Development Regulations for more information. Consult with Planning Staff if you have questions.

**Required Signatures:**

By signing this application, as the foresaid applicant or authorized agent:

- I certify that I have read and completely understand the application;
- I certify that the information contained in this application and it's attachments are true and correct;
- I understand that all information provided on this form and all other documents submitted as part of my proposal is a matter of public record;
- I understand that copies of this information may be supplied upon request to an interested party.
- I understand that additional funds may be required through the course of review for special studies, legal review costs, and/or engineering review.
- I understand that by submitting this application I am not guaranteed a place on any particular agenda. I further understand that the City Planner will place me on an agenda for review when the application is deemed substantially complete.

☒ Project proposed to have 1 acre or more of site disturbance:

**-Project may need to apply for a Maine Construction General Permit and shall comply with the requirements of DEP Chapter 500 Stormwater Regulations, as they apply.**

**Signature of applicant:**



Date: 6/18/21

**Signature of owner of property:**



Date: 6/18/21

**IF PLAN APPROVAL IS ANTICIPATED, PROVIDE 2 FULL SIZE MYLARS & 2 FULL SIZE PAPER COPIES FOR BOARD SIGNATURE (AS APPLICABLE).  
CHECK WITH PLANNING STAFF FOR CLARIFICATION.**

**CHECKLIST FOR  
SITE PLAN  
REQUIREMENTS**

**YES**   **NO**

- |                                     |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Be on sheet size of 24 by 36 inches.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The scale of said plan shall be not less than one inch equals 50 feet and shall be indicated on the plat by use of a bar scale.                                                                                                                                                                                                                                                                                                                                         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The plan shall bear the date, title, north point.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The plan shall contain a location or vicinity sketch (suggested scale one inch equals 800 feet).                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The plan shall contain the name and address of the developer and applicant.                                                                                                                                                                                                                                                                                                                                                                                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | All appropriate dimensional requirements.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <input type="checkbox"/>            | <input type="checkbox"/> | Existing and proposed easements. N/A                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Plan of the site showing existing watercourses and water bodies, seasonal wet areas.                                                                                                                                                                                                                                                                                                                                                                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Plan of the site showing soil type and location of test borings.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Location of all existing and proposed utilities.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Topographic contours (every five percent for zero to three percent slope; or every two feet for steeper areas).                                                                                                                                                                                                                                                                                                                                                         |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Plan should include preservation and supplementation of existing dominant vegetation.                                                                                                                                                                                                                                                                                                                                                                                   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Plan shall indicate which features are to be retained and which are to be removed or altered.                                                                                                                                                                                                                                                                                                                                                                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Location of stone walls, graveyards, fences, stands of trees, and other important unique natural areas and site features, including but not limited to floodplains, deer wintering areas, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, sand and gravel aquifers, and historic and/or archaeological resources, together with description of such features. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Plan view of all buildings with their use, size, location, and first-floor elevation in respect to grade.                                                                                                                                                                                                                                                                                                                                                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Standard elevation view of existing and proposed buildings or structures on-site.                                                                                                                                                                                                                                                                                                                                                                                       |

**YES   NO**

- |                                     |                          |                                                                                                                                                                                                                                                 |
|-------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Outline of any buildings located within 200 feet of such existing or proposed buildings or structures indicating their shape, size, location, heights and volume.                                                                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Existing use of abutting properties shall be identified with approximate location of any structures thereon including access roads.                                                                                                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Location, width, curbing, and paving of access ways, egress ways, and streets within the site for both pedestrian and vehicular use.                                                                                                            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The location of off-street parking and loading spaces with a layout of the parking indicated.                                                                                                                                                   |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The size and proposed location of water mains and sanitary sewerage facilities will all necessary engineering data.                                                                                                                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The size and location of all other existing and proposed public service connections including, without limitation, gas lines, power lines, telephone lines, and fire alarm connections and locations, indicating whether above or below ground. |
| <input type="checkbox"/>            | <input type="checkbox"/> | The type, nature, and composition of all solid, liquid, and gaseous waste, industrial or otherwise, and the location, type, and design criteria of the storage and disposal facilities dealing with such waste. N/A                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | A landscape plan and open space areas indicating grade change, vegetation to be preserved, new plantings used to stabilize areas of cut and fill, screening; plus size, location, purpose and type of vegetation.                               |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | A drainage plan including location, elevation, layout of catch basins and other surface and subsurface drainage features.                                                                                                                       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Location, size and design of proposed signs and other advertising or instructional devices.                                                                                                                                                     |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Existing and proposed contours and finished grade elevations as well as the type, extent, and location of existing and proposed landscaping and open space areas which will be retained.                                                        |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Location and type of lighting for outdoor facilities.                                                                                                                                                                                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Lines of existing and proposed abutting streets showing width.                                                                                                                                                                                  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Surveyed property lines showing their bearing and distances and monument locations.                                                                                                                                                             |
| <input type="checkbox"/>            | <input type="checkbox"/> | If subdivision is involved, the lines and names of all proposed streets, lanes, ways, or easements intended to be dedicated for public or private use. N/A                                                                                      |

# DEMPSEY DRIVE

MARCEL AVENUE, BIDDEFORD MAINE 04005

For  
DEMPSEY, LLC  
P.O. BOX 468  
OLD ORCHARD BEACH, MAINE 04064

## PLAN INDEX

- 1 SITE PLAN
- 2 STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS PLAN
- 3 EROSION CONTROL DETAILS
- 4 STANDARD DETAILS A
- 5 STANDARD DETAILS B
- 6 STANDARD DETAILS C
- 7 LIGHTING AND LANDSCAPING PLAN



*Berry, Huff, McDonald, Milligan Inc.*  
*Engineers, Surveyors*

28 State Street  
Gorham, Maine 04038

Tel. (207) 839-2771  
Fax (207) 839-8250



| <u>SYMBOL</u>                                                                     | <u>DESCRIPTION</u>               |
|-----------------------------------------------------------------------------------|----------------------------------|
|  | STONE MONUMENT FOUND             |
|  | GRANITE MONUMENT FOUND           |
|  | IRON PIPE/ROD FOUND              |
|  | CAPPED IRON ROD FOUND (PLS#2190) |
|  | 5/8" IRON ROD W/ CAP TO BE SET   |
|  | UTILITY POLE                     |
|  | SIGN                             |
|  | HYDRANT                          |
|  | WATER SHUTOFF                    |
|  | SEWER MANHOLE                    |
|  | STREAM                           |
|  | TREE LINE                        |
|  | WETLANDS                         |
|  | PROPERTY LINE                    |
|  | ABUTTER PROPERTY LINE            |
|  | EDGE OF PAVEMENT                 |
|  | EXISTING CONTOUR                 |
|  | ABOVE GROUND                     |
|  | NOW OR FORMERLY SILT FENCE       |

| Q CURVE DATA |                                                                           |
|--------------|---------------------------------------------------------------------------|
| CURVE #1     | R=200.00'<br>L=47.16'<br>T=23.69'<br>C=47.05'<br>PC=0+26.31<br>PT=0+73.47 |
| CURVE #2     | R=200.00'<br>L=83.01'<br>T=42.11'<br>C=82.41'<br>PC=0+99.56<br>PT=1+82.56 |

| STORMDRAIN/SEWER PIPES                              |  |
|-----------------------------------------------------|--|
| P1 - 12" S.D., L=61', S=0.005'/FT.                  |  |
| P2 - 12" S.D., L=60', S=0.005'/FT., INV. OUT 142.30 |  |
| P3 - 12" S.D., L=85', S=0.004'/FT.                  |  |
| P4 - 12" S.D., L=62', S=0.004'/FT.                  |  |
| SS1 - 8" PVC, L=296', S=0.005'/FT.                  |  |
| SS2 - 8" PVC, L=196', S=0.005'/FT.                  |  |
| SS3 - 8" PVC, L=TBD', S=TBD'/FT.                    |  |
| GUSF A & B - 6" PVC, L=464'                         |  |
| GUSF C - 6" PVC, L=91'                              |  |

## STORMDRAIN/SEWER STRUCTURES

|       |                                                         |
|-------|---------------------------------------------------------|
| CB#1  | RIM 146.40<br>12" INV. 143.00                           |
| CB#2  | RIM 147.50<br>15" INV. 144.94                           |
| DMH#1 | RIM 146.90<br>12" INV. IN 142.70<br>12" INV. OUT 142.60 |
| DMH#2 | RIM 147.90<br>15" INV. IN 144.60<br>15" INV. OUT 144.50 |
| SMH#1 | RIM 147.40<br>8" INV. 142.00                            |
| SMH#2 | RIM 147.60<br>8" INV. IN 140.52<br>8" INV. OUT 140.42   |
| SMH#3 | RIM 147.50<br>8" INV. IN 139.44<br>8" INV. OUT 139.34   |

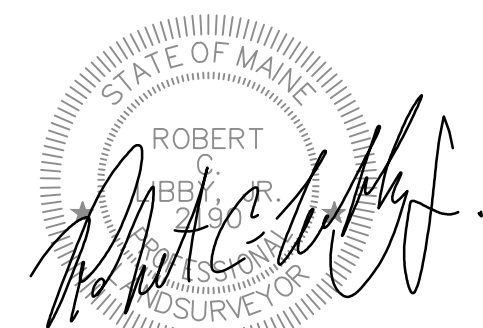
## NOTES:

- OWNER: HEIRS OF CLARENCE BELANGER  
C/O THOMAS BELANGER  
81 SOUTH WATERBORO ROAD  
LYMAN, MAINE 04002  
  
HEIRS OF CLARENCE BELANGER  
23 BELRIDGE TRAIL  
LYMAN, MAINE 4002-7405
- APPLICANT: TOM GILLIS, LANDMATTERS, LLC  
P.O. BOX 468  
OLD ORCHARD BEACH, MAINE 04064
- SURVEYOR: ROBERT C. LIBBY JR., PLS #2190  
BH2M  
28 STATE STREET  
GORHAM, MAINE
- WETLAND DELINEATION: ALEXANDER FINAMORE, CWS, LSE  
440 SWAMP ROAD  
DURHAM, MAINE 04222
- ENGINEER: STEVEN BLAKE, BH2M  
PE #11695
- DEED REFERENCE: BK. 3010, PG. 210 &  
BK. 4303, PG. 149
- TAX MAP REFERENCE: MAP 74, LOT 11 & MAP 74, LOT 10-2
- ZONING: I2, INDUSTRIAL 2
- MINIMUM STANDARDS: FRONTAGE - 50'  
SETBACKS - 30' FRONT-MARCEL AVENUE  
40' FRONT-LANDRY STREET  
25' SIDE AND REAR  
(50' AT RESIDENTIAL DISTRICT)
- LOT AREA: 181,794 S.F. (4.173 ACRES)
- SEWER SERVICE: PUBLIC
- WATER SERVICE: PUBLIC
- ELECTRIC/TELEPHONE: UNDERGROUND
- BENCHMARK: BM A - 4" NAIL IN UTILITY POLE #J1  
0.2' A.G. ON THE NORTH-EASTERLY  
SIDE OF MARCEL AVE., ELEVATION  
141.39 NAVD 88

- WETLAND IMPACTS: WETLAND IMPACT #1.....138 SF  
WETLAND IMPACT #2.....4,416 SF  
WETLAND IMPACT #3.....727 SF  
WETLAND IMPACT #4.....2,999 SF  
WETLAND IMPACT #5.....36 SF  
TOTAL WETLAND IMPACTS.....8,316 SF
- PLAN REFERENCES: A. "PLAN OF RESUBDIVISION OF LOT-1  
AIRPORT IND. PARK II LAND OF THE CITY  
OF BIDDEFORD, ME. ON LANDRY ST. IN,  
BIDDEFORD, ME" DATED AUG. 7, 1984, BY  
THE CITY OF BIDDEFORD, ME. ENGINEERING  
DEPT. RECORDED AT THE YORK REGISTRY  
OF DEEDS BOOK 132 PAGE 23.  
  
B. "PLAN SHOWING A PORTION OF MARCEL  
AVENUE IN, BIDDEFORD, ME" DATED SEPT.  
19, 1986, BY THE CITY OF BIDDEFORD, ME.  
ENGINEERING DEPT. RECORDED AT THE  
YORK REGISTRY OF DEEDS BOOK 160 PAGE  
29.  
  
C. "PLAN SHOWING LAND SURVEYED FOR THE  
CITY OF BIDDEFORD KNOWN AS THE  
BIDDEFORD MUNICIPAL AIRPORT" DATED  
JUNE 8, 1983 BY THE CITY OF BIDDEFORD,  
ME. FILE NO TR-BB11-686"
- PARKING REQUIREMENTS:  
BUILDING MATERIAL STORAGE:  
1 SPACE/500 S.F. OF FLOOR AREA  
34,500 S.F. BUILDING = 69 SPACES  
500 S.F.

I CERTIFY THAT THIS SURVEY CONFORMS  
TO THE MAINE BOARD OF LICENSURE  
FOR PROFESSIONAL LAND SURVEYORS  
TECHNICAL STANDARDS OF PRACTICE FOR  
A STANDARD BOUNDARY SURVEY WITH  
THE FOLLOWING EXCEPTIONS:

- NO SURVEYORS REPORT



ROBERT C. LIBBY JR.

PLS #2190

THIS PLAN REVIEWED AND APPROVED BY THE CITY  
OF BIDDEFORD PLANNING BOARD.

DATE

CHAIR

SITE PLAN

DEMPSEY DRIVE

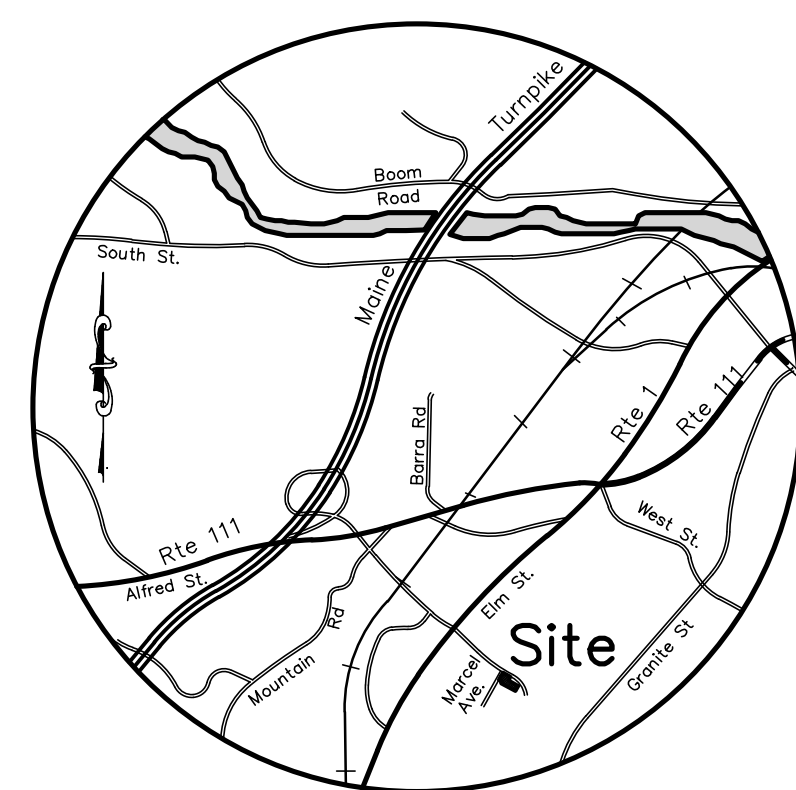
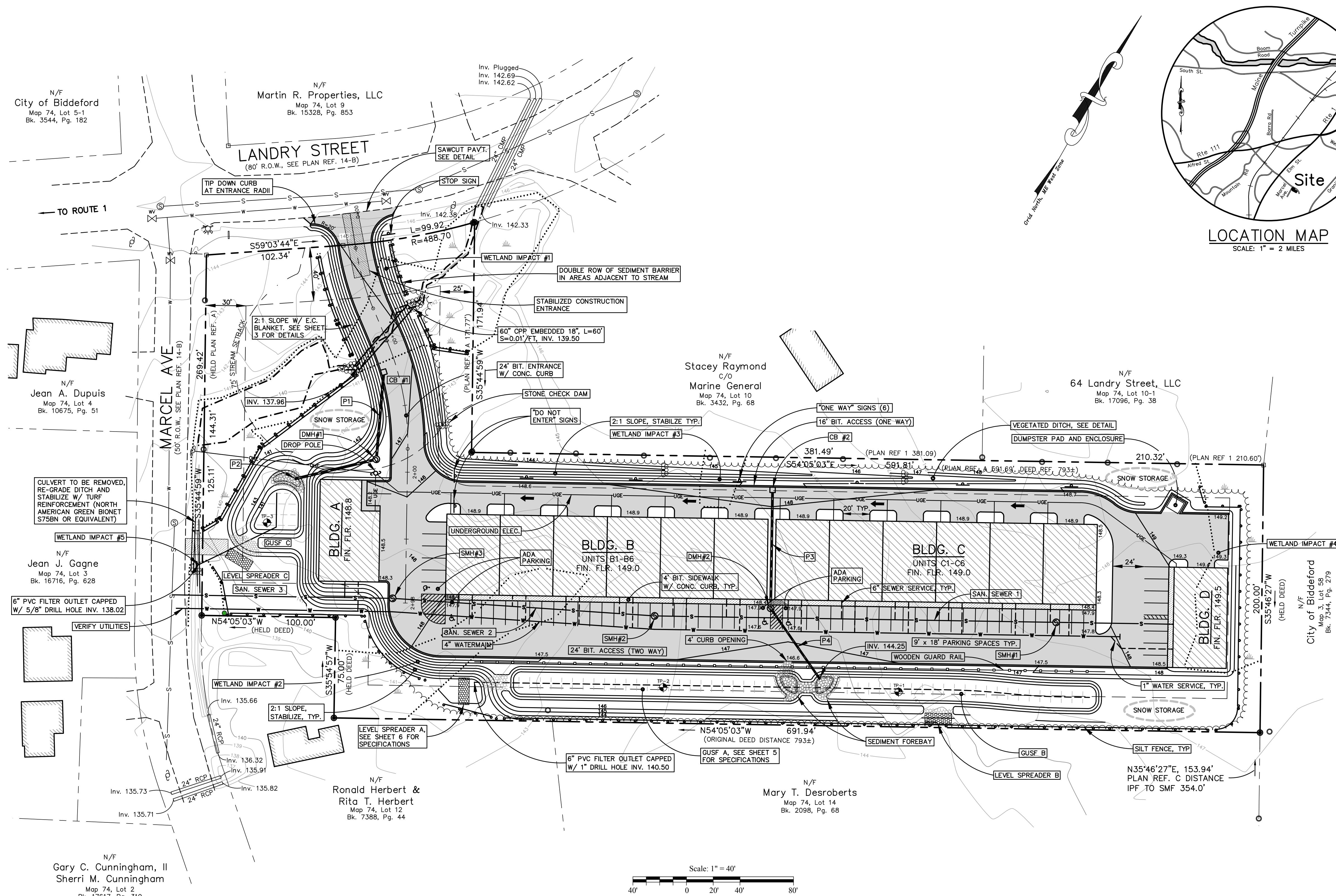
MARCEL AVE  
BIDDEFORD, MAINE

| DESIGNED | DATE      |
|----------|-----------|
| A. Fagan | Mar. 2019 |
| DRAWN    | SCALE     |
| Dept.    | 1" = 40'  |
| CHECKED  | JOB. NO.  |
| S. Blake | 19003     |

SHEET

1

REPRODUCTION OR REUSE OF THIS  
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LOCATION MAP  
SCALE: 1" = 2 MILES

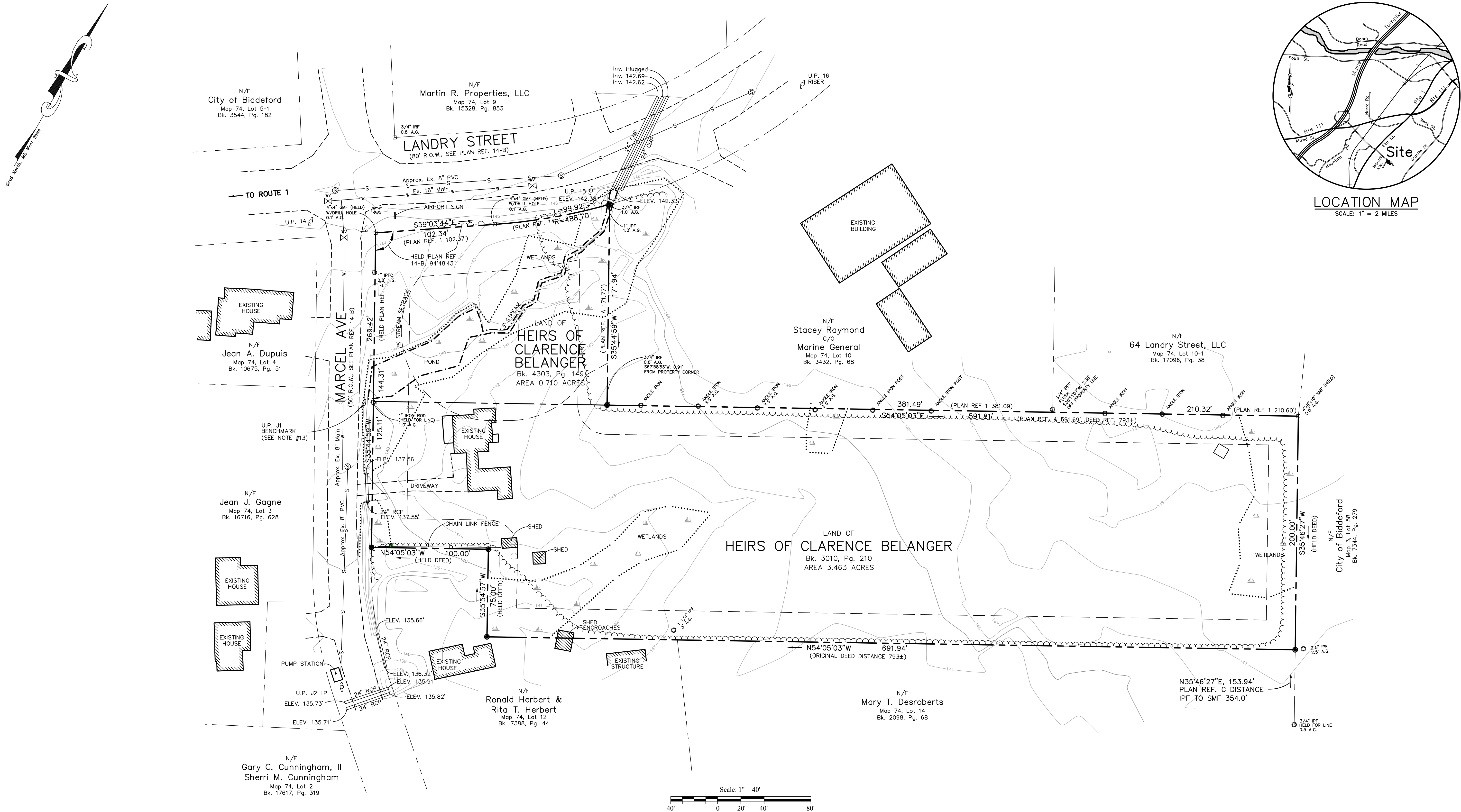


**BH2M**  
Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors

28 State Street  
Portland, Maine 04103  
Tel: (207) 859-9771  
Fax: (207) 859-8250

DEMSEY, LLC  
P.O. Box 468  
Old Orchard Beach, Maine





| SYMBOL | DESCRIPTION                      |
|--------|----------------------------------|
|        | STONE MONUMENT FOUND             |
|        | GRANITE MONUMENT FOUND           |
|        | IRON PIPE/ROD FOUND              |
|        | CAPPED IRON ROD FOUND (PLS#2190) |
|        | 5/8" IRON ROD W/ CAP TO BE SET   |
|        | UTILITY POLE                     |
|        | SIGN                             |
|        | HYDRANT                          |
|        | WATER SHUTOFF                    |
|        | SEWER MANHOLE                    |
|        | STREAM                           |
|        | TREE LINE                        |
|        | WETLANDS                         |
|        | PROPERTY LINE                    |
|        | ABUTTER PROPERTY LINE            |
|        | EDGE OF PAVEMENT                 |
|        | EXISTING CONTOUR                 |
|        | ABOVE GROUND                     |
|        | NOW OR FORMERLY                  |

| SOILS LEGEND             |                     |
|--------------------------|---------------------|
| SYMBOL                   | DESCRIPTION         |
|                          | SOIL BOUNDARY LINES |
|                          | LIMIT OF WETLANDS   |
| SLOPE DESIGNATION        |                     |
| A = 0 - 3%               |                     |
| B = 3 - 8%               |                     |
| C = 8 - 20%              |                     |
| D = 20%+                 |                     |
| HYDROLOGIC SOIL GROUP    |                     |
| SOIL                     | GROUP               |
| CROGHAN LOAMY SAND (CrB) | A/B                 |
| NAUMBURG SAND (Na)       | UNKNOWN             |

I CERTIFY THAT THIS SURVEY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS TECHNICAL STANDARDS OF PRACTICE FOR A STANDARD BOUNDARY SURVEY WITH THE FOLLOWING EXCEPTIONS:

1. NO SURVEYORS REPORT

ROBERT C. LIBBY JR. PLS #2190

NOTES:

- OWNER: HEIRS OF CLARENCE BELANGER  
C/O THOMAS BELANGER  
81 SOUTH WATERBORO ROAD  
LYMAN, MAINE 04002
- SURVEYOR: ROBERT C. LIBBY JR., PLS #2190  
28 STATE STREET  
GORHAM, MAINE
- WETLAND DELINEATION: ALEXANDER FINAMORE, CWS, LSE  
440 SWAMP ROAD  
DURHAM, MAINE 04222
- DEED REFERENCE: BK. 3010, PG. 210 &  
BK. 4303, PG. 149
- TAX MAP REFERENCE: MAP 74, LOT 11 & MAP 74, LOT 10-2
- ZONING: I2, INDUSTRIAL 2
- MINIMUM STANDARDS: FRONTAGE - 50'  
SETBACKS - 30' FRONT, -MARCEL AVENUE  
40' FRONT, -LANDRY STREET  
25' SIDE AND REAR  
(50' AT RESIDENTIAL DISTRICT)
- LOT AREA: 181,794 S.F. (4.173 ACRES)
- BENCHMARK: BM A - 4" NAIL IN UTILITY POLE #J1 0.2'  
ABOVE GRADE ON THE NORTH-EASTERLY  
SIDE OF MARCEL AVE., ELEV. 141.39 NAVD  
88
- ABUTTING STRUCTURES: BUILDINGS ON ABUTTING LOTS ARE SHOWN  
PER THE CITY OF BIDDEFORD GIS.
- PLAN REFERENCES: A. "PLAN OF RESUBDIVISION OF LOT-I  
AIRPORT IND. PARK II LAND OF THE CITY  
OF BIDDEFORD, ME ON LANDRY ST. IN,  
BIDDEFORD, ME" DATED AUG. 7, 1984, BY  
THE CITY OF BIDDEFORD, ME. ENGINEERING  
DEPT. RECORDED AT THE YORK REGISTRY  
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C. "PLAN SHOWING LAND SURVEYED FOR THE  
CITY OF BIDDEFORD KNOWN AS THE  
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JUNE 8, 1963 BY THE CITY OF BIDDEFORD,  
ME. FILE NO TR-BB11-686"

**BH2M**

Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors  
28 State Street  
Biddeford, Maine 04005  
Tel: (207) 839-9771  
Fax: (207) 839-8250

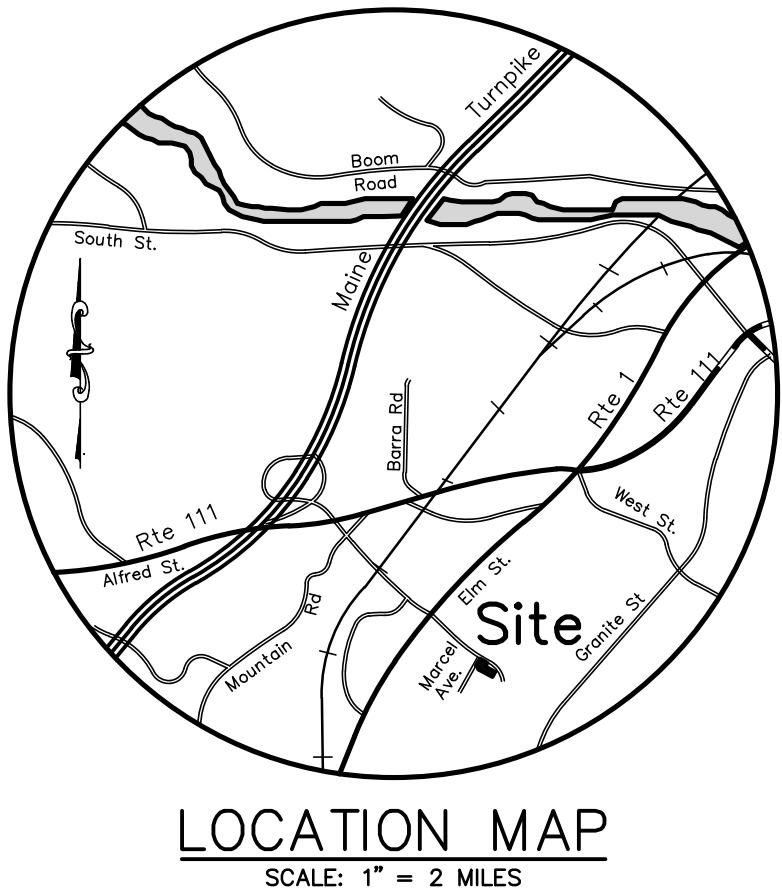
FOR  
DEMPSEY, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

STANDARD BOUNDARY  
SURVEY & EXISTING  
CONDITIONS PLAN

| DESIGNED     | DATE      |
|--------------|-----------|
| Survey       | Mar. 2019 |
| DRAWN        | SCALE     |
| T. Mullen    | 1" = 40'  |
| CHECKED      | JOB. NO.  |
| R. Libby Jr. | 19003     |

SHEET  
2

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EXPRESSED WRITTEN CONSENT  
OF BH2M INC. IS PROHIBITED



| NO. | DATE    | REVISION                                      |
|-----|---------|-----------------------------------------------|
| 1   | 4/10/19 | Submitted Plan For Town Review                |
| 2   | 5/15/19 | Submitted Plan For City Review                |
| 3   | 7/16/19 | Revised Per City Comments                     |
| 4   | 8/14/19 | Revised Per Peer Review                       |
| 5   | 9/11/19 | Revised Per City, Peer Review, & DEP Comments |
| 6   | 9/20/19 | Revised Per DEP Comments                      |



EROSION AND SEDIMENT CONTROL PLAN

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 LATEST REVISION OF TO THE 2003 MAINE EROSION AND SEDIMENT CONTROL BMPs MANUAL FOR DESIGNERS AND ENGINEERS, AND THE LATEST MAINE TO THE 2003 MAINE EROSION AND SEDIMENT CONTROL FIELD GUIDE FOR CONTRACTORS. SEE MANUALS FOR ADDITIONAL INFORMATION AND DETAILS.

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 BMPs" MANUAL, DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST REVISION.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 7 DAYS OF INITIAL DISTURBANCE OF THE PREVIOUS SITE. IF THE DISTURBANCE IS WITHIN 75 FEET OF A WETLAND OR WATERBODY, THE AREA SHALL BE STABILIZED WITHIN 2 DAYS OR PRIOR TO ANY STORM EVENT, WHICHEVER COMES FIRST.
- EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREA SHOULD BE LIMITED TO THAT WHICH CAN BE MULCHED IN ONE DAY.
- 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 MORE THAN ONE ACRE OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION.
- SEDIMENT BARRIERS (EROSION CONTROL MIX, STONE CHOCK DAMS, STABILIZED CONSTRUCTION ENTRANCE, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM. THE CONTRACTOR SHALL MAINTAIN THE STABILIZED CONSTRUCTION ENTRANCE UNTIL ALL DISTURBED AREAS ARE STABILIZED.
- INSTALL EROSION CONTROL MIX AT TOP OF SLOPES TO FILTER SILT FROM RUNOFF. SEE E.C. MIX DETAIL FOR PROPER INSTALLATION. EROSION CONTROL MIX WILL REMAIN IN PLACE PER NOTE #5. THE USE OF AN EROSION CONTROL MIX BERM IS PROHIBITED AT THE BASE OF SLOPES STEEPER THAN 8% OR WHERE THERE IS FLOWING WATER.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED, AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY BEFORE AND FOLLOWING ANY SIGNIFICANT RAINFALL (ONE INCH OR MORE IN A 24-HOUR PERIOD) OR SNOW MELT OR REMOVAL AND LONGER SERVABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE CONTRACTOR BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. WHEN SEDIMENT DEPOSITS 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 STABILIZED BY TURF EROSION CONTROL MEASURES. SHALL BE REMOVED WITHIN 30 DAYS OF PERMANENT STABILIZATION. PERMANENT STABILIZATION IS 90% GRASS CATCH IN VEGETATED AREAS.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN ONE AND ONE HALF TO ONE (1.5 TO 1). EROSION CONTROL MIX IS AN ACCEPTABLE STABILIZATION MEASURE FOR SLOPES UP TO 3:1, WITH LIMITS THAT ARE COVERED BY NOTES ON THIS SHEET. SLOPES BETWEEN 3:1 AND 2:1 SHALL BE STABILIZED WITH EROSION CONTROL BLANKETS, AND ALL SLOPES GREATER THAN 2:1 SHALL BE STABILIZED WITH RIPRAP.
- IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCHING (CORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
- TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED BY AUG. 15 OR 45 DAYS PRIOR TO THE FIRST KILLING FROST (OCT. 1) TO PROTECT FROM SPRING FLOOD PROBLEMS.
- 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 OFF-SITE IN AN ACCEPTABLE MANNER.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION (EXCEPT AS NOTED ABOVE). ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
  - FOUR INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
  - APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 80 POUNDS PER ACRE OR 18.4 POUNDS PER 1000 SQUARE FEET USING 10-20-20 (N-P20S-K20) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER 1,000 SQ. FT.).
  - FOLLOWING SEED BED PREPARATION, DITCHES AND BANK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREeping RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUEGRASS, 44% CREeping RED FESCUE, AND 12% PERENNIAL RYEGRASS. SEEDING RATE IS 1.03 LBS PER 1000 SQ. FT. LAWN MIXTURE OF 50% MAY BE SUBSTITUTED FOR SEED. SEED MIX SHALL CONTAIN 10% ANNUAL RYE GRASS.
  - HAY MULCH AT THE RATE OF 70-90 LBS PER 1000 SQUARE FEET OR A HYDRO-APPLICATION OF ASPHALT, WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL, OR RMB PLUS WILL BE USED ON HAY MULCH FOR WIND CONTROL.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS ONCE THE SITE IS STABILIZED WITH 90% GRASS CATCH IN VEGETATED AREAS. TEMPORARY EROSION AND SEDIMENT CONTROL BLANKET SHALL BE USED IN ALL DITCHES AND SWALES AS SHOWN IN DETAILS.
- WETLANDS WILL BE PROTECTED WITH EROSION CONTROL MIX OR SILT FENCE INSTALLED AT THE EDGE FOR THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE. ALL AREAS WITHIN 75 FEET OF A PROTECTED NATURAL RESOURCE MUST BE PROTECTED WITH A DOUBLE ROW OF SEDIMENT BARRIERS DURING WINTER CONSTRUCTION.
- ALL STORMWATER WILL BE PREVENTED FROM RUNNING ONTO STOCKPILES. SEDIMENT BARRIERS WILL BE INSTALLED DOWNGRADIENT OF ALL STOCKPILES.
- PERMANENT POST-CONSTRUCTION BMPs (VEGETATED SWALES, WET PONDS, ETC.) WILL NOT BE USED TO MANAGE FLOWS DURING CONSTRUCTION WITHOUT SPECIAL PROTECTION AND/OR RESTORATION.

- MULCH AND MULCH ANCHORING
- | MULCH LOCATION                                                                 | MULCH                                                     | RATE (1000 S.F.)        |
|--------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------|
| PROTECTED AREA                                                                 | STRAW OR HAY *                                            | 100 POUNDS              |
| WINDY AREAS                                                                    | SHREDDED OR CHOPPED CORNSTALKS, STRAW OR HAY (ANCHORED) * | 185-275 POUNDS          |
| MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES (GREATER THAN OR EQUAL TO 3:1) | AJTE MESH OR EXCESSIVE MAT                                | AS REQUIRED AS REQUIRED |
- \* A HYDRO-APPLICATION OF WOOD, OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL, OR RMB PLUS WILL BE USED ON HAY MULCH FOR WIND CONTROL.
- MULCH ANCHORING
- ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD./BLOCK). MULCH NETTING (AS PER MANUFACTURED; WOOD CELLULOSE FIBER (750 LBS/ACRE); USE OF A SERRATED STRAIGHT DISK. NETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.
- Additional temporary seed mixture (for periods less than 12 months).
- | Season                               | Seed                  | Rate         |
|--------------------------------------|-----------------------|--------------|
| Summer (5/15 - 8/15)                 | Sudangrass            | 40 lbs/acre  |
|                                      | Oats                  | 80 lbs/acre  |
| Late Summer/Early Fall (8/15 - 9/15) | Perennial Ryegrass    | 40 lbs/acre  |
| Fall (9/15 - 11/1)                   | Winter Rye            | 112 lbs/acre |
| Winter (11/1 - 4/1)                  | Mulch w/ Dormant Seed | 80 lbs/acre* |
| Spring (4/1 - 7/1)                   | Oats                  | 80 lbs/acre  |
|                                      | Annual Ryegrass       | 40 lbs/acre  |
- \*Seed Rate Only

#### CONSTRUCTION OVERSIGHT

THE APPLICANT WILL RETAIN THE SERVICES OF A STORMWATER INSPECTOR WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS AND CONDITIONS OF THE PERMIT TO INSPECT THE CONSTRUCTION AND STABILIZATION OF ALL STORMWATER MANAGEMENT STRUCTURES. IF NECESSARY, THE INSPECTOR WILL WILL INTERRUPT THE STORMWATER FACILITIES CONSTRUCTION PLAN FOR THE CONTRACTOR. ONCE ALL STORMWATER MANAGEMENT STRUCTURES ARE CONSTRUCTED AND STABILIZED, THE INSPECTOR WILL NOTIFY THE DEPARTMENT IN WRITING WITHIN 30 DAYS TO STATE THAT THE STORMWATER FACILITY HAS BEEN COMPLETED. ACCOMPANYING THE INSPECTOR'S NOTIFICATION MUST BE A LOG OF INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA OF EVERY MINERAL SOIL AND SOIL MEDIA SPECIFIED IN THE PLANS AND USED ON-SITE. CONSTRUCTION INSPECTIONS SHALL TAKE PLACE ONCE A WEEK AS WELL AS BEFORE AND WITHIN 24 HOURS AFTER A STORM EVENT, AND BEFORE PERMANENT STABILIZATION MEASURES ARE INSTALLED.

#### LOT GRADING AND DRIVEWAY LOCATION

INSPECTIONS BY A PROFESSIONAL ENGINEER WILL CONSIST OF A VISIT TO THE SITE PRIOR TO CONSTRUCTION TO CONSULT WITH THE EARTHWORK CONTRACTOR AND A POST CONSTRUCTION MEETING TO CONFIRM GRADING ON LOTS AND FOR ALL DRIVEWAYS TO ENSURE RUNOFF IS DIRECTED ACCORDING TO PLANS AND TO OVERSEE THE RE-STABILIZATION OF THE LOT INTO A VEGETATED COVER.

#### BASIC STANDARDS - EROSION CONTROL MEASURES

MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. ALL MAINTENANCE ISSUES IDENTIFIED BY THE STORMWATER INSPECTOR NEED TO BE COMPLETED NO LATER THAN THE END OF THE NEXT WORK DAY. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE.

#### EROSION CONTROL DURING CONSTRUCTION

- WINTER CONSTRUCTION
- WINTER CONSTRUCTION PERIOD: OCTOBER 1 THROUGH APRIL 15
  - OVERWINTER STABILIZATION OF DITCHES AND CHANNELS:

ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL GRASS LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF A DITCH OR CHANNEL IS NOT GRASS-LINED BY SEPTEMBER 1, 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: 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 SOD AT THE BASE OF THE DITCH WITH JUTE OR PLASTIC NETTING TO PREVENT THE SOD FROM SLOUGHING DURING FLOOD CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
    - 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 FLOOD FLOWS AND FLOW VELOCITIES WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
  - OVERWINTER STABILIZATION OF DISTURBED SLOPES:

ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL SLOPES TO BE VEGETATED MUST BE SEEDING AND MULCHED BY SEPTEMBER 1. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 10% TO BE A SLOPE. IF A SLOPE OF 10% OR GREATER 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 MATS. BY OCTOBER 1 THE DISTURBED SLOPE MUST BE SEEDING WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED MULCH OVER THE SEEDING. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 70% OF THE SLOPE BY NOVEMBER 1, THEN THE CONTRACTOR WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX OR WITH STONE RIPRAP AS DESCRIBED IN THE FOLLOWING STANDARDS:

    - STABILIZE THE SOIL WITH SOD:

THE DISTURBED SLOPE MUST BE STABILIZED 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, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH JUTE OR PLASTIC NETTING TO PREVENT THE SOD FROM SLOUGHING DURING FLOOD CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
    - STABILIZE THE SOIL WITH EROSION CONTROL MIX:

EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 15. THE CONTRACTOR WILL NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GRADES GREATER THAN 5% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE. SEE THE TEMPORARY MULCHING BMP SECTION.
    - STABILIZE THE SOIL WITH STONE RIPRAP:

PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE DEVELOPER'S OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND REQUIRED STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP. SEE THE RIPRAP SLOPE STABILIZATION BMP SECTION.
  - OVERWINTER STABILIZATION OF DISTURBED SOILS:

BY SEPTEMBER 15, ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 10% MUST BE SEEDING AND MULCHED. IF THE 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 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDING 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 FAILS TO COVER AT LEAST 70% OF THE DISTURBED SOIL BEFORE NOVEMBER 1, THEN MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED BELOW.
    - 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. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR WILL COVER THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.
- STABILIZATION SCHEDULE BEFORE WINTER:

SEPTEMBER 15 ALL DISTURBED AREAS MUST BE SEEDING AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDING AND MULCHED. ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET.

OCTOBER 1 IF THE SLOPE IS STABILIZED WITH AN EROSION CONTROL BLANKET AND SEEDING, ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDING AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND MULCHED.

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.
- DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.
- AREAS WITHIN 100 FEET OF STREAMS THAT ARE NOT STABILIZED WITH VEGETATION BY DEC. 1 SHALL BE MULCHED AND ANCHORED WITH NETTING. IF WORK CONTINUES IN THIS AREA DURING THE WINTER, A DOUBLE LINE OF SEDIMENT BARRIERS MUST BE USED.

- CONSTRUCTION INSPECTION AND MAINTENANCE
- IF AN INSPECTION DETERMINES THAT A CORRECTIVE ACTION IS REQUIRED, THE ACTION OR REPAIR SHALL BE STARTED BY THE END OF THE NEXT WORKDAY AND COMPLETED WITHIN SEVEN DAYS OR BEFORE THE NEXT STORM EVENT. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. ONCE A WEEK AND BEFORE AND AFTER EACH SIGNIFICANT RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE INSPECTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES. INTERMEDIATE AREAS, MATERIAL STORAGE AREAS AND VEHICLE ACCESS POINTS AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.
- INSPECTION FORMS AND DOCUMENTATION OF CORRECTIVE ACTIONS SHALL BE MAINTAINED FOR A MINIMUM OF THREE YEARS.
- ALL CONSTRUCTION INSPECTIONS SHALL BE CONDUCTED BY SOMEONE WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS AND CONDITIONS IN THE STORMWATER PERMIT.

- HOUSEKEEPING:
- SPILL PREVENTION, CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
  - 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 INTRUSION AREA. AN "INTRUSION 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, LAKES, BERM, SWALES, AND OTHER FORMS OF SECONDARY CONTAMINATION THAT PREVENT DISCHARGE. GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
  - FUGITIVE SEDIMENT AND DUST, ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL. ANY OFFSITE TRACKING OF MUD OR SEDIMENT SHALL BE VACUUMED IMMEDIATELY AND PRIOR TO THE NEXT SIGNIFICANT STORM EVENT.
  - DEBRIS AND OTHER MATERIALS, LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
  - TRENCH OR FOUNDATION DE-WATERING, TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SiltED AND HINDERS CORRECT SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL, WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
  - NON-STORMWATER DISCHARGES, IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES, WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
    - DISCHARGES FROM FIREFIGHTING ACTIVITY;
    - FIRE HYDRANT FLUSHINGS;
    - VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
    - DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX (C)(3);
    - ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
    - PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;
    - UNCONTAMINATED GROUNDWATER OR SPRING WATER;
    - FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
    - UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX (C)(3));
    - POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
    - LANDSCAPE IRRIGATION.

- UNAUTHORIZED NON-STORMWATER DISCHARGES, THE DEPARTMENT'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C (6). SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:
- WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
  - FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
  - SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
  - TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

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

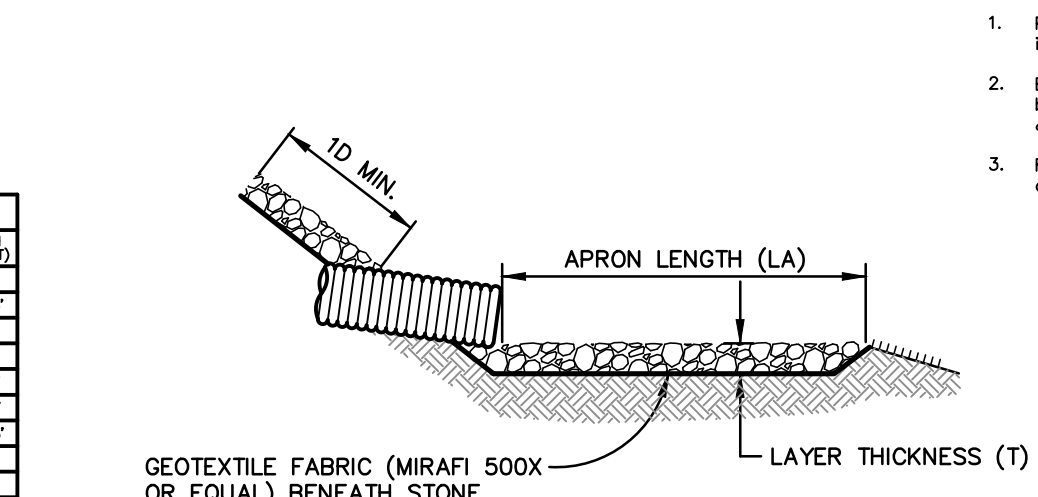
- PLACE BARRIER ALONG RELATIVELY LEVEL CONTOUR. ECM BERM PROHIBITED AT THE BASE OF SLOPES > 8% OR WHERE THERE IS FLOWING WATER. SEE MAINE EROSION AND SEDIMENT CONTROL FIELD GUIDE FOR CONTRACTORS FOR INSTALLATION INSTRUCTIONS.
- EROSION CONTROL MIX SHOULD CONTAIN A WELL GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. ECM SHOULD BE FREE OF REFUSE, PHYSICAL CONTAMINATES, AND MATERIAL TOXIC TO PLANT GROWTH.
- ORGANIC MATTER > 80% DRY WEIGHT
  - PARTICLE SIZE BY WEIGHT: 100% PASSING 6" SCREEN
  - 75-85% PASSING 0.75" SCREEN
  - SOLUBLE SALT CONTENT < 4.0 MMHOS/CM
  - PH TO BE BETWEEN 5.0 & 8.0

#### EROSION CONTROL MIX BERM

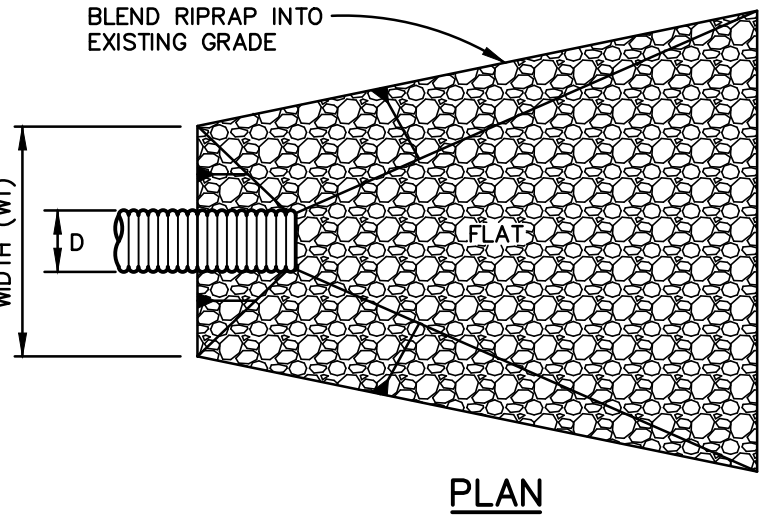
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#### STABILIZED CONSTRUCTION ENTRANCE

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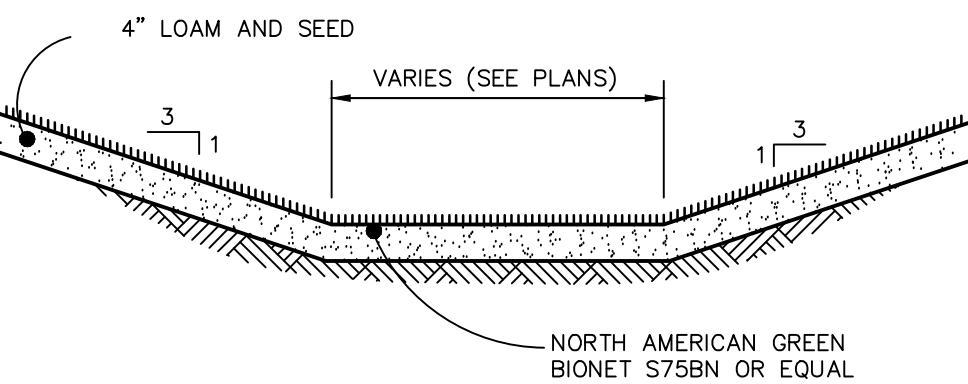


#### SECTION



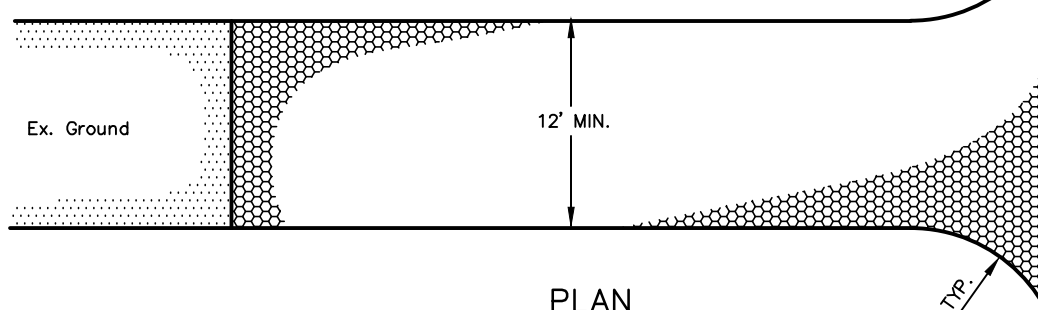
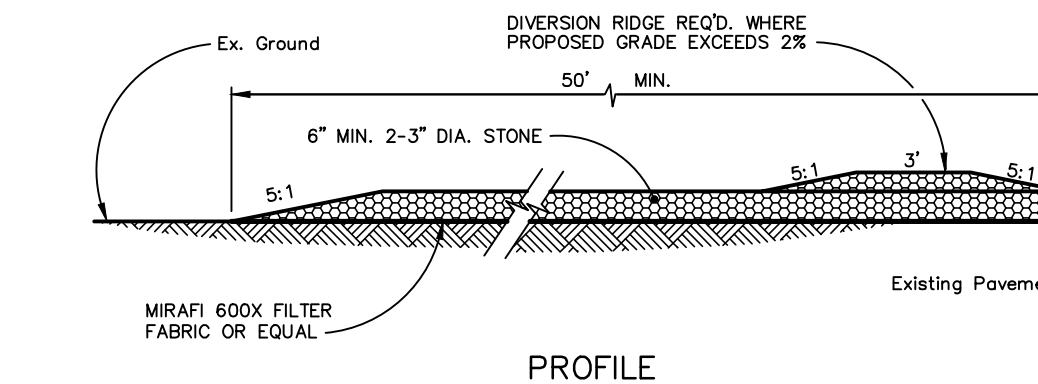
#### PIPE OUTLET PROTECTION

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#### VEGETATED DITCH DETAIL

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NOTES:

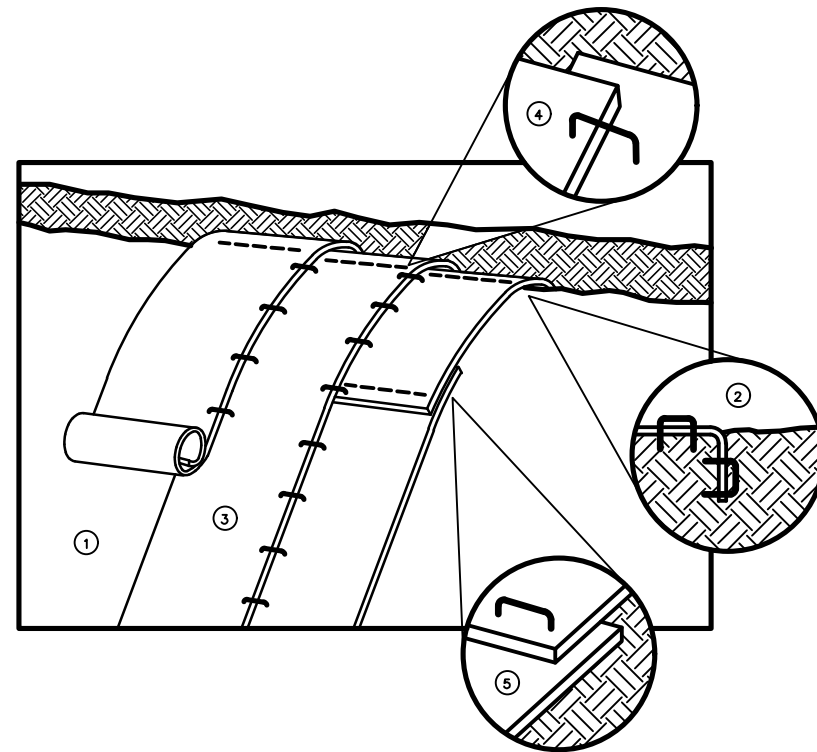
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY.

WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

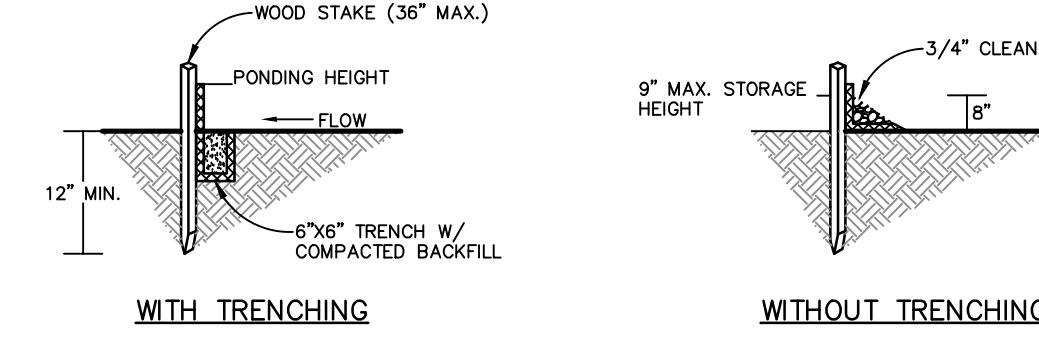
- Prepare soil before installing blankets, including lime, fertilizer & seed.
- Begin at top of slope by anchoring blanket in 6" x 6" trench. Backfill & compact trench after stapling.
- Roll blankets down or horizontally across slope.
- The edges of parallel blankets must be stapled with approx. 2" overlap.
- When blankets must be spliced down the slope, place blankets end over end (staple stay) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Slope Stabilization:  
Erosion Control Blanket shall be in accordance with M.D.O.T. standard specifications, Section 6.13, Temporary Erosion Control Blankets and Extended Use Erosion Control Blankets.



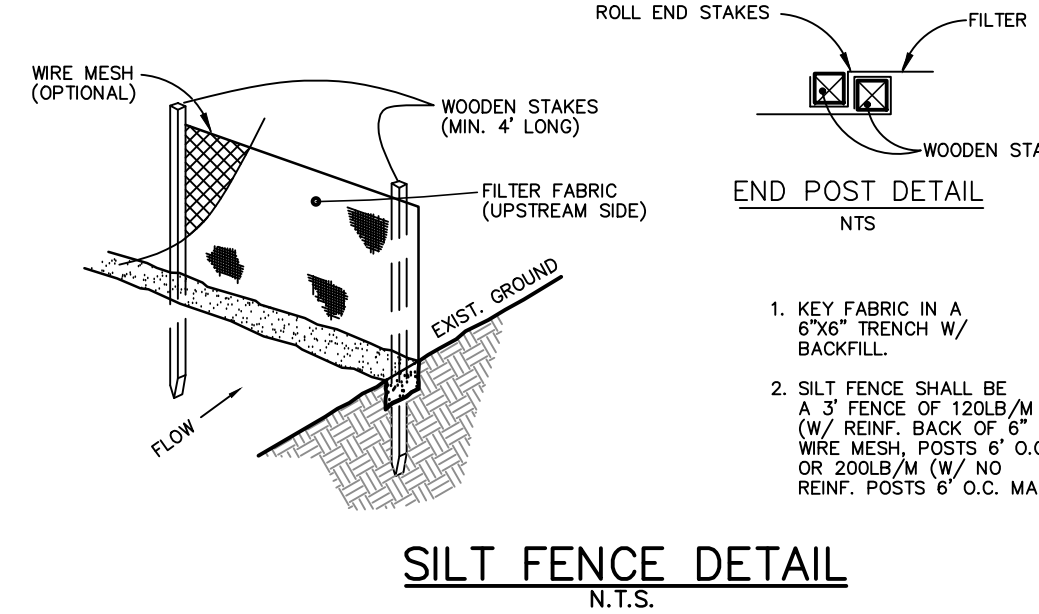
#### 2:1 SLOPE STABILIZATION DETAIL

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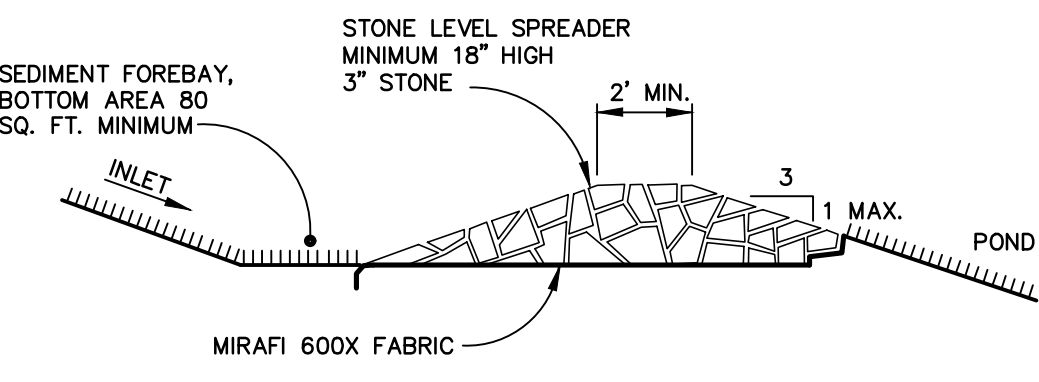
#### WITH TRENCHING

#### WITHOUT TRENCHING



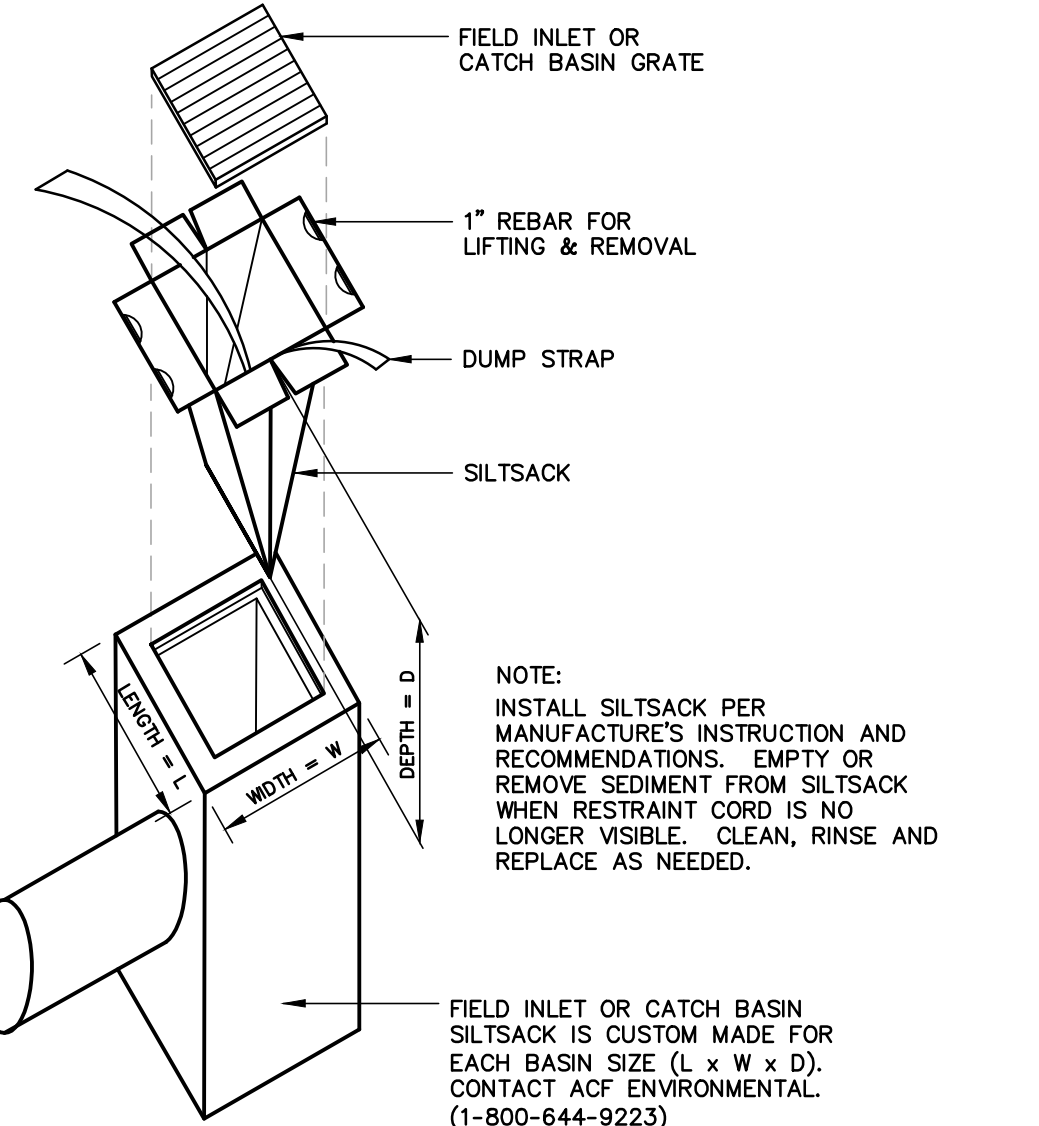
#### SILT FENCE DETAIL

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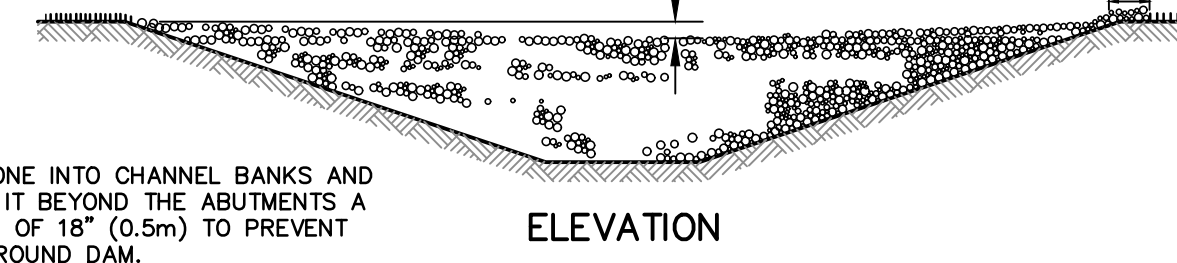
#### SEDIMENT FOREBAY

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#### SILT SACK INLET SEDIMENT CONTROL DEVICE

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#### ELEVATION

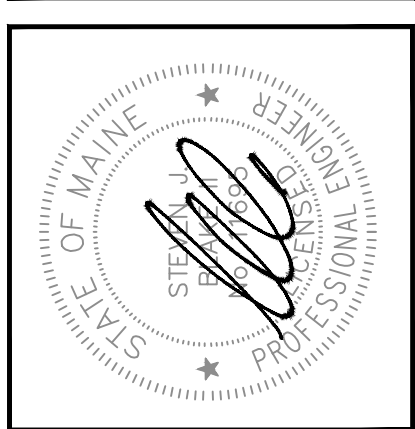
#### CROSS SECTION

#### SPACING

#### STONE CHECK DAM DETAIL

NTS

| NO. | DATE    | REVISION                                      | DESCRIPTION |
|-----|---------|-----------------------------------------------|-------------|
| 1   | 4/10/19 | Submitted Plan For Town Review                |             |
| 2   | 5/15/19 | Submitted Plan For City Review                |             |
| 3   | 7/16/19 | Revised Per City Comments                     |             |
| 4   | 8/14/19 | Revised Per City Comments                     |             |
| 5   | 9/11/19 | Revised Per City, Peer Review, & DEP Comments |             |
| 6   | 9/20/19 | Revised Per DEP Comments                      |             |



**BH2M**

**Berry, Huff, MacDonald, Milligan, Inc.**  
Engineers, Surveyors

28 Starr Street  
Corvallis, Maine 04848

Tel: (207) 859-9771  
Fax: (207) 859-8250

FOR  
Dumfries, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

**EROSION CONTROL DETAILS**

**DEMISEY DRIVE**

MARCEL AVE  
BIDDEFORD, MAINE

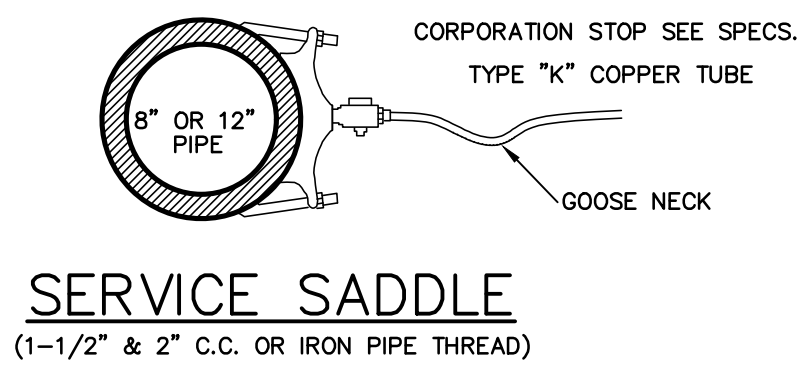
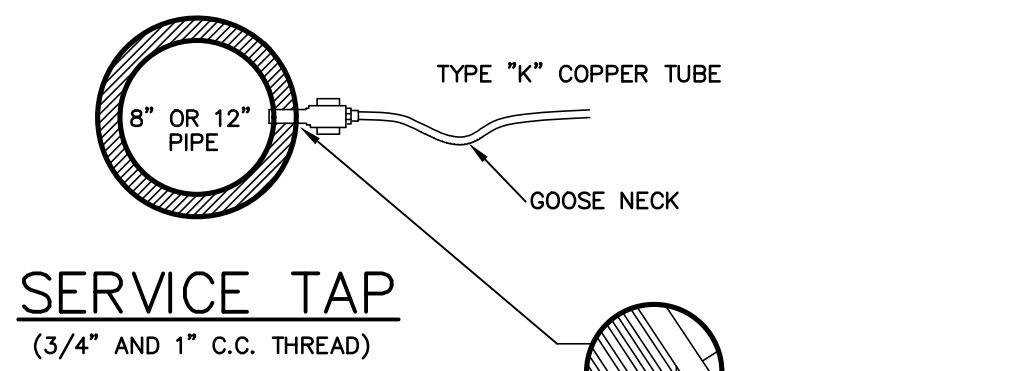
| DESIGNED    | DATE      |
|-------------|-----------|
| Dept.       | Mar. 2019 |
| DRAWN       | SCALE     |
| Dept.       | As Noted  |
| CHECKED     | JOB. NO.  |
| W. Thompson | 19003     |

SHEET

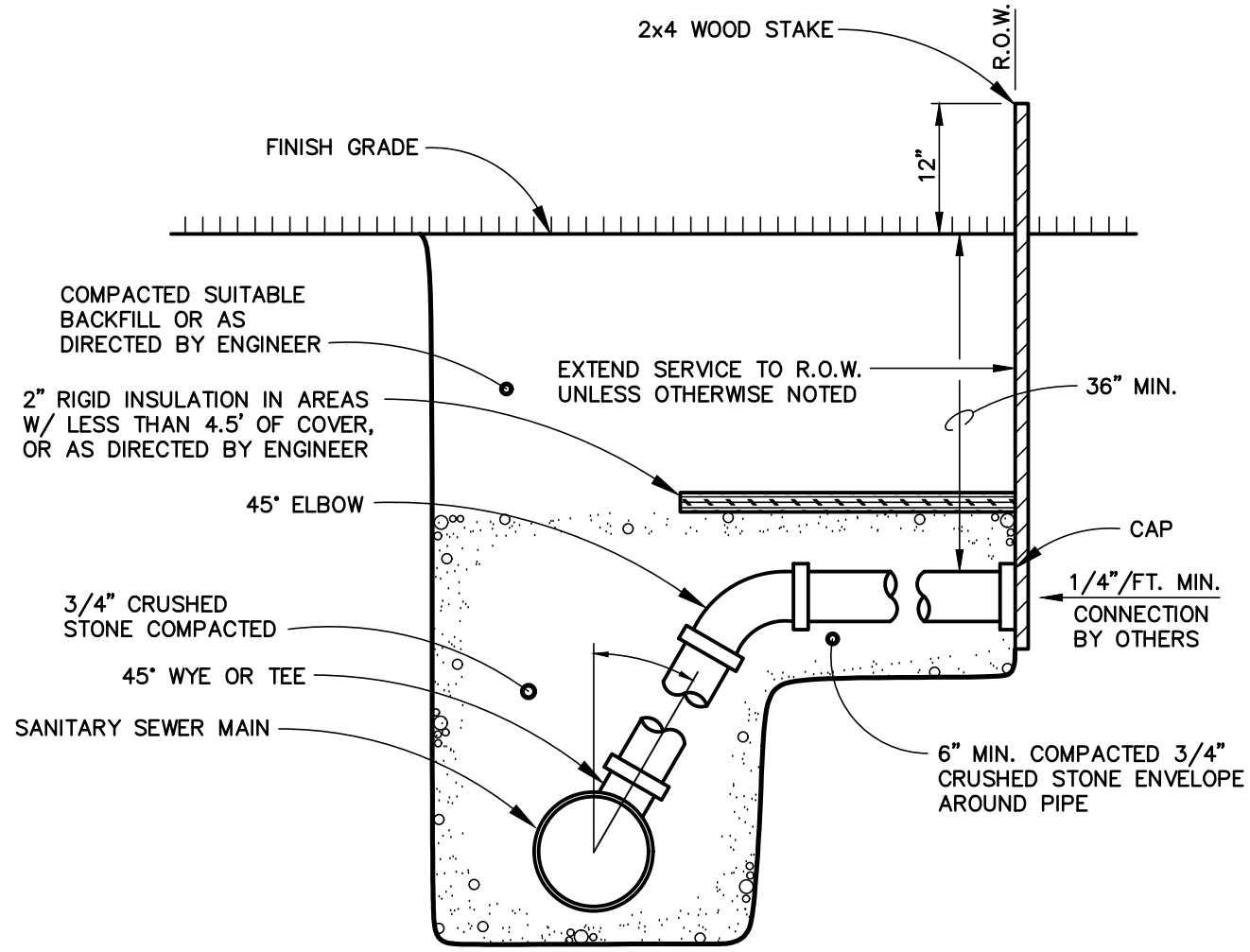
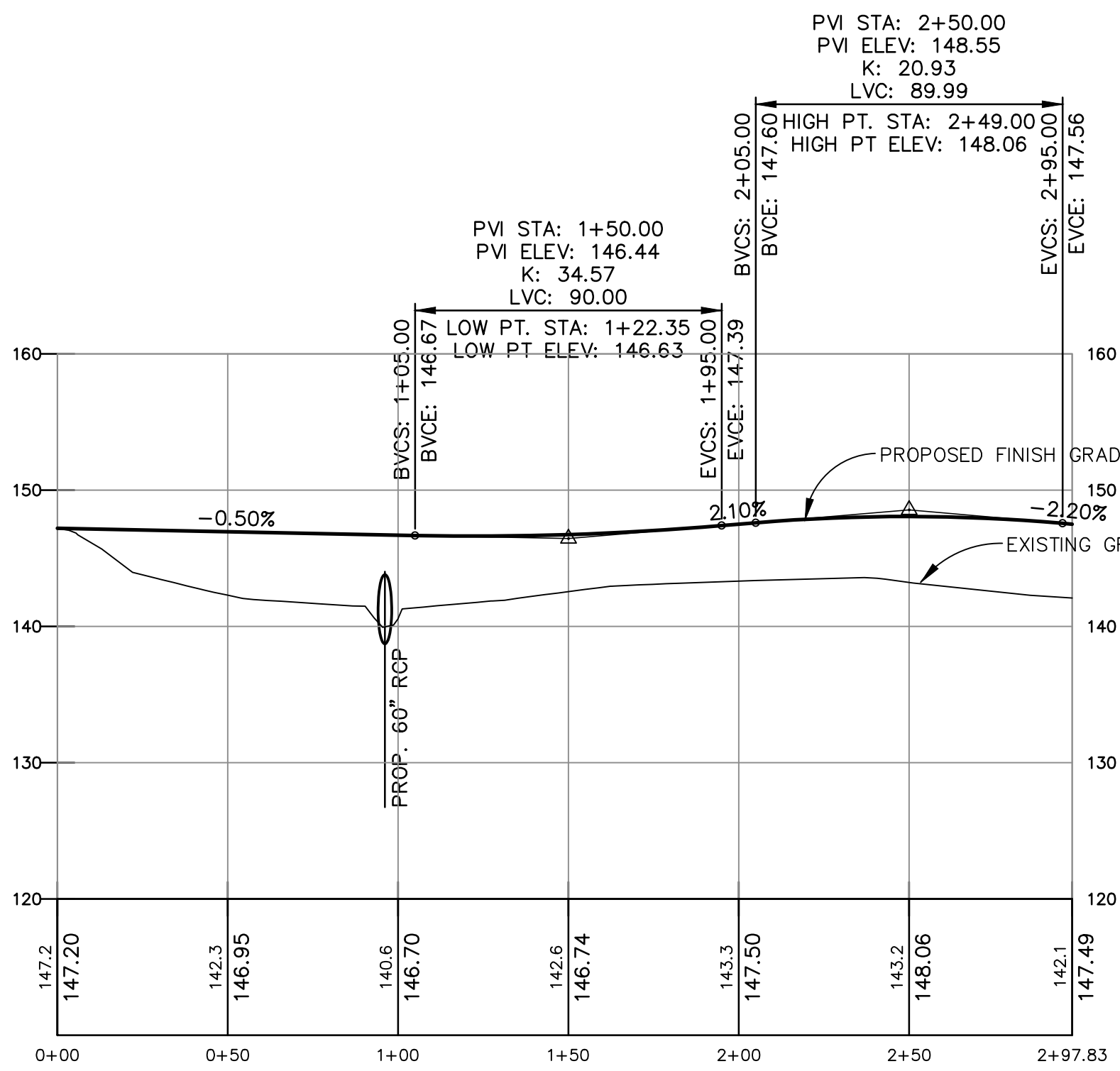
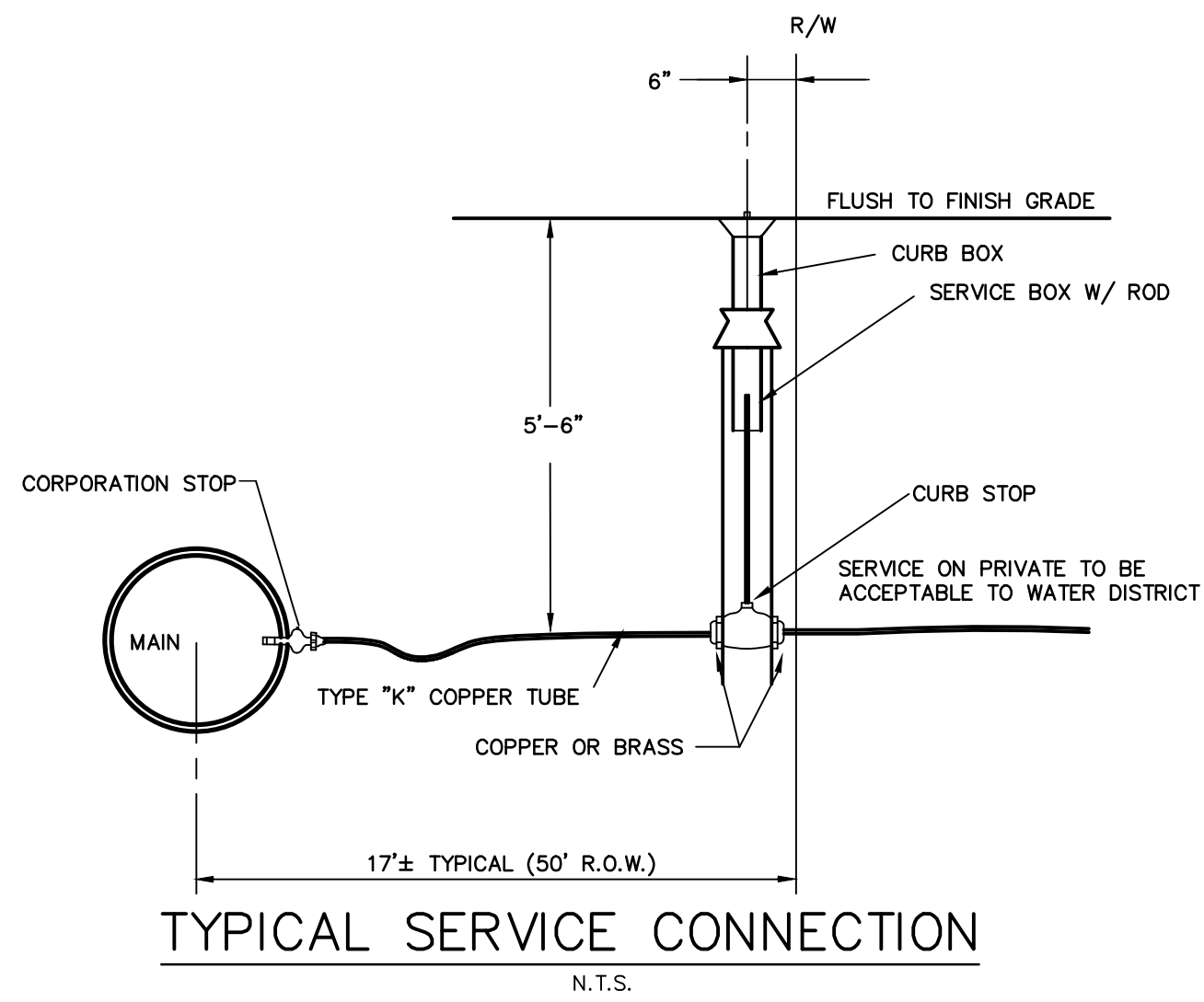
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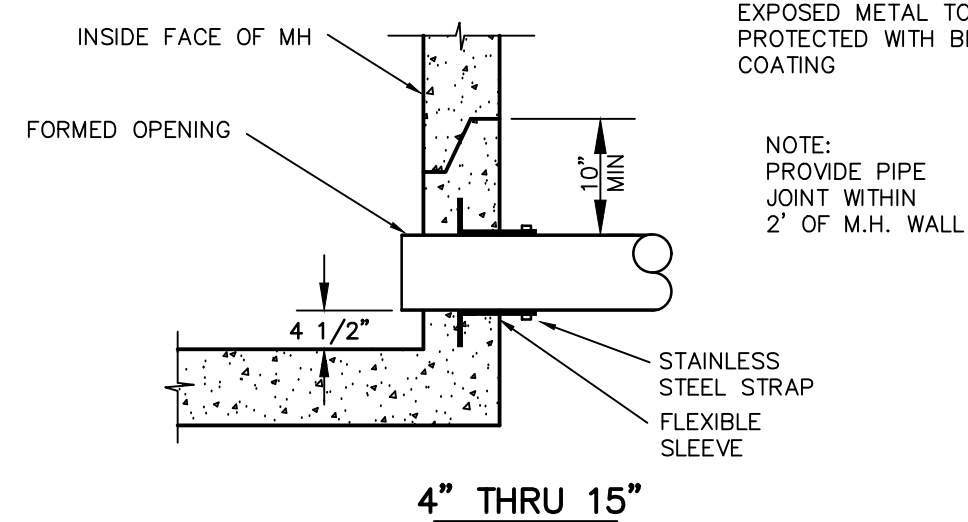
NOTE: SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTERACT THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS).



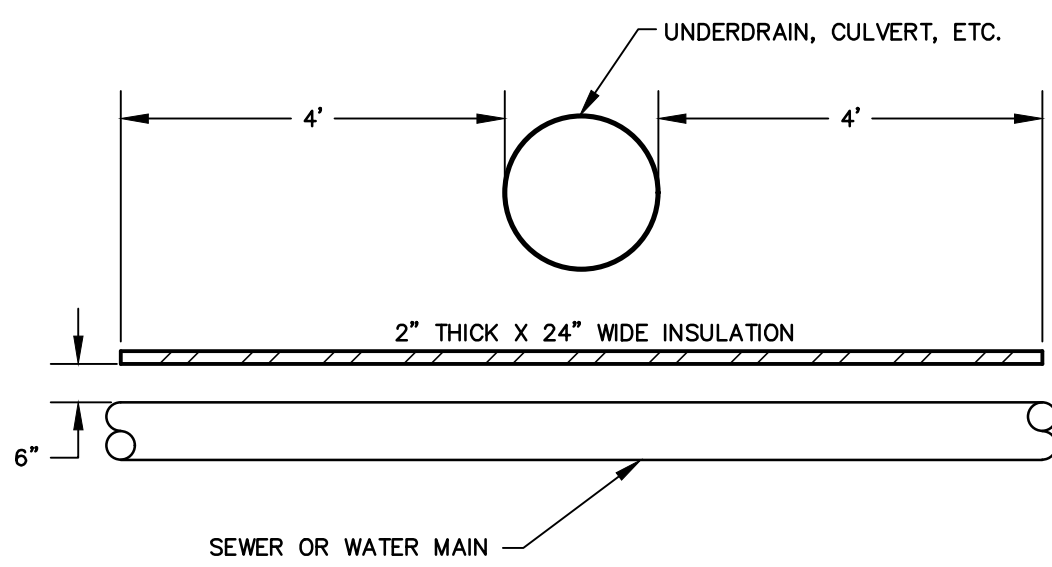
PIPE DIAMETERS MAY VARY, SEE TYPICAL PIPE TRENCH DETAIL.

WHERE 30° MINIMUM ANGLE BETWEEN SEWER CONNECTION AT THE SEWER MAIN AND THE VERTICAL CANNOT BE MAINTAINED, PROVIDE A PRECAST SEWER CHIMNEY.

IF 2x4 STAKE IS CUT OFF FLUSH OR SLIGHTLY BELOW GRADE, PROVIDE MIN. OF 2 1/2" O.D. SPIKES DRIVEN INTO TOP OF STAKE TO PROVIDE METAL DETECTABILITY.

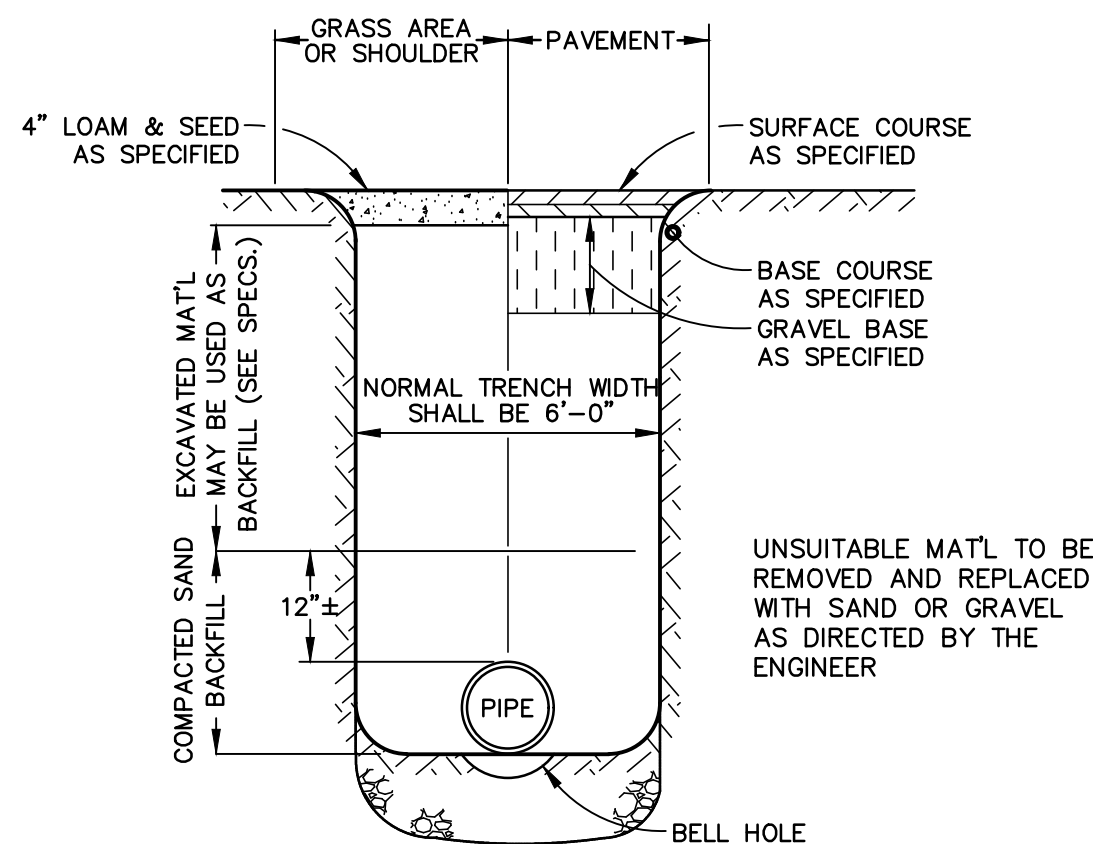


**MANHOLE TO PIPE CONNECTION DETAIL**  
N.T.S.

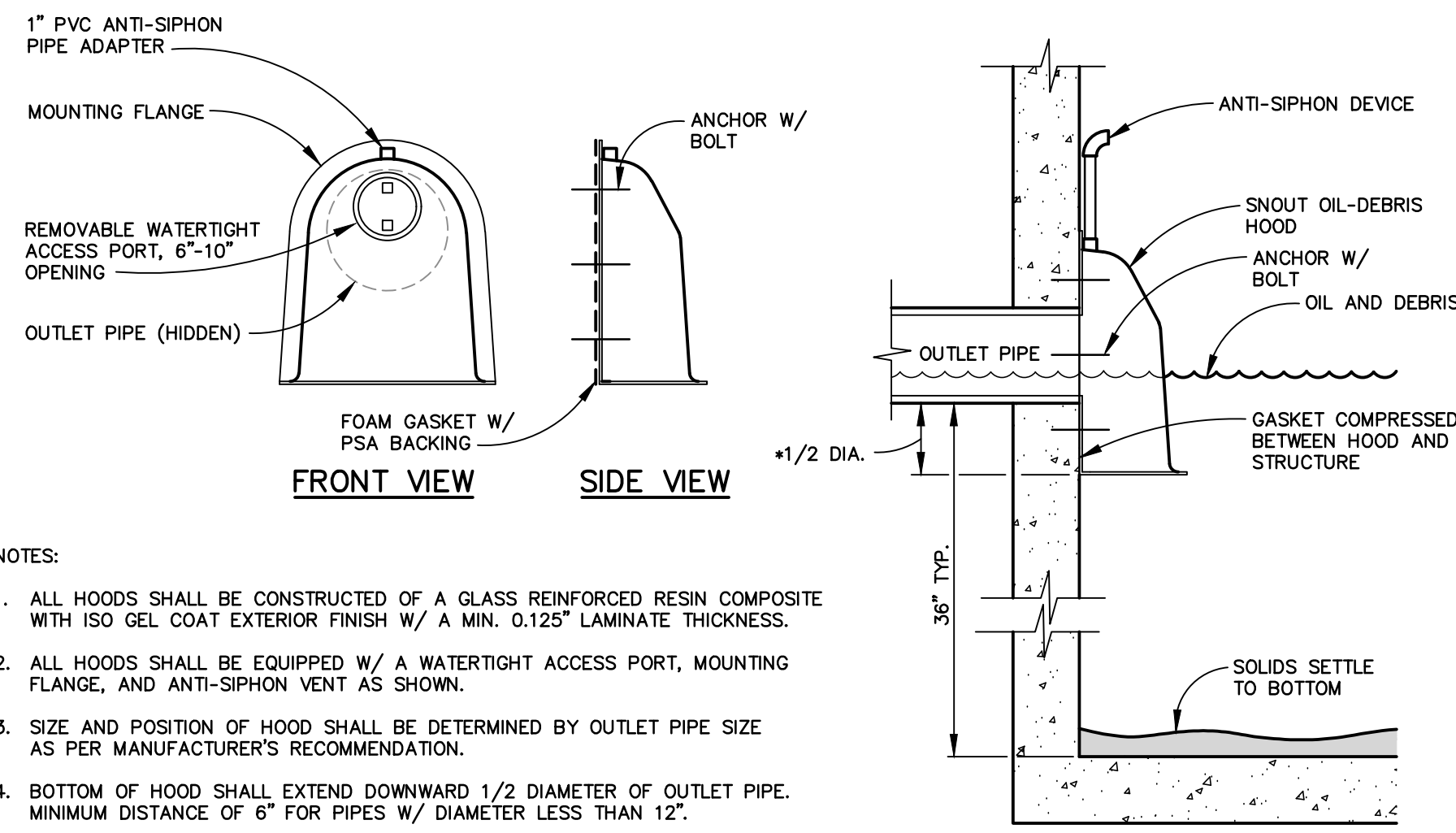


NOTE: 2" RIGID INSULATION SHALL BE "HI 60" EXTRUDED POLYSTYRENE BY DOW CO. OR APPROVED EQUAL. CONTRACTOR SHALL INSULATE PER DETAIL WHEN PROPOSED SEWER COMES WITHIN 24" OF EXISTING CULVERT.

**INSULATION DETAIL "A"**  
N.T.S.



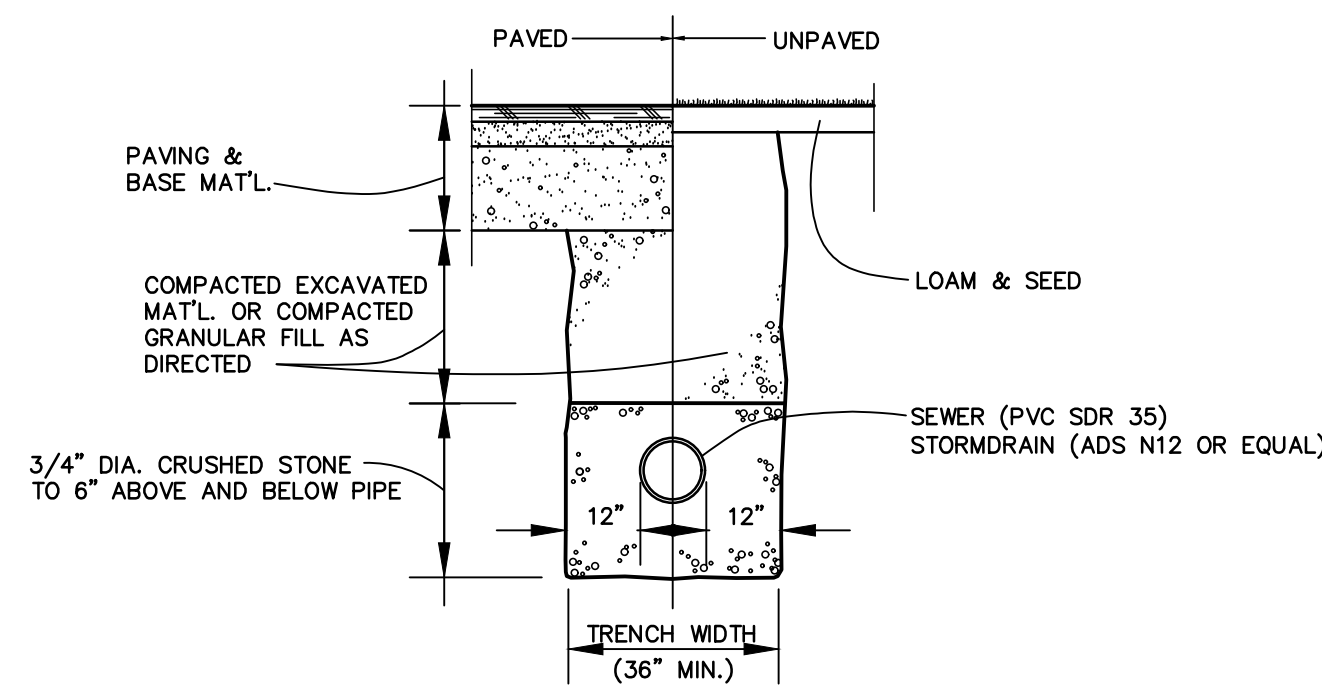
**WATER THROUGH EARTH TRENCH**  
N.T.S.



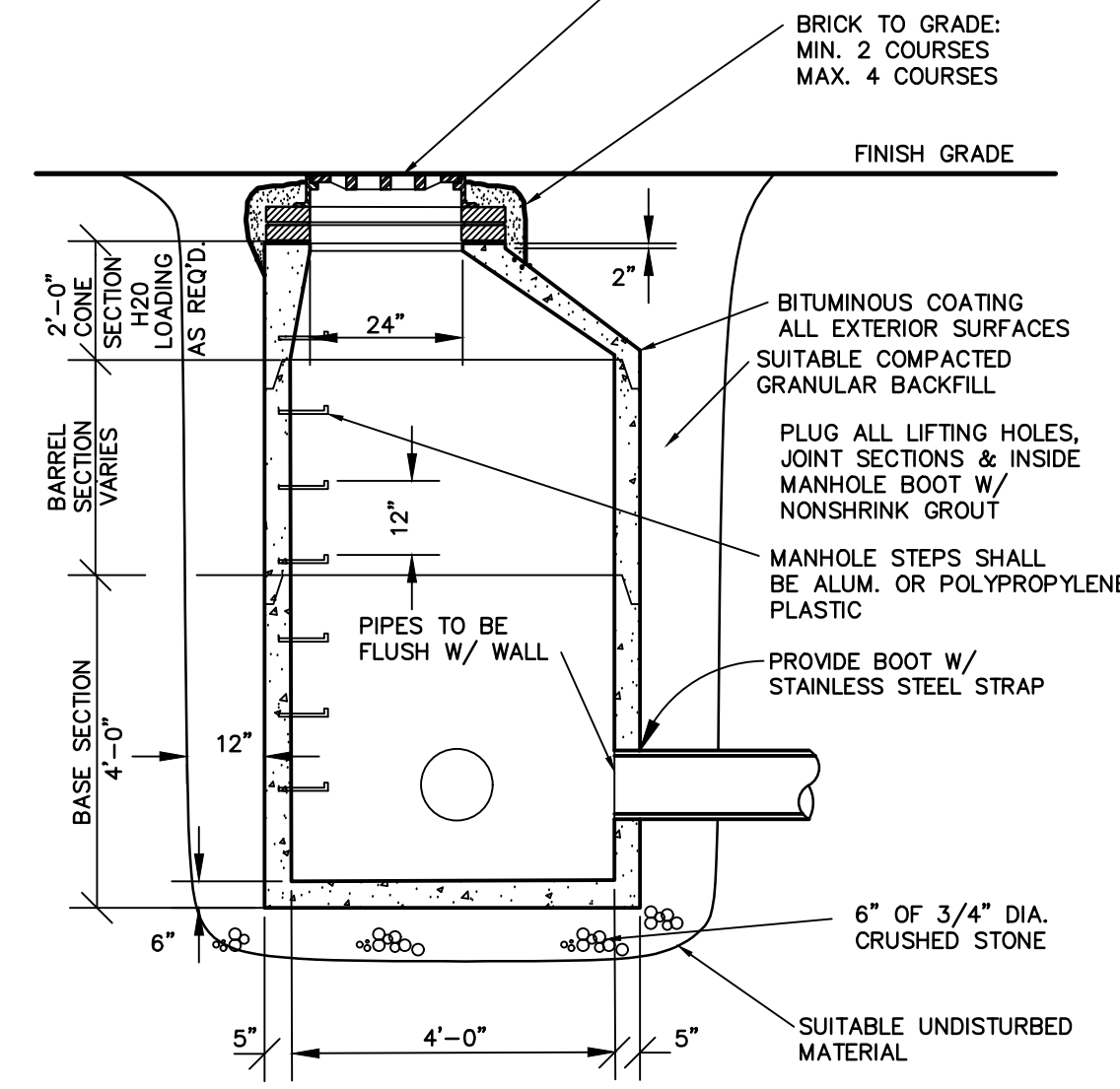
- NOTES:
- ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH W/ A MIN. 0.125" LAMINATE THICKNESS.
  - ALL HOODS SHALL BE EQUIPPED W/ A WATERTIGHT ACCESS PORT, MOUNTING FLANGE, AND ANTI-SIPHON VENT AS SHOWN.
  - SIZE AND POSITION OF HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
  - BOTTOM OF HOOD SHALL EXTEND DOWNWARD 1/2 DIAMETER OF OUTLET PIPE. MINIMUM DISTANCE OF 6" FOR PIPES W/ DIAMETER LESS THAN 12".
  - ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD, 3" MIN. AND MAX. 24".
  - MOUNTING SURFACE SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATL.
  - HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER.
  - HOOD PER "BEST MANAGEMENT PRODUCTS, INC." OR EQUAL.

**OIL-DEBRIS HOOD**  
N.T.S.

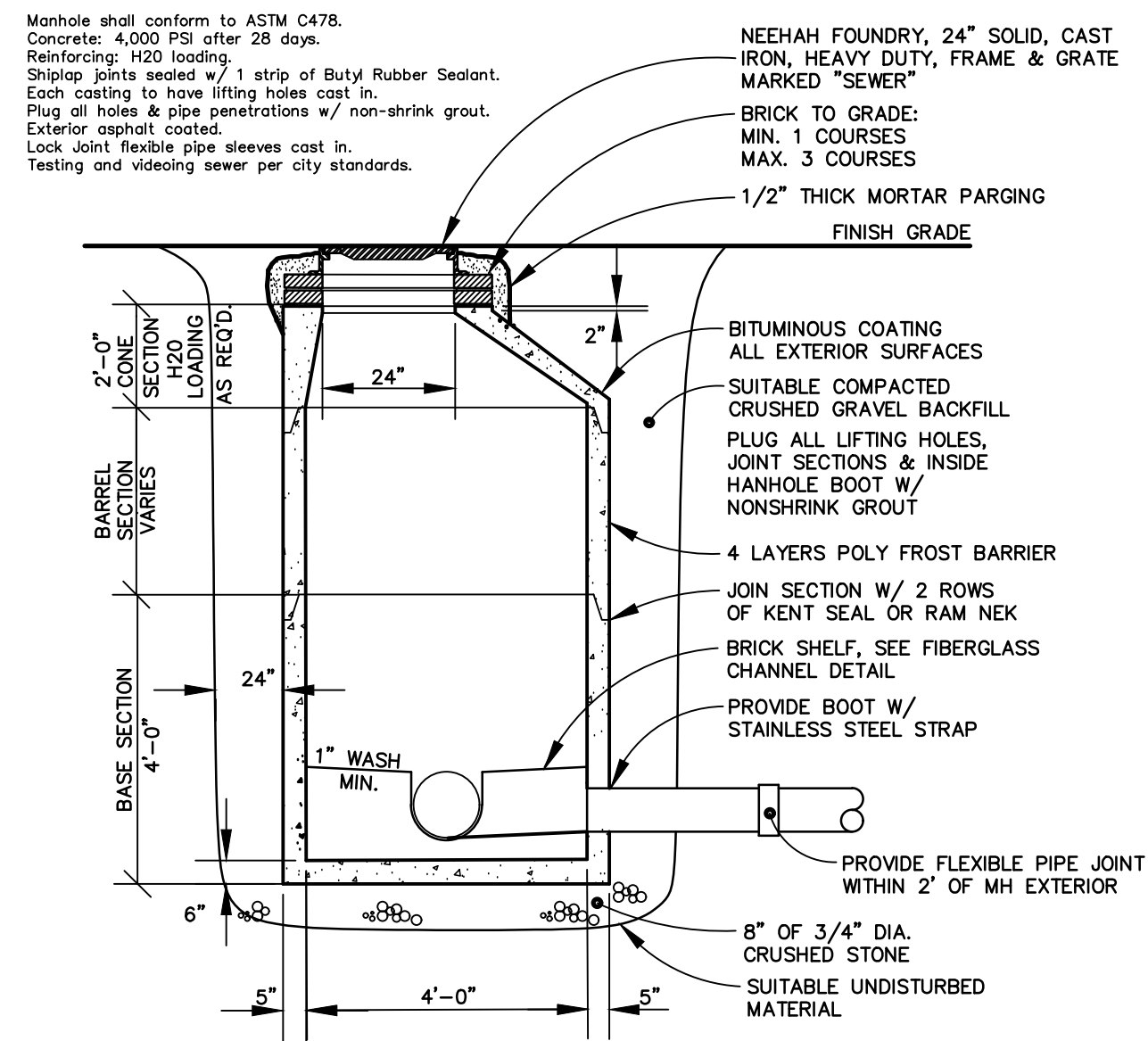
- NOTES:
- Trench width shown is payment width for rockexcavation & replacement of unsuitable material.
  - Do not mechanically compact directly over flexible pipe (e.g. PVC, Polyethylene).
  - Concrete pipe shall have sand bedding.



Manhole shall conform to ASTM C478. Concrete: 4,000 PSI after 28 days. Reinforcing: H20 loading. Shipap joints sealed w/ 1 strip of Butyl Rubber Sealant. Each casting to have lifting holes cast in. Plug all holes & pipe penetrations w/ non-shrink grout. Exterior asphalt coated. Lock Joint flexible pipe sleeves cast in.

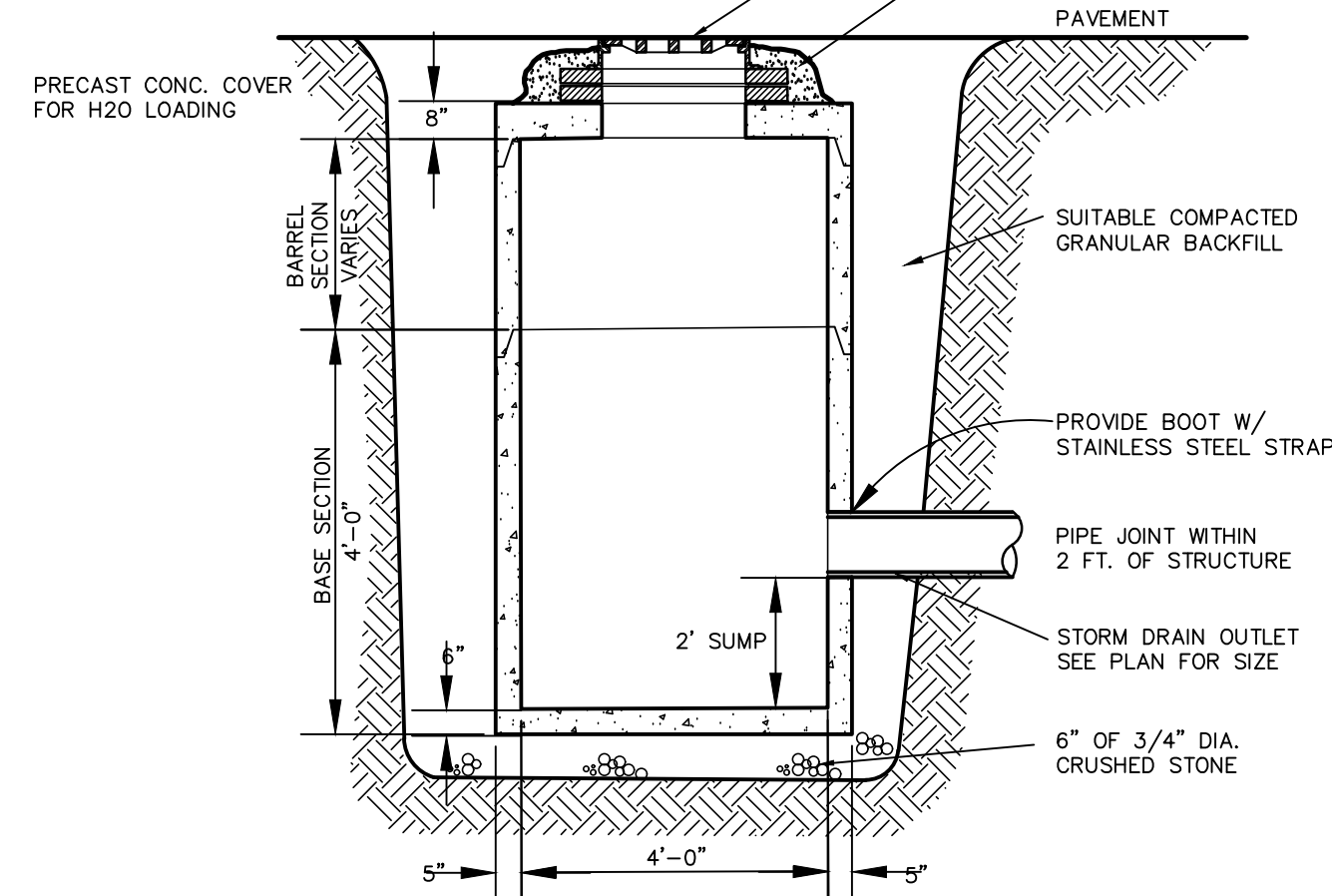


**PRECAST CONCRETE DRAIN MANHOLE**  
N.T.S.

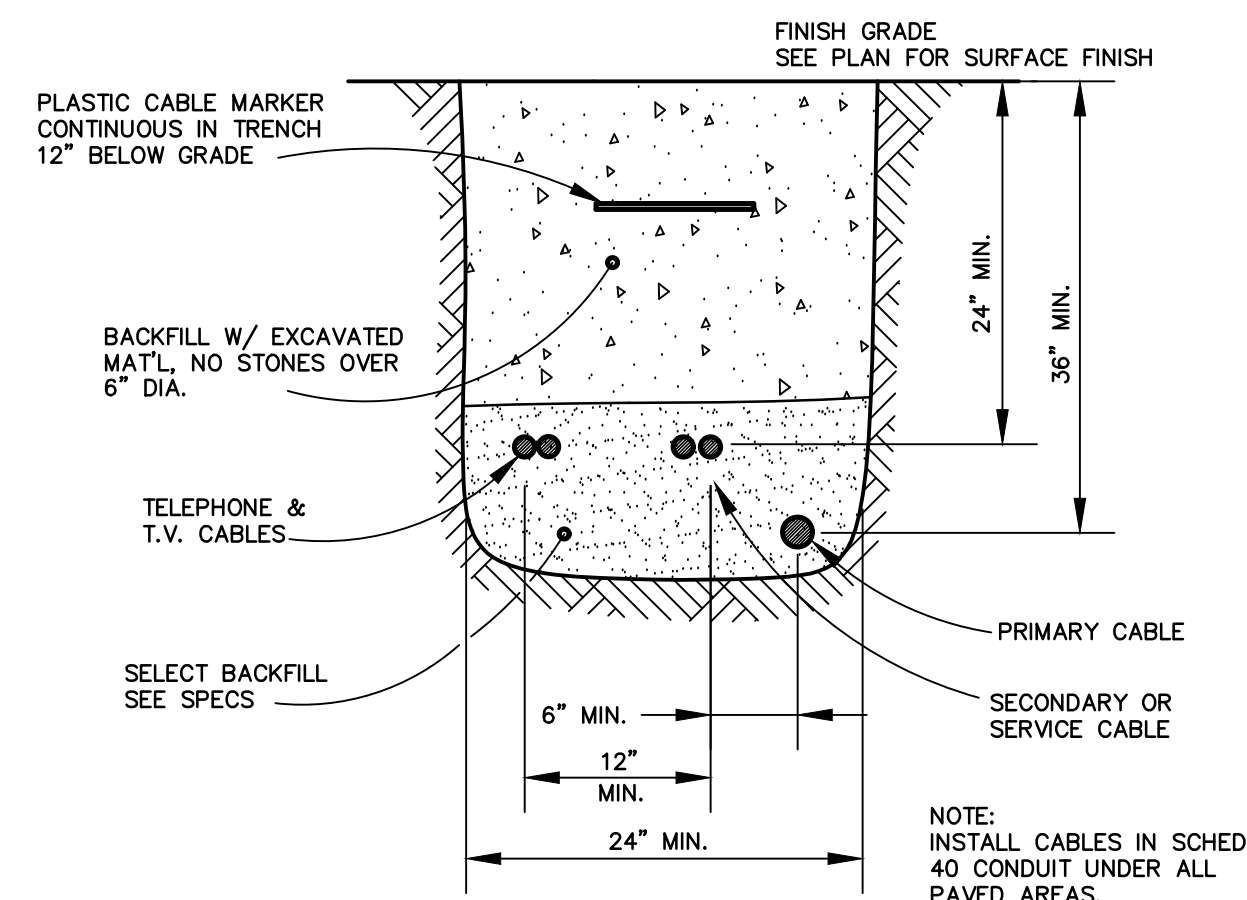


**PRECAST CONCRETE SANITARY SEWER MANHOLE**  
N.T.S.

Manhole shall conform to ASTM C478. Concrete: 4,000 PSI after 28 days. Reinforcing: H20 loading. Shipap joints sealed w/ 1 strip of Butyl Rubber Sealant. Each casting to have lifting holes cast in. Plug all holes & pipe penetrations w/ non-shrink grout. Exterior asphalt coated. Lock Joint flexible pipe sleeves cast in.

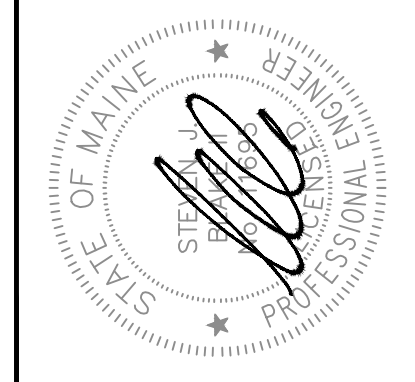


**PRECAST CONCRETE CATCH BASIN DETAIL**  
N.T.S.



**UNDERGROUND CABLE TRENCH**  
N.T.S.

| NO. | DATE    | DESCRIPTION                                   |
|-----|---------|-----------------------------------------------|
| 1   | 4/10/19 | Submitted Plan For Town Review                |
| 2   | 5/15/19 | Submitted Plan For City Review                |
| 3   | 7/16/19 | Revised Per City Comments                     |
| 4   | 8/14/19 | Revised Per Peer Review                       |
| 5   | 9/11/19 | Revised Per City, Peer Review, & DEP Comments |
| 6   | 9/20/19 | Revised Per DEP Comments                      |



**BH2M**  
Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors  
28 Starr Street  
Gorham, Maine 04038  
Tel. (207) 839-2771  
Fax (207) 839-8250

FOR  
Dempsey, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

**STANDARD DETAILS A**  
DEMPSEY DRIVE

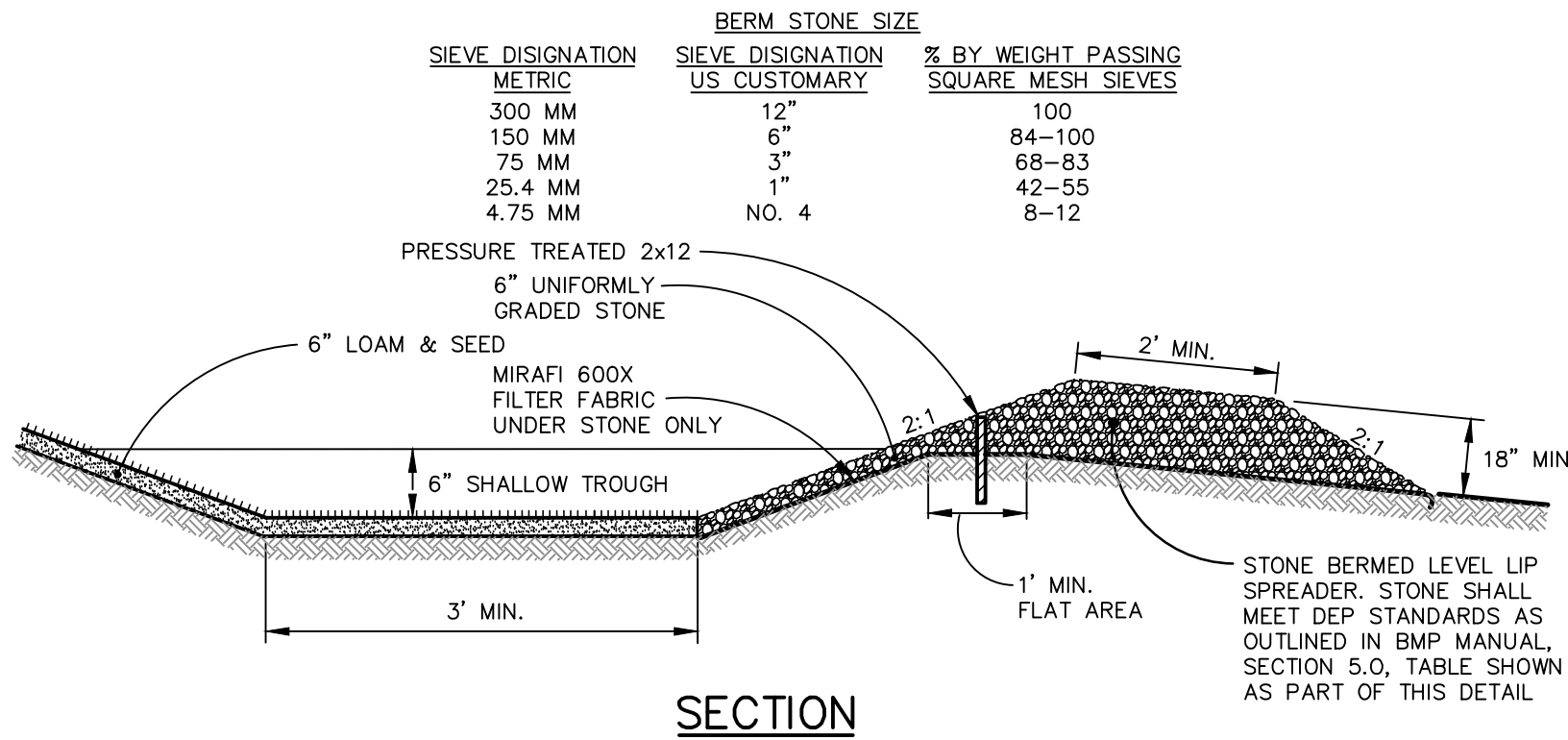
|                        |                   |
|------------------------|-------------------|
| DESIGNED<br>Dept.      | DATE<br>Mar. 2019 |
| DRAWN<br>Dept.         | SCALE<br>As Noted |
| CHECKED<br>W. Thompson | JOB. NO.<br>19003 |

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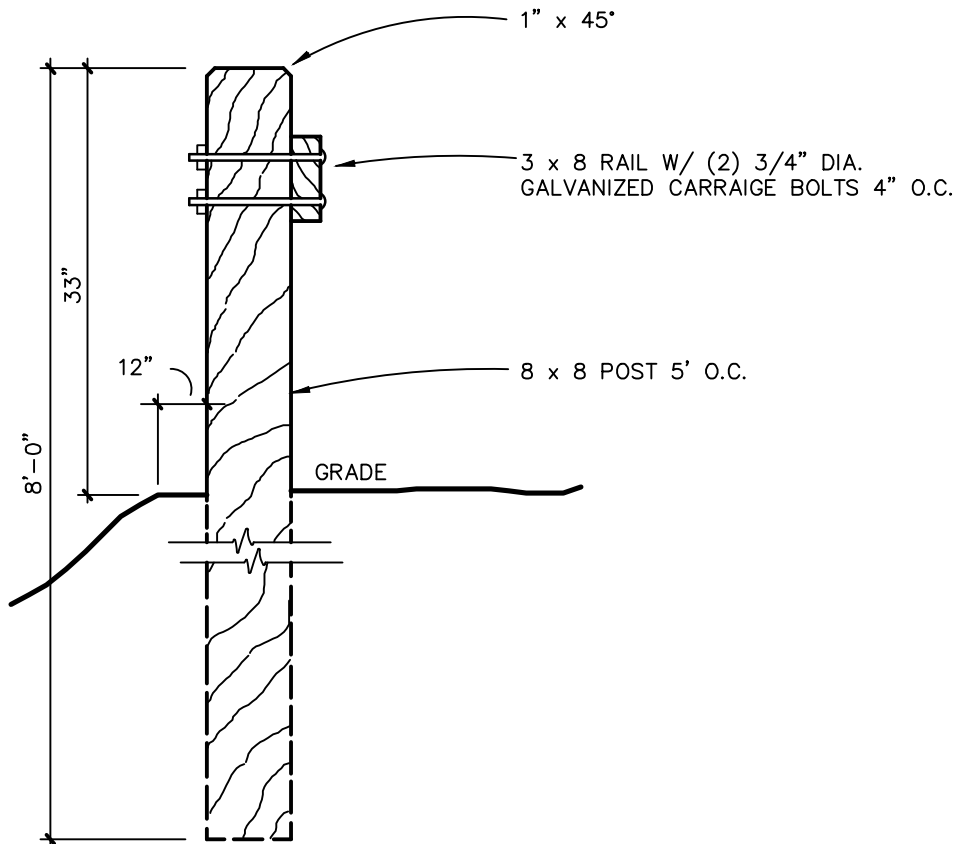




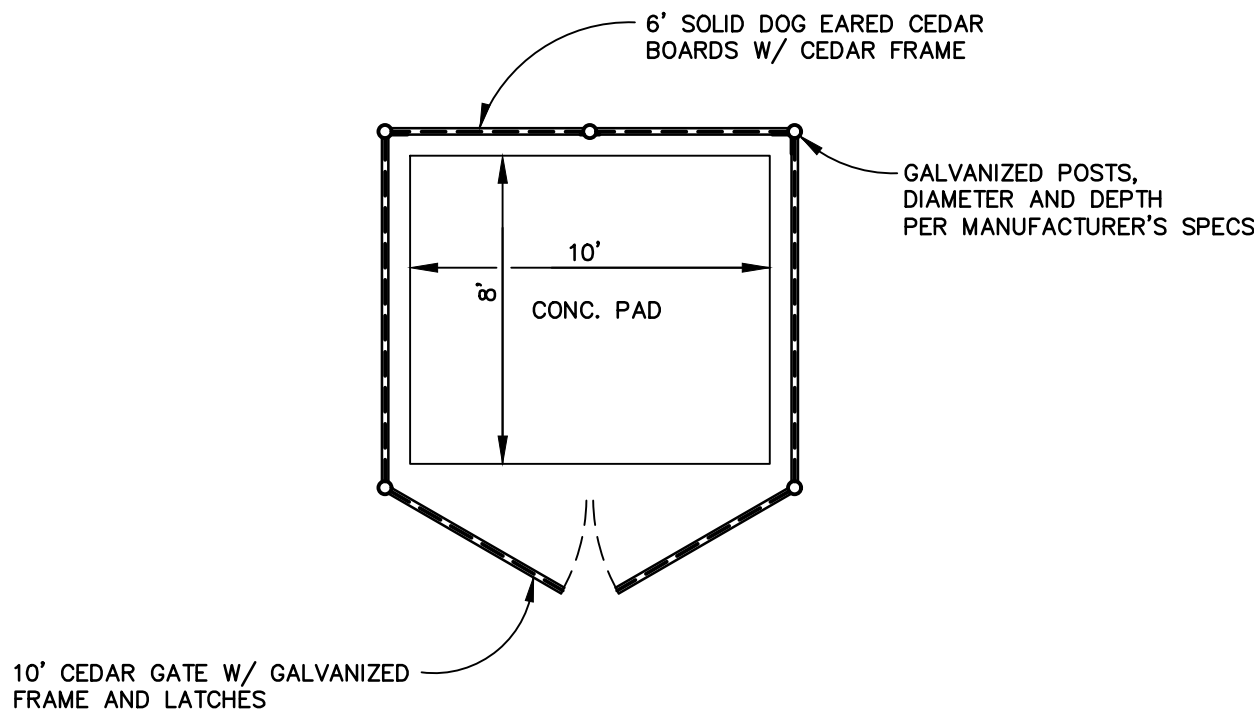
- CONSTRUCTION SPECIFICATIONS:**
- SPREADERS SHALL BE INSTALLED WITH A LEVEL INSTRUMENT. CONSTRUCT LEVEL LIP TO OR GRADE TO ENSURE UNIFORM SHEET FLOW. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL, NOT FILL.
  - SELECTED GEOTEXTILE FABRIC BASED ON UNDISTURBED SOILS (SANDS, SILTS, CLAYS, ETC.).
  - PLACE UNIFORMLY GRADED STONE (SEE TABLE 5-3).
  - THE INLET DITCH SHALL NOT EXCEED A 1% GRADE FOR AT LEAST 20 FEET BEFORE ENTERING THE SPREADER.
  - STORM RUN-OFF CONVERTED TO SHEET FLOW ACROSS OUTLET APRON SHALL FLOW ONTO STABILIZED AREAS. RUNOFF SHALL NOT BE RECONCENTRATED IMMEDIATELY BELOW THE POINT OF DISCHARGE.
  - PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED.
  - CONSTRUCTION OF LEVEL LIP SPREADER SHALL BE FROM UPHILL SIDE ONLY. LEVEL LIP AND AREA BELOW SPREADER SHALL BE AT EXISTING GRADES AND UNDISTURBED BY EARTHWORK OR EQUIPMENT EXCEPT AS NOTED ON PLAN.
  - CONSTRUCT SPREADER WITH LIP AT EXISTING ELEVATION AS SPECIFIED.
  - DOWN GRADIENT AND RECEIVING AREA MUST BE NATURALLY WELL VEGETATED.
  - DISCHARGE NOT PERMITTED WITHIN 25' OF A STREAM OR WETLAND. CONSULT DEP IF STRUCTURE MUST BE WITHIN 75' OF STREAM OR WATER BODY.

**LEVEL LIP SPREADER**  
NTS

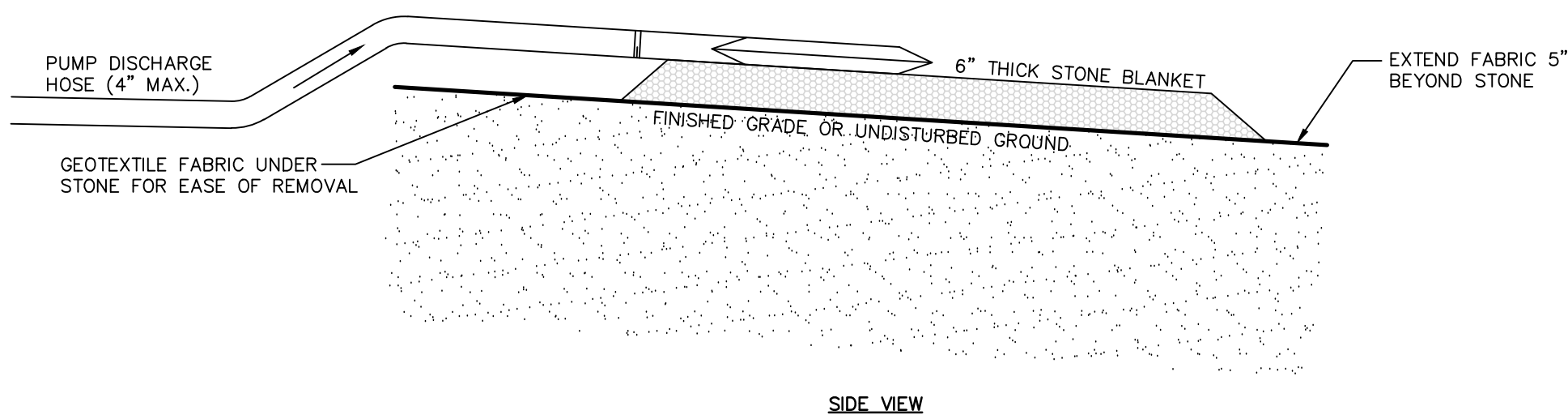
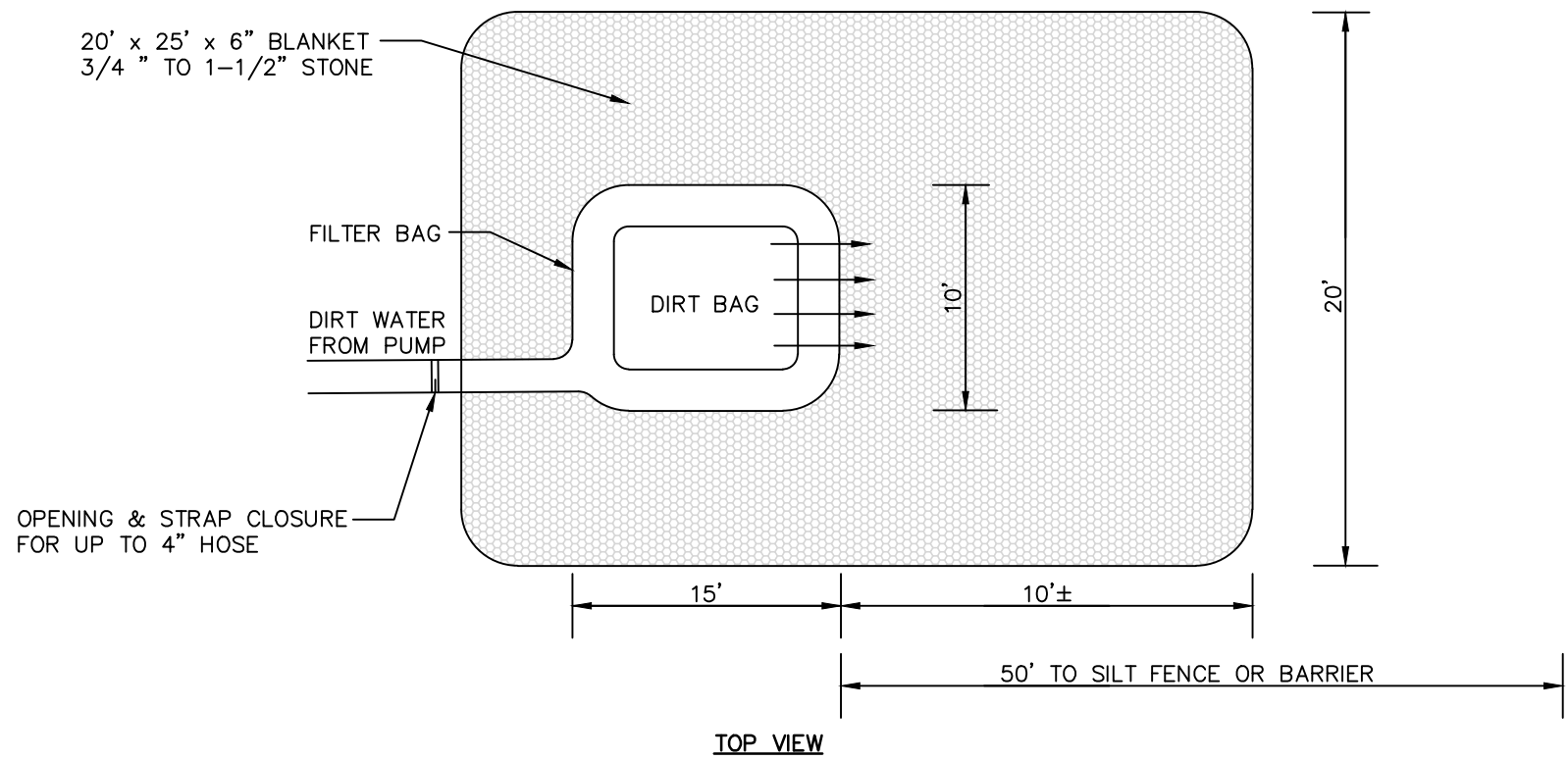
| LEVEL SPREADER | DIMENSIONS | TROUGH EL. | BERM EL. |
|----------------|------------|------------|----------|
| A              | 8'x20'     | 140.50     | 142.50   |
| B              | 8'x20'     | 145.50     | 147.50   |
| C              | 8'x20'     | 140.50     | 142.50   |



**TYPICAL GUARD RAIL**  
N.T.S.



**DUMPSTER ENCLOSURE**  
NTS



- NOTES:**
- DIRT BAG MATERIAL BASED ON PARTICLE SIZE IN DIRTY WATER, I.E. FOR COARSE PARTICLES A WOVEN MATERIAL; FOR SILTS/GLAYS A NON-WOVEN MATERIAL.
  - DO NOT OVER PRESSURIZE DIRT BAG OR USE BEYOND CAPACITY.
  - LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
  - DOWN GRADIENT RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION, E.G. FOREST FLOOR OR COARSE GRAVEL/STONE.
  - DISCHARGE NOT PERMITTED WITHIN 25' OF A STREAM OR WETLAND. CONSULT DEP IF STRUCTURE MUST BE WITHIN 75' OF STREAM OR WATER BODY. SECONDARY CONTAINMENT MAY BE REQUIRED.

**PUMPED DISCHARGE SEDIMENT  
CONTROL DEVICE ("DIRT BAG")**  
NTS

**DEWATERING PROCEDURE:**

SITE DEWATERING SHOULD BE COMPLETED IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL - BMP SECTION G-3 (CONSTRUCTION DEWATERING) DATED MARCH 2003 AS SUMMARIZED BELOW:

**CONSIDERATIONS:**

- THE DISCHARGE AREAS SHOULD BE CHOSEN WITH CAREFUL CONSIDERATION TO DOWN GRADIENT WATER RESOURCES AND THE LANDSCAPE ABILITY TO TREAT WATER FLOWS FROM THE DEWATERING PROCESS. A WOODED BUFFER IS BEST. ALL BUFFER REQUIREMENTS ARE FOUND IN THE VEGETATED BUFFER BMP SECTION. THE DISCHARGE SHOULD BE STOPPED IMMEDIATELY IF THE RECEIVING AREA IS SHOWING ANY SIGNS OF UNSTABILITY OR EROSION.
- IF THE COLLECTED RUNOFF IS CONTAMINATED WITH OIL, GREASE OR OTHER PETROLEUM PRODUCTS, OIL/WATER SEPARATOR OR A FILTRATION MECHANISM MAY BE NECESSARY PRIOR TO THE DISCHARGE. ANOTHER METHOD OF DISPOSAL SUCH AS CONTAINMENT AND TRUCKING AWAY BY A MAINE DEP LICENSED TRANSPORTER WILL NEED TO BE IMPLEMENTED IF THE WATER HAS BEEN CONTAMINATED BY TOXIC AND HAZARDOUS MATERIALS.
- ALL REQUIREMENTS OF STATE LAW AND PERMIT REQUIREMENTS OF LOCAL, STATE AND FEDERAL AGENCIES MUST BE MET.

**SPECIFICATIONS:**

DEWATERING EXCAVATED AREAS MUST BE IN TWO DISTINCT PHASES. THE REMOVAL OF THE COLLECTED WATER WITHIN THE EXCAVATION AND THE TREATMENT OF THE COLLECTED WATER.

**PHYSICAL DEWATERING**

THE REMOVAL OF WATER FROM THE EXCAVATED AREA CAN BE ACCOMPLISHED BY NUMEROUS METHODS. THE MOST COMMON OF THESE ARE: GRAVITY DRAIN THROUGH DAYLIGHT CHANNELS, MECHANICAL PUMPING, SIPHONING, AND USING THE BUCKET OF CONSTRUCTION EQUIPMENT TO SCOOP AND DUMP WATER FROM THE EXCAVATION.

- CHANNELS DUG DISCHARGING WATER FROM THE EXCAVATED AREA NEED TO BE STABLE. IF FLOW VELOCITIES CAUSE EROSION WITHIN THE CHANNEL THEN DITCH LINING SHOULD BE USED.
- BUCKETED WATER SHOULD BE DISCHARGED IN A STABLE MANNER TO THE SEDIMENT REMOVAL AREA. A SPLASH PAD OF RIPRAP UNDERLAIN WITH GEOTEXTILE MAY BE NECESSARY TO PREVENT SCOURING OF THE SOIL IN THE BASIN.
- DEWATERING IN PERIODS OF INTENSE, HEAVY RAIN, WHEN THE INFILTRATIVE CAPACITY OF THE SOIL IS EXCEEDED, SHOULD BE AVOIDED.

**SEDIMENT REMOVAL:**

MANY METHODS OF SETTLING OR FILTERING SEDIMENT ARE AVAILABLE FOR THE CONTRACTOR TO CONSIDER:

- FLOW TO THE SEDIMENT REMOVAL STRUCTURE MAY NOT EXCEED THE SEDIMENT REMOVAL STRUCTURE'S CAPACITY TO SETTLE AND FILTER FLOW OR THE STRUCTURE'S VOLUME CAPACITY.
- SEDIMENT REMOVAL BASINS SHOULD DISCHARGE WHEREVER POSSIBLE TO A WELL-VEGETATED BUFFER THROUGH SHEET FLOW AND SHOULD MAXIMIZE THE DISTANCE TO THE NEAREST WATER RESOURCE AND MINIMIZING THE SLOPE OF THE BUFFER AREA.
- VARIOUS BASINS HAVE BEEN PROPOSED IN PAST PROJECTS:
  - AN ENCLOSURE OF JERSEY BARRIERS WITH A LARGE PIECE OF SILT TAPE GEOTEXTILE.
  - A TEMPORARY ENCLOSURE CONSTRUCTED WITH HAY BALES, SILT FENCE, OR BOTH. EROSION CONTROL MIX ALSO MAY BE INCORPORATED WITH SILT FENCE OR HAY BALES.
  - DIRECT DISCHARGE TO A MANUFACTURED/PRE-MADE STRUCTURE SPECIFICALLY DESIGNED FOR SEDIMENT REMOVAL, LIKE SILT SAK, SILT BAG, OR OTHER SIMILAR PRODUCT.
  - CONCRETE OR STEEL SETTLING CHAMBERED SYSTEMS FOR SEDIMENT REMOVAL.
  - EXCAVATED OR BERMED SEDIMENTATION PONDS OR STRUCTURES. SIDE SLOPES NO GREATER THAN 2 TO 1, OR WITH A COMBINED INTERIOR AND EXTERIOR SLOPE OF NO GREATER THAN 5 TO 1. SEE THE SEDIMENT TRAP BMP SECTION.
  - A STORMWATER DETENTION POND MAY BE USED AS A STILLING BASIN DURING CONSTRUCTION. HOWEVER, A SEDIMENT BARRIER NEEDS TO BE INSTALLED TO THE OUTLET STRUCTURE TO PREVENT THE DISCHARGE OF SEDIMENT. SEE THE SEDIMENT POND CONSTRUCTION BMP SECTION.

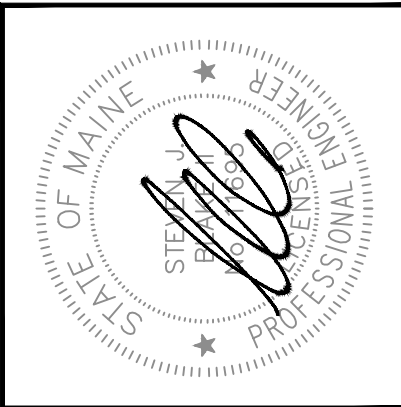
**INSTALLATION REQUIREMENTS:**

- FOR TRENCH EXCAVATION, LIMIT THE TRENCH LENGTH TO 500 FEET AND PLACE THE EXCAVATED MATERIAL ON THE UP GRADIENT SIDE OF THE TRENCH.
- INSTALL DIVERSION DITCHES OR BERMS TO MINIMIZE THE AMOUNT OF CLEAN STORMWATER RUNOFF ALLOWED INTO THE EXCAVATED AREA.
- NEVER DISCHARGE TO AREAS THAT ARE BARE OR NEWLY VEGETATED.

**MAINTENANCE:**

DURING THE ACTIVE DEWATERING PROCESS, INSPECTION OF THE DEWATERING FACILITY SHOULD BE REVIEWED FREQUENTLY. SPECIAL ATTENTION SHOULD BE PAID TO THE BUFFER AREA FOR ANY SIGN OF EROSION AND CONCENTRATION OF FLOW THAT MAY COMPROMISE THE BUFFER AREA. OBSERVE WHERE POSSIBLE THE VISUAL QUALITY OF THE EFFLUENT AND DETERMINE IF ADDITIONAL TREATMENT CAN BE PROVIDED.

| NO. | DATE    | REVISION | DESCRIPTION                                   |
|-----|---------|----------|-----------------------------------------------|
| 1   | 5/15/19 |          | Submitted Plan For City Review                |
| 2   | 5/15/19 |          | Submitted Plan For City Review                |
| 3   | 7/16/19 |          | Revised Per City Comments                     |
| 4   | 8/14/19 |          | Revised Per Peer Review                       |
| 5   | 9/11/19 |          | Revised Per City, Peer Review, & DEP Comments |
| 6   | 9/20/19 |          | Revised Per DEP Comments                      |



**BH2M**

**Berry, Huff, McDonald, Milligan Inc.**  
Engineers, Surveyors

28 Starr Street  
Gorham, Maine 04038

Tel: (207) 839-9771  
Fax: (207) 839-8250

FOR  
Dempsey, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

**STANDARD DETAILS C**

**DEMPSEY DRIVE**

MARCEL AVE  
BIDDEFORD, MAINE

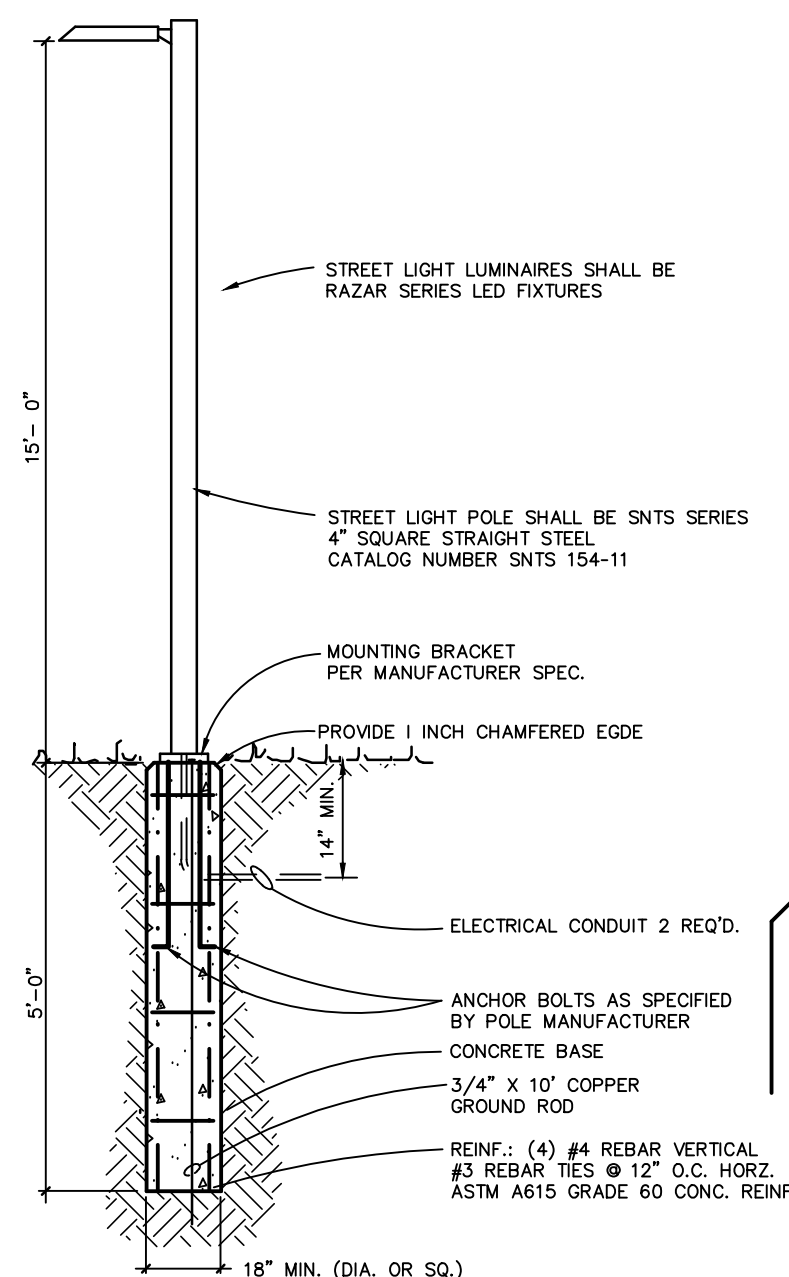
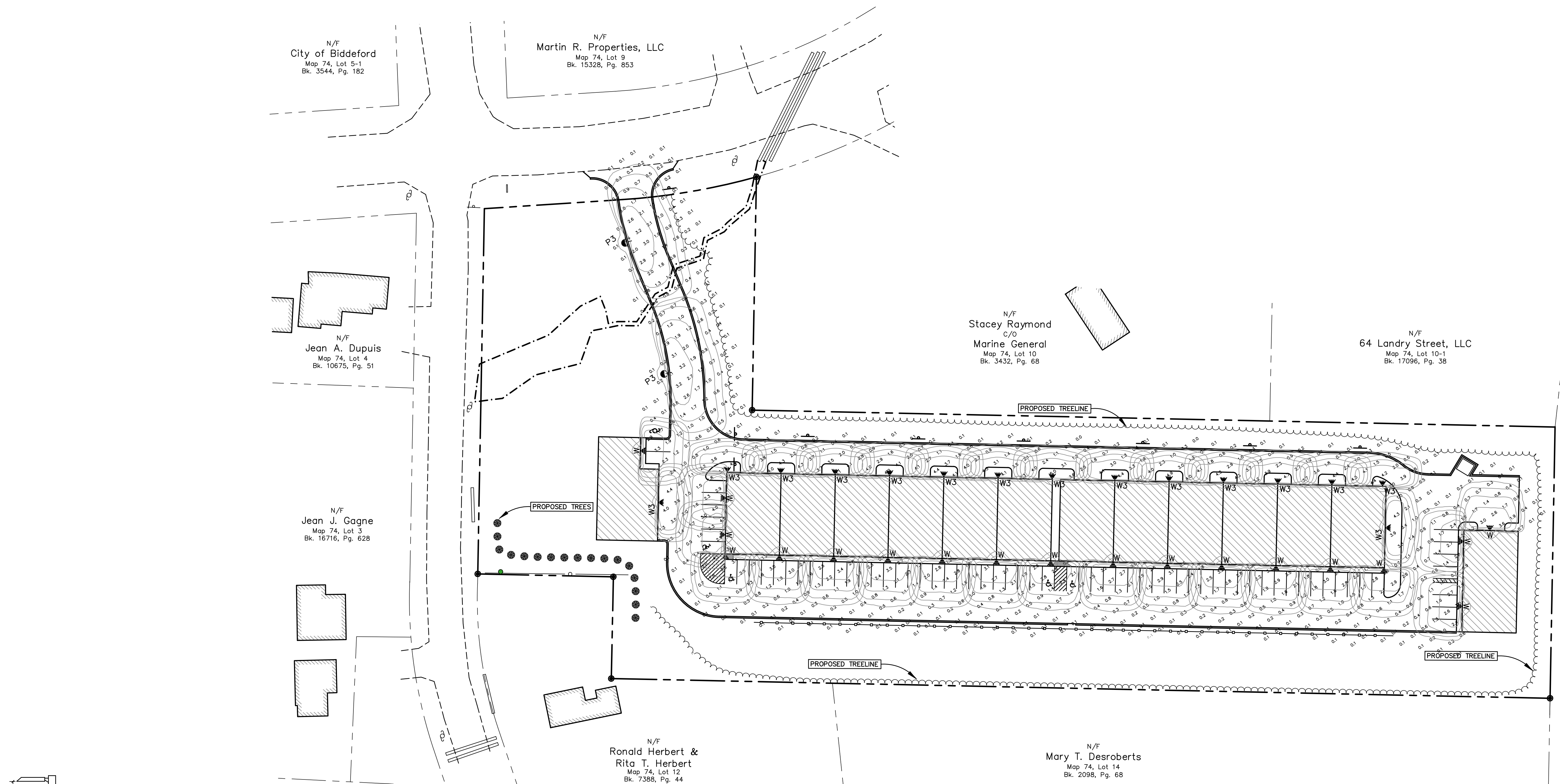
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|------------------------|-------------------|
| DESIGNED<br>Dept.      | DATE<br>Mar. 2019 |
| DRAWN<br>Dept.         | SCALE<br>As Noted |
| CHECKED<br>W. Thompson | JOB. NO.<br>19003 |

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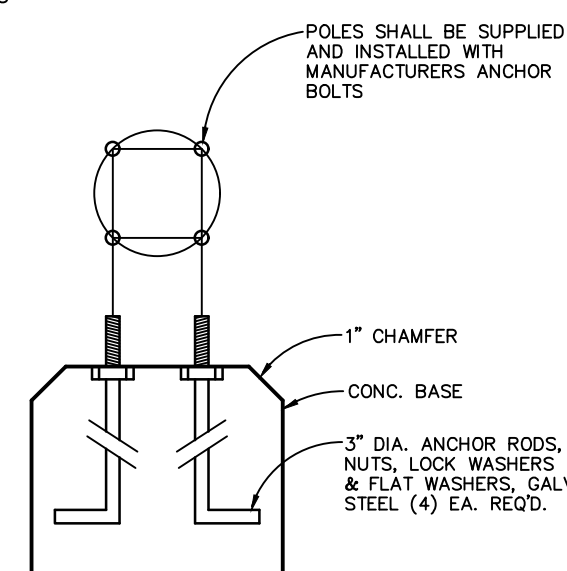
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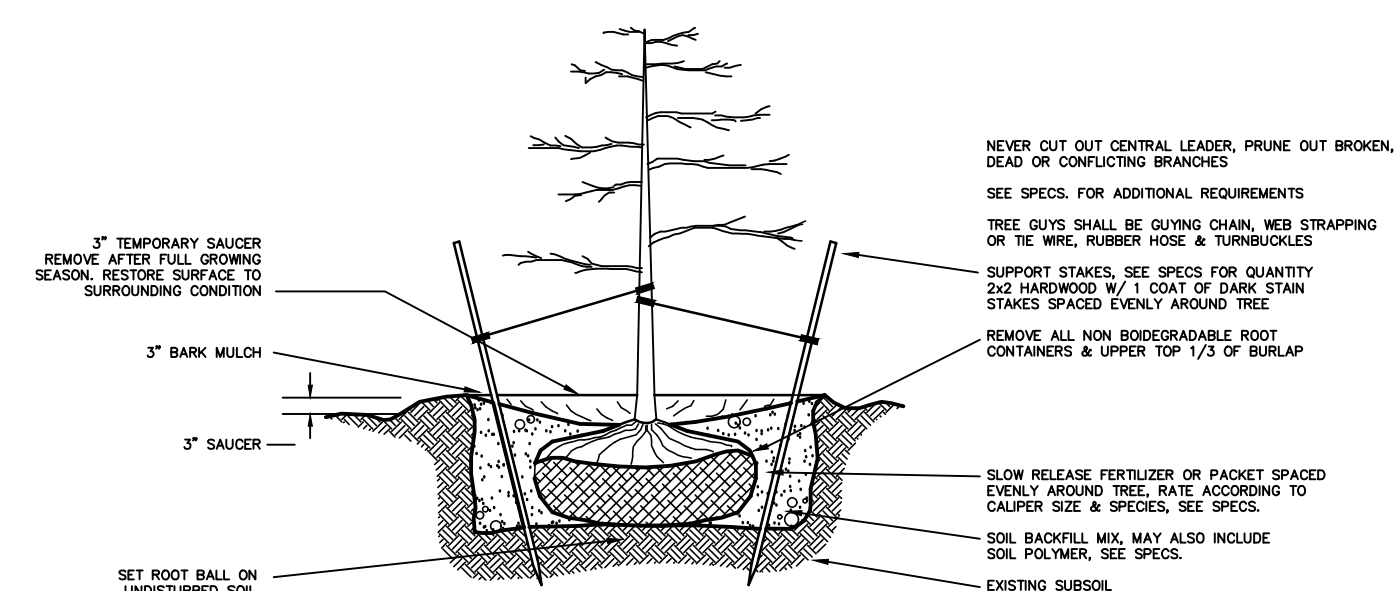




LIGHT POLE DETAIL  
N.T.S.



BOLT LAYOUT  
& MATERIALS



TREE PLANTING & STAKING DETAIL  
N.T.S.

#### PLANTING SCHEDULE

| SYMBOL | SCIENTIFIC NAME | COMMON NAME              | QUANTITY | SIZE  |
|--------|-----------------|--------------------------|----------|-------|
|        | NIGRA           | DARK AMERICAN ARBORVITAE | 16       | 5'-6' |

#### PLANTING NOTES:

- PERIMETER VEGETATION SHALL BE PROTECTED DURING CONSTRUCTION.
- PROPOSED PLANTING LOCATIONS SHALL BE SELECTED SO AS TO NOT REMOVE EXISTING BUFFER PLANTINGS.

| Symbol | Qty | Arrangement |
|--------|-----|-------------|
| ◀ W    | 19  | SINGLE      |
| ◀ W3   | 15  | SINGLE      |
| ◀ P3   | 2   | SINGLE      |

#### Luminaire Schedule

| Description                                     |
|-------------------------------------------------|
| RZR-WM1-IV-FT-20PLED-525mA-NW-HS                |
| RZR-WM1-III-20PLED-525mA-NW-HS/ WALL MTD 9' AFG |
| RZR-M-III-48LED-NW-525-HS/ SNTS154-11(15' AFG)  |

PARKING AREA ONLY  
NEW PARKING AREAS

Illuminance (Fc)  
Average = 1.68  
Maximum = 5.0  
Minimum = 0.1  
Avg/Min Ratio = 16.80  
Max/Min Ratio = 50.00  
PHOTOMETRICS AND LIGHT BY CHARRON INC.



**BH2M**  
Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors  
28 Starr Street  
Portland, Maine 04108  
Tel: (207) 859-2771  
Fax: (207) 859-8250

FOR  
Dempsey, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

#### LIGHTING AND LANDSCAPING PLAN DEMPSEY DRIVE

MARCEL AVE.  
BIDDEFORD, MAINE

| DESIGNED | DATE      |
|----------|-----------|
| A. Fagan | Mar. 2019 |
| DRAWN    | SCALE     |
| Dept.    | 1" = 40'  |
| CHECKED  | JOB. NO.  |
| S. Blake | 19003     |

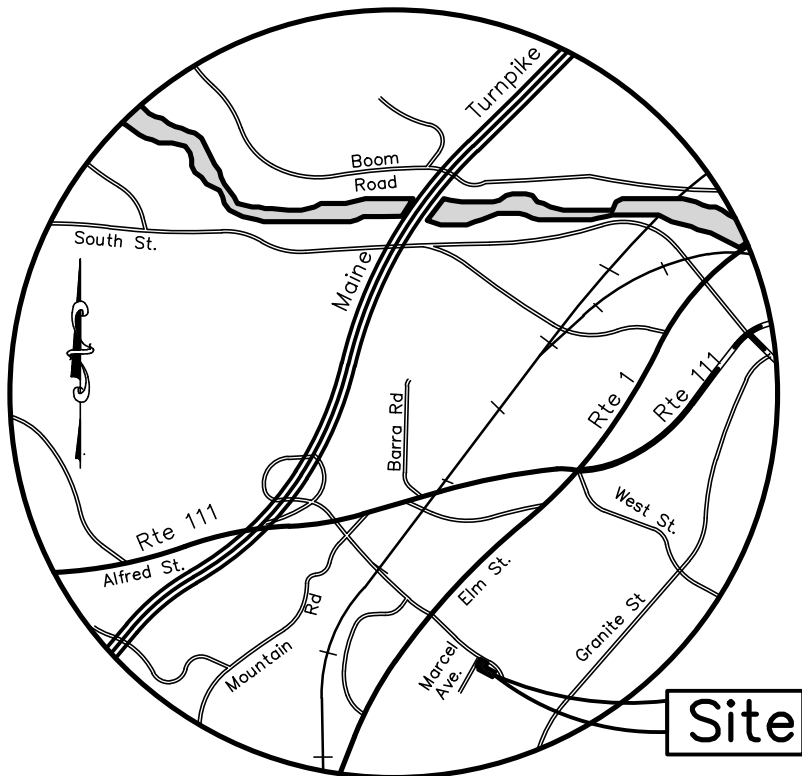
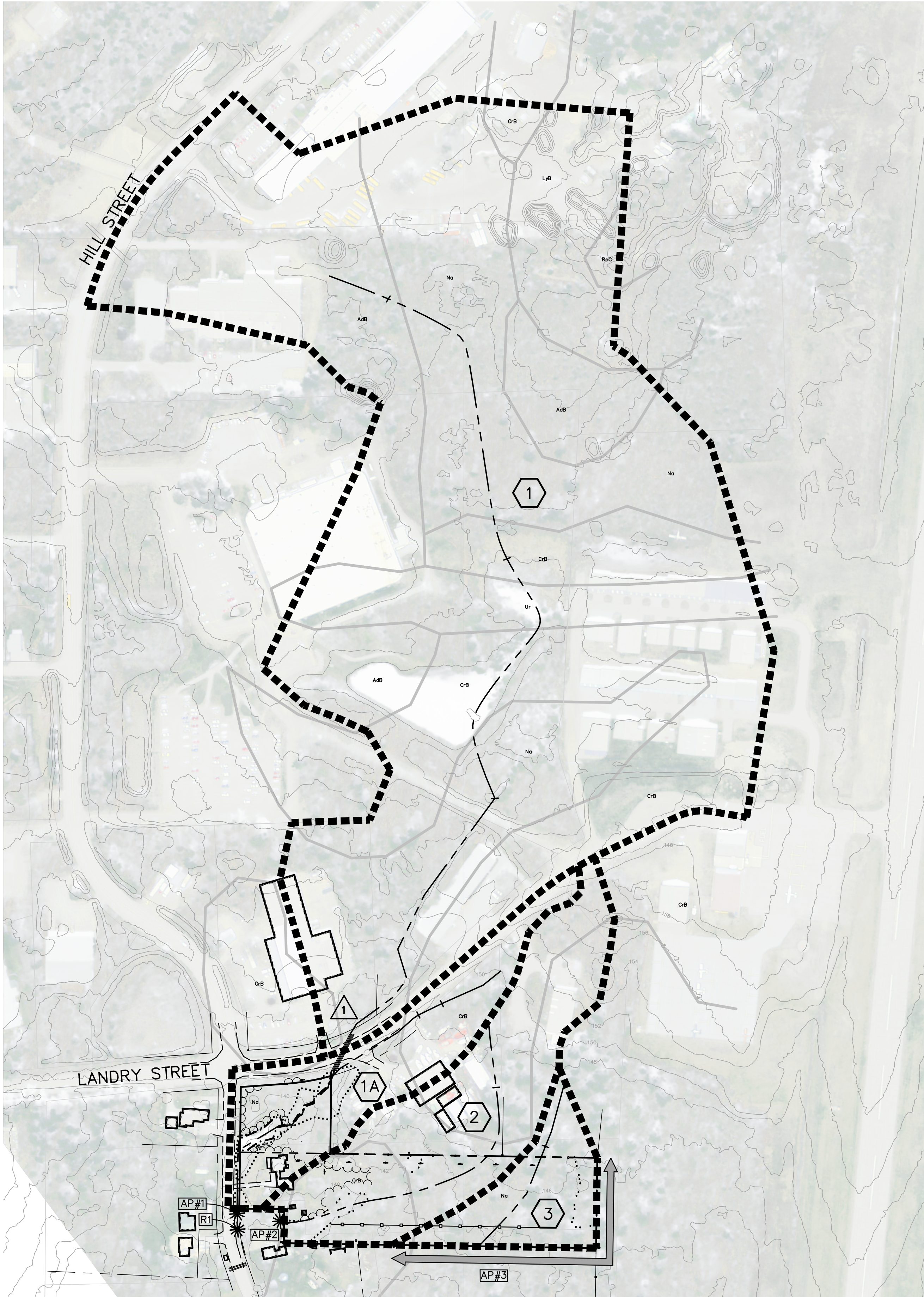
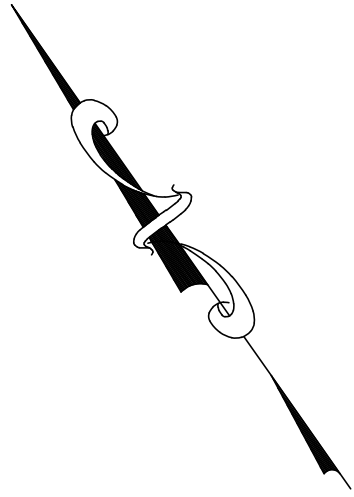
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| 6   | 9/20/19 | Revised Per DEP Comments                      |             |





LOCATION MAP  
SCALE: 1" = 2 MILES

NOTES:

1. APPLICANT: TOM GILLIS, LANDMATTERS, LLC  
P.O. BOX 468  
OLD ORCHARD BEACH, MAINE 04064
2. SURVEYOR: ROBERT C. LIBBY JR., PLS #2190  
BH2M  
28 STATE STREET  
GORHAM, MAINE
3. WETLAND DELINEATION: ALEXANDER FINAMORE, CWS, LSE  
440 SWAMP ROAD  
DURHAM, MAINE 04222
4. SOILS: SOILS SHOWN PER USDA WEB SOIL SURVEY
5. TOPOGRAPHY: MAINE STATE 2' GIS CONTOURS

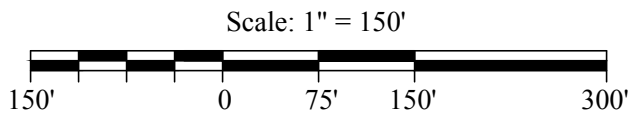
| ANALYSIS POINT | PRE DEVELOPMENT FLOWS |              |              |
|----------------|-----------------------|--------------|--------------|
|                | 2 YR. STORM           | 10 YR. STORM | 25 YR. STORM |
| AP-1           | 16.44 CFS             | 34.83 CFS    | 47.27 CFS    |
| AP-2           | 0.87 CFS              | 2.84 CFS     | 4.85 CFS     |
| AP-3           | 1.04 CFS              | 2.12 CFS     | 3.06 CFS     |
| R1             | 17.27 CFS             | 37.41 CFS    | 51.29 CFS    |

TO SUMMARY  
(FOR THOSE NOT LABELED ON THE PLAN)  
SUBCATCHMENT TO ROUTE

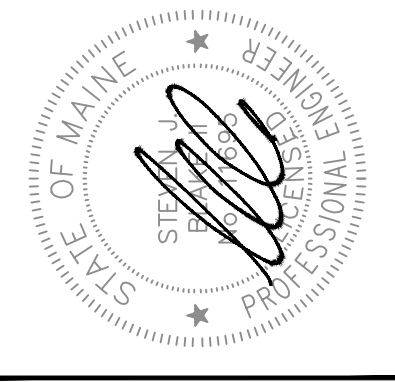
|       |                                                            |
|-------|------------------------------------------------------------|
| SA-1  | 150' SHEET, 660' SHALLOW,<br>644' WATER BODY, 650' CHANNEL |
| SA-1A | 150' SHEET, 57' SHALLOW, 660 CHANNEL                       |
| SA-2  | 150' SHEET, 638' SHALLOW                                   |
| SA-3  | 150' SHEET, 270' SHALLOW                                   |

| SYMBOL | LEGEND                      | DESCRIPTION |
|--------|-----------------------------|-------------|
|        | TEST PIT                    |             |
|        | POND                        |             |
|        | DRAINAGE SUB AREA           |             |
|        | REACH                       |             |
|        | DRAINAGE AREA BOUNDARY      |             |
|        | TIME OF CONCENTRATION ROUTE |             |
|        | LIMIT OF WETLANDS           |             |
|        | EXISTING CONTOUR            |             |
|        | PROPOSED CONTOUR            |             |

| SOILS LEGEND          |                     |
|-----------------------|---------------------|
| SYMBOL                | DESCRIPTION         |
|                       | SOIL BOUNDARY LINES |
|                       | LIMIT OF WETLANDS   |
| SLOPE DESIGNATION     |                     |
| A = 0 - 3%            |                     |
| B = 3 - 8%            |                     |
| C = 8 - 20%           |                     |
| D = 20%+              |                     |
| HYDROLOGIC SOIL GROUP |                     |
| SOIL                  | GROUP               |
| ADAMS (AdB)           | A                   |
| CROGHAN (CrB)         | A                   |
| LYMAN (LyB)           | D                   |
| NAUMBURG (Na)         | A/D *               |
| ROCK OUTCROP (Roc)    | D                   |
| URBAN (Ur)            | D                   |
| * ASSUME D SOIL TYPE  |                     |



| REVISION |         | DESCRIPTION                                   |
|----------|---------|-----------------------------------------------|
| NO.      | DATE    |                                               |
| 1        | 4/10/19 | Submitted Plan For City Review                |
| 2        | 5/15/19 | Submitted Plan For City Review                |
| 3        | 7/16/19 | Revised Per City Comments                     |
| 4        | 8/14/19 | Revised Per Peer Review                       |
| 5        | 9/11/19 | Revised Per City, Peer Review, & DEP Comments |
| 6        | 9/20/19 | Revised Per DEP Comments                      |



**BH2M**  
Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors  
28 State Street  
Gorham, Maine 04038  
Tel: (207) 839-2771  
Fax: (207) 839-8250

FOR  
Dempsey, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

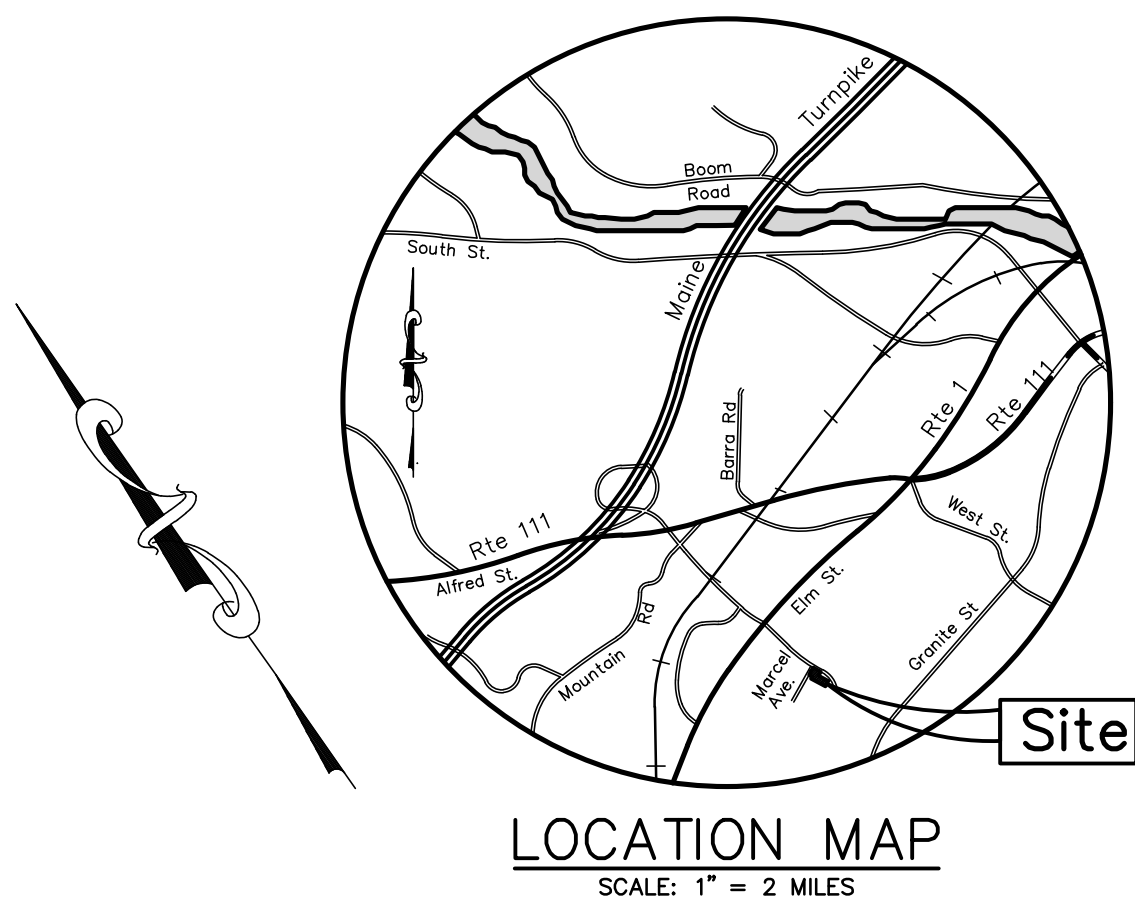
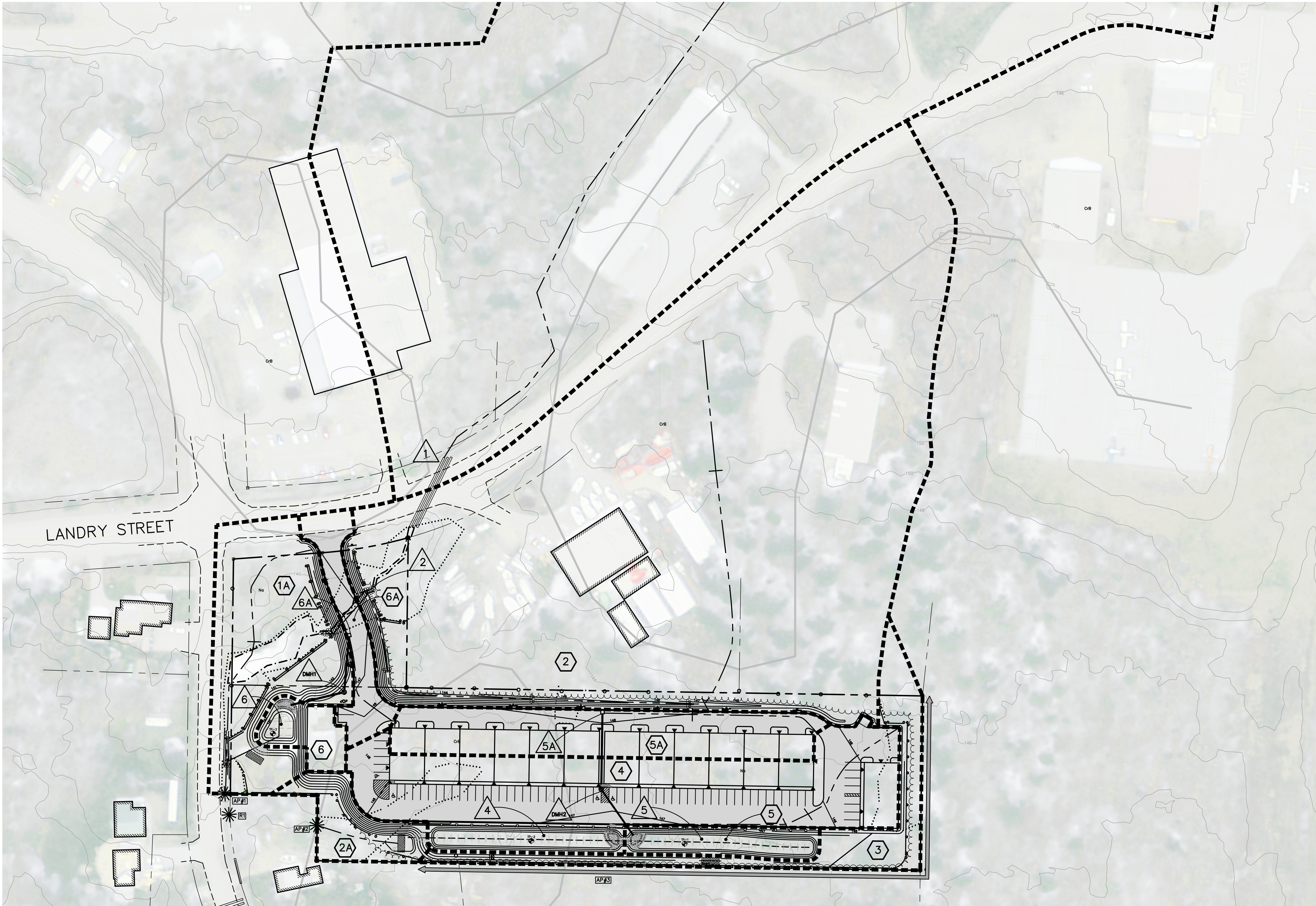
PRE DEVELOPMENT  
DEMPSEY DRIVE  
COMMERCIAL CONDOMINIUMS  
MARCEL AVE.  
BIDDEFORD, MAINE

|                      |                   |
|----------------------|-------------------|
| DESIGNED<br>A. Fagan | DATE<br>Mar. 2019 |
| DRAWN<br>Dept.       | SCALE<br>As Noted |
| CHECKED<br>S. Blake  | JOB. NO.<br>19003 |

SHEET  
**A**

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- NOTES:
1. APPLICANT: TOM GILLIS, LANDMATTERS, LLC  
P.O. BOX 468  
OLD ORCHARD BEACH, MAINE 04064
  2. SURVEYOR: ROBERT C. LIBBY JR., PLS #2190  
28 STATE STREET  
GORHAM, MAINE
  3. WETLAND DELINEATION: ALEXANDER FINAMORE, CWS, LSE  
440 SWAMP ROAD  
DURHAM, MAINE 04222
  4. SOILS: SOILS SHOWN PER USDA WEB SOIL SURVEY
  5. TOPOGRAPHY: MAINE STATE 2' GIS CONTOURS

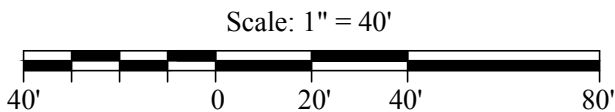
| ANALYSIS POINT | POST DEVELOPMENT FLOWS |                    |                    |
|----------------|------------------------|--------------------|--------------------|
|                | FLOW RATE = POST (PRE) |                    |                    |
|                | 2 YR. STORM            | 10 YR. STORM       | 25 YR. STORM       |
| AP-1           | 17.31 (16.44) CFS*     | 36.82 (34.83) CFS* | 50.03 (47.27) CFS* |
| AP-2           | 0.06 (0.87) CFS        | 1.86 (2.84) CFS    | 4.59 (4.85) CFS    |
| AP-3           | 0.41 (1.04) CFS        | 0.92 (2.12) CFS    | 2.87 (3.06) CFS    |
| R1             | 17.36 (17.27) CFS*     | 37.74 (37.41) CFS* | 51.14 (51.29) CFS  |

\* = INCREASE IN POST DEVELOPMENT FLOW RATE

| Tc SUMMARY                          |                                                         |
|-------------------------------------|---------------------------------------------------------|
| (FOR THOSE NOT LABELED ON THE PLAN) |                                                         |
| SUBCATCHMENT                        | Tc ROUTE                                                |
| SA-1                                | 150' SHEET, 660' SHALLOW, 644' WATER BODY, 650' CHANNEL |
| SA-1A                               | 150' SHEET, 183' CHANNEL                                |
| SA-2                                | 150' SHEET, 276' SHALLOW, 478' CHANNEL                  |
| SA-2A                               | 80' SHEET                                               |
| SA-3                                | 65' SHEET                                               |
| SA-4                                | 150' SHEET, 30' SHALLOW, 199' CHANNEL                   |
| SA-5                                | 6 MIN. DIRECT ENTRY                                     |
| SA-5A                               | 28' SHEET, 228' SHALLOW                                 |
| SA-6                                | 6 MIN. DIRECT ENTRY                                     |
| SA-6A                               | 52' SHEET, 68' SHALLOW                                  |

| SOILS LEGEND          |                     |
|-----------------------|---------------------|
| SYMBOL                | DESCRIPTION         |
|                       | SOIL BOUNDARY LINES |
|                       | LIMIT OF WETLANDS   |
| SLOPE DESIGNATION     |                     |
| A                     | 0 - 3%              |
| B                     | 3 - 8%              |
| C                     | 8 - 20%             |
| D                     | 20%+                |
| HYDROLOGIC SOIL GROUP |                     |
| SOIL                  | GROUP               |
| ADAMS (AdB)           | A                   |
| CROGHAN (CrB)         | A                   |
| LYMAN (LyB)           | D                   |
| NAUMBURG (Na)         | A/D *               |
| ROCK OUTCROP (Roc)    | D                   |
| URBAN (Ur)            | D                   |
| * ASSUME D SOIL TYPE  |                     |

| SYMBOL | DESCRIPTION                 |
|--------|-----------------------------|
|        | TEST PIT                    |
|        | POND                        |
|        | DRAINAGE SUB AREA           |
|        | REACH                       |
|        | DRAINAGE AREA BOUNDARY      |
|        | TIME OF CONCENTRATION ROUTE |
|        | LIMIT OF WETLANDS           |
|        | EXISTING CONTOUR            |
|        | PROPOSED CONTOUR            |

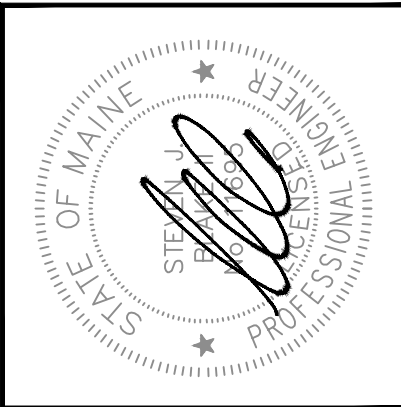


| Subcatchment ID | Proposed Impervious Area (sf) | Proposed Landscaped Area (sf) | Proposed Developed Area (sf) | Existing Impervious Area (sf) | Existing Landscaped Area (sf) | Treated Impervious Area (sf) | Treated Developed Area (sf) | BMP ID |
|-----------------|-------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|--------|
| 1A              | 0                             | 5,407                         | 5,407                        | 0                             | 7,029                         | 0                            | 0                           | None   |
| 2               | 0                             | 9,386                         | 9,386                        | 0                             | 0                             | 0                            | 0                           | None   |
| 2A              | 0                             | 3,438                         | 3,438                        | 0                             | 1,487                         | 0                            | 0                           | None   |
| 3               | 0                             | 4,607                         | 4,607                        | 0                             | 0                             | 0                            | 0                           | None   |
| 4               | 51,581                        | 8,726                         | 60,307                       | 0                             | 0                             | 51,581                       | 60,307                      | GUSF A |
| 5               | 0                             | 7,772                         | 7,772                        | 0                             | 0                             | 0                            | 7,772                       | GUSF B |
| 5A              | 24,906                        | 1,903                         | 26,809                       | 0                             | 0                             | 24,906                       | 26,809                      | GUSF B |
| 6               | 3,098                         | 2,824                         | 5,922                        | 0                             | 0                             | 3,098                        | 5,922                       | GUSF C |
| 6A              | 8,105                         | 156                           | 8,261                        | 0                             | 0                             | 8,105                        | 8,261                       | GUSF C |
| Total           | 87,690                        | 44,219                        | 131,909                      | 0                             | 8,516                         | 87,690                       | 109,071                     |        |

Note: All existing onsite impervious area is being removed as part of this development.

| New Development Treatment Summary         |         |
|-------------------------------------------|---------|
| Total Proposed Impervious Area (sq. ft.)= | 87,690  |
| Total Proposed Developed Area (sq. ft.)=  | 131,909 |
| Total Treated Impervious Area (sq. ft.)=  | 87,690  |
| Total Treated Developed Area (sq. ft.)=   | 109,071 |
| Impervious Area Treatment % =             | 100.00% |
| Developed Area Treatment % =              | 82.69%  |

| REVISION | DESCRIPTION |
|----------|-------------|
| NO.      | DATE        |
| 1        | 4/10/19     |
| 2        | 5/15/19     |
| 3        | 7/16/19     |
| 4        | 8/14/19     |
| 5        | 9/11/19     |
| 6        | 9/20/19     |



**BH2M**

**Berry, Huff, McDonald, Milligan Inc.**

Engineers, Surveyors

28 State Street  
Durham, Maine 04222

Tel: (207) 839-9771  
Fax: (207) 839-8250

FOR  
Dempsey, LLC  
P.O. Box 468  
Old Orchard Beach, Maine

POST DEVELOPMENT

DEMPSEY DRIVE

MARCEL AVE  
BIDDEFORD, MAINE

| DESIGNED | DATE      |
|----------|-----------|
| A. Fagan | Mar. 2019 |
| DRAWN    | SCALE     |
| Dept.    | As Noted  |
| CHECKED  | JOB. NO.  |
| S. Blake | 19003     |

SHEET

**B**

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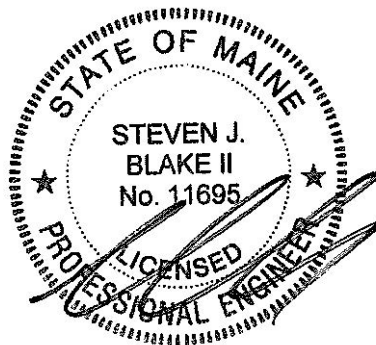


**STORMWATER MANAGEMENT REPORT  
FOR  
DEMPSEY DRIVE  
COMMERCIAL STORAGE FACILITY  
Landry Street  
Biddeford, Maine**

**For  
Tom Gillis  
Landmatters, LLC.**

**May 2019**

**REVISED  
July 2019  
September 2019**



**Prepared By:**

**Berry Huff McDonald Milligan, Inc.  
Engineers Surveyors Planners  
28 State Street  
Gorham, ME 04038  
207-839-2771  
FAX 207-839-8250  
[sblake@bh2m.com](mailto:sblake@bh2m.com)**

## **TABLE OF CONTENTS**

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| 1.2 | DESCRIPTION OF POINTS OF ANALYSIS.....                    | 2 |
| 1.3 | PRE DEVELOPMENT CONDITIONS .....                          | 2 |
| 1.4 | POST DEVELOPMENT CONDITIONS.....                          | 3 |
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| 1.6 | STORMWATER QUANTITY .....                                 | 4 |
| 1.7 | STORMWATER QUALITY .....                                  | 4 |
| 1.8 | CONCLUSION.....                                           | 5 |

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| APPENDIX C | PRE DEVELOPMENT CALCULATIONS              |
| APPENDIX D | POST DEVELOPMENT CALCULATIONS             |
| APPENDIX E | WATER QUALITY AND BMP SIZING CALCULATIONS |
| APPENDIX F | DOWNSTREAM SWALE AND CULVERT ANALYSIS     |
| APPENDIX G | OPERATION AND MAINTENANCE MANUAL          |
| APPENDIX H | TEST PIT LOGS – MAINLY SOILS              |



# STORMWATER MANAGEMENT REPORT

**For:**  
**Tom Gillis, Landmatters, LLC.**  
**Landry Street**  
**Biddeford, Maine**

## 1.0 INTRODUCTION

Tom Gillis is proposing to build a commercial storage facility located on Landry Street in Biddeford. The project will include construction of a paved access drive, underground utilities, and stormwater management infrastructure to support the development. The proposed infrastructure improvements will create approximately 87,690 sf of impervious area and 44,219 sf of landscaped area totaling 131,909 sf of developed area for the project.

The following stormwater management plan has been prepared in accordance with the Maine Department of Environmental Protections “Stormwater Management Rules” Chapters 500, 501 and 502 as well as the most recent version of the “Maine Stormwater Best Management Practices Manual”. The proposed project will be required to meet the Basic, and General Standards.

## 1.1 OVERVIEW OF MODELING METHODOGY AND SOURCE INFORMATION

Hydrologic Analysis: The pre and post development conditions have been modeled using modeling software (Hydrocad Version 10) which is based upon the methodology contained within the USDA Soil Conservation Service Technical Release 55. Type III 24-hour storm distributions for York County were used for the analysis. The following frequencies and 24-hour rainfall amounts were used for the analysis:

| Return Period  | 24-Hour Rainfall Depth |
|----------------|------------------------|
| 2-Year Storm   | 3.30 inches            |
| 10-Year Storm  | 4.90 inches            |
| 25-Year Storm  | 6.20 inches            |
| 100-Year Storm | 8.70 inches            |

Soils: The soils used for the stormwater analysis were digitized from the Medium Intensity Soils Maps for York County. Refer to Sheets A and B for soils information.

The soils include:

| Map Unit Name | Hydrologic Soil Group |
|---------------|-----------------------|
| Adams         | A                     |
| Croghan       | A                     |
| Lyman         | D                     |
| Naumburg      | A/D*                  |
| Rock Outcrop  | D                     |
| Urban         | D                     |

\* Assume Type D Soil

Topography: LIDAR data from the aerial mapping

Natural Resources: Wetland delineations provided by Mainely Soils

## 1.2 **DESCRIPTION OF POINTS OF ANALYSIS**

The watershed model analyzes the discharge of runoff at one Analysis Point as described below:

### Analysis Point #1

Description: Ditch along Marcel Ave. at the property boundary.

Pre-Development Tributary Drainage Areas: SA-1 & 1A

Post Development Tributary Drainage Areas: SA-1, 1A, 2, 6, & 6A

### Analysis Point #2

Description: Ditch between the abutting property and the project boundary.

Pre-Development Tributary Drainage Areas: SA-2

Post Development Tributary Drainage Areas: SA-2A, & 4

### Analysis Point #3

Description: Southern property boundary.

Pre-Development Tributary Drainage Areas: SA-3

Post Development Tributary Drainage Areas: SA-3, 5, & 5A

### Reach #1

Reach 1 is a combination of flows from analysis point 1 and 2. This reach shows what flow rates will be at the driveway culvert of the abutting property because analysis points 1 and 2 meet just outside of the property boundary.

## 1.3 **PRE DEVELOPMENT CONDITIONS**

The Existing Conditions are shown on sheet 2 and sheet A of the accompanying plans. The parcel to be developed encompasses an area of approximately 4.173 acres and is located on Landry Street in Biddeford. The parcel is mostly wooded and is primarily surrounded by industrial and residential properties. The parcel lies within

the watershed of an unnamed stream that is tributary to Thatcher Brook which is an urban impaired stream.

The watershed that was analyzed for this project is approximately 53 acres in size. The analysis points are located along the southern boundary of the parcel and are described in Section 1.2 of this report. The watershed is bounded by Hill Street to the North, Marcel Ave to the West, and a mix of forest, industrial buildings, and residential lots to the South and East.

The Pre-Development Drainage Plan is included as Sheet A of the accompanying plans and the Calculations are attached as Appendix C.

The Pre-Development Drainage Model predicts the following peak flow rates:

| <b>Pre-Development Peak Flows (cu. ft./sec)</b> |               |                |                |
|-------------------------------------------------|---------------|----------------|----------------|
| <b>Analysis Point</b>                           | <b>2-Year</b> | <b>10-Year</b> | <b>25-Year</b> |
| AP-1                                            | 16.44         | 34.83          | 47.27          |
| AP-2                                            | 0.87          | 2.84           | 4.85           |
| AP-3                                            | 1.04          | 2.12           | 3.06           |
| Reach 1                                         | 17.27         | 37.41          | 51.29          |

#### **1.4 POST DEVELOPMENT CONDITIONS**

The proposed project will include development of 14 commercial storage units, access roads, and stormwater treatment facilities. Below is a summary of the proposed impervious area for full build-out of the project.

|                           |   |                  |
|---------------------------|---|------------------|
| Proposed Impervious Area  | = | 87,690 sf        |
| <u>Proposed Lawn Area</u> | = | <u>44,219 sf</u> |
| Proposed Developed Area   | = | 131,909 sf       |

The proposed project will include three Grassed Underdrain Soil Filters to provide water quality treatment and attenuation of peak flows for portions of the project.

The Post Development Drainage Plan is included as Sheet B of the accompanying plan set and the Calculations are attached as Appendix D.

The Post-Development Watershed Model predicts the following peak flow rates:

| <b>Post Development Peak Flows (cu. ft./sec)</b> |               |                |                |
|--------------------------------------------------|---------------|----------------|----------------|
| <b>Analysis Point</b>                            | <b>2-Year</b> | <b>10-Year</b> | <b>25-Year</b> |
| AP-1                                             | 17.31         | 36.82          | 50.03          |
| AP-2                                             | 0.06          | 1.86           | 4.59           |
| AP-3                                             | 0.41          | 0.92           | 2.87           |
| Reach 1                                          | 17.36         | 37.74          | 51.14          |



## 1.5 BASIC STANDARDS

Basic Standards are the Erosion and Sediment Control measures detailed in the E & S plan shown on Sheet 3 of the project plans.

## 1.6 STORMWATER QUANTITY

The following Table compares the Pre and Post Development peak discharge rates for the 2, 10, and 25-year return periods.

| Peak Flow Comparison (cu. ft./sec) |        |       |         |       |         |       |
|------------------------------------|--------|-------|---------|-------|---------|-------|
| Analysis Point                     | 2-Year |       | 10-Year |       | 25-Year |       |
|                                    | Pre    | Post  | Pre     | Post  | Pre     | Post  |
| AP-1                               | 16.44  | 17.13 | 34.83   | 36.82 | 47.27   | 50.03 |
| AP-2                               | 0.87   | 0.06  | 2.84    | 1.86  | 4.85    | 4.59  |
| AP-3                               | 1.04   | 0.41  | 2.12    | 0.92  | 3.06    | 2.87  |
| Reach 1                            | 17.27  | 17.36 | 37.41   | 37.74 | 51.29   | 51.14 |

The proposed stormwater design treats the runoff and reduces the Post Development peak flow rates to less than the Pre Development peak flow rates for all storm events at analysis points 2 and 3. An increase in flow rate is created at analysis point 1 for all storm events. The combined flow rates of analysis points 1 and 2 which meet just downstream of the parcels property boundary, (Reach 1) are decreased for the 25-year storm event. The 2 and 10-year storm events result in a 0.5% and 0.9% increase in flow rate (respectively) in the downstream ditch. Flows to the downgradient culvert will be reduced in the 25-year storm event. The downstream ditch and culvert has been modeled as part of the pre and post development stormwater analysis and the documents pertaining to this analysis can be found in Appendix F of this stormwater report.

## 1.7 STORMWATER QUALITY

The stormwater management system includes catch basins, storm drains, and three grassed underdrain filters. The proposed BMP's have been designed in accordance with the design requirements outlined in the Maine Stormwater Best Management Practices Manual. Refer to Appendix E for detailed calculations. Below is a summary of the treatment areas for the project.

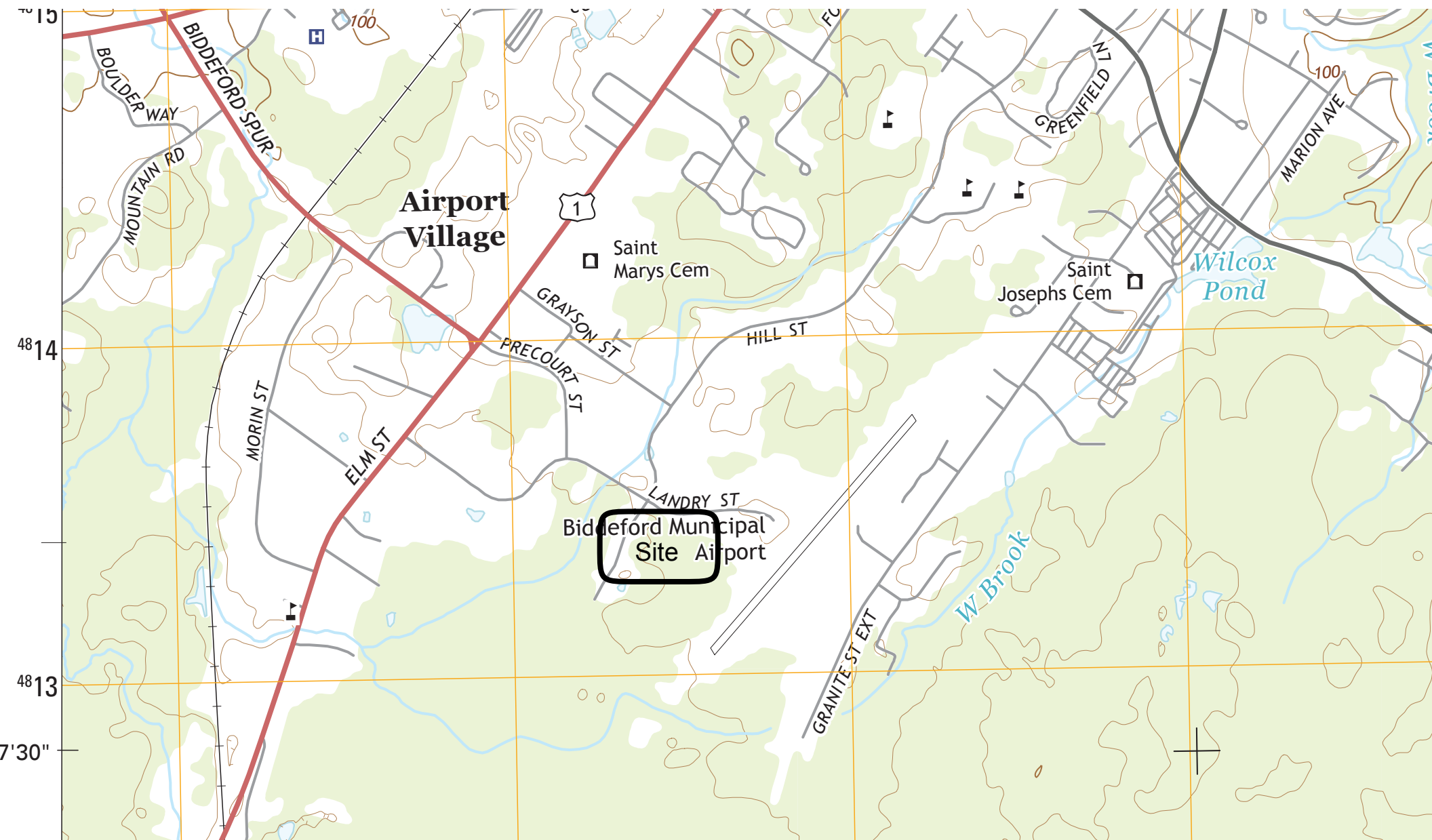
|                                     |                               |
|-------------------------------------|-------------------------------|
| Total Proposed Impervious Area:     | 87,690 sf                     |
| Total Proposed Developed Area:      | 131,909 sf                    |
| Total Treated Impervious Area:      | 87,690 sf                     |
| Total Treated Developed Area:       | 109,071 sf                    |
| <b>Impervious Area Treatment %:</b> | <b>100.00% (95% Required)</b> |
| <b>Developed Area Treatment %:</b>  | <b>82.69% (80% Required)</b>  |

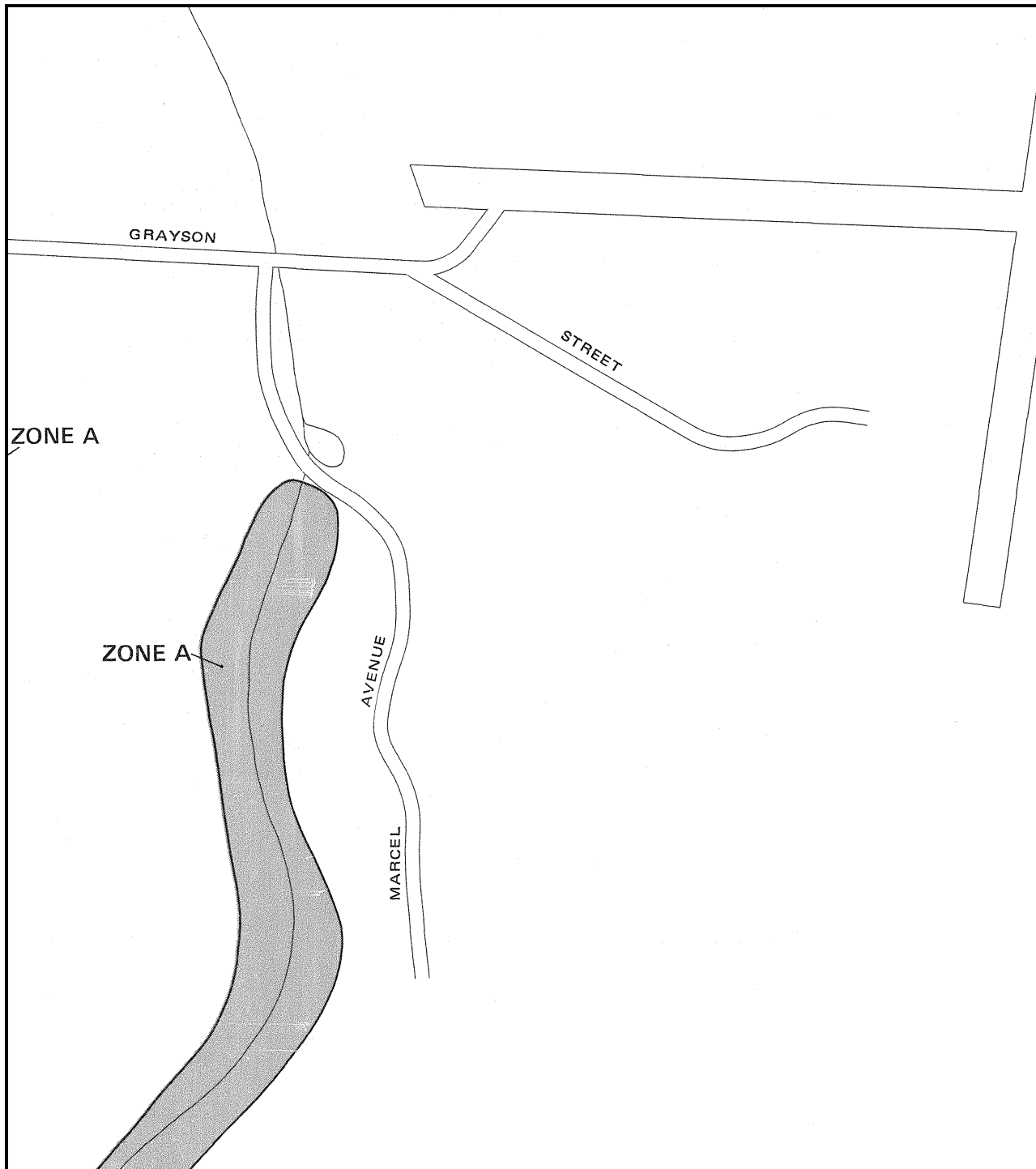
## **1.8    CONCLUSION**

The proposed stormwater management facilities have been designed to mitigate impacts associated with development on the stormwater runoff. The proposed facilities have been designed to meet the Basic, and General Standards required by Chapter 500.

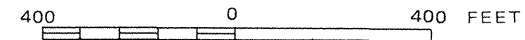
**Appendix A**  
**Figures**







APPROXIMATE SCALE



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

CITY OF  
BIDDEFORD,  
MAINE  
YORK COUNTY

PANEL 9 OF 11  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

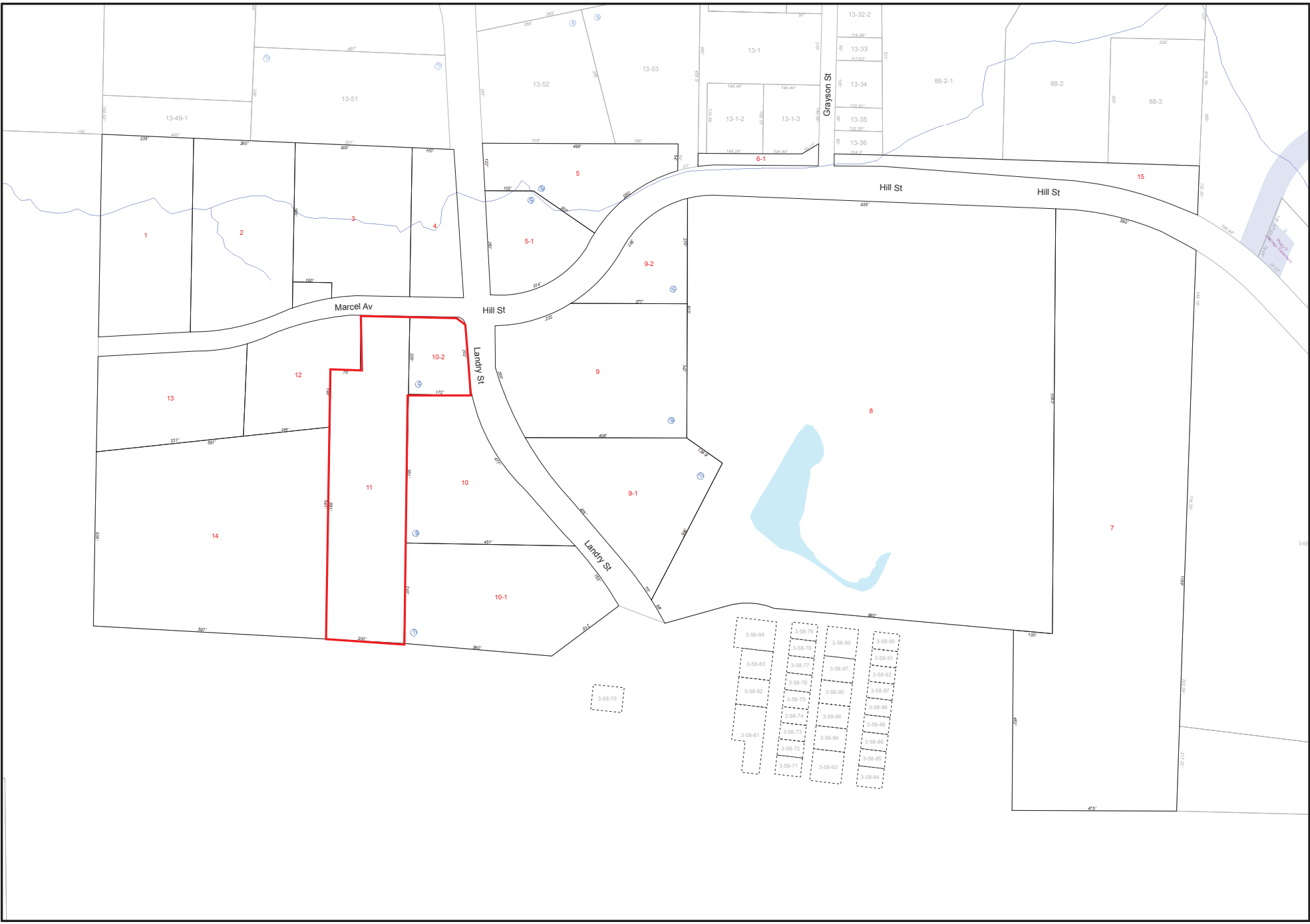
COMMUNITY-PANEL NUMBER  
230145 0009 B

EFFECTIVE DATE:  
MAY 15, 1984



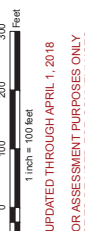
Federal Emergency Management Agency

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](http://www.msc.fema.gov)





North is based on the  
Maine State  
Coordinate System  
NAD 1983  
North Rotation is 304°



1 inch = 100 feet  
UPDATED THROUGH APRIL 1, 2018  
FOR ASSESSMENT PURPOSES ONLY  
NOT TO BE USED FOR CONVEYANCES



The City of Biddeford, Maine  
**OFFICIAL TAX MAP**  
Office of The Tax Assessor  
Nicholas Desjardins, CMA  
Assessor

This Map is prepared by  
**The City of Biddeford, Maine**  
Technology Department  
GIS Division  
208 Main Street, P.O. Box 556, Biddeford, Maine 04005  
207-271-5660, [gis@biddefordmaine.org](mailto:gis@biddefordmaine.org)

**74**  
Tax Map



# Maine DEP Urban Impaired Stream Watershed Map







United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for York County, Maine



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil



scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



# Custom Soil Resource Report Soil Map



## 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 1:20,000.

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

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

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

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

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

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

Soil Survey Area: York County, Maine  
Survey Area Data: Version 17, Sep 11, 2018

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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

## Map Unit Legend

| Map Unit Symbol                    | Map Unit Name                                      | Acres in AOI | Percent of AOI |
|------------------------------------|----------------------------------------------------|--------------|----------------|
| AdB                                | Adams loamy sand, 0 to 8 percent slopes            | 33.5         | 16.0%          |
| Ch                                 | Chocorua peat                                      | 0.6          | 0.3%           |
| CrB                                | Croghan loamy sand, 0 to 8 percent slopes          | 54.9         | 26.3%          |
| LyB                                | Lyman-Rock outcrop complex, 3 to 8 percent slopes  | 13.8         | 6.6%           |
| LyC                                | Lyman-Rock outcrop complex, 8 to 15 percent slopes | 0.4          | 0.2%           |
| Na                                 | Naumburg sand                                      | 84.1         | 40.3%          |
| RoC                                | Rock outcrop-Lyman complex, 3 to 15 percent slopes | 2.1          | 1.0%           |
| Ur                                 | Urban land                                         | 19.4         | 9.3%           |
| W                                  | Water bodies                                       | 0.2          | 0.1%           |
| <b>Totals for Area of Interest</b> |                                                    | <b>208.9</b> | <b>100.0%</b>  |

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a



given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## York County, Maine

### AdB—Adams loamy sand, 0 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2wqn9

*Elevation:* 10 to 2,000 feet

*Mean annual precipitation:* 31 to 95 inches

*Mean annual air temperature:* 27 to 52 degrees F

*Frost-free period:* 90 to 160 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Adams and similar soils:* 85 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Adams

##### Setting

*Landform:* Outwash terraces

*Landform position (two-dimensional):* Backslope, summit

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy glaciofluvial deposits

##### Typical profile

*Ap - 0 to 7 inches:* loamy sand

*Bs - 7 to 21 inches:* sand

*BC - 21 to 27 inches:* sand

*C - 27 to 65 inches:* sand

##### Properties and qualities

*Slope:* 0 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.42 to 14.17 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Salinity, maximum in profile:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water storage in profile:* Low (about 3.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3s

*Hydrologic Soil Group:* A

*Hydric soil rating:* No

## **Ch—Chocorua peat**

### **Map Unit Composition**

*Chocorua and similar soils: 87 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Chocorua**

#### **Setting**

*Landform: Bogs*

*Parent material: Organic material*

#### **Typical profile**

*Oe - 0 to 32 inches: mucky peat*

*H2 - 32 to 65 inches: stratified gravelly sand to loamy fine sand*

#### **Properties and qualities**

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Natural drainage class: Very poorly drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 14.17 in/hr)*

*Depth to water table: About 0 inches*

*Frequency of flooding: None*

*Frequency of ponding: Frequent*

*Available water storage in profile: High (about 11.2 inches)*

#### **Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 8w*

*Hydrologic Soil Group: A/D*

*Hydric soil rating: Yes*

## **CrB—Croghan loamy sand, 0 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol: 9k5d*

*Elevation: 150 to 1,200 feet*

*Mean annual precipitation: 30 to 50 inches*

*Mean annual air temperature: 37 to 45 degrees F*

*Frost-free period: 90 to 160 days*

*Farmland classification: Farmland of statewide importance*

### **Map Unit Composition**

*Croghan and similar soils: 87 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Description of Croghan

### Setting

*Landform:* Outwash deltas, outwash plains  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Sandy glaciofluvial deposits derived from granite and gneiss

### Typical profile

*Oa - 0 to 2 inches:* highly decomposed plant material  
*H1 - 2 to 7 inches:* loamy sand  
*H2 - 7 to 28 inches:* sand  
*H3 - 28 to 65 inches:* sand

### Properties and qualities

*Slope:* 0 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 14.17 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 4.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* A  
*Hydric soil rating:* No

## LyB—Lyman-Rock outcrop complex, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2trqh  
*Elevation:* 0 to 560 feet  
*Mean annual precipitation:* 36 to 65 inches  
*Mean annual air temperature:* 36 to 52 degrees F  
*Frost-free period:* 60 to 160 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Lyman, very stony, and similar soils:* 65 percent  
*Rock outcrop:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Lyman, Very Stony

### Setting

*Landform:* Mountains, hills

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*Landform position (two-dimensional):* Shoulder, summit, backslope

*Landform position (three-dimensional):* Mountaintop, mountainbase, crest, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loam

*E - 3 to 5 inches:* fine sandy loam

*Bhs - 5 to 7 inches:* loam

*Bs1 - 7 to 11 inches:* loam

*Bs2 - 11 to 18 inches:* channery loam

*R - 18 to 28 inches:* bedrock

### Properties and qualities

*Slope:* 3 to 8 percent

*Percent of area covered with surface fragments:* 1.5 percent

*Depth to restrictive feature:* 11 to 24 inches to lithic bedrock

*Natural drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 14.03 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* D

*Hydric soil rating:* No

## Description of Rock Outcrop

### Setting

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Shoulder, backslope, summit

*Landform position (three-dimensional):* Mountaintop, mountainbase, crest, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Igneous and metamorphic rock

### Typical profile

*R - 0 to 10 inches:* bedrock

### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to very high (0.00 to 14.17 in/hr)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated): 8s*  
*Hydric soil rating: Unranked*

## **LyC—Lyman-Rock outcrop complex, 8 to 15 percent slopes**

### **Map Unit Setting**

*National map unit symbol: 2trqj*  
*Elevation: 0 to 790 feet*  
*Mean annual precipitation: 36 to 65 inches*  
*Mean annual air temperature: 36 to 52 degrees F*  
*Frost-free period: 60 to 160 days*  
*Farmland classification: Not prime farmland*

### **Map Unit Composition**

*Lyman, very stony, and similar soils: 62 percent*  
*Rock outcrop: 25 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Lyman, Very Stony**

#### **Setting**

*Landform: Mountains, hills*  
*Landform position (two-dimensional): Shoulder, summit, backslope*  
*Landform position (three-dimensional): Mountaintop, mountainbase, crest, side slope*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist*

#### **Typical profile**

*Oe - 0 to 1 inches: moderately decomposed plant material*  
*A - 1 to 3 inches: loam*  
*E - 3 to 5 inches: fine sandy loam*  
*Bhs - 5 to 7 inches: loam*  
*Bs1 - 7 to 11 inches: loam*  
*Bs2 - 11 to 18 inches: channery loam*  
*R - 18 to 28 inches: bedrock*

#### **Properties and qualities**

*Slope: 8 to 15 percent*  
*Percent of area covered with surface fragments: 1.5 percent*  
*Depth to restrictive feature: 11 to 24 inches to lithic bedrock*  
*Natural drainage class: Somewhat excessively drained*  
*Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)*  
*Depth to water table: More than 80 inches*  
*Frequency of flooding: None*  
*Frequency of ponding: None*



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*Available water storage in profile:* Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* D

*Hydric soil rating:* No

### Description of Rock Outcrop

#### Setting

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Mountaintop, mountainbase, crest, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Igneous and metamorphic rock

#### Typical profile

*R - 0 to 10 inches:* bedrock

#### Properties and qualities

*Slope:* 8 to 15 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to very high  
(0.00 to 14.17 in/hr)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

## Na—Naumburg sand

### Map Unit Setting

*National map unit symbol:* 9k67

*Elevation:* 200 to 1,800 feet

*Mean annual precipitation:* 34 to 50 inches

*Mean annual air temperature:* 41 to 45 degrees F

*Frost-free period:* 90 to 130 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Naumburg and similar soils:* 85 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Naumburg

#### Setting

*Landform:* Outwash plains

*Landform position (two-dimensional):* Toeslope

## Custom Soil Resource Report

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy glaciofluvial deposits derived from granite and gneiss

### Typical profile

*Oa - 0 to 2 inches:* highly decomposed plant material

*H1 - 2 to 9 inches:* sand

*H2 - 9 to 32 inches:* sand

*H3 - 32 to 65 inches:* sand

### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.42 to 6.00 in/hr)

*Depth to water table:* About 6 to 18 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 4.2 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* A/D

*Hydric soil rating:* Yes

## RoC—Rock outcrop-Lyman complex, 3 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2trqt

*Elevation:* 0 to 720 feet

*Mean annual precipitation:* 36 to 65 inches

*Mean annual air temperature:* 36 to 52 degrees F

*Frost-free period:* 60 to 160 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Rock outcrop:* 59 percent

*Lyman, very stony, and similar soils:* 23 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains, hills

*Landform position (two-dimensional):* Shoulder, backslope, summit

*Landform position (three-dimensional):* Mountainflank, mountaintop, mountainbase, crest, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

## Custom Soil Resource Report

*Parent material:* Igneous and metamorphic rock

### Typical profile

*R - 0 to 10 inches:* bedrock

### Properties and qualities

*Slope:* 3 to 15 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to very high  
(0.00 to 14.17 in/hr)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

## Description of Lyman, Very Stony

### Setting

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Shoulder, summit, backslope

*Landform position (three-dimensional):* Mountaintop, mountainflank,  
mountainbase, crest, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or  
loamy supraglacial till derived from phyllite and/or loamy supraglacial till  
derived from mica schist

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loam

*E - 3 to 5 inches:* fine sandy loam

*Bhs - 5 to 7 inches:* loam

*Bs1 - 7 to 11 inches:* loam

*Bs2 - 11 to 18 inches:* channery loam

*R - 18 to 28 inches:* bedrock

### Properties and qualities

*Slope:* 3 to 15 percent

*Percent of area covered with surface fragments:* 1.5 percent

*Depth to restrictive feature:* 11 to 24 inches to lithic bedrock

*Natural drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00  
to 14.03 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* D

*Hydric soil rating:* No



## Ur—Urban land

### Map Unit Composition

*Urban land:* 90 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Urban Land

#### Setting

*Landform position (two-dimensional):* Foothslope, toeslope

*Landform position (three-dimensional):* Base slope, tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

#### Typical profile

*H1 - 0 to 6 inches:* variable

#### Properties and qualities

*Slope:* 0 to 8 percent

*Natural drainage class:* Moderately well drained

*Depth to water table:* About 24 to 72 inches

*Available water storage in profile:* Very low (about 0.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* No

## W—Water bodies

### Map Unit Composition

*Water:* 100 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Water

#### Setting

*Landform:* Hills

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**Appendix B**  
**Wetland Report**

To: Bill Thompson  
BH2M, Inc.

Date: January 24, 2019



Project #: 19009

From: Alex Finamore, CWS, LSE  
Mainely Soils, LLC

Re: 23 Marcel Avenue, Biddeford, ME – Wetland Delineation  
Memorandum

At the request of BH2M, Inc (the "Client"), Mainely Soils, LLC conducted on-site wetland and waterbody delineations at an approximately 4.15 acre parcel located at 23 Marcel Avenue in Biddeford, Maine. The Client is assisting the property owner in developing the commercially zoned property. Mainely Soils conducted these field investigations to provide baseline environmental data to inform the proposed re-use of the site. The natural resources assessments described in this report were completed in January 2019. In addition to describing the identified resources this report describes the existing conditions within the study area, and the methodologies employed for the assessments.

## PROJECT DESCRIPTION

The project site is located within a zone of commercial development along the Landry Street corridor. The proposed development site is currently occupied by a vacant residential dwelling and associated outbuildings (sheds). Surrounding land use to the north and west is residential and commercial along Landry Street and Marcel Avenue. Forested land dominates the landscape to the south with the Biddeford Municipal Airport to the east. In total, the wetland and waterbody delineation survey area encompassed approximately 4.15 acres, identified by the City of Biddeford as Tax Map 74 Lot 11.

## SITE DESCRIPTION

The Study Area occurs in the Southern Coastal biophysical region of Maine (McMahon, 1990). The Southern Coastal biophysical region is characterized by relatively flat terrain, with elevations generally ranging up to 100 feet above sea level. Bedrock is frequently exposed and covered by thin glacial deposits. Along the immediate coast, soils are generally deep sands (where beaches occur) or shallow sandy loams that are well to excessively drained. Extensive coarse-grained glaciomarine deposits occur in the central portion of the South Coastal Region and along its western margin. The survey area is located within the Saco River watershed (Hydrologic Unit Classification (HUC) 8 identification 01060002), although surface water drainage within the site and vicinity is highly altered by existing developed land surfaces and stormwater management systems.

The Natural Resource Conservation Service soil survey mapping identifies native soils at the site as being formed within sandy deltaic or glaciofluvial deposits (Naumburg and Croghan series) (Web Soil Survey, 2018). The Naumburg series is a somewhat poorly drained soil map unit, portions of which contain hydric (wetland) soils. The Croghan series is a moderately well drained soil map unit. Soils within the site and the general vicinity have previously been substantially altered by historical site development. Alterations in such disturbed areas typically includes the addition of fill/transported materials, excavation and bank cuts, graded surfaces, and the addition of pavement.

## Study Methodology

Mainely Soils conducted wetland delineation field work within the survey area on January 18, 2019. Mainely Soils delineated the boundary of wetlands in accordance with the Army Corps of Engineers 1987 Wetland Delineation Manual (1987 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and

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Northeast Region (Version 2.0) (Regional Supplement, 2012). All wetland delineations were conducted using the Routine Determination Methods, which requires that a wetland contain a dominance of hydrophytic vegetation, hydric soils, and evidence of hydrology in order to be considered a wetland. Wetland boundaries were located and demarcated using pink and black day-glow “WETLAND DELINEATION” flagging, with each flag labeled with the corresponding alphabetic wetland identification code and a flag number (i.e. A-1). Wetland flag locations were recorded in the field using a Trimble® GPS unit capable of sub meter accuracy, post processed, and transferred and incorporated onto project mapping.

Mainely Soils completed one wetland and one upland Regional Supplement data form along the boundary of each identified wetland system to document the boundary. Additional field notes were also taken to record the classification of each wetland in accordance with the Classification of Wetlands and Deepwater Habitats of the United States, general site characteristics, unique qualities observed during the site assessment, and other considerations relevant to investigation findings and the future completion of a wetlands functions and values assessment in accordance with the Highway Methodology Workbook: Supplement. Mainely Soils took representative photographs of each wetland, drew labeled field sketches of the wetland boundary on an aerial photograph-based map, and recorded notes on the flagging sequence for each wetland.

Mainely Soils surveyed the site for streams, in accordance with the State of Maine Natural Resources Protection Act stream criteria and definitions. One intermittent stream segment was identified within the site.

Mainely Soils surveyed the site for potential vernal pools, in accordance with the State of Maine Natural Resources Protection Act vernal pool definitions. One ponded area was identified onsite, but was not considered a potential vernal pool due to the presence of an inlet and a permanently flooded water regime.

## Study Results

Using the methodologies described above, Mainely Soils conducted a wetland delineation on January 18, 2019. A description of the identified resources follows. Supporting attachments Representative Photographs (Attachment 1). Wetland Delineation Data Forms can be provided upon request..

Wetlands at the project site consisted of five features; four palustrine seasonally saturated forested wetlands (PFO1E) dominated by deciduous trees (Wetlands A1, A3, A4, and A5), and one small palustrine emergent “wet meadow” (PEM1E) wetland (Wetland A2) (Cowardin et al, 1979).

Wetland A15-1 was in the north western portion of the site and was located in a concave depression formed by existing site contours. It had a seasonally saturated hydroperiod and was associated with intermittent Stream S1. A small excavated pond was located along Marcel Avenue. The outlet to the pond was a vegetated road ditch along Marcel Avenue draining in a southwesterly direction. Dominant vegetation consisted of red maple (*Acer rubrum*), gray birch (*Betula populifolia*), winterberry (*Ilex verticillata*), speckled alder (*Alnus incana*), cinnamon fern (*Osmunda cinnamomea*), purple loosestrife (*Lythrum salicaria*), and sensitive fern (*Onoclea sensibilis*). Soils within the wetland had a dark sandy loam surface overlaying a depleted loamy sand substratum. Evidence of wetland hydrology included pockets of water stained leaves, and saturation within 12” of the soil surface at the time of field investigations on January 18, 2019.

Wetland A15-2 was in the western portion of the site and was located in a concave depression draining southwesterly within a vegetated road ditch. Hydrology was provided from the road ditch to the north associated with Wetland A1. This wetland had a saturated hydroperiod and prevalent vegetation consisted of broadleaf cattail (*Typha latifolia*) and

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purple loosestrife. The previously disturbed soils within the wetland consisted of fill debris (rock/brick/metal/etc) overlaying a depleted loamy sand substratum. Evidence of wetland hydrology included small pockets of water stained leaves, and saturation within 12" of the soil surface at the time of field investigations on January 18, 2019.

Wetlands A3, A4, and A5 were found on the central and eastern portions of the site. Wetlands A3 and A5 drained in a westerly direction whereas wetland A4 drained in a southeasterly direction. Dominant plants within these wetlands included red maple, gray birch, white pine (*Pinus strobus*), winterberry, highbush blueberry (*Vaccinium corymbosum*), sheep laurel (*Kalmia angustifolia*), cinnamon fern, and goldthread (*Coptis trifolia*). Evidence of wetland hydrology included saturation within the top 12 inches of the mineral surface, water stained vegetation and patches of sphagnum moss. Soils within these wetlands consisted of a dark loamy surface overlaying a depleted sandy substratum.

One intermittent stream segment was identified onsite located within Wetland A1. It flowed from a culvert outfall along Landry Street and terminated within the man-made pond along Marcel Avenue. The stream had a sandy mineral substrate between two defined banks approximately 6-8" in height. At the time of the delineation, there was approximately 2-3 inches of flowing water. The inlet to the culvert on the north side of Landry Street consisted of a vegetated road ditch. The outlet to the man-made pond consisted of a vegetated road ditch without a mineral bottom.

### Summary

The information contained in this memorandum was collected in order to provide detailed, on-site information regarding wetland and waterbody resources. This information is intended to be used for project planning purposes and to support permitting needs. Four PFO1E wetlands and one PEM1E wetland were delineated on the site, and were identified as Wetlands A1-A5. One intermittent stream segment was located onsite within Wetland A1 starting at a culvert outfall and terminating at a man-made pond. No potential vernal pools were identified on the site.

Wetlands are regulated by the U.S. Army Corps of Engineers under the federal Clean Water Act, and by the Maine Department of Environmental Protection under the Maine Natural Resources Protection Act (NRPA). The State of Maine further differentiates wetlands under NRPA by regulating certain wetlands as "wetlands of special significance" (WOSS). Neither of the wetlands within the site constitute a WOSS under NRPA, although they are still subject to NRPA jurisdiction as non-WOSS wetlands.

Wetlands within the survey area may be further regulated under municipal ordinances, such as Shoreland Zone, Site Plan Review, or other local ordinances. Impacts to wetlands resulting from proposed project development require that permits first be obtained from the MDEP and the USACE before proceeding with construction, and where applicable, municipal governing bodies. Consultation with these agencies early in the project design process is encouraged.

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**Attachments:**

1. Representative Site Photographs

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## **Attachment 1**

### **Representative Site Photographs**

Natural Resource Photographs – 01/18/2019  
23 Marcel Avenue, Biddeford, Maine

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Photo 1: View looking north across Wetland A1 near Marcel Avenue near flag 4.



Photo 2: View looking easterly across forested Wetland A1 along Landry Street.

Natural Resource Photographs – 01/18/2019  
23 Marcel Avenue, Biddeford, Maine

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**Photo 3:** View looking downstream of Stream S1 within Wetland A1.



**Photo 4:** View looking upstream of Stream S1 within Wetland A1.



Natural Resource Photographs – 01/18/2019  
23 Marcel Avenue, Biddeford, Maine

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Photo 5: View east at Wetland A2 adjacent to Marcel Avenue near flag 1.



Photo 6: View west through Wetland A3 near flag 5.

Natural Resource Photographs – 01/18/2019  
23 Marcel Avenue, Biddeford, Maine

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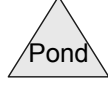
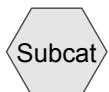
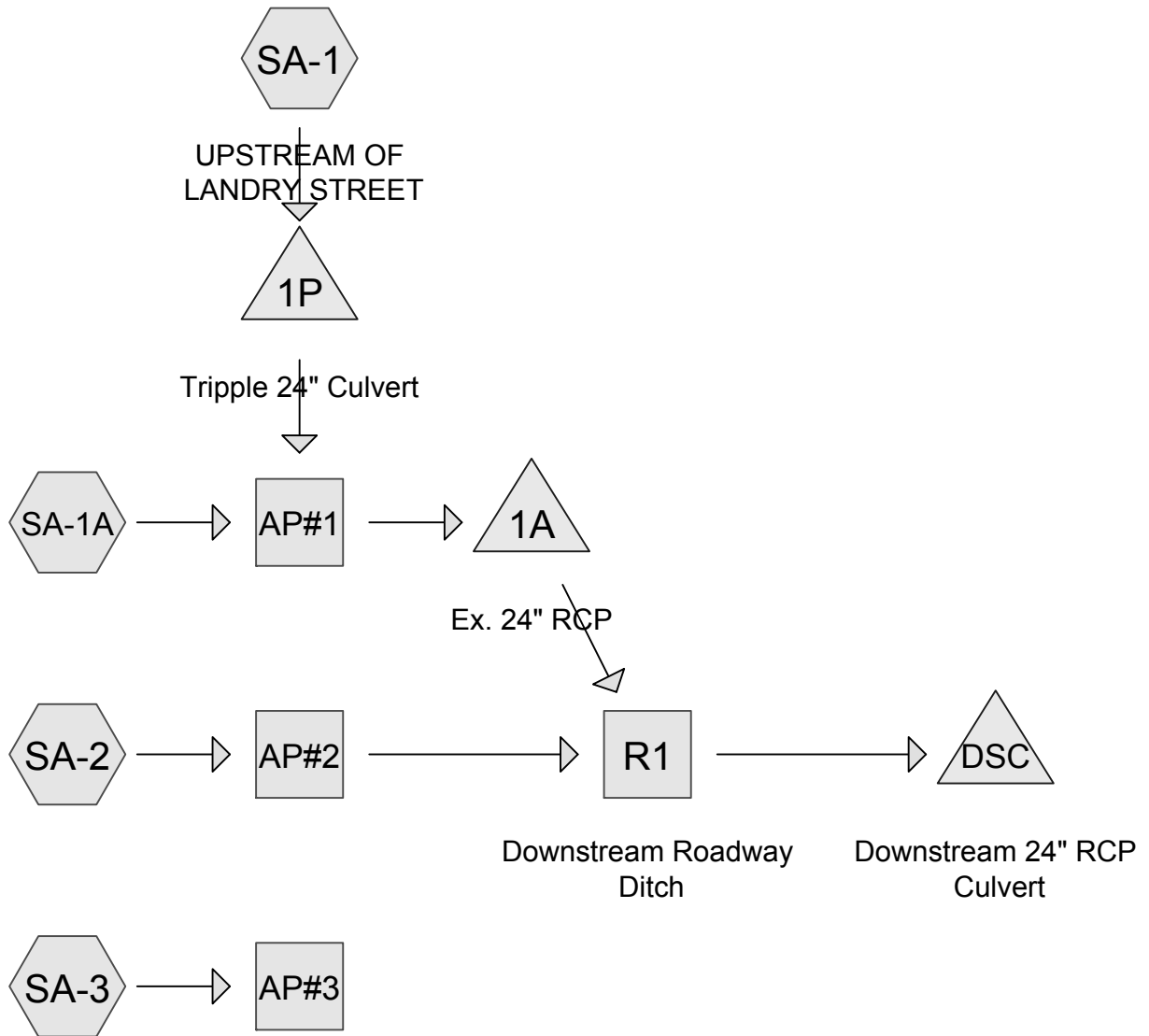


**Photo 7:** View northeast at Wetland A4 near flag 5.



**Photo 8:** View north at Wetland A5.

**Appendix C**  
**Pre Development Calculations**



**Routing Diagram for Pre Development Revised - Dempsey Drive**

Prepared by BH2M, Printed 9/13/2019

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## Pre Development Revised - Dempsey Drive

Prepared by BH2M

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### Area Listing (selected nodes)

| Area<br>(acres) | CN        | Description<br>(subcatchment-numbers)                |
|-----------------|-----------|------------------------------------------------------|
| 0.289           | 39        | >75% Grass cover, Good, HSG A (SA-2)                 |
| 0.339           | 80        | >75% Grass cover, Good, HSG D (SA-1A, SA-2)          |
| 0.082           | 98        | Existing House & Driveway (SA-1A, SA-2)              |
| 1.236           | 98        | Existing Roadway (SA-1, SA-1A, SA-2)                 |
| 12.647          | 89        | Urban commercial, 85% imp, HSG A (SA-1, SA-1A, SA-2) |
| 9.616           | 95        | Urban commercial, 85% imp, HSG D (SA-1, SA-1A, SA-2) |
| 11.025          | 30        | Woods, Good, HSG A (SA-1, SA-1A, SA-2, SA-3)         |
| 13.542          | 77        | Woods, Good, HSG D (SA-1, SA-1A, SA-2, SA-3)         |
| <b>48.777</b>   | <b>73</b> | <b>TOTAL AREA</b>                                    |

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 16.12 cfs @ 13.06 hrs, Volume= 3.135 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                 |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                            |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                   |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                              |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                             |

### Summary for Subcatchment SA-1A:

Runoff = 2.26 cfs @ 12.63 hrs, Volume= 0.318 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 22,466    | 98 | Existing Roadway                 |
| * | 3,273     | 98 | Existing House & Driveway        |
|   | 20,262    | 89 | Urban commercial, 85% imp, HSG A |
|   | 22,036    | 95 | Urban commercial, 85% imp, HSG D |
|   | 12,147    | 80 | >75% Grass cover, Good, HSG D    |
|   | 27,588    | 30 | Woods, Good, HSG A               |
|   | 42,758    | 77 | Woods, Good, HSG D               |
|   | 150,530   | 76 | Weighted Average                 |
|   | 88,838    |    | 59.02% Pervious Area             |
|   | 61,692    |    | 40.98% Impervious Area           |

**Pre Development Revised - Dempsey Driv Type III 24-hr 2-Year Storm Event Rainfall=3.30"**

Prepared by BH2M

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 38.6        | 150              | 0.0100           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 1.9         | 57               | 0.0100           | 0.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 2.6         | 660              | 0.0180           | 4.25                 | 25.47             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 43.1        | 867              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 0.87 cfs @ 13.03 hrs, Volume= 0.189 af, Depth&gt; 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 870     | 98 | Existing Roadway                 |
| * 308     | 98 | Existing House & Driveway        |
| 35,288    | 89 | Urban commercial, 85% imp, HSG A |
| 31,389    | 95 | Urban commercial, 85% imp, HSG D |
| 12,572    | 39 | >75% Grass cover, Good, HSG A    |
| 2,623     | 80 | >75% Grass cover, Good, HSG D    |
| 82,030    | 30 | Woods, Good, HSG A               |
| 56,986    | 77 | Woods, Good, HSG D               |
| 222,066   | 62 | Weighted Average                 |
| 164,213   |    | 73.95% Pervious Area             |
| 57,853    |    | 26.05% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 45.3        | 150              | 0.0067           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 18.0        | 638              | 0.0140           | 0.59                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 63.3        | 788              | Total            |                      |                   |                                                                  |

**Summary for Subcatchment SA-3:**

Runoff = 1.04 cfs @ 12.75 hrs, Volume= 0.162 af, Depth&gt; 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

**Pre Development Revised - Dempsey Driv Type III 24-hr 2-Year Storm Event Rainfall=3.30"**

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| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| 648       | 30 | Woods, Good, HSG A    |
| 72,645    | 77 | Woods, Good, HSG D    |
| 73,293    | 77 | Weighted Average      |
| 73,293    |    | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                      |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------|
| 45.3     | 150           | 0.0067        | 0.06              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 7.3      | 270           | 0.0150        | 0.61              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 52.6     | 420           | Total         |                   |                |                                                                  |

**Summary for Reach AP#1:**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 0.97" for 2-Year Storm Event event  
 Inflow = 16.44 cfs @ 13.20 hrs, Volume= 3.406 af  
 Outflow = 16.44 cfs @ 13.20 hrs, Volume= 3.406 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#2:**

Inflow Area = 5.098 ac, 26.05% Impervious, Inflow Depth > 0.44" for 2-Year Storm Event event  
 Inflow = 0.87 cfs @ 13.03 hrs, Volume= 0.189 af  
 Outflow = 0.87 cfs @ 13.03 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#3:**

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 1.16" for 2-Year Storm Event event  
 Inflow = 1.04 cfs @ 12.75 hrs, Volume= 0.162 af  
 Outflow = 1.04 cfs @ 12.75 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach R1: Downstream Roadway Ditch**

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.26 cfs @ 13.15 hrs, Volume= 3.594 af  
 Outflow = 17.27 cfs @ 13.20 hrs, Volume= 3.593 af, Atten= 0%, Lag= 3.2 min

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

Max. Velocity= 3.51 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 2.16 fps, Avg. Travel Time= 0.4 min



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Peak Storage= 246 cf @ 13.20 hrs

Average Depth at Peak Storage= 1.26'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035

Side Slope Z-value= 1.5 ' ' Top Width= 8.00'

Length= 50.0' Slope= 0.0100 ' '

Inlet Invert= 137.00', Outlet Invert= 136.50'

**Summary for Pond 1A: Ex. 24" RCP**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 0.97" for 2-Year Storm Event event  
 Inflow = 16.44 cfs @ 13.20 hrs, Volume= 3.406 af  
 Outflow = 16.45 cfs @ 13.23 hrs, Volume= 3.405 af, Atten= 0%, Lag= 1.4 min  
 Primary = 16.45 cfs @ 13.23 hrs, Volume= 3.405 af

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

Peak Elev= 140.05' @ 13.23 hrs Surf.Area= 1,200 sf Storage= 730 cf

Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.4 min calculated for 3.405 af (100% of inflow)

Center-of-Mass det. time= 0.3 min ( 875.5 - 875.1 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 137.00'              | 730 cf                    | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 137.00              | 10                   | 0                         | 0                                                          |
| 138.00              | 25                   | 18                        | 18                                                         |
| 139.00              | 100                  | 63                        | 80                                                         |
| 140.00              | 1,200                | 650                       | 730                                                        |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 137.56' | <b>24.0" Round Culvert</b><br>L= 24.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 ' ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=16.42 cfs @ 13.23 hrs HW=140.05' (Free Discharge)↑**1=Culvert** (Barrel Controls 16.42 cfs @ 5.38 fps)

### Summary for Pond 1P: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 0.98" for 2-Year Storm Event event  
 Inflow = 16.12 cfs @ 13.06 hrs, Volume= 3.135 af  
 Outflow = 15.38 cfs @ 13.24 hrs, Volume= 3.088 af, Atten= 5%, Lag= 11.1 min  
 Primary = 15.38 cfs @ 13.24 hrs, Volume= 3.088 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 143.76' @ 13.24 hrs Surf.Area= 14,216 sf Storage= 10,917 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 15.1 min calculated for 3.088 af (99% of inflow)  
 Center-of-Mass det. time= 10.3 min ( 878.7 - 868.4 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=15.37 cfs @ 13.24 hrs HW=143.76' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 15.37 cfs @ 3.98 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.27 cfs @ 13.20 hrs, Volume= 3.593 af  
 Outflow = 17.23 cfs @ 13.26 hrs, Volume= 3.592 af, Atten= 0%, Lag= 3.1 min  
 Primary = 17.23 cfs @ 13.26 hrs, Volume= 3.592 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 138.36' @ 13.26 hrs Surf.Area= 942 sf Storage= 614 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.3 min calculated for 3.580 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 877.0 - 876.7 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 135.00' | 1,470 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 135.00              | 10                   | 0                         | 0                         |
| 136.00              | 25                   | 18                        | 18                        |
| 137.00              | 75                   | 50                        | 68                        |
| 138.00              | 500                  | 288                       | 355                       |
| 139.00              | 1,730                | 1,115                     | 1,470                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                  |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/ Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=17.21 cfs @ 13.26 hrs HW=138.36' (Free Discharge)

↑**1=Culvert** (Barrel Controls 17.21 cfs @ 5.48 fps)

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 35.14 cfs @ 13.01 hrs, Volume= 6.612 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                 |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                            |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                   |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                              |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                             |

### Summary for Subcatchment SA-1A:

Runoff = 4.69 cfs @ 12.60 hrs, Volume= 0.647 af, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 22,466    | 98 | Existing Roadway                 |
| * | 3,273     | 98 | Existing House & Driveway        |
|   | 20,262    | 89 | Urban commercial, 85% imp, HSG A |
|   | 22,036    | 95 | Urban commercial, 85% imp, HSG D |
|   | 12,147    | 80 | >75% Grass cover, Good, HSG D    |
|   | 27,588    | 30 | Woods, Good, HSG A               |
|   | 42,758    | 77 | Woods, Good, HSG D               |
|   | 150,530   | 76 | Weighted Average                 |
|   | 88,838    |    | 59.02% Pervious Area             |
|   | 61,692    |    | 40.98% Impervious Area           |



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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 38.6        | 150              | 0.0100           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 1.9         | 57               | 0.0100           | 0.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 2.6         | 660              | 0.0180           | 4.25                 | 25.47             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 43.1        | 867              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 2.84 cfs @ 12.93 hrs, Volume= 0.515 af, Depth&gt; 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 870     | 98 | Existing Roadway                 |
| * 308     | 98 | Existing House & Driveway        |
| 35,288    | 89 | Urban commercial, 85% imp, HSG A |
| 31,389    | 95 | Urban commercial, 85% imp, HSG D |
| 12,572    | 39 | >75% Grass cover, Good, HSG A    |
| 2,623     | 80 | >75% Grass cover, Good, HSG D    |
| 82,030    | 30 | Woods, Good, HSG A               |
| 56,986    | 77 | Woods, Good, HSG D               |
| 222,066   | 62 | Weighted Average                 |
| 164,213   |    | 73.95% Pervious Area             |
| 57,853    |    | 26.05% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 45.3        | 150              | 0.0067           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 18.0        | 638              | 0.0140           | 0.59                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 63.3        | 788              | Total            |                      |                   |                                                                  |

**Summary for Subcatchment SA-3:**

Runoff = 2.12 cfs @ 12.72 hrs, Volume= 0.326 af, Depth&gt; 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

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| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| 648       | 30 | Woods, Good, HSG A    |
| 72,645    | 77 | Woods, Good, HSG D    |
| 73,293    | 77 | Weighted Average      |
| 73,293    |    | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                      |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------|
| 45.3     | 150           | 0.0067        | 0.06              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 7.3      | 270           | 0.0150        | 0.61              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 52.6     | 420           | Total         |                   |                |                                                                  |

**Summary for Reach AP#1:**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 2.06" for 10-Year Storm Event event  
Inflow = 34.83 cfs @ 13.19 hrs, Volume= 7.195 af  
Outflow = 34.83 cfs @ 13.19 hrs, Volume= 7.195 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#2:**

Inflow Area = 5.098 ac, 26.05% Impervious, Inflow Depth > 1.21" for 10-Year Storm Event event  
Inflow = 2.84 cfs @ 12.93 hrs, Volume= 0.515 af  
Outflow = 2.84 cfs @ 12.93 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#3:**

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 2.32" for 10-Year Storm Event event  
Inflow = 2.12 cfs @ 12.72 hrs, Volume= 0.326 af  
Outflow = 2.12 cfs @ 12.72 hrs, Volume= 0.326 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach R1: Downstream Roadway Ditch**

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 1.96" for 10-Year Storm Event event  
Inflow = 38.19 cfs @ 13.15 hrs, Volume= 7.710 af  
Outflow = 37.41 cfs @ 13.16 hrs, Volume= 7.708 af, Atten= 2%, Lag= 0.6 min

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

Max. Velocity= 4.28 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 2.46 fps, Avg. Travel Time= 0.3 min

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Peak Storage= 437 cf @ 13.16 hrs

Average Depth at Peak Storage= 1.84'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035

Side Slope Z-value= 1.5 ' ' Top Width= 8.00'

Length= 50.0' Slope= 0.0100 ' '

Inlet Invert= 137.00', Outlet Invert= 136.50'

**Summary for Pond 1A: Ex. 24" RCP**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 2.06" for 10-Year Storm Event event  
 Inflow = 34.83 cfs @ 13.19 hrs, Volume= 7.195 af  
 Outflow = 35.59 cfs @ 13.15 hrs, Volume= 7.195 af, Atten= 0%, Lag= 0.0 min  
 Primary = 35.59 cfs @ 13.15 hrs, Volume= 7.195 af

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

Peak Elev= 142.45' @ 13.15 hrs Surf.Area= 1,200 sf Storage= 730 cf

Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.4 min calculated for 7.195 af (100% of inflow)

Center-of-Mass det. time= 0.3 min ( 860.2 - 859.8 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 137.00' | 730 cf        | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 137.00              | 10                   | 0                         | 0                         |
| 138.00              | 25                   | 18                        | 18                        |
| 139.00              | 100                  | 63                        | 80                        |
| 140.00              | 1,200                | 650                       | 730                       |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 137.56' | <b>24.0" Round Culvert</b><br>L= 24.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 ' ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=35.52 cfs @ 13.15 hrs HW=142.44' (Free Discharge)

1=Culvert (Barrel Controls 35.52 cfs @ 11.31 fps)

### Summary for Pond 1P: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 2.06" for 10-Year Storm Event event  
 Inflow = 35.14 cfs @ 13.01 hrs, Volume= 6.612 af  
 Outflow = 32.75 cfs @ 13.23 hrs, Volume= 6.548 af, Atten= 7%, Lag= 13.3 min  
 Primary = 32.75 cfs @ 13.23 hrs, Volume= 6.548 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 144.47' @ 13.23 hrs Surf.Area= 22,048 sf Storage= 23,507 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 13.2 min calculated for 6.548 af (99% of inflow)  
 Center-of-Mass det. time= 10.0 min ( 863.3 - 853.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                      |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 ' S= 0.0050 ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=32.73 cfs @ 13.23 hrs HW=144.47' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 32.73 cfs @ 4.69 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 1.96" for 10-Year Storm Event event  
 Inflow = 37.41 cfs @ 13.16 hrs, Volume= 7.708 af  
 Outflow = 38.74 cfs @ 13.20 hrs, Volume= 7.707 af, Atten= 0%, Lag= 2.3 min  
 Primary = 38.74 cfs @ 13.20 hrs, Volume= 7.707 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 141.24' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 7.707 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 861.5 - 861.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 135.00' | 1,470 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |



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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 135.00              | 10                   | 0                         | 0                         |
| 136.00              | 25                   | 18                        | 18                        |
| 137.00              | 75                   | 50                        | 68                        |
| 138.00              | 500                  | 288                       | 355                       |
| 139.00              | 1,730                | 1,115                     | 1,470                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=38.67 cfs @ 13.20 hrs HW=141.22' (Free Discharge)

↑**1=Culvert** (Barrel Controls 38.67 cfs @ 12.31 fps)

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 52.15 cfs @ 13.00 hrs, Volume= 9.785 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                   |
|----------|---------------|---------------|-------------------|----------------|-----------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                              |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                     |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                                |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' / Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                               |

### Summary for Subcatchment SA-1A:

Runoff = 6.82 cfs @ 12.60 hrs, Volume= 0.943 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 22,466    | 98 | Existing Roadway                 |
| * | 3,273     | 98 | Existing House & Driveway        |
|   | 20,262    | 89 | Urban commercial, 85% imp, HSG A |
|   | 22,036    | 95 | Urban commercial, 85% imp, HSG D |
|   | 12,147    | 80 | >75% Grass cover, Good, HSG D    |
|   | 27,588    | 30 | Woods, Good, HSG A               |
|   | 42,758    | 77 | Woods, Good, HSG D               |
|   | 150,530   | 76 | Weighted Average                 |
|   | 88,838    |    | 59.02% Pervious Area             |
|   | 61,692    |    | 40.98% Impervious Area           |

**Pre Development Revised - Dempsey Dri Type III 24-hr 25-Year Storm Event Rainfall=6.20"**

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 38.6        | 150              | 0.0100           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 1.9         | 57               | 0.0100           | 0.50                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 2.6         | 660              | 0.0180           | 4.25                 | 25.47             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 43.1        | 867              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 4.85 cfs @ 12.90 hrs, Volume= 0.845 af, Depth&gt; 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 870     | 98 | Existing Roadway                 |
| * 308     | 98 | Existing House & Driveway        |
| 35,288    | 89 | Urban commercial, 85% imp, HSG A |
| 31,389    | 95 | Urban commercial, 85% imp, HSG D |
| 12,572    | 39 | >75% Grass cover, Good, HSG A    |
| 2,623     | 80 | >75% Grass cover, Good, HSG D    |
| 82,030    | 30 | Woods, Good, HSG A               |
| 56,986    | 77 | Woods, Good, HSG D               |
| 222,066   | 62 | Weighted Average                 |
| 164,213   |    | 73.95% Pervious Area             |
| 57,853    |    | 26.05% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 45.3        | 150              | 0.0067           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 18.0        | 638              | 0.0140           | 0.59                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 63.3        | 788              | Total            |                      |                   |                                                                  |

**Summary for Subcatchment SA-3:**

Runoff = 3.06 cfs @ 12.71 hrs, Volume= 0.471 af, Depth&gt; 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

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| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| 648       | 30 | Woods, Good, HSG A    |
| 72,645    | 77 | Woods, Good, HSG D    |
| 73,293    | 77 | Weighted Average      |
| 73,293    |    | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                      |
|----------|---------------|---------------|-------------------|----------------|------------------------------------------------------------------|
| 45.3     | 150           | 0.0067        | 0.06              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |
| 7.3      | 270           | 0.0150        | 0.61              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps        |
| 52.6     | 420           | Total         |                   |                |                                                                  |

**Summary for Reach AP#1:**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 3.04" for 25-Year Storm Event event  
 Inflow = 47.27 cfs @ 13.26 hrs, Volume= 10.653 af  
 Outflow = 47.27 cfs @ 13.26 hrs, Volume= 10.653 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#2:**

Inflow Area = 5.098 ac, 26.05% Impervious, Inflow Depth > 1.99" for 25-Year Storm Event event  
 Inflow = 4.85 cfs @ 12.90 hrs, Volume= 0.845 af  
 Outflow = 4.85 cfs @ 12.90 hrs, Volume= 0.845 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach AP#3:**

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 3.36" for 25-Year Storm Event event  
 Inflow = 3.06 cfs @ 12.71 hrs, Volume= 0.471 af  
 Outflow = 3.06 cfs @ 12.71 hrs, Volume= 0.471 af, Atten= 0%, Lag= 0.0 min

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

**Summary for Reach R1: Downstream Roadway Ditch**

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 2.93" for 25-Year Storm Event event  
 Inflow = 52.11 cfs @ 13.20 hrs, Volume= 11.497 af  
 Outflow = 51.29 cfs @ 13.20 hrs, Volume= 11.494 af, Atten= 2%, Lag= 0.0 min

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

Max. Velocity= 4.63 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 2.64 fps, Avg. Travel Time= 0.3 min



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Peak Storage= 554 cf @ 13.19 hrs

Average Depth at Peak Storage= 2.14'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035

Side Slope Z-value= 1.5 ' ' Top Width= 8.00'

Length= 50.0' Slope= 0.0100 ' '

Inlet Invert= 137.00', Outlet Invert= 136.50'

**Summary for Pond 1A: Ex. 24" RCP**

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 3.04" for 25-Year Storm Event event  
 Inflow = 47.27 cfs @ 13.26 hrs, Volume= 10.653 af  
 Outflow = 48.07 cfs @ 13.30 hrs, Volume= 10.652 af, Atten= 0%, Lag= 2.2 min  
 Primary = 48.07 cfs @ 13.30 hrs, Volume= 10.652 af

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

Peak Elev= 145.02' @ 13.30 hrs Surf.Area= 1,200 sf Storage= 730 cf

Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.3 min calculated for 10.652 af (100% of inflow)

Center-of-Mass det. time= 0.3 min ( 853.0 - 852.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 137.00'              | 730 cf                    | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 137.00              | 10                   | 0                         | 0                                                          |
| 138.00              | 25                   | 18                        | 18                                                         |
| 139.00              | 100                  | 63                        | 80                                                         |
| 140.00              | 1,200                | 650                       | 730                                                        |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 137.56' | <b>24.0" Round Culvert</b><br>L= 24.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 ' ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=48.02 cfs @ 13.30 hrs HW=145.01' (Free Discharge)↑**1=Culvert** (Inlet Controls 48.02 cfs @ 15.28 fps)

### Summary for Pond 1P: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 3.05" for 25-Year Storm Event event  
 Inflow = 52.15 cfs @ 13.00 hrs, Volume= 9.785 af  
 Outflow = 44.69 cfs @ 13.33 hrs, Volume= 9.709 af, Atten= 14%, Lag= 19.6 min  
 Primary = 44.69 cfs @ 13.33 hrs, Volume= 9.709 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.18' @ 13.33 hrs Surf.Area= 30,714 sf Storage= 42,157 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 13.8 min calculated for 9.677 af (99% of inflow)  
 Center-of-Mass det. time= 11.1 min ( 856.2 - 845.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                                      |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 ' S= 0.0050 ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=44.67 cfs @ 13.33 hrs HW=145.17' (Free Discharge)

↑1=Culvert (Inlet Controls 44.67 cfs @ 4.74 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 2.93" for 25-Year Storm Event event  
 Inflow = 51.29 cfs @ 13.20 hrs, Volume= 11.494 af  
 Outflow = 52.57 cfs @ 13.20 hrs, Volume= 11.493 af, Atten= 0%, Lag= 0.3 min  
 Primary = 52.57 cfs @ 13.20 hrs, Volume= 11.493 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 144.39' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 11.493 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 854.1 - 853.6 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 135.00' | 1,470 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 135.00              | 10                   | 0                         | 0                         |
| 136.00              | 25                   | 18                        | 18                        |
| 137.00              | 75                   | 50                        | 68                        |
| 138.00              | 500                  | 288                       | 355                       |
| 139.00              | 1,730                | 1,115                     | 1,470                     |

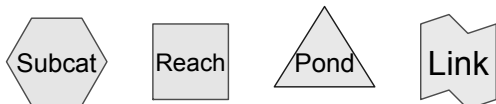
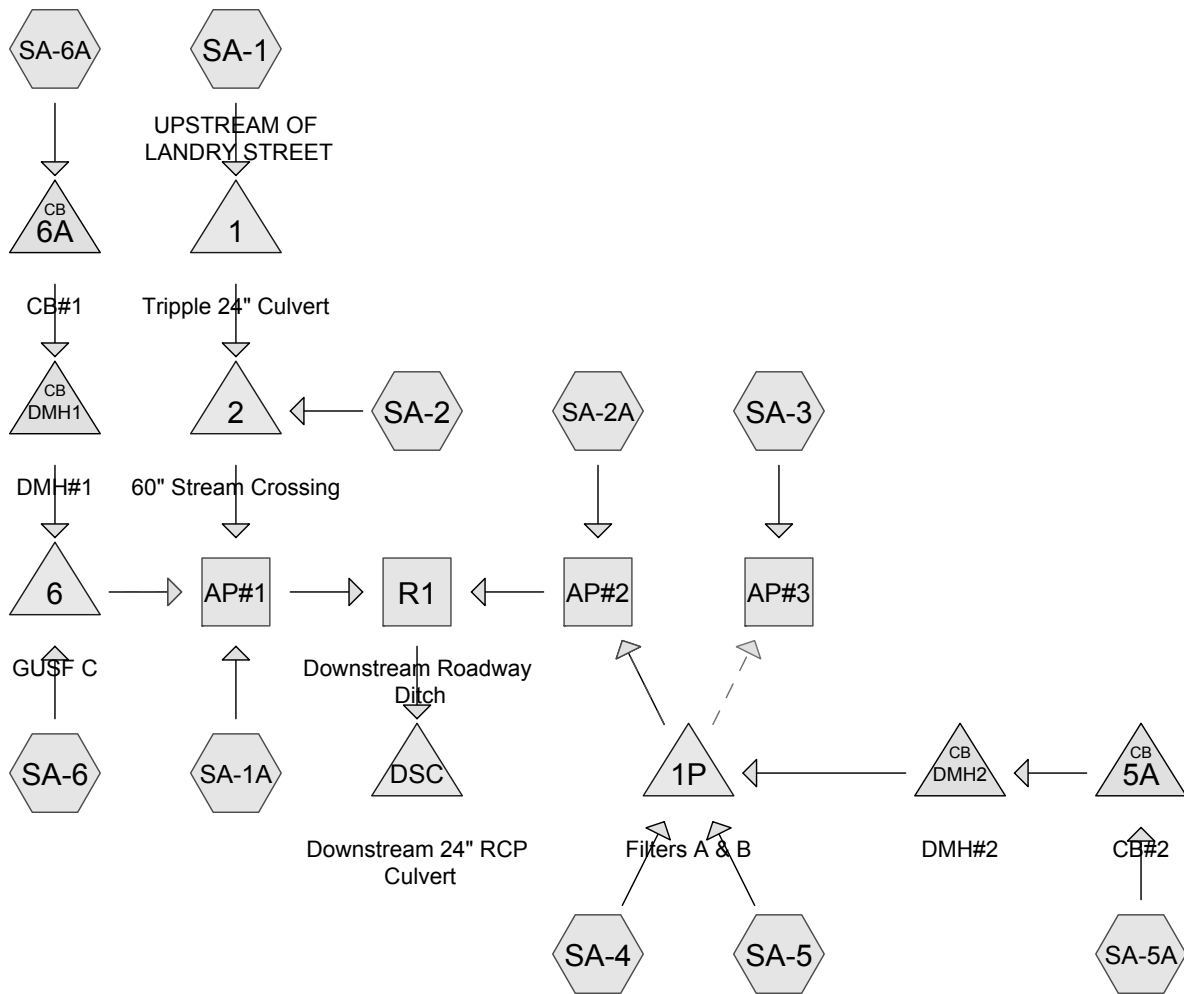
| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=52.56 cfs @ 13.20 hrs HW=144.39' (Free Discharge)

↑**1=Culvert** (Inlet Controls 52.56 cfs @ 16.73 fps)







**Routing Diagram for Post Development Revised - Dempsey Drive**  
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## Post Development Revised - Dempsey Drive

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### Area Listing (selected nodes)

| Area<br>(acres) | CN        | Description<br>(subcatchment-numbers)                                  |
|-----------------|-----------|------------------------------------------------------------------------|
| 0.019           | 39        | >75% Grass cover, Good, HSG A (SA-2A)                                  |
| 0.177           | 80        | >75% Grass cover, Good, HSG D (SA-1A, SA-2A)                           |
| 1.236           | 98        | Existing Roadway (SA-1, SA-1A, SA-2, SA-6A)                            |
| 0.310           | 39        | Proposed Grass (A) (SA-2, SA-2A, SA-3, SA-4, SA-5A, SA-6A)             |
| 0.705           | 80        | Proposed Grass (D) (SA-1A, SA-2, SA-2A, SA-3, SA-4, SA-5, SA-5A, SA-6) |
| 2.013           | 98        | Proposed Impervious (SA-4, SA-5A, SA-6, SA-6A)                         |
| 12.647          | 89        | Urban commercial, 85% imp, HSG A (SA-1, SA-2)                          |
| 9.616           | 95        | Urban commercial, 85% imp, HSG D (SA-1, SA-2)                          |
| 10.275          | 30        | Woods, Good, HSG A (SA-1, SA-2, SA-2A, SA-3)                           |
| 11.778          | 77        | Woods, Good, HSG D (SA-1, SA-1A, SA-2, SA-3)                           |
| <b>48.777</b>   | <b>75</b> | <b>TOTAL AREA</b>                                                      |

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 16.12 cfs @ 13.06 hrs, Volume= 3.135 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                 |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                            |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                   |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                              |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                             |

### Summary for Subcatchment SA-1A:

Runoff = 0.93 cfs @ 12.37 hrs, Volume= 0.102 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 5,034     | 98 | Existing Roadway              |
| * | 5,407     | 80 | Proposed Grass (D)            |
|   | 7,029     | 80 | >75% Grass cover, Good, HSG D |
|   | 19,896    | 77 | Woods, Good, HSG D            |
|   | 37,366    | 81 | Weighted Average              |
|   | 32,332    |    | 86.53% Pervious Area          |
|   | 5,034     |    | 13.47% Impervious Area        |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 24.9        | 150              | 0.0300           | 0.10                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 0.8         | 183              | 0.0130           | 3.61                 | 21.65             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 25.7        | 333              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 2.82 cfs @ 12.71 hrs, Volume= 0.432 af, Depth&gt; 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 16,917  | 98 | Existing Roadway                 |
| * 2,543   | 39 | Proposed Grass (A)               |
| * 6,843   | 80 | Proposed Grass (D)               |
| 55,550    | 89 | Urban commercial, 85% imp, HSG A |
| 53,425    | 95 | Urban commercial, 85% imp, HSG D |
| 72,500    | 30 | Woods, Good, HSG A               |
| 62,603    | 77 | Woods, Good, HSG D               |
| 270,381   | 71 | Weighted Average                 |
| 160,835   |    | 59.48% Pervious Area             |
| 109,546   |    | 40.52% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 34.7        | 150              | 0.0130           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 10.8        | 276              | 0.0073           | 0.43                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 1.6         | 478              | 0.0130           | 4.86                 | 48.59             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=2.00' Z= 2.0 ' Top.W=9.00'<br>n= 0.035 |
| 47.1        | 904              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2A:**

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth&gt; 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"



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|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 2,750     | 39 | Proposed Grass (A)            |
| * | 688       | 80 | Proposed Grass (D)            |
|   | 820       | 39 | >75% Grass cover, Good, HSG A |
|   | 667       | 80 | >75% Grass cover, Good, HSG D |
|   | 4,346     | 30 | Woods, Good, HSG A            |
|   | 9,271     | 41 | Weighted Average              |
|   | 9,271     |    | 100.00% Pervious Area         |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 21.0        | 80               | 0.0130           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |

**Summary for Subcatchment SA-3:**

Runoff = 0.41 cfs @ 12.16 hrs, Volume= 0.034 af, Depth&gt; 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description           |
|---|-----------|----|-----------------------|
| * | 1,404     | 39 | Proposed Grass (A)    |
| * | 3,203     | 80 | Proposed Grass (D)    |
|   | 748       | 30 | Woods, Good, HSG A    |
|   | 13,060    | 77 | Woods, Good, HSG D    |
|   | 18,415    | 73 | Weighted Average      |
|   | 18,415    |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                           |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------------------------------------|
| 10.6        | 65               | 0.0067           | 0.10                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.30" |

**Summary for Subcatchment SA-4:**

Runoff = 3.48 cfs @ 12.12 hrs, Volume= 0.266 af, Depth&gt; 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 51,581    | 98 | Proposed Impervious    |
| * | 5,605     | 39 | Proposed Grass (A)     |
| * | 3,121     | 80 | Proposed Grass (D)     |
|   | 60,307    | 92 | Weighted Average       |
|   | 8,726     |    | 14.47% Pervious Area   |
|   | 51,581    |    | 85.53% Impervious Area |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 2.2         | 150              | 0.0100           | 1.15                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 30               | 0.0100           | 2.03                 |                   | <b>Shallow Concentrated Flow,</b><br>Paved Kv= 20.3 fps            |
| 0.3         | 199              | 0.0500           | 10.14                | 5.07              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b>                                               |
| 8.7         | 379              | Total            |                      |                   |                                                                    |

**Summary for Subcatchment SA-5:**

Runoff = 0.30 cfs @ 12.10 hrs, Volume= 0.020 af, Depth&gt; 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| * 7,772   | 80 | Proposed Grass (D)    |
| 7,772     |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b> |

**Summary for Subcatchment SA-5A:**

Runoff = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af, Depth&gt; 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

| Area (sf) | CN | Description            |
|-----------|----|------------------------|
| * 24,906  | 98 | Proposed Impervious    |
| * 1,057   | 39 | Proposed Grass (A)     |
| * 846     | 80 | Proposed Grass (D)     |
| 26,809    | 95 | Weighted Average       |
| 1,903     |    | 7.10% Pervious Area    |
| 24,906    |    | 92.90% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                      |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------------|
| 0.4         | 28               | 0.0200           | 1.08                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"                                         |
| 1.2         | 228              | 0.0050           | 3.30                 | 1.73              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' Z= 0.2 & 0.0 ' Top.W=1.10'<br>n= 0.013 |
| 1.6         | 256              | Total            |                      |                   |                                                                                                  |

### Summary for Subcatchment SA-6:

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 3,098     | 98 | Proposed Impervious    |
| * | 2,824     | 80 | Proposed Grass (D)     |
|   | 5,922     | 89 | Weighted Average       |
|   | 2,824     |    | 47.69% Pervious Area   |
|   | 3,098     |    | 52.31% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 6.0         |                  |                  |                      |                   | Direct Entry, |

### Summary for Subcatchment SA-6A:

Runoff = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-Year Storm Event Rainfall=3.30"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 1,385     | 98 | Existing Roadway       |
| * | 8,105     | 98 | Proposed Impervious    |
| * | 156       | 39 | Proposed Grass (A)     |
|   | 9,646     | 97 | Weighted Average       |
|   | 156       |    | 1.62% Pervious Area    |
|   | 9,490     |    | 98.38% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 0.7         | 52               | 0.0200           | 1.23                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 68               | 0.0260           | 7.31                 | 3.66              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 0.9         | 120              | Total            |                      |                   |                                                                    |

### Summary for Reach AP#1:

Inflow Area = 45.963 ac, 44.42% Impervious, Inflow Depth > 0.96" for 2-Year Storm Event event  
Inflow = 17.31 cfs @ 13.19 hrs, Volume= 3.660 af  
Outflow = 17.31 cfs @ 13.19 hrs, Volume= 3.660 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#2:

Inflow Area = 2.391 ac, 73.43% Impervious, Inflow Depth > 0.27" for 2-Year Storm Event event  
 Inflow = 0.06 cfs @ 20.00 hrs, Volume= 0.053 af  
 Outflow = 0.06 cfs @ 20.00 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#3:

Inflow Area = 0.423 ac, 0.00% Impervious, Inflow Depth > 0.95" for 2-Year Storm Event event  
 Inflow = 0.41 cfs @ 12.16 hrs, Volume= 0.034 af  
 Outflow = 0.41 cfs @ 12.16 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.36 cfs @ 13.19 hrs, Volume= 3.713 af  
 Outflow = 17.36 cfs @ 13.19 hrs, Volume= 3.712 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 3.51 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.5 min

Peak Storage= 247 cf @ 13.19 hrs  
 Average Depth at Peak Storage= 1.27'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 '/' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 '/'  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 0.98" for 2-Year Storm Event event  
 Inflow = 16.12 cfs @ 13.06 hrs, Volume= 3.135 af  
 Outflow = 15.38 cfs @ 13.24 hrs, Volume= 3.088 af, Atten= 5%, Lag= 11.1 min  
 Primary = 15.38 cfs @ 13.24 hrs, Volume= 3.088 af



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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 143.76' @ 13.24 hrs Surf.Area= 14,216 sf Storage= 10,917 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 15.1 min calculated for 3.088 af (99% of inflow)  
 Center-of-Mass det. time= 10.3 min ( 878.7 - 868.4 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                              |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 ' / ' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=15.37 cfs @ 13.24 hrs HW=143.76' (Free Discharge)

↑**1=Culvert** (Barrel Controls 15.37 cfs @ 3.98 fps)

**Summary for Pond 1P: Filters A & B**

Inflow Area = 2.178 ac, 80.61% Impervious, Inflow Depth > 2.31" for 2-Year Storm Event event  
 Inflow = 5.03 cfs @ 12.08 hrs, Volume= 0.419 af  
 Outflow = 0.06 cfs @ 20.00 hrs, Volume= 0.053 af, Atten= 99%, Lag= 475.1 min  
 Primary = 0.06 cfs @ 20.00 hrs, Volume= 0.053 af  
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af  
 Tertiary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.56' @ 20.00 hrs Surf.Area= 9,790 sf Storage= 15,944 cf  
 Flood Elev= 146.90' Surf.Area= 10,596 sf Storage= 20,381 cf

Plug-Flow detention time= 262.8 min calculated for 0.053 af (13% of inflow)  
 Center-of-Mass det. time= 68.3 min ( 832.0 - 763.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 143.50'              | 20,381 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 143.50              | 5,703                | 0                         | 0                                                          |
| 144.00              | 6,549                | 3,063                     | 3,063                                                      |
| 145.00              | 8,745                | 7,647                     | 10,710                                                     |
| 146.00              | 10,596               | 9,671                     | 20,381                                                     |

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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 141.17' | <b>6.0" Round Culvert</b><br>L= 48.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 141.17' / 141.00' S= 0.0035 '/' Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf     |
| #2     | Device 1  | 141.00' | <b>1.0" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 145.60' | <b>12.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64 |
| #4     | Tertiary  | 145.75' | <b>16.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.06 cfs @ 20.00 hrs HW=145.56' (Free Discharge)

↑ **1=Culvert** (Passes 0.06 cfs of 1.46 cfs potential flow)

↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.09 fps)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=143.50' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Tertiary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=143.50' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Summary for Pond 2: 60" Stream Crossing

Inflow Area = 44.748 ac, 44.72% Impervious, Inflow Depth > 0.94" for 2-Year Storm Event event  
 Inflow = 17.03 cfs @ 13.19 hrs, Volume= 3.520 af  
 Outflow = 17.03 cfs @ 13.19 hrs, Volume= 3.520 af, Atten= 0%, Lag= 0.1 min  
 Primary = 17.03 cfs @ 13.19 hrs, Volume= 3.520 af

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

Peak Elev= 141.24' @ 13.19 hrs Surf.Area= 59 sf Storage= 8 cf

Flood Elev= 147.00' Surf.Area= 45,197 sf Storage= 82,965 cf

Plug-Flow detention time= 0.0 min calculated for 3.508 af (100% of inflow)

Center-of-Mass det. time= 0.0 min ( 875.8 - 875.8 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 141.00'              | 82,965 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 141.00              | 8                    | 0                         | 0                                                          |
| 142.00              | 217                  | 113                       | 113                                                        |
| 143.00              | 4,455                | 2,336                     | 2,449                                                      |
| 144.00              | 10,237               | 7,346                     | 9,795                                                      |
| 145.00              | 18,414               | 14,326                    | 24,120                                                     |
| 146.00              | 27,039               | 22,727                    | 46,847                                                     |
| 147.00              | 45,197               | 36,118                    | 82,965                                                     |

| Device | Routing | Invert  | Outlet Devices                                  |
|--------|---------|---------|-------------------------------------------------|
| #1     | Primary | 140.00' | <b>60.0" Round Culvert w/ 18.0" inside fill</b> |

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L= 60.0' CPP, projecting, no headwall, Ke= 0.900  
 Inlet / Outlet Invert= 138.50' / 137.88' S= 0.0103 ' S= 0.0103 ' Cc= 0.900  
 n= 0.012, Flow Area= 14.68 sf

**Primary OutFlow** Max=17.02 cfs @ 13.19 hrs HW=141.24' (Free Discharge)↑**1=Culvert** (Inlet Controls 17.02 cfs @ 2.80 fps)**Summary for Pond 5A: CB#2**

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 2.59" for 2-Year Storm Event event  
 Inflow = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af  
 Outflow = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af

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

Peak Elev= 145.89' @ 12.03 hrs

Flood Elev= 147.50'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.94' | <b>12.0" Round Culvert</b><br>L= 85.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.94' / 144.60' S= 0.0040 ' S= 0.0040 ' Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.94 cfs @ 12.03 hrs HW=145.87' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.94 cfs @ 3.33 fps)**Summary for Pond 6: GUSF C**

Inflow Area = 0.357 ac, 80.86% Impervious, Inflow Depth > 2.50" for 2-Year Storm Event event  
 Inflow = 1.01 cfs @ 12.03 hrs, Volume= 0.074 af  
 Outflow = 0.33 cfs @ 12.36 hrs, Volume= 0.038 af, Atten= 68%, Lag= 20.3 min  
 Primary = 0.02 cfs @ 12.36 hrs, Volume= 0.019 af  
 Secondary = 0.31 cfs @ 12.36 hrs, Volume= 0.019 af

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

Peak Elev= 142.55' @ 12.36 hrs Surf.Area= 1,434 sf Storage= 1,650 cf

Flood Elev= 143.70' Surf.Area= 1,690 sf Storage= 2,359 cf

Plug-Flow detention time= 147.3 min calculated for 0.038 af (51% of inflow)

Center-of-Mass det. time= 60.4 min ( 811.5 - 751.0 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 141.00' | 2,359 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 141.00              | 777                  | 0                         | 0                         |
| 142.00              | 1,125                | 951                       | 951                       |
| 143.00              | 1,690                | 1,408                     | 2,359                     |

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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 138.67' | <b>6.0" Round Culvert</b><br>L= 65.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 138.67' / 138.02' S= 0.0100 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf      |
| #2     | Device 1  | 138.67' | <b>0.6" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 142.50' | <b>12.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.02 cfs @ 12.36 hrs HW=142.55' (Free Discharge)↑ **1=Culvert** (Passes 0.02 cfs of 1.30 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 9.45 fps)**Secondary OutFlow** Max=0.29 cfs @ 12.36 hrs HW=142.55' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.54 fps)**Summary for Pond 6A: CB#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 2.78" for 2-Year Storm Event event  
 Inflow = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af  
 Outflow = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af

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

Peak Elev= 143.52' @ 12.01 hrs

Flood Elev= 146.40'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                 |
|--------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 143.00' | <b>12.0" Round Culvert</b><br>L= 61.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 143.00' / 142.70' S= 0.0049 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=0.75 cfs @ 12.01 hrs HW=143.51' (Free Discharge)↑ **1=Culvert** (Barrel Controls 0.75 cfs @ 2.76 fps)**Summary for Pond DMH1: DMH#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 2.78" for 2-Year Storm Event event  
 Inflow = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af  
 Outflow = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.78 cfs @ 12.01 hrs, Volume= 0.051 af

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

Peak Elev= 143.12' @ 12.01 hrs

Flood Elev= 146.90'

| Device | Routing | Invert  | Outlet Devices                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------|
| #1     | Primary | 142.60' | <b>12.0" Round Culvert</b><br>L= 60.0' CPP, square edge headwall, Ke= 0.500 |

Inlet / Outlet Invert= 142.60' / 142.30' S= 0.0050 ' / ' Cc= 0.900  
n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=0.75 cfs @ 12.01 hrs HW=143.10' (Free Discharge)

↑**1=Culvert** (Barrel Controls 0.75 cfs @ 2.77 fps)

### Summary for Pond DMH2: DMH#2

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 2.59" for 2-Year Storm Event event  
Inflow = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af  
Outflow = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min  
Primary = 2.03 cfs @ 12.03 hrs, Volume= 0.133 af

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

Peak Elev= 145.46' @ 12.03 hrs

Flood Elev= 147.90'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                    |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.50' | <b>12.0" Round Culvert</b><br>L= 62.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.50' / 144.25' S= 0.0040 ' / ' Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.94 cfs @ 12.03 hrs HW=145.43' (Free Discharge)

↑**1=Culvert** (Barrel Controls 1.94 cfs @ 3.32 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
Inflow = 17.36 cfs @ 13.19 hrs, Volume= 3.712 af  
Outflow = 17.35 cfs @ 13.22 hrs, Volume= 3.711 af, Atten= 0%, Lag= 1.7 min  
Primary = 17.35 cfs @ 13.22 hrs, Volume= 3.711 af

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

Peak Elev= 138.37' @ 13.22 hrs Surf.Area= 955 sf Storage= 624 cf

Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.3 min calculated for 3.699 af (100% of inflow)

Center-of-Mass det. time= 0.3 min ( 873.6 - 873.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |



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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=17.33 cfs @ 13.22 hrs HW=138.37' (Free Discharge)

↑**1=Culvert** (Barrel Controls 17.33 cfs @ 5.52 fps)

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 35.14 cfs @ 13.01 hrs, Volume= 6.612 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                 |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                            |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                   |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                              |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                             |

### Summary for Subcatchment SA-1A:

Runoff = 1.76 cfs @ 12.36 hrs, Volume= 0.192 af, Depth> 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 5,034     | 98 | Existing Roadway              |
| * | 5,407     | 80 | Proposed Grass (D)            |
|   | 7,029     | 80 | >75% Grass cover, Good, HSG D |
|   | 19,896    | 77 | Woods, Good, HSG D            |
|   | 37,366    | 81 | Weighted Average              |
|   | 32,332    |    | 86.53% Pervious Area          |
|   | 5,034     |    | 13.47% Impervious Area        |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 24.9        | 150              | 0.0300           | 0.10                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 0.8         | 183              | 0.0130           | 3.61                 | 21.65             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 25.7        | 333              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 6.57 cfs @ 12.67 hrs, Volume= 0.957 af, Depth&gt; 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 16,917  | 98 | Existing Roadway                 |
| * 2,543   | 39 | Proposed Grass (A)               |
| * 6,843   | 80 | Proposed Grass (D)               |
| 55,550    | 89 | Urban commercial, 85% imp, HSG A |
| 53,425    | 95 | Urban commercial, 85% imp, HSG D |
| 72,500    | 30 | Woods, Good, HSG A               |
| 62,603    | 77 | Woods, Good, HSG D               |
| 270,381   | 71 | Weighted Average                 |
| 160,835   |    | 59.48% Pervious Area             |
| 109,546   |    | 40.52% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 34.7        | 150              | 0.0130           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 10.8        | 276              | 0.0073           | 0.43                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 1.6         | 478              | 0.0130           | 4.86                 | 48.59             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=2.00' Z= 2.0 ' Top.W=9.00'<br>n= 0.035 |
| 47.1        | 904              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2A:**

Runoff = 0.01 cfs @ 12.66 hrs, Volume= 0.004 af, Depth&gt; 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

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|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 2,750     | 39 | Proposed Grass (A)            |
| * | 688       | 80 | Proposed Grass (D)            |
|   | 820       | 39 | >75% Grass cover, Good, HSG A |
|   | 667       | 80 | >75% Grass cover, Good, HSG D |
|   | 4,346     | 30 | Woods, Good, HSG A            |
|   | 9,271     | 41 | Weighted Average              |
|   | 9,271     |    | 100.00% Pervious Area         |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 21.0        | 80               | 0.0130           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |

**Summary for Subcatchment SA-3:**

Runoff = 0.92 cfs @ 12.16 hrs, Volume= 0.072 af, Depth&gt; 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description           |
|---|-----------|----|-----------------------|
| * | 1,404     | 39 | Proposed Grass (A)    |
| * | 3,203     | 80 | Proposed Grass (D)    |
|   | 748       | 30 | Woods, Good, HSG A    |
|   | 13,060    | 77 | Woods, Good, HSG D    |
|   | 18,415    | 73 | Weighted Average      |
|   | 18,415    |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                           |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------------------------------------|
| 10.6        | 65               | 0.0067           | 0.10                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.30" |

**Summary for Subcatchment SA-4:**

Runoff = 5.55 cfs @ 12.12 hrs, Volume= 0.435 af, Depth&gt; 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 51,581    | 98 | Proposed Impervious    |
| * | 5,605     | 39 | Proposed Grass (A)     |
| * | 3,121     | 80 | Proposed Grass (D)     |
|   | 60,307    | 92 | Weighted Average       |
|   | 8,726     |    | 14.47% Pervious Area   |
|   | 51,581    |    | 85.53% Impervious Area |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 2.2         | 150              | 0.0100           | 1.15                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 30               | 0.0100           | 2.03                 |                   | <b>Shallow Concentrated Flow,</b><br>Paved Kv= 20.3 fps            |
| 0.3         | 199              | 0.0500           | 10.14                | 5.07              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b>                                               |
| 8.7         | 379              | Total            |                      |                   |                                                                    |

**Summary for Subcatchment SA-5:**

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.039 af, Depth&gt; 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| * 7,772   | 80 | Proposed Grass (D)    |
| 7,772     |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b> |

**Summary for Subcatchment SA-5A:**

Runoff = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af, Depth&gt; 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

| Area (sf) | CN | Description            |
|-----------|----|------------------------|
| * 24,906  | 98 | Proposed Impervious    |
| * 1,057   | 39 | Proposed Grass (A)     |
| * 846     | 80 | Proposed Grass (D)     |
| 26,809    | 95 | Weighted Average       |
| 1,903     |    | 7.10% Pervious Area    |
| 24,906    |    | 92.90% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                      |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------------|
| 0.4         | 28               | 0.0200           | 1.08                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"                                         |
| 1.2         | 228              | 0.0050           | 3.30                 | 1.73              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' Z= 0.2 & 0.0 ' Top.W=1.10'<br>n= 0.013 |
| 1.6         | 256              | Total            |                      |                   |                                                                                                  |



### Summary for Subcatchment SA-6:

Runoff = 0.56 cfs @ 12.09 hrs, Volume= 0.039 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 3,098     | 98 | Proposed Impervious    |
| * | 2,824     | 80 | Proposed Grass (D)     |
|   | 5,922     | 89 | Weighted Average       |
|   | 2,824     |    | 47.69% Pervious Area   |
|   | 3,098     |    | 52.31% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 6.0         |                  |                  |                      |                   | Direct Entry, |

### Summary for Subcatchment SA-6A:

Runoff = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-Year Storm Event Rainfall=4.90"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 1,385     | 98 | Existing Roadway       |
| * | 8,105     | 98 | Proposed Impervious    |
| * | 156       | 39 | Proposed Grass (A)     |
|   | 9,646     | 97 | Weighted Average       |
|   | 156       |    | 1.62% Pervious Area    |
|   | 9,490     |    | 98.38% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 0.7         | 52               | 0.0200           | 1.23                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 68               | 0.0260           | 7.31                 | 3.66              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 0.9         | 120              | Total            |                      |                   |                                                                    |

### Summary for Reach AP#1:

Inflow Area = 45.963 ac, 44.42% Impervious, Inflow Depth > 2.03" for 10-Year Storm Event event  
Inflow = 36.82 cfs @ 13.16 hrs, Volume= 7.779 af  
Outflow = 36.82 cfs @ 13.16 hrs, Volume= 7.779 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#2:

Inflow Area = 2.391 ac, 73.43% Impervious, Inflow Depth > 1.55" for 10-Year Storm Event event  
 Inflow = 1.86 cfs @ 12.54 hrs, Volume= 0.308 af  
 Outflow = 1.86 cfs @ 12.54 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#3:

Inflow Area = 0.423 ac, 0.00% Impervious, Inflow Depth > 2.03" for 10-Year Storm Event event  
 Inflow = 0.92 cfs @ 12.16 hrs, Volume= 0.072 af  
 Outflow = 0.92 cfs @ 12.16 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.01" for 10-Year Storm Event event  
 Inflow = 37.74 cfs @ 13.15 hrs, Volume= 8.087 af  
 Outflow = 37.74 cfs @ 13.16 hrs, Volume= 8.085 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.29 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 1.95 fps, Avg. Travel Time= 0.4 min

Peak Storage= 440 cf @ 13.15 hrs  
 Average Depth at Peak Storage= 1.84'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 '/' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 '/'  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 2.06" for 10-Year Storm Event event  
 Inflow = 35.14 cfs @ 13.01 hrs, Volume= 6.612 af  
 Outflow = 32.75 cfs @ 13.23 hrs, Volume= 6.548 af, Atten= 7%, Lag= 13.3 min  
 Primary = 32.75 cfs @ 13.23 hrs, Volume= 6.548 af

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 144.47' @ 13.23 hrs Surf.Area= 22,048 sf Storage= 23,507 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 13.2 min calculated for 6.548 af (99% of inflow)  
 Center-of-Mass det. time= 10.0 min ( 863.3 - 853.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 ' / Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=32.73 cfs @ 13.23 hrs HW=144.47' (Free Discharge)

↑**1=Culvert** (Barrel Controls 32.73 cfs @ 4.69 fps)

**Summary for Pond 1P: Filters A & B**

Inflow Area = 2.178 ac, 80.61% Impervious, Inflow Depth > 3.76" for 10-Year Storm Event event  
 Inflow = 8.04 cfs @ 12.08 hrs, Volume= 0.683 af  
 Outflow = 1.85 cfs @ 12.54 hrs, Volume= 0.305 af, Atten= 77%, Lag= 27.4 min  
 Primary = 0.06 cfs @ 12.54 hrs, Volume= 0.059 af  
 Secondary = 1.80 cfs @ 12.54 hrs, Volume= 0.246 af  
 Tertiary = 0.00 cfs @ 12.55 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.75' @ 12.54 hrs Surf.Area= 10,134 sf Storage= 17,792 cf  
 Flood Elev= 146.90' Surf.Area= 10,596 sf Storage= 20,381 cf

Plug-Flow detention time= 195.0 min calculated for 0.305 af (45% of inflow)  
 Center-of-Mass det. time= 98.5 min ( 852.8 - 754.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 143.50'              | 20,381 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 143.50              | 5,703                | 0                         | 0                                                          |
| 144.00              | 6,549                | 3,063                     | 3,063                                                      |
| 145.00              | 8,745                | 7,647                     | 10,710                                                     |
| 146.00              | 10,596               | 9,671                     | 20,381                                                     |

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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 141.17' | <b>6.0" Round Culvert</b><br>L= 48.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 141.17' / 141.00' S= 0.0035 '/' Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf     |
| #2     | Device 1  | 141.00' | <b>1.0" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 145.60' | <b>12.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64 |
| #4     | Tertiary  | 145.75' | <b>16.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.06 cfs @ 12.54 hrs HW=145.75' (Free Discharge)

↑ **1=Culvert** (Passes 0.06 cfs of 1.49 cfs potential flow)

↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.30 fps)

**Secondary OutFlow** Max=1.79 cfs @ 12.54 hrs HW=145.75' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.79 cfs @ 0.99 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 12.55 hrs HW=145.75' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.03 fps)

## Summary for Pond 2: 60" Stream Crossing

Inflow Area = 44.748 ac, 44.72% Impervious, Inflow Depth > 2.01" for 10-Year Storm Event event  
 Inflow = 36.34 cfs @ 13.16 hrs, Volume= 7.505 af  
 Outflow = 36.34 cfs @ 13.17 hrs, Volume= 7.505 af, Atten= 0%, Lag= 0.4 min  
 Primary = 36.34 cfs @ 13.17 hrs, Volume= 7.505 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 142.05' @ 13.17 hrs Surf.Area= 447 sf Storage= 131 cf  
 Flood Elev= 147.00' Surf.Area= 45,197 sf Storage= 82,965 cf

Plug-Flow detention time= 0.0 min calculated for 7.505 af (100% of inflow)

Center-of-Mass det. time= 0.0 min ( 860.1 - 860.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 141.00'              | 82,965 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 141.00              | 8                    | 0                         | 0                                                          |
| 142.00              | 217                  | 113                       | 113                                                        |
| 143.00              | 4,455                | 2,336                     | 2,449                                                      |
| 144.00              | 10,237               | 7,346                     | 9,795                                                      |
| 145.00              | 18,414               | 14,326                    | 24,120                                                     |
| 146.00              | 27,039               | 22,727                    | 46,847                                                     |
| 147.00              | 45,197               | 36,118                    | 82,965                                                     |

| Device | Routing | Invert  | Outlet Devices                                  |
|--------|---------|---------|-------------------------------------------------|
| #1     | Primary | 140.00' | <b>60.0" Round Culvert w/ 18.0" inside fill</b> |

**Post Development Revised - Dempsey DrType III 24-hr 10-Year Storm Event Rainfall=4.90"**

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L= 60.0' CPP, projecting, no headwall, Ke= 0.900  
 Inlet / Outlet Invert= 138.50' / 137.88' S= 0.0103 ' S= 0.0103 ' Cc= 0.900  
 n= 0.012, Flow Area= 14.68 sf

**Primary OutFlow** Max=36.31 cfs @ 13.17 hrs HW=142.05' (Free Discharge)↑**1=Culvert** (Inlet Controls 36.31 cfs @ 3.64 fps)**Summary for Pond 5A: CB#2**

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 4.07" for 10-Year Storm Event event  
 Inflow = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af  
 Outflow = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min  
 Primary = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af

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

Peak Elev= 146.52' @ 12.02 hrs

Flood Elev= 147.50'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.94' | <b>12.0" Round Culvert</b><br>L= 85.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.94' / 144.60' S= 0.0040 ' S= 0.0040 ' Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.98 cfs @ 12.02 hrs HW=146.44' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.98 cfs @ 3.79 fps)**Summary for Pond 6: GUSF C**

Inflow Area = 0.357 ac, 80.86% Impervious, Inflow Depth > 3.95" for 10-Year Storm Event event  
 Inflow = 1.57 cfs @ 12.03 hrs, Volume= 0.118 af  
 Outflow = 1.54 cfs @ 12.07 hrs, Volume= 0.081 af, Atten= 2%, Lag= 2.5 min  
 Primary = 0.02 cfs @ 12.07 hrs, Volume= 0.020 af  
 Secondary = 1.52 cfs @ 12.07 hrs, Volume= 0.061 af

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

Peak Elev= 142.64' @ 12.07 hrs Surf.Area= 1,485 sf Storage= 1,781 cf

Flood Elev= 143.70' Surf.Area= 1,690 sf Storage= 2,359 cf

Plug-Flow detention time= 111.2 min calculated for 0.081 af (69% of inflow)

Center-of-Mass det. time= 43.3 min ( 787.9 - 744.6 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 141.00' | 2,359 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 141.00              | 777                  | 0                         | 0                         |
| 142.00              | 1,125                | 951                       | 951                       |
| 143.00              | 1,690                | 1,408                     | 2,359                     |



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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 138.67' | <b>6.0" Round Culvert</b><br>L= 65.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 138.67' / 138.02' S= 0.0100 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf      |
| #2     | Device 1  | 138.67' | <b>0.6" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 142.50' | <b>12.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.02 cfs @ 12.07 hrs HW=142.63' (Free Discharge)↑ **1=Culvert** (Passes 0.02 cfs of 1.32 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 9.55 fps)**Secondary OutFlow** Max=1.41 cfs @ 12.07 hrs HW=142.63' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.41 cfs @ 0.91 fps)**Summary for Pond 6A: CB#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 4.25" for 10-Year Storm Event event  
 Inflow = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af  
 Outflow = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af

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

Peak Elev= 143.65' @ 12.01 hrs

Flood Elev= 146.40'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                 |
|--------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 143.00' | <b>12.0" Round Culvert</b><br>L= 61.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 143.00' / 142.70' S= 0.0049 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.13 cfs @ 12.01 hrs HW=143.64' (Free Discharge)↑ **1=Culvert** (Barrel Controls 1.13 cfs @ 3.05 fps)**Summary for Pond DMH1: DMH#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 4.25" for 10-Year Storm Event event  
 Inflow = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af  
 Outflow = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.18 cfs @ 12.01 hrs, Volume= 0.078 af

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

Peak Elev= 143.25' @ 12.01 hrs

Flood Elev= 146.90'

| Device | Routing | Invert  | Outlet Devices                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------|
| #1     | Primary | 142.60' | <b>12.0" Round Culvert</b><br>L= 60.0' CPP, square edge headwall, Ke= 0.500 |

Inlet / Outlet Invert= 142.60' / 142.30' S= 0.0050 ' / ' Cc= 0.900  
n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.14 cfs @ 12.01 hrs HW=143.24' (Free Discharge)

↑**1=Culvert** (Barrel Controls 1.14 cfs @ 3.06 fps)

### Summary for Pond DMH2: DMH#2

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 4.07" for 10-Year Storm Event event  
Inflow = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af  
Outflow = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min  
Primary = 3.11 cfs @ 12.02 hrs, Volume= 0.209 af

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

Peak Elev= 146.02' @ 12.02 hrs

Flood Elev= 147.90'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                    |
|--------|---------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.50' | <b>12.0" Round Culvert</b><br>L= 62.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.50' / 144.25' S= 0.0040 ' / ' Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=2.98 cfs @ 12.02 hrs HW=145.96' (Free Discharge)

↑**1=Culvert** (Barrel Controls 2.98 cfs @ 3.79 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.01" for 10-Year Storm Event event  
Inflow = 37.74 cfs @ 13.16 hrs, Volume= 8.085 af  
Outflow = 39.01 cfs @ 13.15 hrs, Volume= 8.084 af, Atten= 0%, Lag= 0.0 min  
Primary = 39.01 cfs @ 13.15 hrs, Volume= 8.084 af

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

Peak Elev= 141.28' @ 13.15 hrs Surf.Area= 1,730 sf Storage= 1,470 cf

Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 8.084 af (100% of inflow)

Center-of-Mass det. time= 0.5 min ( 858.6 - 858.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=39.00 cfs @ 13.15 hrs HW=141.28' (Free Discharge)

↑**1=Culvert** (Barrel Controls 39.00 cfs @ 12.41 fps)

### Summary for Subcatchment SA-1: UPSTREAM OF LANDRY STREET

Runoff = 52.15 cfs @ 13.00 hrs, Volume= 9.785 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description                      |
|---|-----------|----|----------------------------------|
| * | 30,520    | 98 | Existing Roadway                 |
|   | 495,370   | 89 | Urban commercial, 85% imp, HSG A |
|   | 365,457   | 95 | Urban commercial, 85% imp, HSG D |
|   | 369,981   | 30 | Woods, Good, HSG A               |
|   | 417,512   | 77 | Woods, Good, HSG D               |
|   | 1,678,840 | 74 | Weighted Average                 |
|   | 916,617   |    | 54.60% Pervious Area             |
|   | 762,223   |    | 45.40% Impervious Area           |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description                                                                                 |
|----------|---------------|---------------|-------------------|----------------|---------------------------------------------------------------------------------------------|
| 45.9     | 150           | 0.0065        | 0.05              |                | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                            |
| 25.2     | 660           | 0.0076        | 0.44              |                | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                   |
| 1.1      | 644           |               | 9.83              |                | <b>Lake or Reservoir,</b><br>Mean Depth= 3.00'                                              |
| 2.2      | 650           | 0.0120        | 4.93              | 78.92          | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=2.00' D=2.00' Z= 3.0 ' Top.W=14.00'<br>n= 0.035 |
| 74.4     | 2,104         | Total         |                   |                |                                                                                             |

### Summary for Subcatchment SA-1A:

Runoff = 2.46 cfs @ 12.35 hrs, Volume= 0.271 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 5,034     | 98 | Existing Roadway              |
| * | 5,407     | 80 | Proposed Grass (D)            |
|   | 7,029     | 80 | >75% Grass cover, Good, HSG D |
|   | 19,896    | 77 | Woods, Good, HSG D            |
|   | 37,366    | 81 | Weighted Average              |
|   | 32,332    |    | 86.53% Pervious Area          |
|   | 5,034     |    | 13.47% Impervious Area        |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 24.9        | 150              | 0.0300           | 0.10                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 0.8         | 183              | 0.0130           | 3.61                 | 21.65             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00'<br>n= 0.035 |
| 25.7        | 333              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2:**

Runoff = 10.00 cfs @ 12.66 hrs, Volume= 1.447 af, Depth&gt; 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

| Area (sf) | CN | Description                      |
|-----------|----|----------------------------------|
| * 16,917  | 98 | Existing Roadway                 |
| * 2,543   | 39 | Proposed Grass (A)               |
| * 6,843   | 80 | Proposed Grass (D)               |
| 55,550    | 89 | Urban commercial, 85% imp, HSG A |
| 53,425    | 95 | Urban commercial, 85% imp, HSG D |
| 72,500    | 30 | Woods, Good, HSG A               |
| 62,603    | 77 | Woods, Good, HSG D               |
| 270,381   | 71 | Weighted Average                 |
| 160,835   |    | 59.48% Pervious Area             |
| 109,546   |    | 40.52% Impervious Area           |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------|
| 34.7        | 150              | 0.0130           | 0.07                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30"                           |
| 10.8        | 276              | 0.0073           | 0.43                 |                   | <b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps                                  |
| 1.6         | 478              | 0.0130           | 4.86                 | 48.59             | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=2.00' Z= 2.0 ' Top.W=9.00'<br>n= 0.035 |
| 47.1        | 904              | Total            |                      |                   |                                                                                            |

**Summary for Subcatchment SA-2A:**

Runoff = 0.05 cfs @ 12.51 hrs, Volume= 0.009 af, Depth&gt; 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"



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|   | Area (sf) | CN | Description                   |
|---|-----------|----|-------------------------------|
| * | 2,750     | 39 | Proposed Grass (A)            |
| * | 688       | 80 | Proposed Grass (D)            |
|   | 820       | 39 | >75% Grass cover, Good, HSG A |
|   | 667       | 80 | >75% Grass cover, Good, HSG D |
|   | 4,346     | 30 | Woods, Good, HSG A            |
|   | 9,271     | 41 | Weighted Average              |
|   | 9,271     |    | 100.00% Pervious Area         |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                      |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------------------------------------------|
| 21.0        | 80               | 0.0130           | 0.06                 |                   | <b>Sheet Flow,</b><br>Woods: Light underbrush n= 0.400 P2= 3.30" |

**Summary for Subcatchment SA-3:**

Runoff = 1.37 cfs @ 12.15 hrs, Volume= 0.107 af, Depth&gt; 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description           |
|---|-----------|----|-----------------------|
| * | 1,404     | 39 | Proposed Grass (A)    |
| * | 3,203     | 80 | Proposed Grass (D)    |
|   | 748       | 30 | Woods, Good, HSG A    |
|   | 13,060    | 77 | Woods, Good, HSG D    |
|   | 18,415    | 73 | Weighted Average      |
|   | 18,415    |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                           |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------------------------------------|
| 10.6        | 65               | 0.0067           | 0.10                 |                   | <b>Sheet Flow,</b><br>Grass: Short n= 0.150 P2= 3.30" |

**Summary for Subcatchment SA-4:**

Runoff = 7.21 cfs @ 12.12 hrs, Volume= 0.573 af, Depth&gt; 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 51,581    | 98 | Proposed Impervious    |
| * | 5,605     | 39 | Proposed Grass (A)     |
| * | 3,121     | 80 | Proposed Grass (D)     |
|   | 60,307    | 92 | Weighted Average       |
|   | 8,726     |    | 14.47% Pervious Area   |
|   | 51,581    |    | 85.53% Impervious Area |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 2.2         | 150              | 0.0100           | 1.15                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 30               | 0.0100           | 2.03                 |                   | <b>Shallow Concentrated Flow,</b><br>Paved Kv= 20.3 fps            |
| 0.3         | 199              | 0.0500           | 10.14                | 5.07              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b>                                               |
| 8.7         | 379              | Total            |                      |                   |                                                                    |

**Summary for Subcatchment SA-5:**

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.055 af, Depth&gt; 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

| Area (sf) | CN | Description           |
|-----------|----|-----------------------|
| * 7,772   | 80 | Proposed Grass (D)    |
| 7,772     |    | 100.00% Pervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description          |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 6.0         |                  |                  |                      |                   | <b>Direct Entry,</b> |

**Summary for Subcatchment SA-5A:**

Runoff = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af, Depth&gt; 5.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

| Area (sf) | CN | Description            |
|-----------|----|------------------------|
| * 24,906  | 98 | Proposed Impervious    |
| * 1,057   | 39 | Proposed Grass (A)     |
| * 846     | 80 | Proposed Grass (D)     |
| 26,809    | 95 | Weighted Average       |
| 1,903     |    | 7.10% Pervious Area    |
| 24,906    |    | 92.90% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                                                      |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------------------------------------|
| 0.4         | 28               | 0.0200           | 1.08                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"                                         |
| 1.2         | 228              | 0.0050           | 3.30                 | 1.73              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' Z= 0.2 & 0.0 ' Top.W=1.10'<br>n= 0.013 |
| 1.6         | 256              | Total            |                      |                   |                                                                                                  |

### Summary for Subcatchment SA-6:

Runoff = 0.74 cfs @ 12.09 hrs, Volume= 0.053 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 3,098     | 98 | Proposed Impervious    |
| * | 2,824     | 80 | Proposed Grass (D)     |
|   | 5,922     | 89 | Weighted Average       |
|   | 2,824     |    | 47.69% Pervious Area   |
|   | 3,098     |    | 52.31% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
|-------------|------------------|------------------|----------------------|-------------------|---------------|
| 6.0         |                  |                  |                      |                   | Direct Entry, |

### Summary for Subcatchment SA-6A:

Runoff = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-Year Storm Event Rainfall=6.20"

|   | Area (sf) | CN | Description            |
|---|-----------|----|------------------------|
| * | 1,385     | 98 | Existing Roadway       |
| * | 8,105     | 98 | Proposed Impervious    |
| * | 156       | 39 | Proposed Grass (A)     |
|   | 9,646     | 97 | Weighted Average       |
|   | 156       |    | 1.62% Pervious Area    |
|   | 9,490     |    | 98.38% Impervious Area |

| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                                                        |
|-------------|------------------|------------------|----------------------|-------------------|--------------------------------------------------------------------|
| 0.7         | 52               | 0.0200           | 1.23                 |                   | <b>Sheet Flow,</b><br>Smooth surfaces n= 0.011 P2= 3.30"           |
| 0.2         | 68               | 0.0260           | 7.31                 | 3.66              | <b>Trap/Vee/Rect Channel Flow,</b><br>Bot.W=1.00' D=0.50' n= 0.013 |
| 0.9         | 120              | Total            |                      |                   |                                                                    |

### Summary for Reach AP#1:

Inflow Area = 45.963 ac, 44.42% Impervious, Inflow Depth > 3.01" for 25-Year Storm Event event  
Inflow = 50.03 cfs @ 13.21 hrs, Volume= 11.544 af  
Outflow = 50.03 cfs @ 13.21 hrs, Volume= 11.544 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#2:

Inflow Area = 2.391 ac, 73.43% Impervious, Inflow Depth > 2.45" for 25-Year Storm Event event  
 Inflow = 4.59 cfs @ 12.26 hrs, Volume= 0.488 af  
 Outflow = 4.59 cfs @ 12.26 hrs, Volume= 0.488 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach AP#3:

Inflow Area = 0.423 ac, 0.00% Impervious, Inflow Depth > 4.18" for 25-Year Storm Event event  
 Inflow = 2.87 cfs @ 12.24 hrs, Volume= 0.147 af  
 Outflow = 2.87 cfs @ 12.24 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.0 min

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

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.99" for 25-Year Storm Event event  
 Inflow = 51.15 cfs @ 13.20 hrs, Volume= 12.033 af  
 Outflow = 51.14 cfs @ 13.20 hrs, Volume= 12.030 af, Atten= 0%, Lag= 0.3 min

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

Max. Velocity= 4.63 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.4 min

Peak Storage= 553 cf @ 13.20 hrs

Average Depth at Peak Storage= 2.13'

Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035

Side Slope Z-value= 1.5 ' ' Top Width= 8.00'

Length= 50.0' Slope= 0.0100 ' '

Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1: Tripple 24" Culvert

Inflow Area = 38.541 ac, 45.40% Impervious, Inflow Depth > 3.05" for 25-Year Storm Event event  
 Inflow = 52.15 cfs @ 13.00 hrs, Volume= 9.785 af  
 Outflow = 44.69 cfs @ 13.33 hrs, Volume= 9.709 af, Atten= 14%, Lag= 19.6 min  
 Primary = 44.69 cfs @ 13.33 hrs, Volume= 9.709 af

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.18' @ 13.33 hrs Surf.Area= 30,714 sf Storage= 42,157 cf  
 Flood Elev= 146.50' Surf.Area= 40,810 sf Storage= 71,614 cf

Plug-Flow detention time= 13.8 min calculated for 9.677 af (99% of inflow)  
 Center-of-Mass det. time= 11.1 min ( 856.2 - 845.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 142.50'              | 71,614 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 142.50              | 3,050                | 0                         | 0                                                          |
| 144.00              | 16,295               | 14,509                    | 14,509                                                     |
| 146.00              | 40,810               | 57,105                    | 71,614                                                     |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 142.62' | <b>24.0" Round Culvert X 3.00</b><br>L= 90.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 142.62' / 142.17' S= 0.0050 ' / Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=44.67 cfs @ 13.33 hrs HW=145.17' (Free Discharge)

↑**1=Culvert** (Inlet Controls 44.67 cfs @ 4.74 fps)

**Summary for Pond 1P: Filters A & B**

Inflow Area = 2.178 ac, 80.61% Impervious, Inflow Depth > 4.95" for 25-Year Storm Event event  
 Inflow = 10.46 cfs @ 12.08 hrs, Volume= 0.899 af  
 Outflow = 6.37 cfs @ 12.26 hrs, Volume= 0.520 af, Atten= 39%, Lag= 10.6 min  
 Primary = 0.06 cfs @ 12.26 hrs, Volume= 0.060 af  
 Secondary = 4.50 cfs @ 12.26 hrs, Volume= 0.418 af  
 Tertiary = 1.81 cfs @ 12.26 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.88' @ 12.26 hrs Surf.Area= 10,366 sf Storage= 19,079 cf  
 Flood Elev= 146.90' Surf.Area= 10,596 sf Storage= 20,381 cf

Plug-Flow detention time= 155.8 min calculated for 0.520 af (58% of inflow)  
 Center-of-Mass det. time= 75.2 min ( 824.9 - 749.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 143.50'              | 20,381 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 143.50              | 5,703                | 0                         | 0                                                          |
| 144.00              | 6,549                | 3,063                     | 3,063                                                      |
| 145.00              | 8,745                | 7,647                     | 10,710                                                     |
| 146.00              | 10,596               | 9,671                     | 20,381                                                     |



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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 141.17' | <b>6.0" Round Culvert</b><br>L= 48.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 141.17' / 141.00' S= 0.0035 '/' Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf     |
| #2     | Device 1  | 141.00' | <b>1.0" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 145.60' | <b>12.0' long x 12.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64 |
| #4     | Tertiary  | 145.75' | <b>16.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.06 cfs @ 12.26 hrs HW=145.87' (Free Discharge)

↑ **1=Culvert** (Passes 0.06 cfs of 1.51 cfs potential flow)

↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.44 fps)

**Secondary OutFlow** Max=4.46 cfs @ 12.26 hrs HW=145.87' (Free Discharge)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 4.46 cfs @ 1.36 fps)

**Tertiary OutFlow** Max=1.77 cfs @ 12.26 hrs HW=145.87' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Weir Controls 1.77 cfs @ 0.89 fps)

## Summary for Pond 2: 60" Stream Crossing

Inflow Area = 44.748 ac, 44.72% Impervious, Inflow Depth > 2.99" for 25-Year Storm Event event  
 Inflow = 49.43 cfs @ 13.20 hrs, Volume= 11.156 af  
 Outflow = 49.42 cfs @ 13.23 hrs, Volume= 11.156 af, Atten= 0%, Lag= 1.5 min  
 Primary = 49.42 cfs @ 13.23 hrs, Volume= 11.156 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 142.54' @ 13.23 hrs Surf.Area= 2,507 sf Storage= 848 cf  
 Flood Elev= 147.00' Surf.Area= 45,197 sf Storage= 82,965 cf

Plug-Flow detention time= 0.1 min calculated for 11.156 af (100% of inflow)

Center-of-Mass det. time= 0.1 min ( 852.8 - 852.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 141.00'              | 82,965 cf                 | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 141.00              | 8                    | 0                         | 0                                                          |
| 142.00              | 217                  | 113                       | 113                                                        |
| 143.00              | 4,455                | 2,336                     | 2,449                                                      |
| 144.00              | 10,237               | 7,346                     | 9,795                                                      |
| 145.00              | 18,414               | 14,326                    | 24,120                                                     |
| 146.00              | 27,039               | 22,727                    | 46,847                                                     |
| 147.00              | 45,197               | 36,118                    | 82,965                                                     |

| Device | Routing | Invert  | Outlet Devices                                  |
|--------|---------|---------|-------------------------------------------------|
| #1     | Primary | 140.00' | <b>60.0" Round Culvert w/ 18.0" inside fill</b> |

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L= 60.0' CPP, projecting, no headwall, Ke= 0.900  
 Inlet / Outlet Invert= 138.50' / 137.88' S= 0.0103 '/ Cc= 0.900  
 n= 0.012, Flow Area= 14.68 sf

**Primary OutFlow** Max=49.40 cfs @ 13.23 hrs HW=142.54' (Free Discharge)↑**1=Culvert** (Inlet Controls 49.40 cfs @ 4.10 fps)**Summary for Pond 5A: CB#2**

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 5.27" for 25-Year Storm Event event  
 Inflow = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af  
 Outflow = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min  
 Primary = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af

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

Peak Elev= 147.10' @ 12.02 hrs

Flood Elev= 147.50'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                 |
|--------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.94' | <b>12.0" Round Culvert</b><br>L= 85.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.94' / 144.60' S= 0.0040 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=3.81 cfs @ 12.02 hrs HW=146.98' (Free Discharge)↑**1=Culvert** (Barrel Controls 3.81 cfs @ 4.86 fps)**Summary for Pond 6: GUSF C**

Inflow Area = 0.357 ac, 80.86% Impervious, Inflow Depth > 5.14" for 25-Year Storm Event event  
 Inflow = 2.02 cfs @ 12.03 hrs, Volume= 0.153 af  
 Outflow = 1.97 cfs @ 12.05 hrs, Volume= 0.117 af, Atten= 2%, Lag= 1.6 min  
 Primary = 0.02 cfs @ 12.05 hrs, Volume= 0.021 af  
 Secondary = 1.96 cfs @ 12.05 hrs, Volume= 0.096 af

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

Peak Elev= 142.66' @ 12.05 hrs Surf.Area= 1,498 sf Storage= 1,817 cf

Flood Elev= 143.70' Surf.Area= 1,690 sf Storage= 2,359 cf

Plug-Flow detention time= 101.0 min calculated for 0.117 af (76% of inflow)

Center-of-Mass det. time= 40.7 min ( 782.0 - 741.4 )

| Volume | Invert  | Avail.Storage | Storage Description                                        |
|--------|---------|---------------|------------------------------------------------------------|
| #1     | 141.00' | 2,359 cf      | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 141.00              | 777                  | 0                         | 0                         |
| 142.00              | 1,125                | 951                       | 951                       |
| 143.00              | 1,690                | 1,408                     | 2,359                     |

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| Device | Routing   | Invert  | Outlet Devices                                                                                                                                                                     |
|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary   | 138.67' | <b>6.0" Round Culvert</b><br>L= 65.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 138.67' / 138.02' S= 0.0100 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.20 sf      |
| #2     | Device 1  | 138.67' | <b>0.6" Vert. Orifice/Grate</b> C= 0.600                                                                                                                                           |
| #3     | Secondary | 142.50' | <b>12.0' long x 11.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.53 2.59 2.70 2.68 2.67 2.68 2.66 2.64 |

**Primary OutFlow** Max=0.02 cfs @ 12.05 hrs HW=142.66' (Free Discharge)↑ **1=Culvert** (Passes 0.02 cfs of 1.32 cfs potential flow)↑ **2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 9.59 fps)**Secondary OutFlow** Max=1.93 cfs @ 12.05 hrs HW=142.66' (Free Discharge)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.93 cfs @ 1.01 fps)**Summary for Pond 6A: CB#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 5.44" for 25-Year Storm Event event  
 Inflow = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af  
 Outflow = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af

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

Peak Elev= 143.76' @ 12.01 hrs

Flood Elev= 146.40'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                 |
|--------|---------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 143.00' | <b>12.0" Round Culvert</b><br>L= 61.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 143.00' / 142.70' S= 0.0049 '/ Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=1.44 cfs @ 12.01 hrs HW=143.74' (Free Discharge)↑ **1=Culvert** (Barrel Controls 1.44 cfs @ 3.23 fps)**Summary for Pond DMH1: DMH#1**

Inflow Area = 0.221 ac, 98.38% Impervious, Inflow Depth > 5.44" for 25-Year Storm Event event  
 Inflow = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af  
 Outflow = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min  
 Primary = 1.50 cfs @ 12.01 hrs, Volume= 0.100 af

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

Peak Elev= 143.36' @ 12.01 hrs

Flood Elev= 146.90'

| Device | Routing | Invert  | Outlet Devices                                                              |
|--------|---------|---------|-----------------------------------------------------------------------------|
| #1     | Primary | 142.60' | <b>12.0" Round Culvert</b><br>L= 60.0' CPP, square edge headwall, Ke= 0.500 |

Inlet / Outlet Invert= 142.60' / 142.30' S= 0.0050 ' S= 0.0050 ' Cc= 0.900  
n= 0.012, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.44 cfs @ 12.01 hrs HW=143.34' (Free Discharge)

↑1=Culvert (Barrel Controls 1.44 cfs @ 3.24 fps)

### Summary for Pond DMH2: DMH#2

Inflow Area = 0.615 ac, 92.90% Impervious, Inflow Depth > 5.27" for 25-Year Storm Event event  
Inflow = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af  
Outflow = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min  
Primary = 3.99 cfs @ 12.02 hrs, Volume= 0.270 af

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

Peak Elev= 146.51' @ 12.02 hrs

Flood Elev= 147.90'

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                            |
|--------|---------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 144.50' | <b>12.0" Round Culvert</b><br>L= 62.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 144.50' / 144.25' S= 0.0040 ' S= 0.0040 ' Cc= 0.900<br>n= 0.012, Flow Area= 0.79 sf |

**Primary OutFlow** Max=3.81 cfs @ 12.02 hrs HW=146.41' (Free Discharge)

↑1=Culvert (Barrel Controls 3.81 cfs @ 4.86 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.99" for 25-Year Storm Event event  
Inflow = 51.14 cfs @ 13.20 hrs, Volume= 12.030 af  
Outflow = 51.64 cfs @ 13.20 hrs, Volume= 12.029 af, Atten= 0%, Lag= 0.0 min  
Primary = 51.64 cfs @ 13.20 hrs, Volume= 12.029 af

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

Peak Elev= 144.12' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf

Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 12.029 af (100% of inflow)

Center-of-Mass det. time= 0.5 min ( 850.8 - 850.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=51.64 cfs @ 13.20 hrs HW=144.12' (Free Discharge)

↑**1=Culvert** (Inlet Controls 51.64 cfs @ 16.44 fps)





**WATER QUALITY CALCULATIONS**  
**Dempsey Drive**

| Subcatchment ID | Proposed Impervious Area (sf) | Proposed Landscaped Area (sf) | Proposed Developed Area (sf) | Existing Impervious Area (sf) | Existing Landscaped Area (sf) | Treated Impervious Area (sf) | Treated Developed Area (sf) | BMP ID |
|-----------------|-------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|--------|
| 1A              | 0                             | 5,407                         | 5,407                        | 0                             | 7,029                         | 0                            | 0                           | None   |
| 2               | 0                             | 9,386                         | 9,386                        | 0                             | 0                             | 0                            | 0                           | None   |
| 2A              | 0                             | 3,438                         | 3,438                        | 0                             | 1,487                         | 0                            | 0                           | None   |
| 3               | 0                             | 4,607                         | 4,607                        | 0                             | 0                             |                              |                             | None   |
| 4               | 51,581                        | 8,726                         | 60,307                       | 0                             | 0                             | 51,581                       | 60,307                      | GUSF A |
| 5               | 0                             | 7,772                         | 7,772                        | 0                             | 0                             | 0                            | 7,772                       | GUSF B |
| 5A              | 24,906                        | 1,903                         | 26,809                       | 0                             | 0                             | 24,906                       | 26,809                      | GUSF B |
| 6               | 3,098                         | 2,824                         | 5,922                        | 0                             | 0                             | 3,098                        | 5,922                       | GUSF C |
| 6A              | 8,105                         | 156                           | 8,261                        | 0                             | 0                             | 8,105                        | 8,261                       | GUSF C |
| <b>Total</b>    | <b>87,690</b>                 | <b>44,219</b>                 | <b>131,909</b>               | <b>0</b>                      | <b>8,516</b>                  | <b>87,690</b>                | <b>109,071</b>              |        |

Note: All existing onsite impervious area is being removed as part of this development.

| New Development Treatment Summary         |                |
|-------------------------------------------|----------------|
| Total Proposed Impervious Area (sq. ft.)= | 87,690         |
| Total Proposed Developed Area (sq. ft.)=  | 131,909        |
| Total Treated Impervious Area (sq. ft.)=  | 87,690         |
| Total Treated Developed Area (sq. ft.)=   | 109,071        |
| <b>Impervious Area Treatment % =</b>      | <b>100.00%</b> |
| <b>Developed Area Treatment % =</b>       | <b>82.69%</b>  |

## Grassed Underdrained Soil Filter A Calculations

| Subcatchment ID | Impervious Area (sf) | WQ Impervious Area Runoff Depth (inches) | WQ Impervious Volume Required (ft <sup>3</sup> ) | Landscaped Area (sf) | WQ Landscape Area Runoff Depth (inches) | WQ Landscape Volume Required (ft <sup>3</sup> ) | Total WQ Volume Required (ft <sup>3</sup> ) |
|-----------------|----------------------|------------------------------------------|--------------------------------------------------|----------------------|-----------------------------------------|-------------------------------------------------|---------------------------------------------|
| 4               | 51,581               | 1.00                                     | 4,298                                            | 8,726                | 0.40                                    | 291                                             | 4,589                                       |
| <b>Total</b>    | <b>51,581</b>        |                                          | <b>4,298</b>                                     | <b>8,726</b>         |                                         | <b>291</b>                                      | <b>4,589</b>                                |

| Summary of Underdrain Filter Sizing                |              |
|----------------------------------------------------|--------------|
| Total WQ Volume Required (ft <sup>3</sup> )        | 4,589        |
| WQ Volume Provided (ft <sup>3</sup> )              | <b>5,387</b> |
| Filter Surface Elevation                           | 143.50       |
| WQ Surface Elevation                               | 145.00       |
| Invert of Underdrain                               | 141.17       |
| 5% of Tributary Impervious Area (ft <sup>2</sup> ) | 2,579        |
| 2% of Tributary Landscaped (ft <sup>2</sup> )      | 175          |
| Filter Surface Area Required (ft <sup>2</sup> )    | 2,754        |
| Filter Surface Area Provided (ft <sup>2</sup> )    | <b>2,870</b> |

| Underdrain Filter Volume                           |                                 |                                       |                                 |                                      |
|----------------------------------------------------|---------------------------------|---------------------------------------|---------------------------------|--------------------------------------|
| Elevation                                          | Surface Area (ft <sup>2</sup> ) | Average Stage Area (ft <sup>2</sup> ) | Stage Volume (ft <sup>3</sup> ) | Cumulative Volume (ft <sup>3</sup> ) |
| 143.5                                              | 2,870                           |                                       |                                 | 0                                    |
| 144                                                | 3,295                           | 3,083                                 | 1,541                           | 1,541                                |
| 145                                                | 4,397                           | 3,846                                 | 3,846                           | 5,387                                |
| Water Quality Volume Provided (at Elevation 145) = |                                 |                                       |                                 | <b>5,387</b>                         |

| Orifice Sizing                  |        |
|---------------------------------|--------|
| Discharge Coefficient           | 0.62   |
| Orifice Size (inches)           | 1      |
| Orifice Size (feet)             | 0.08   |
| Orifice Area (ft <sup>2</sup> ) | 0.005  |
| Orifice Centerline Elevation    | 141.42 |

Orifice Eqn:  $C \cdot A \cdot (2gH)^{1/2}$

| Q (cfs)               | Stage Elevation | Total Drawdown at Stage | Pond Area    | Drawdown Time (hrs) |
|-----------------------|-----------------|-------------------------|--------------|---------------------|
| <b>0.0391</b>         | <b>143.5</b>    | <b>0.00</b>             | <b>2,870</b> | <b>0.00</b>         |
| <b>0.0436</b>         | <b>144</b>      | <b>0.50</b>             | <b>3,295</b> | <b>10.51</b>        |
| <b>0.0513</b>         | <b>145</b>      | <b>1.00</b>             | <b>4,397</b> | <b>23.81</b>        |
| Total Drawdown Time = |                 |                         |              | <b>34.31</b>        |

| Required Sediment Storage        |              |                | Provided Storage Volume    |               |           |
|----------------------------------|--------------|----------------|----------------------------|---------------|-----------|
| Area to be Sanded                | 1.18         | acres          | Total # of CB's            | 0             |           |
| Sand Used per Storm              | 500          | lbs/acre-storm | Sump Depth                 | 2             | ft        |
| Weight of Sand                   | 90           | lbs/cf         | CB Diameter                | 4             | ft        |
| # of Storms per Year             | 10           | storms/year    | CB Sediment Storage Volume | 0.00          | cf        |
| <b>Sediment Storage Required</b> | <b>65.79</b> | <b>cf/year</b> | Forebay Volume             | 100           | cf        |
|                                  |              |                | <b>Total Volume</b>        | <b>100.00</b> | <b>cf</b> |

## Grassed Underdrained Soil Filter B Calculations

| Subcatchment ID | Impervious Area (sf) | WQ Impervious Area<br>Runoff Depth (inches) | WQ Impervious Volume<br>Required (ft <sup>3</sup> ) | Landscaped Area (sf) | WQ Landscape Area Runoff<br>Depth (inches) | WQ Landscape Volume<br>Required (ft <sup>3</sup> ) | Total WQ Volume<br>Required (ft <sup>3</sup> ) |
|-----------------|----------------------|---------------------------------------------|-----------------------------------------------------|----------------------|--------------------------------------------|----------------------------------------------------|------------------------------------------------|
| 5               | 0                    | 1.00                                        | 0                                                   | 7,772                | 0.40                                       | 259                                                | 259                                            |
| 5A              | 24,906               | 1.00                                        | 2,076                                               | 1,903                | 0.40                                       | 63                                                 | 2,139                                          |
| <b>Total</b>    | <b>24,906</b>        |                                             | <b>2,076</b>                                        | <b>9,675</b>         |                                            | <b>323</b>                                         | <b>2,398</b>                                   |

| Summary of Underdrain Filter Sizing                |              |
|----------------------------------------------------|--------------|
| Total WQ Volume Required (ft <sup>3</sup> )        | 2,398        |
| WQ Volume Provided (ft <sup>3</sup> )              | <b>5,322</b> |
| Filter Surface Elevation                           | 143.50       |
| WQ Surface Elevation                               | 145.00       |
| Invert of Underdrain                               | 141.17       |
| 5% of Tributary Impervious Area (ft <sup>2</sup> ) | 1,245        |
| 2% of Tributary Landscaped (ft <sup>2</sup> )      | 194          |
| Filter Surface Area Required (ft <sup>2</sup> )    | 1,439        |
| Filter Surface Area Provided (ft <sup>2</sup> )    | <b>2,833</b> |

| Underdrain Filter Volume                           |                                 |                                       |                                 |                                         |
|----------------------------------------------------|---------------------------------|---------------------------------------|---------------------------------|-----------------------------------------|
| Elevation                                          | Surface Area (ft <sup>2</sup> ) | Average Stage Area (ft <sup>2</sup> ) | Stage Volume (ft <sup>3</sup> ) | Cumulative Volume<br>(ft <sup>3</sup> ) |
| 143.5                                              | 2,833                           |                                       |                                 | 0                                       |
| 144                                                | 3,254                           | 3,044                                 | 1,522                           | 1,522                                   |
| 145                                                | 4,347                           | 3,801                                 | 3,801                           | 5,322                                   |
| Water Quality Volume Provided (at Elevation 145) = |                                 |                                       |                                 | <b>5,322</b>                            |

| Orifice Sizing                  |        |
|---------------------------------|--------|
| Discharge Coefficient           | 0.62   |
| Orifice Size (inches)           | 1      |
| Orifice Size (feet)             | 0.08   |
| Orifice Area (ft <sup>2</sup> ) | 0.005  |
| Orifice Centerline Elevation    | 141.42 |

Orifice Eqn:  $C \cdot A \cdot (2gH)^{1/2}$

| Q (cfs)                      | Stage Elevation | Total Drawdown at Stage | Pond Area    | Drawdown Time (hrs) |
|------------------------------|-----------------|-------------------------|--------------|---------------------|
| <b>0.0391</b>                | <b>143.5</b>    | <b>0.00</b>             | <b>2,833</b> | <b>0.00</b>         |
| <b>0.0436</b>                | <b>144</b>      | <b>0.50</b>             | <b>3,254</b> | <b>10.38</b>        |
| <b>0.0513</b>                | <b>145</b>      | <b>1.00</b>             | <b>4,347</b> | <b>23.53</b>        |
| <b>Total Drawdown Time =</b> |                 |                         |              | <b>33.91</b>        |

| Required Sediment Storage        |              |                | Provided Storage Volume    |               |           |
|----------------------------------|--------------|----------------|----------------------------|---------------|-----------|
| Area to be Sanded                | 0.57         | acres          | Total # of CB's            | 1             |           |
| Sand Used per Storm              | 500          | lbs/acre-storm | Sump Depth                 | 2             | ft        |
| Weight of Sand                   | 90           | lbs/cf         | CB Diameter                | 4             | ft        |
| # of Storms per Year             | 10           | storms/year    | CB Sediment Storage Volume | 25.12         | cf        |
| <b>Sediment Storage Required</b> | <b>31.76</b> | <b>cf/year</b> | Forebay Volume             | 100           | cf        |
|                                  |              |                | <b>Total Volume</b>        | <b>125.12</b> | <b>cf</b> |

### Grassed Underdrained Soil Filter C Calculations

| Subcatchment ID | Impervious Area (sf) | WQ Impervious Area Runoff Depth (inches) | WQ Impervious Volume Required (ft <sup>3</sup> ) | Landscaped Area (sf) | WQ Landscape Area Runoff Depth (inches) | WQ Landscape Volume Required (ft <sup>3</sup> ) | Total WQ Volume Required (ft <sup>3</sup> ) |
|-----------------|----------------------|------------------------------------------|--------------------------------------------------|----------------------|-----------------------------------------|-------------------------------------------------|---------------------------------------------|
| 6               | 3,098                | 1.00                                     | 258                                              | 2,824                | 0.40                                    | 94                                              | 352                                         |
| 6A              | 8,105                | 1.00                                     | 675                                              | 156                  | 0.40                                    | 5                                               | 681                                         |
| <b>Total</b>    | <b>11,203</b>        |                                          | <b>934</b>                                       | <b>2,980</b>         |                                         | <b>99</b>                                       | <b>1,033</b>                                |

| Summary of Underdrain Filter Sizing                |              |
|----------------------------------------------------|--------------|
| Total WQ Volume Required (ft <sup>3</sup> )        | 1,033        |
| WQ Volume Provided (ft <sup>3</sup> )              | <b>1,563</b> |
| Filter Surface Elevation                           | 141.00       |
| WQ Surface Elevation                               | 142.50       |
| Invert of Underdrain                               | 138.67       |
| 5% of Tributary Impervious Area (ft <sup>2</sup> ) | 560          |
| 2% of Tributary Landscaped (ft <sup>2</sup> )      | 60           |
| Filter Surface Area Required (ft <sup>2</sup> )    | 620          |
| Filter Surface Area Provided (ft <sup>2</sup> )    | <b>777</b>   |

| Underdrain Filter Volume                                    |                                 |                                       |                                 |                                      |
|-------------------------------------------------------------|---------------------------------|---------------------------------------|---------------------------------|--------------------------------------|
| Elevation                                                   | Surface Area (ft <sup>2</sup> ) | Average Stage Area (ft <sup>2</sup> ) | Stage Volume (ft <sup>3</sup> ) | Cumulative Volume (ft <sup>3</sup> ) |
| 141                                                         | 777                             | 0                                     | 0                               | 0                                    |
| 142                                                         | 1,125                           | 951                                   | 951                             | 951                                  |
| 142.5                                                       | 1,321                           | 1,223                                 | 612                             | 1,563                                |
| <b>Water Quality Volume Provided (at Elevation 141.5) =</b> |                                 |                                       |                                 | <b>1,563</b>                         |

| Orifice Sizing                  |        |
|---------------------------------|--------|
| Discharge Coefficient           | 0.62   |
| Orifice Size (inches)           | 0.625  |
| Orifice Size (feet)             | 0.05   |
| Orifice Area (ft <sup>2</sup> ) | 0.002  |
| Orifice Centerline Elevation    | 138.92 |

Orifice Eqn:  $C \cdot A \cdot (2gH)^{1/2}$

| Q (cfs)                      | Stage Elevation | Total Drawdown at Stage | Pond Area    | Drawdown Time (hrs) |
|------------------------------|-----------------|-------------------------|--------------|---------------------|
| <b>0.0153</b>                | <b>141</b>      | <b>0.00</b>             | <b>777</b>   | <b>0.00</b>         |
| <b>0.0186</b>                | <b>142</b>      | <b>1.00</b>             | <b>1,125</b> | <b>16.81</b>        |
| <b>0.0200</b>                | <b>142.5</b>    | <b>0.50</b>             | <b>1,321</b> | <b>9.15</b>         |
| <b>Total Drawdown Time =</b> |                 |                         |              | <b>25.96</b>        |

| Required Sediment Storage        |              |                | Provided Storage Volume    |              |           |
|----------------------------------|--------------|----------------|----------------------------|--------------|-----------|
| Area to be Sanded                | 0.26         | acres          | Total # of CB's            | 1            |           |
| Sand Used per Storm              | 500          | lbs/acre-storm | Sump Depth                 | 2            | ft        |
| Weight of Sand                   | 90           | lbs/cf         | CB Diameter                | 4            | ft        |
| # of Storms per Year             | 10           | storms/year    | CB Sediment Storage Volume | 25.12        | cf        |
| <b>Sediment Storage Required</b> | <b>14.29</b> | <b>cf/year</b> | Forebay Volume             | 57           | cf        |
|                                  |              |                | <b>Total Volume</b>        | <b>82.12</b> | <b>cf</b> |



**Appendix F**  
**Downstream Swale and Culvert Analysis**

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.26 cfs @ 13.15 hrs, Volume= 3.594 af  
 Outflow = 17.27 cfs @ 13.20 hrs, Volume= 3.593 af, Atten= 0%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 3.51 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 2.16 fps, Avg. Travel Time= 0.4 min

Peak Storage= 246 cf @ 13.20 hrs  
 Average Depth at Peak Storage= 1.26'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 ' / ' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 ' / '  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1A: Ex. 24" RCP

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 0.97" for 2-Year Storm Event event  
 Inflow = 16.44 cfs @ 13.20 hrs, Volume= 3.406 af  
 Outflow = 16.45 cfs @ 13.23 hrs, Volume= 3.405 af, Atten= 0%, Lag= 1.4 min  
 Primary = 16.45 cfs @ 13.23 hrs, Volume= 3.405 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 140.05' @ 13.23 hrs Surf.Area= 1,200 sf Storage= 730 cf  
 Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.4 min calculated for 3.405 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 875.5 - 875.1 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 137.00'              | 730 cf                    | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 137.00              | 10                   | 0                         | 0                                                          |
| 138.00              | 25                   | 18                        | 18                                                         |
| 139.00              | 100                  | 63                        | 80                                                         |
| 140.00              | 1,200                | 650                       | 730                                                        |

| Device | Routing | Invert  | Outlet Devices             |
|--------|---------|---------|----------------------------|
| #1     | Primary | 137.56' | <b>24.0" Round Culvert</b> |

**Pre Development Revised - Dempsey Driv Type III 24-hr 2-Year Storm Event Rainfall=3.30"**

Prepared by BH2M

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L= 24.0' RCP, groove end projecting, Ke= 0.200  
Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 '/ Cc= 0.900  
n= 0.012, Flow Area= 3.14 sf

**Primary OutFlow** Max=16.42 cfs @ 13.23 hrs HW=140.05' (Free Discharge)

↑**1=Culvert** (Barrel Controls 16.42 cfs @ 5.38 fps)

**Summary for Pond DSC: Downstream 24" RCP Culvert**

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
Inflow = 17.27 cfs @ 13.20 hrs, Volume= 3.593 af  
Outflow = 17.23 cfs @ 13.26 hrs, Volume= 3.592 af, Atten= 0%, Lag= 3.1 min  
Primary = 17.23 cfs @ 13.26 hrs, Volume= 3.592 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Peak Elev= 138.36' @ 13.26 hrs Surf.Area= 942 sf Storage= 614 cf  
Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.3 min calculated for 3.580 af (100% of inflow)

Center-of-Mass det. time= 0.3 min ( 877.0 - 876.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                  |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/ Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=17.21 cfs @ 13.26 hrs HW=138.36' (Free Discharge)

↑**1=Culvert** (Barrel Controls 17.21 cfs @ 5.48 fps)

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 1.96" for 10-Year Storm Event event  
 Inflow = 38.19 cfs @ 13.15 hrs, Volume= 7.710 af  
 Outflow = 37.41 cfs @ 13.16 hrs, Volume= 7.708 af, Atten= 2%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.28 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 2.46 fps, Avg. Travel Time= 0.3 min

Peak Storage= 437 cf @ 13.16 hrs  
 Average Depth at Peak Storage= 1.84'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 ' / ' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 ' / '  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1A: Ex. 24" RCP

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 2.06" for 10-Year Storm Event event  
 Inflow = 34.83 cfs @ 13.19 hrs, Volume= 7.195 af  
 Outflow = 35.59 cfs @ 13.15 hrs, Volume= 7.195 af, Atten= 0%, Lag= 0.0 min  
 Primary = 35.59 cfs @ 13.15 hrs, Volume= 7.195 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 142.45' @ 13.15 hrs Surf.Area= 1,200 sf Storage= 730 cf  
 Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.4 min calculated for 7.195 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 860.2 - 859.8 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 137.00'              | 730 cf                    | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 137.00              | 10                   | 0                         | 0                                                          |
| 138.00              | 25                   | 18                        | 18                                                         |
| 139.00              | 100                  | 63                        | 80                                                         |
| 140.00              | 1,200                | 650                       | 730                                                        |
| Device              | Routing              | Invert                    | Outlet Devices                                             |
| #1                  | Primary              | 137.56'                   | <b>24.0" Round Culvert</b>                                 |

L= 24.0' RCP, groove end projecting, Ke= 0.200  
 Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 '/ Cc= 0.900  
 n= 0.012, Flow Area= 3.14 sf

**Primary OutFlow** Max=35.52 cfs @ 13.15 hrs HW=142.44' (Free Discharge)

↑**1=Culvert** (Barrel Controls 35.52 cfs @ 11.31 fps)

### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 1.96" for 10-Year Storm Event event  
 Inflow = 37.41 cfs @ 13.16 hrs, Volume= 7.708 af  
 Outflow = 38.74 cfs @ 13.20 hrs, Volume= 7.707 af, Atten= 0%, Lag= 2.3 min  
 Primary = 38.74 cfs @ 13.20 hrs, Volume= 7.707 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 141.24' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 7.707 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 861.5 - 861.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                  |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/ Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=38.67 cfs @ 13.20 hrs HW=141.22' (Free Discharge)

↑**1=Culvert** (Barrel Controls 38.67 cfs @ 12.31 fps)



### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 2.93" for 25-Year Storm Event event  
 Inflow = 52.11 cfs @ 13.20 hrs, Volume= 11.497 af  
 Outflow = 51.29 cfs @ 13.20 hrs, Volume= 11.494 af, Atten= 2%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.63 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 2.64 fps, Avg. Travel Time= 0.3 min

Peak Storage= 554 cf @ 13.19 hrs  
 Average Depth at Peak Storage= 2.14'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 '/' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 '/'  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond 1A: Ex. 24" RCP

Inflow Area = 41.997 ac, 45.04% Impervious, Inflow Depth > 3.04" for 25-Year Storm Event event  
 Inflow = 47.27 cfs @ 13.26 hrs, Volume= 10.653 af  
 Outflow = 48.07 cfs @ 13.30 hrs, Volume= 10.652 af, Atten= 0%, Lag= 2.2 min  
 Primary = 48.07 cfs @ 13.30 hrs, Volume= 10.652 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 145.02' @ 13.30 hrs Surf.Area= 1,200 sf Storage= 730 cf  
 Flood Elev= 140.00' Surf.Area= 1,200 sf Storage= 730 cf

Plug-Flow detention time= 0.3 min calculated for 10.652 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 853.0 - 852.7 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 137.00'              | 730 cf                    | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 137.00              | 10                   | 0                         | 0                                                          |
| 138.00              | 25                   | 18                        | 18                                                         |
| 139.00              | 100                  | 63                        | 80                                                         |
| 140.00              | 1,200                | 650                       | 730                                                        |
| Device              | Routing              | Invert                    | Outlet Devices                                             |
| #1                  | Primary              | 137.56'                   | <b>24.0" Round Culvert</b>                                 |

**Pre Development Revised - Dempsey Dri Type III 24-hr 25-Year Storm Event Rainfall=6.20"**

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L= 24.0' RCP, groove end projecting, Ke= 0.200  
Inlet / Outlet Invert= 137.56' / 137.55' S= 0.0004 '/ Cc= 0.900  
n= 0.012, Flow Area= 3.14 sf

**Primary OutFlow** Max=48.02 cfs @ 13.30 hrs HW=145.01' (Free Discharge)

↑**1=Culvert** (Inlet Controls 48.02 cfs @ 15.28 fps)

**Summary for Pond DSC: Downstream 24" RCP Culvert**

Inflow Area = 47.094 ac, 42.98% Impervious, Inflow Depth > 2.93" for 25-Year Storm Event event  
Inflow = 51.29 cfs @ 13.20 hrs, Volume= 11.494 af  
Outflow = 52.57 cfs @ 13.20 hrs, Volume= 11.493 af, Atten= 0%, Lag= 0.3 min  
Primary = 52.57 cfs @ 13.20 hrs, Volume= 11.493 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Peak Elev= 144.39' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 11.493 af (100% of inflow)  
Center-of-Mass det. time= 0.5 min ( 854.1 - 853.6 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                  |
|--------|---------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/ Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=52.56 cfs @ 13.20 hrs HW=144.39' (Free Discharge)

↑**1=Culvert** (Inlet Controls 52.56 cfs @ 16.73 fps)

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.36 cfs @ 13.19 hrs, Volume= 3.713 af  
 Outflow = 17.36 cfs @ 13.19 hrs, Volume= 3.712 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 3.51 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.5 min

Peak Storage= 247 cf @ 13.19 hrs  
 Average Depth at Peak Storage= 1.27'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 ' / ' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 ' / '  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 0.92" for 2-Year Storm Event event  
 Inflow = 17.36 cfs @ 13.19 hrs, Volume= 3.712 af  
 Outflow = 17.35 cfs @ 13.22 hrs, Volume= 3.711 af, Atten= 0%, Lag= 1.7 min  
 Primary = 17.35 cfs @ 13.22 hrs, Volume= 3.711 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 138.37' @ 13.22 hrs Surf.Area= 955 sf Storage= 624 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.3 min calculated for 3.699 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 873.6 - 873.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

**Post Development Revised - Dempsey Dri Type III 24-hr 2-Year Storm Event Rainfall=3.30"**

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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=17.33 cfs @ 13.22 hrs HW=138.37' (Free Discharge)

↑**1=Culvert** (Barrel Controls 17.33 cfs @ 5.52 fps)

### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.01" for 10-Year Storm Event event  
 Inflow = 37.74 cfs @ 13.15 hrs, Volume= 8.087 af  
 Outflow = 37.74 cfs @ 13.16 hrs, Volume= 8.085 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.29 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 1.95 fps, Avg. Travel Time= 0.4 min

Peak Storage= 440 cf @ 13.15 hrs  
 Average Depth at Peak Storage= 1.84'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 ' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 '  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.01" for 10-Year Storm Event event  
 Inflow = 37.74 cfs @ 13.16 hrs, Volume= 8.085 af  
 Outflow = 39.01 cfs @ 13.15 hrs, Volume= 8.084 af, Atten= 0%, Lag= 0.0 min  
 Primary = 39.01 cfs @ 13.15 hrs, Volume= 8.084 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 141.28' @ 13.15 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 8.084 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 858.6 - 858.0 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

**Post Development Revised - Dempsey DrType III 24-hr 10-Year Storm Event Rainfall=4.90"**

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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=39.00 cfs @ 13.15 hrs HW=141.28' (Free Discharge)

↑**1=Culvert** (Barrel Controls 39.00 cfs @ 12.41 fps)



### Summary for Reach R1: Downstream Roadway Ditch

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.99" for 25-Year Storm Event event  
 Inflow = 51.15 cfs @ 13.20 hrs, Volume= 12.033 af  
 Outflow = 51.14 cfs @ 13.20 hrs, Volume= 12.030 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Max. Velocity= 4.63 fps, Min. Travel Time= 0.2 min  
 Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.4 min

Peak Storage= 553 cf @ 13.20 hrs  
 Average Depth at Peak Storage= 2.13'  
 Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 44.85 cfs

2.00' x 2.00' deep channel, n= 0.035  
 Side Slope Z-value= 1.5 '/' Top Width= 8.00'  
 Length= 50.0' Slope= 0.0100 '/'  
 Inlet Invert= 137.00', Outlet Invert= 136.50'



### Summary for Pond DSC: Downstream 24" RCP Culvert

Inflow Area = 48.354 ac, 45.86% Impervious, Inflow Depth > 2.99" for 25-Year Storm Event event  
 Inflow = 51.14 cfs @ 13.20 hrs, Volume= 12.030 af  
 Outflow = 51.64 cfs @ 13.20 hrs, Volume= 12.029 af, Atten= 0%, Lag= 0.0 min  
 Primary = 51.64 cfs @ 13.20 hrs, Volume= 12.029 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 144.12' @ 13.20 hrs Surf.Area= 1,730 sf Storage= 1,470 cf  
 Flood Elev= 139.00' Surf.Area= 1,730 sf Storage= 1,470 cf

Plug-Flow detention time= 0.5 min calculated for 12.029 af (100% of inflow)  
 Center-of-Mass det. time= 0.5 min ( 850.8 - 850.3 )

| Volume              | Invert               | Avail.Storage             | Storage Description                                        |
|---------------------|----------------------|---------------------------|------------------------------------------------------------|
| #1                  | 135.00'              | 1,470 cf                  | <b>Custom Stage Data (Prismatic)</b> Listed below (Recalc) |
| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)                                  |
| 135.00              | 10                   | 0                         | 0                                                          |
| 136.00              | 25                   | 18                        | 18                                                         |
| 137.00              | 75                   | 50                        | 68                                                         |
| 138.00              | 500                  | 288                       | 355                                                        |
| 139.00              | 1,730                | 1,115                     | 1,470                                                      |

**Post Development Revised - Dempsey DrType III 24-hr 25-Year Storm Event Rainfall=6.20"**

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| Device | Routing | Invert  | Outlet Devices                                                                                                                                                                   |
|--------|---------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #1     | Primary | 135.66' | <b>24.0" Round Culvert</b><br>L= 30.0' RCP, groove end projecting, Ke= 0.200<br>Inlet / Outlet Invert= 135.66' / 135.65' S= 0.0003 '/' Cc= 0.900<br>n= 0.012, Flow Area= 3.14 sf |

**Primary OutFlow** Max=51.64 cfs @ 13.20 hrs HW=144.12' (Free Discharge)

↑**1=Culvert** (Inlet Controls 51.64 cfs @ 16.44 fps)



# **OPERATIONS & MAINTENANCE PLAN** **FOR STORMWATER FACILITIES**

**For  
Dempsey Drive  
Landry Street  
Biddeford, Maine**



**Prepared By:**

**Berry Huff McDonald Milligan, Inc.  
Engineers Surveyors Planners  
28 State Street  
Gorham, ME 04038  
207-839-2771  
FAX 207-839-8250  
[sblake@bh2m.com](mailto:sblake@bh2m.com)**

## **Project Narrative**

The proposed project is a commercial storage facility. The development includes roadways, underground utilities and stormwater management facilities. The proposed development is subject to the standard and special conditions of the Stormwater Law Permit issued by the Maine Department of Environmental Protection. The following outlines the proposed BMP's and their required inspection, maintenance, and reporting:

The Applicant, Tom Gillis, will be responsible for all operation and maintenance of the proposed site improvements during construction. If an inspection determines that corrective action is required during construction the applicant's contractor is responsible for making the repair. This repair shall begin by the end of the following work day and completed within seven days or before the next storm event.

The Applicant, Tom Gillis, will be responsible for post construction operations and maintenance until a Dempsey Drive Business Association is established. Once the Dempsey Drive Business Association is established they will be responsible for Post Construction operations and maintenance. Before the license can be transferred from the applicant to the Dempsey Drive Business Association, the applicant is required to provide the Maine DEP with the following information:

1. Demonstrate that the Dempsey Drive Business Association has been formed.
2. Provide a copy of the bylaws that includes all stormwater infrastructure as common area.
3. Provide documentation that the Dempsey Drive Business Association approved and has accepted the final bylaws, thereby accepting this responsibility.

**Contacts:**

Design Engineer: BH2M  
28 State Street  
Gorham, Me. 04038  
(207) 839-2771

Developer/Applicant: Tom Gillis, Land Matters, LLC.  
P.O. Box 468  
Old Orchard Beach, Maine 04064

Owner: Heirs of Clarence Belanger

Post Construction Stormwater Inspector: (See definition of Inspector in Post Construction  
Stormwater Infrastructure Management Ordinance)

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Contractors:

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## **Inspection**

The applicant, Tom Gillis, is responsible for complying with the Maine DEP Stormwater Law Permit. The Applicant will be responsible for inspection and maintenance during construction and the Dempsey Drive Business Association will be responsible for Post-Construction operations. The development is also subject to State Stormwater Management Law and will be subject to a “Five-year Recertification for Long-Term Maintenance of Stormwater Management Systems”.

## **Purpose**

The following O&M Plan provides guidance and schedules for compliance with the Town’s Post Construction Stormwater Infrastructure Management Ordinance and the State Stormwater Law.

## **Definitions**

Significant Period of Rain: 1” or more of rain in a 24-hour period.

## **Inspection Scope**

Construction inspections shall include all disturbed and impervious areas, material storage areas, vehicle access points, and all erosion and sediment control measures.

## **Inspection Frequency**

An inspection is required at least once a week and before and after (within twenty-four (24) hours) a significant storm event. If an inspection determines that corrective action is required the repair shall begin by the end of the following work day and completed within seven (7) days or before the next storm event.

## **Inspector Qualifications**

For Post-Construction Inspections, the qualified post-construction stormwater inspector with knowledge of erosion and stormwater control, including the standards and conditions of this projects permit shall be retained by the Owner.

During construction, it is the responsibility of the Applicant and the applicant’s contractor to inspect, maintain and repair Post-Construction BMP’s until such time that the BMP’s are accepted by the Dempsey Drive Business Association.

## **Inspection/Maintenance Responsibility**

The Applicant, Tom Gillis, shall be responsible for inspection and maintenance during construction. If an inspection determines that corrective action is required during construction the applicant’s contractor is responsible for making the repair. This repair shall begin by the end of the following work day and completed within seven days or before the next storm event.

It shall be the Dempsey Drive Business Association's responsibility to retain the services of the Post-Construction Stormwater Inspector and provide for the repair and maintenance noted by inspections, if any. When maintenance is required by inspection, the Dempsey Drive Business Association shall perform the required maintenance and/or repairs in a timely fashion and notify the Inspector when the maintenance is complete. The Association shall maintain detailed records of the inspections and maintenance performed.

### **Documentation**

Construction inspection forms and documentation of corrective active actions shall be maintained for at least three (3) years. Post construction inspection forms and documentation of corrective active actions shall be maintained for at least five (5) years.

### **O&M Plan**

The following is a summary of the required inspection and maintenance for the Post-Construction BMP's:

### **Access Roads**

1. On-site inspection of the roads shall be performed at least twice annually and after a significant period of rainfall.
  - a) All low spots of pooling water shall be re-graded to direct the water off the pavement and to the appropriate, catch basin or ditch.
  - b) Areas of erosions shall be repaired immediately. This includes all grassy area adjacent to the road.
  - c) Sweeping the roadway free of sand after the winter season should be completed annually in the spring of the year.

### **Storm Drain and Catch Basins**

1. Inspect catch basin inlets on a monthly basis for debris or conditions which could inhibit flow entry. Remove debris and properly dispose.
2. Inspect all catch basin structures annually.
  - a) Check that rims are securely attached and properly set to optimize flow entry.
  - b) Measure and record silt accumulation, if any. Sumps shall be cleaned at least on a yearly basis in the spring. All sediment removed should be disposed of properly.
3. Check pipelines annually to determine silt accumulation, if any. Remove excess silt if found.

### **Vegetated Swales/Ditches**

1. On-site inspection of the vegetated ditches shall be on a monthly schedule and after a significant period of rainfall.
  - a) Ditches should be inspected to repair erosion problems, remove any accumulated debris and to check the condition and integrity of the check dams.
  - b) Ditches shall be mowed periodically to a minimum grass height of 6". Ditches shall be maintained such that woody vegetation is removed from the flow line of the ditch or areas that may impede the capacity of the ditch.
  - c) The use of pesticides and fertilizer should be limited to what is needed to promote a healthy/stable growth of vegetation.

### **Sediment Forebay**

1. On-site inspection of the rip-rap on a monthly schedule or after a significant period of rainfall.
  - a.) Carefully inspect to determine if high flows have caused scour beneath the rip-rap or dislodged any of the stones. If repairs are needed, they should be accomplished immediately.

### **Grassed Underdrain Filter**

1. On-site inspection of Grassed Underdrain Filters shall be twice per year (May 1 and October 1). The following shall be accomplished:
  - a.) Record date of inspection
  - b.) Identify person making the inspection
  - c.) Record observed water depth. (If no rain within last 24-36 hours should be dry.
  - d.) Inspect rip rap for debris accumulation
  - e.) Remove debris.
  - f.) Inspect for evidence of snow storage.
  - g.) Inspect for evidence of vehicles driving on bmp.
  - h.) Mow grassed slopes and/or repair slopes if eroded.
  - i.) Clean accumulated sediment from forebay.

### **Snow Storage Areas**

1. On-site inspection of the snow storage areas on an annual schedule.
  - a.) Carefully inspect to determine the condition of vegetation and remove any accumulated debris. If repairs are needed, they should be accomplished immediately.

## **Attachments**

1. Inspection & Maintenance Log
2. See attached Appendix B “Inspection and Maintenance” from MDEP Stormwater Regulations.
3. See attached “Appendix C” from MDEP Stormwater Regulations for performance standards.
4. Site Plan – Dempsey Drive Storage Facility.

**INSPECTION SUMMARY**  
**DEMPSEY DRIVE**

| <b><u>Inspection of</u></b>       | <b><u>Schedule *</u></b> |
|-----------------------------------|--------------------------|
| • Access Drives and Parking Areas |                          |
| Inspect                           | Twice Annually           |
| Sweep Road                        | Annually                 |
| • Storm Drain and Catch Basins    |                          |
| Inspect (CB Inlets)               | Monthly                  |
| Inspect (CB Sumps)                | Annually                 |
| Measure Silt & Remove             | Annually                 |
| • Sediment Forebay                |                          |
| Inspect                           | Monthly                  |
| Remove Litter                     | Annually                 |
| • Grassed Underdrain Filter       |                          |
| Inspect                           | Bi-Annually              |
| Remove Litter                     | Annually                 |

\* After significant rainstorm in addition to regular inspections. Inspections shall be within 3 days of significant rainfall.



## **INSPECTION AND MAINTENANCE LOG**

Dempsey Drive  
Post Construction Stormwater  
Inspection & Maintenance Log

Date of Inspection: \_\_\_\_\_

Inspection by: \_\_\_\_\_

Purpose of Inspection: Monthly, Yearly, Significant Rainfall (circle one)

- Access Drives and Parking Areas

Description of Conditions:

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Maintenance & Date of Repairs:

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Annual Sweeping (date & Contractors):

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Follow Up Needed:

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- Storm drain and catch basins  
Description:

Description of Conditions:

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Maintenance & Date of Repairs:

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Sediment Inspection & Removal:

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Date & Contractor for Sump Cleaning:

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Follow Up Needed:

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- Sediment Forebay  
Description of Conditions:

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Maintenance & Date of Repairs:

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Follow Up Needed:

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- Grassed Underdrained Soil Filter A  
Description:

Description of Conditions:

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Evidence of Snow Storage: Y / N

Evidence of Vehicle on Filter: Y / N

Maintenance & Date of Repairs:

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Sediment Inspection & Removal:

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Date & Contractor for Sump Cleaning:

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Follow Up Needed:

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- Grassed Underdrained Soil Filter B  
Description:

Description of Conditions:

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Evidence of Snow Storage: Y / N

Evidence of Vehicle on Filter: Y / N

Maintenance & Date of Repairs:

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Sediment Inspection & Removal:

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Date & Contractor for Sump Cleaning:

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Follow Up Needed:

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- Grassed Underdrained Soil Filter C  
Description:

Description of Conditions:

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Evidence of Snow Storage: Y / N

Evidence of Vehicle on Filter: Y / N

Maintenance & Date of Repairs:

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Sediment Inspection & Removal:

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Date & Contractor for Sump Cleaning:

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Follow Up Needed:

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Inspector Signature



**APPENDIX B. Inspection and maintenance**

This appendix applies to all projects, except that a project that is eligible for stormwater PBR need only meet the standards in Section 1.

See Appendix D(5) for additional maintenance requirements related to infiltration of stormwater.

**1. During construction.** The following standards must be met during construction.

- (a) **Inspection and corrective action.** Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
- (b) **Maintenance.** If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.
- (c) **Documentation.** Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to Department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

**2. Post-construction.** The following standards must be met after construction.

- (a) **Plan.** Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 7(C)(2) for submission requirements.
- (b) **Inspection and maintenance.** All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.

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**NOTE:** Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

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- (i) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).
- (ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.
- (iii) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
- (iv) Inspect and clean out catch basins. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).
- (v) Inspect resource and treatment buffers once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.
- (vi) Inspect at least once per year, each stormwater management pond or basin, including the pond's embankments, outlet structure, and emergency spillway. Remove and dispose of accumulated sediments in the pond. Control woody vegetation on the pond's embankments.
- (vii) Inspect at least one per year, each underdrained filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.
- (viii) Inspect each manufactured system installed on the site, including the system's inlet, treatment chamber(s), and outlet at least once per year, or in accordance with the maintenance

guidelines recommended by the manufacturer based on the estimated runoff and pollutant load expected to the system from the project. Remove and dispose of accumulated sediments, debris, and contaminated waters from the system and, if applicable, remove and replace any clogged or spent filter media.

**(c) Regular maintenance**

- (i) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- (ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

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**NOTE:** Contact the Department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

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- (d) **Documentation.** Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.
- 3. Re-certification.** Submit a certification of the following to the Department within three months of the expiration of each five-year interval from the date of issuance of the permit.
- (a) **Identification and repair of erosion problems.** All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
  - (b) **Inspection and repair of stormwater control system.** All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

- (c) **Maintenance.** The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

4. **Duration of maintenance.** Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the Department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with Department standards. Upon such assumption of responsibility, and approval by the Department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.
5. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

**APPENDIX C. Housekeeping**

These performance standards apply to all projects except for stormwater PBR projects.

1. **Spill prevention.** Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

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**NOTE:** Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at :  
<http://www.maine.gov/dep/spills/emergspillresp/>

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2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See Appendix D for license by rule standards for infiltration of stormwater.

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**NOTE:** Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

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3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

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**NOTE:** Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

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4. **Debris and other materials.** Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

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

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

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

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**NOTE:** Dewatering controls are discussed in the “Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection.”

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- 6. Authorized Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

- (a) Discharges from firefighting activity;
- (b) Fire hydrant flushings;
- (c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
- (d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);
- (e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
- (f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
- (g) Uncontaminated air conditioning or compressor condensate;
- (h) Uncontaminated groundwater or spring water;
- (i) Foundation or footer drain-water where flows are not contaminated;
- (j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));
- (k) Potable water sources including waterline flushings; and
- (l) Landscape irrigation.



7. **Unauthorized non-stormwater discharges .** The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:
- (a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
  - (b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
  - (c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
  - (d) Toxic or hazardous substances from a spill or other release.
- (8) **Additional requirements.** Additional requirements may be applied on a site-specific basis.

**Appendix H**  
**Test Pit Logs**

## SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

|                      |                        |                                         |
|----------------------|------------------------|-----------------------------------------|
| <b>Project Name:</b> | <b>Applicant Name:</b> | <b>Project Location (municipality):</b> |
| 23 Marcel Avenue     | BH2M, Inc. (Agent)     | Biddeford                               |

| SOIL DESCRIPTION AND CLASSIFICATION            |             |                                              |                                 |
|------------------------------------------------|-------------|----------------------------------------------|---------------------------------|
| Exploration Symbol:                            | TP-1        | <input checked="" type="checkbox"/> Test Pit | <input type="checkbox"/> Boring |
| 1" Depth of Organic Horizon Above Mineral Soil |             |                                              |                                 |
| Texture                                        | Consistency | Color                                        | Mottling                        |
| 0                                              |             |                                              |                                 |
| 1                                              |             |                                              |                                 |
| 2                                              | SANDY LOAM  | FRIABLE                                      | DARK BROWN                      |
| 3                                              |             |                                              | NONE OBSERVED                   |
| 4                                              |             |                                              |                                 |
| 5                                              | MEDIUM SAND |                                              | GRAY                            |
| 6                                              |             |                                              |                                 |
| 7                                              |             |                                              |                                 |
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| 9                                              |             |                                              |                                 |
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| 11                                             |             |                                              |                                 |
| 12                                             | LOAMY SAND  |                                              | DARK YELLOWISH BROWN            |
| 13                                             |             |                                              |                                 |
| 14                                             |             |                                              |                                 |
| 15                                             |             | LOOSE                                        |                                 |
| 16                                             |             |                                              |                                 |
| 17                                             |             |                                              |                                 |
| 18                                             |             |                                              |                                 |
| 19                                             |             |                                              |                                 |
| 20                                             | MEDIUM SAND |                                              | OLIVE                           |
| 21                                             |             |                                              | COMMON, MEDIUM & DISTINCT       |
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From: Tom Gillis gillist@rocketmail.com  
Subject: Army Corp permit  
Date: November 8, 2019 at 2:07 PM  
To: michael@realtyadvisers.us

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REPLY TO  
ATTENTION OF

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

MAINE GENERAL PERMIT (GP)  
AUTHORIZATION LETTER AND SCREENING SUMMARY

Tom Gillis  
Land Matters, LLC.  
PO Box 468  
Old Orchard Beach, Maine 04064

CORPS PERMIT # NAE-2019-001121  
CORPS GP ID# 19-392  
STATE ID#

DESCRIPTION OF WORK:

To discharge 8,272 square feet of fill into waters of the United States for commercial development located off of Landry Street in Biddeford, Maine as shown on plans entitled "STREAM CROSSING PROFILE", "DEMPSEY DRIVE WETLAND IMPACT #1", "DEMPSEY DRIVE WETLAND IMPACT #2", "DEMPSEY DRIVE WETLAND IMPACT #3", and "DEMPSEY DRIVE WETLAND IMPACT #4" each on 1 sheet and not dated and on plans entitled "SITE PLAN" and "EROSION CONTROL DETAILS" each on 1 sheet and dated "5/15/19".

LAT/LONG COORDINATES : 43 464N18 N -70.477683 ° W USGS QUAD Biddeford, ME

I. CORPS DETERMINATION:

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

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

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

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

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

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

II. STATE ACTIONS: PENDING [ ], ISSUED [ ], DENIED [ ] DATE NA

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

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: July 11, 2019 LEVEL OF REVIEW: CATEGORY 1: CATEGORY 2: X

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

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

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA\_NO USF&WS\_NO NMFS\_NO

If you have any questions on this matter, please contact my staff at 207-623-8367 at our Manchester, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at <http://per2.nwp.usace.army.mil/survey.html>

RICHARD KRISTOFF  
SENIOR PROJECT MANAGER  
MAINE PROJECT OFFICE

FRANK J. DEL GIUDICE  
CHIEF, PERMITS & ENFORCEMENT BRANCH  
REGULATORY DIVISION





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

DEPARTMENT ORDER

IN THE MATTER OF

|                           |                                    |
|---------------------------|------------------------------------|
| LAND MATTERS, LLC         | ) STORMWATER MANAGEMENT LAW        |
| Biddeford, York County    | ) NATURAL RESOURCES PROTECTION ACT |
| DEMPSEY DRIVE             | ) FRESHWATER WETLAND ALTERATION    |
| L-28330-TB-A-N (Approval) | ) WATER QUALITY CERTIFICATION      |
| L-28330-NB-B-N (Approval) | ) FINDINGS OF FACT AND ORDER       |

Pursuant to the provisions of 38 M.R.S. §§ 480-A–480-JJ, 38 M.R.S. § 420-D, Section 401 of the Federal Water Pollution Control Act (33 U. S. C. § 1341), and Chapters 310, 315, and 500 of Department rules, the Department of Environmental Protection has considered the application of LAND MATTERS, LLC. with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Summary: The applicant proposes to construct a stormwater management system for a 14-unit commercial facility that includes four office buildings (A-D); consisting of a (A) 3,098-square foot building, (B) 14,400-square foot building, (C) 14,400-square foot building, and (D) 3,000-square foot building; with a paved access drive, parking, utilities, and associated improvements resulting in 2.01 acres of impervious area and 3.03 acres of developed area. The project is indicated on a set of plans the first of which is entitled “Dempsey Drive, Marcel Avenue, Biddeford Maine 04005,” prepared by BH2M, and dated May 15, 2019 with a latest revision date on any of the sheets of September 20, 2019. The project site is located on Landry Street in the Town of Biddeford.

The applicant is also seeking approval to fill 8,316 square feet of freshwater wetlands under the Natural Resources Protection Act (NRPA).

The applicant also submitted a NRPA Permit-by-Rule Notification Form (PBR#67852), accepted on June 11, 2019, for activities adjacent to a protected natural resource and a stream crossing, agreeing that work will be performed in accordance with Chapter 305 Sections 2 and 10 NRPA standards.

B. Current Use of the Site: The project parcel is approximately 4.17 acres in size and is located on Landry Street. The site of the proposed project is primarily wooded with forested freshwater wetland. The parcel is identified as Lots 10-2 and 11 on Map 74 of the Town of Biddeford’s tax maps.



## 2. STORMWATER STANDARDS:

The proposed project includes approximately 3.03 acres of developed area of which 2.01 acres is impervious area. It lies within the watershed of Thatcher Brook, an urban impaired stream. The applicant submitted a stormwater management plan based on the Basic and General Standards contained in Department Rules, Chapter 500. The proposed stormwater management system consists of three underdrained soil filters as the Best Management Practices (BMPs).

### A. Basic Standards:

(1) Erosion and Sedimentation Control: The applicant submitted an Erosion and Sedimentation Control notes and details that are based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. The plan sheets containing erosion control details were reviewed by, and revised in response to the comments of, the Bureau of Land Resources (BLR).

Erosion control details will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor.

(2) Inspection and Maintenance: The applicant submitted a maintenance plan that addresses both short-term (construction) and long-term (post-construction) inspection and maintenance requirements. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. This plan was reviewed by, and revised in response to the comments of, BLR.

Prior to the formation of a business park association, the applicant will be responsible for all post-construction inspection and maintenance. The applicant may not transfer responsibility for inspection and maintenance of the stormwater management system to a business park association until the applicant demonstrates that this entity has been formed, has provided a copy of the Bylaws identifying all stormwater infrastructure, and provided documentation that the business park association has approved and adopted the final Bylaws, thereby accepting this responsibility.

Within six months of completion of the development, the applicant must submit as-built (record) drawings for stormwater control structures, including the stormwater BMPs, to the BLR.

Storm sewer grit and sediment materials removed from stormwater control structures during maintenance activities must be disposed of in compliance with the Maine Solid Waste Management Rules.

(3) Housekeeping: The proposed project will comply with the performance standards outlined in Appendix C of Chapter 500.

Based on BLR's review of the erosion and sedimentation control plan and the maintenance plan, the Department finds that the proposed project meets the Basic Standards contained in Chapter 500(4)(B) provided the business park association submits documentation transferring the responsibility for maintenance and inspection of the stormwater management system, as-builts are sent to BLR for review, and grit and sediment are disposed of as described above.

**B. General Standards:**

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This mitigation is being achieved by using Best Management Practices that will control runoff from no less than 100% of the impervious area and no less than 82.7% of the developed area.

The stormwater management system proposed by the applicant was reviewed by, and revised in response to comments from, BLR. After a final review, BLR commented that the proposed stormwater management system is designed in accordance with the Chapter 500 General Standards and recommended that the applicant's design engineer or other qualified professional oversee the construction of the three underdrained soil filters to ensure that they are installed in accordance with the details and notes specified on the approved plans.

Within 30 days from completion of the entire system or if the project takes more than one year to complete, at least once per year, the applicant must submit a log of inspection reports detailing the items inspected, photographs taken, and the dates of each inspection to the BLR for review.

Based on the stormwater system's design and BLR's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the Chapter 500 Basic and General Standards provided construction of the stormwater management structures is overseen, documented, recorded, and submitted as described above.

**3. WETLAND IMPACTS:**

The applicant proposes to alter 8,316 square feet of freshwater forested wetlands for the access drive, grading for stormwater conveyances, and part of building D. The applicant has avoided and minimized wetland impacts by placing the access road through the narrower area of wetlands and by steepening the proposed side slopes adjacent to the wetlands from 3H:1V to 2H:1V. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site.

The Department finds that the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. § 420-D, and Chapters 500 of the Department's Regulations:

- A. The applicant has made adequate provision to ensure that the proposed project will meet the Chapter 500 Basic Standards for: (1) erosion and sediment control; (2) inspection and maintenance; (3) housekeeping; and (4) grading and construction activity provided that the appropriate documentation from the business park association is provided, as-built drawings for the stormwater management system are submitted to the BLR, and grit and sediment materials removed from the stormwater management structures during maintenance activities are disposed of in compliance with Maine Solid Waste Management Rules as outlined in Finding 2A..
- B. The applicant has made adequate provision to ensure that the proposed project will meet the Chapter 500 General Standards provided that stormwater construction overseen and inspections and reports are completed as outlined in Finding 2B.

BASED on the above Findings of Fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ, Chapters 310 and 315 of the Department's rules and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment.
- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat; aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classification of the State's waters.

- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed activity is not on an outstanding river segment as noted in 38 M.R.S. § 480-P.

THEREFORE, the Department APPROVES the above noted application of LAND MATTERS, LLC to construct a stormwater management system and alter wetlands to construct four office buildings as described in Finding 1, Maine, SUBJECT TO THE FOLLOWING CONDITIONS, and all applicable standards and regulations:

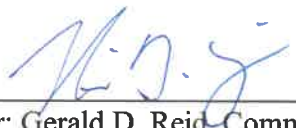
1. The Standard Conditions of Approval, a copy attached.
2. In addition to any specific erosion control measures described in this or previous orders, the applicant (and/or association) shall take all necessary actions to ensure that (its, his, her, their) activities or those of (its, his, her, their) agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.
3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.
4. The applicant may not transfer responsibility for the post-construction inspection and maintenance of the stormwater management system to a business park association, until a letter has been submitted from the Town to the BLR documenting the business park association's agreement to maintain it in accordance with the terms of this Order.
5. Within six months of completion of construction, the applicant must submit as-built (record) drawings for stormwater control structures, including the stormwater BMP, to the BLR.
6. Storm sewer grit and sediment materials removed from stormwater control structures shall be disposed of in compliance with the Maine Solid Waste Management Rules.
7. The applicant shall retain the design engineer or other qualified professional to oversee the construction of the stormwater management structures according to the details and notes specified on the approved plans.

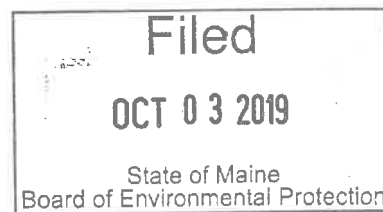
8. Within 30 days of completion of the entire system or if the project takes more than one year to complete, at least once per year, the applicant shall submit a log of inspection reports detailing the items inspected, photographs taken, and dates of each inspection to the BLR for review.

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

DONE AND DATED IN AUGUSTA, MAINE, THIS 2<sup>nd</sup> DAY OF October, 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:   
For: Gerald D. Reid, Commissioner



PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

AAS/L28330ANBN/ATS#84603,84677

## STORMWATER STANDARD CONDITIONS

### STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL

**Standard conditions of approval.** Unless otherwise specifically stated in the approval, a department approval is subject to the following standard conditions pursuant to Chapter 500 Stormwater Management Law.

- (1) Approval of variations from plans. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the permittee. Any variation from these plans, proposals, and supporting documents must be reviewed and approved by the department prior to implementation. Any variation undertaken without approval of the department is in violation of 38 M.R.S. §420-D(8) and is subject to penalties under 38 M.R.S. §349.
- (2) Compliance with all terms and conditions of approval. The applicant shall submit all reports and information requested by the department demonstrating that the applicant has complied or will comply with all terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.
- (3) Advertising. Advertising relating to matters included in this application may not refer to this approval unless it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.
- (4) Transfer of project. Unless otherwise provided in this approval, the applicant may not sell, lease, assign, or otherwise transfer the project or any portion thereof without written approval by the department where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval may only be granted if the applicant or transferee demonstrates to the department that the transferee agrees to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant. Approval of a transfer of the permit must be applied for no later than two weeks after any transfer of property subject to the license.
- (5) Time frame for approvals. If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the department for a new approval. The applicant may not begin construction or operation of the project until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- (6) Certification. Contracts must specify that "all work is to comply with the conditions of the Stormwater Permit." Work done by a contractor or subcontractor pursuant to this approval may not begin before the contractor and any subcontractors have been shown a copy of this approval with the conditions by the permittee, and the permittee and each contractor and subcontractor has certified, on a form provided by the department, that the approval and conditions have been received and read, and that the work will be carried out in accordance with the approval and conditions. Completed certification forms must be forwarded to the department.



- (7) Maintenance. The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the Department. If maintenance responsibility is to be transferred from the permittee to another entity, a transfer request must be filed with the Department which includes the name and contact information for the person or entity responsible for this maintenance. The form must be signed by the responsible person or agent of the responsible entity.
- (8) Recertification requirement. Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the department.
- (a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
  - (b) All aspects of the stormwater control system are operating as approved, have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system, as necessary.
  - (c) The stormwater maintenance plan for the site is being implemented as approved by the Department, and the maintenance log is being maintained.
  - (d) All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning and general maintenance.
  - (e) The Department may waive some or all of these recertification requirements on a case-by-case basis for permittees subject to the Department's Multi-Sector General Permit ("MSGP") and/or Maine Pollutant Discharge Elimination System ("MEPDES") programs where it is demonstrated that these programs are providing stormwater control that is at least as effective as required pursuant to this Chapter.
- (9) Transfer of property subject to the license. If any portion of the property subject to the license containing areas of flow or areas that are flooded are transferred to a new property owner, restrictive covenants protecting these areas must be included in any deeds or leases, and recorded at the appropriate county registry of deeds. Also, in all transfers of such areas and areas containing parts of the stormwater management system, deed restrictions must be included making the property transfer subject to all applicable terms and conditions of the permit. These terms and conditions must be incorporated by specific and prominent reference to the permit in the deed. All transfers must include in the restrictions the requirement that any subsequent transfer must specifically include the same restrictions unless their removal or modification is approved by the Department. These restrictions must be written to be enforceable by the Department, and must reference the permit number.
- (10) Severability. The invalidity or unenforceability of any provision, or part thereof, of this permit shall not affect the remainder of the provision or any other provisions. This permit shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

November 16, 2005 (revised August 15, 2015)



## Natural Resources Protection Act (NRPA) Standard Conditions

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

- A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.
- B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.
- D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.
- E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.
- G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.
- H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

Revised September 2016

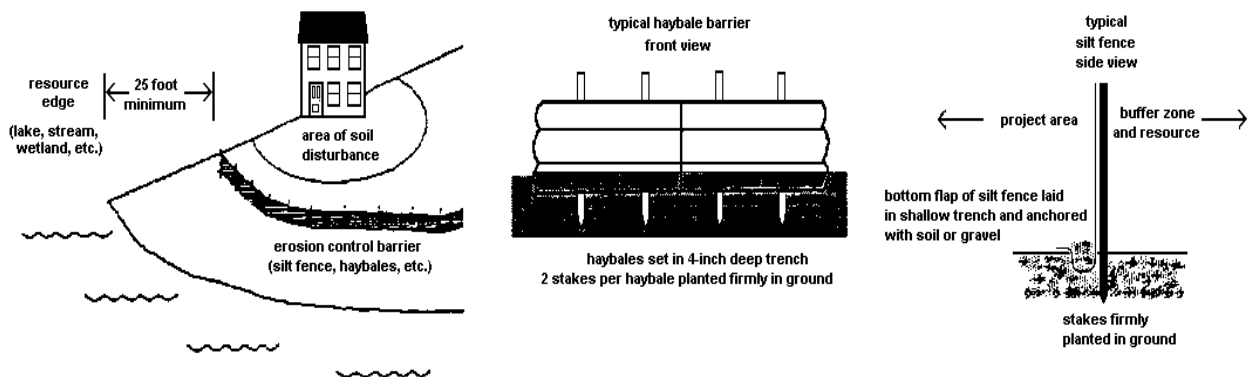


STATE OF MAINE  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
 17 STATE HOUSE STATION, AUGUSTA, MAINE 04333

**Erosion Control for Homeowners**

**Before Construction**

1. If you have hired a contractor, make sure you discuss your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is, and where it is located. Most people can identify the edge of a lake or river. However, the edges of wetlands are often not so obvious. Your contractor may be the person actually pushing dirt around, but you are both responsible for complying with the permit.
2. Call around to find where erosion control materials are available. Chances are your contractor has these materials already on hand. You probably will need silt fence, hay bales, wooden stakes, grass seed (or conservation mix), and perhaps filter fabric. Places to check for these items include farm & feed supply stores, garden & lawn suppliers, and landscaping companies. It is not always easy to find hay or straw during late winter and early spring. It also may be more expensive during those times of year. Plan ahead -- buy a supply early and keep it under a tarp.
3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the soil-disturbance activity.
4. If a contractor is installing the erosion control barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour", meaning at the same level or elevation across the land slope, whenever possible. This keeps stormwater from flowing to the lowest point along the barrier where it can build up and overflow or destroy the barrier.



**During Construction**

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops hitting the bare ground that makes the soil begin to move downslope with the runoff water, and cause erosion. More than 90% of erosion is prevented by keeping the soil covered.
2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. You or your contractor then need to figure out what can be done to prevent more soil from getting past the barrier.

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

### **After Construction**

1. After your project is finished, seed the area. Note that all ground covers are not equal. For example, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high-maintenance areas. But this same seed mix is a poor selection for stabilizing a road shoulder or a cut bank that you don't intend to mow. Your contractor may have experience with different seed mixes, or you might contact a seed supplier for advice.
2. Do not spread grass seed after September 15. There is the likelihood that germinating seedlings could be killed by a frost before they have a chance to become established. Instead, mulch the area with a thick layer of hay or straw. In the spring, rake off the mulch and then seed the area. Don't forget to mulch again to hold in moisture and prevent the seed from washing away or being eaten by birds or other animals.
3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

### **Why Control Erosion?**

#### **To Protect Water Quality**

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

#### **To Protect the Soil**

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

#### **To Save Money (\$\$)**

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



# DEP INFORMATION SHEET

## Appealing a Department Licensing Decision

**Dated: November 2018**

**Contact: (207) 287-2452**

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### **SUMMARY**

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

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

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

### **I. ADMINISTRATIVE APPEALS TO THE BOARD**

#### **LEGAL REFERENCES**

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

#### **DEADLINE TO SUBMIT AN APPEAL TO THE BOARD**

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

#### **HOW TO SUBMIT AN APPEAL TO THE BOARD**

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

### INFORMATION APPEAL PAPERWORK MUST CONTAIN

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

1. *Aggrieved Status.* The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

### OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

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



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

The Board will formally acknowledge receipt of an appeal, and will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the license holder, and interested persons of its decision.

## **II. JUDICIAL APPEALS**

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see 38 M.R.S. § 346(1); 06-096 C.M.R. ch. 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

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

## **ADDITIONAL INFORMATION**

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

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

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# City of Biddeford, Maine

## COST ESTIMATE WORKSHEET

Revised May 9, 2019



**OWNER/APPLICANT:** Tom Gillis / Land Matters LLC

**PROJECT NAME:** Dempsey Drive

|    | ITEM                                         | UNIT        | QUANTITY | UNIT COST | TOTAL  |
|----|----------------------------------------------|-------------|----------|-----------|--------|
| 1  | Clearing and Grubbing                        | Acre        | 3        | 5,000     | 15,000 |
| 2  | Erosion/Sediment Control                     | Lump Sum    | 1        | 3,000     | 3,000  |
| 3  | Site Stabilization                           | Lump Sum    | 1        | 2,000     | 2,000  |
| 4  | Ledge Removal                                | Cubic Yard  |          |           |        |
| 5  | Sanitary Sewer                               |             |          |           |        |
|    | Manholes                                     | Each        | 4        | 2,500     | 10,000 |
|    | Main                                         | Linear Foot | 731      | 30        | 21,930 |
|    | House Services                               | Linear Foot | 200      | 25        | 5,000  |
| 6  | Water Main                                   |             |          |           |        |
|    | Main                                         | Linear Foot | 705      | 30        | 21,150 |
|    | House Services                               | Linear Foot | 336      | 25        | 8,400  |
|    | Hydrants                                     | Each        |          |           |        |
| 7  | Electric                                     |             |          |           |        |
|    | Underground Utility Trench                   | Linear Foot | 840      | 10        | 8,400  |
|    | Conduit/Wiring                               | Linear Foot | 975      | 20        | 19,500 |
|    | Transformer Bases                            | Each        |          |           |        |
| 8  | Storm Drainage                               |             |          |           |        |
|    | Pipe/Culvert                                 | Linear Foot | 328      | 35        | 11,480 |
|    | Catch Basin & DMH                            | Each        | 4        | 2,500     | 10,000 |
|    | Other Treatment Devices Soil Filters         | Each        | 3        | 15,000    | 45,000 |
| 9  | Stormwater Management                        |             |          |           |        |
|    | Outlet Control Structure                     | Each        |          |           |        |
|    | Stormwater Management Facilities             | Each        |          |           |        |
| 10 | Excavate and Grade Subgrade                  | Cubic Yard  | 12,000   | 5         | 60,000 |
| 11 | Roadways                                     |             |          |           |        |
|    | Subbase Gravel                               | Cubic Yard  | 2,354    | 20        | 47,020 |
|    | Base/Finish Gravel                           | Cubic Yard  | 470      | 25        | 11,750 |
|    | Base Paving                                  | Ton         | 614      | 85        | 52,190 |
|    | Finish Paving                                | Ton         | 307      | 85        | 26,095 |
|    | Geotextile Fabric                            | Ton         |          |           |        |
| 12 | Sidewalks                                    |             |          |           |        |
|    | Subbase Gravel Included in Roadway           | Cubic Yard  |          | --        |        |
|    | Base/Finish Gravel Included in Roadway       | Cubic Yard  |          | --        |        |
|    | Base Paving Included in Roadway              | Ton         |          | --        |        |
|    | Finish Paving Included in Roadway            | Ton         |          | --        |        |
| 13 | Parking Lots/Other Areas Included in Roadway |             |          |           |        |
|    | Subbase Gravel Included in Roadway           | Cubic Yard  |          | --        |        |
|    | Base/Finish Gravel Included in Roadway       | Cubic Yard  |          | --        |        |
|    | Base Paving Included in Roadway              | Ton         |          | --        |        |
|    | Finish Paving Included in Roadway            | Ton         |          | --        |        |

# *City of Biddeford, Maine*

## COST ESTIMATE WORKSHEET

|    |                          |                   |       |       |        |
|----|--------------------------|-------------------|-------|-------|--------|
| 14 | Curbing – Bituminous     | Linear Foot       |       | --    |        |
| 15 | Curbing - Concrete       | Linear Foot       | 1,813 | 10    | 18,130 |
| 15 | Curbing – Granite        | Linear Foot       |       | --    |        |
| 16 | Pavement Striping        | Linear Foot       | 1,400 | 0.60  | 870    |
| 17 | Guardrail                | Linear Foot       |       | --    |        |
| 18 | Fencing                  | Linear Foot       |       | --    |        |
| 19 | Loam and Seed            | 1,000 Square Feet | 47    | 1,000 | 47,000 |
| 20 | Riprap                   | Cubic Yard        | 10    | 25    | 250    |
| 21 | Landscaping              | Lump Sum          |       |       |        |
| 22 | Street Lights            | Each              |       |       |        |
| 23 | Site Lighting Wall Packs | Each              | 28    | 200   | 5,600  |
| 24 | Monuments/Iron Pipes     | Lump Sum          | 1     | 600   | 600    |
| 25 | Clean Up                 | Lump Sum          | 1     | 1,000 | 1,000  |
| 26 | As Builts                | Lump Sum          | 1     | 1,000 | 1,000  |
| 27 | Other                    |                   |       |       |        |
| 28 | Other                    |                   |       |       |        |
| 29 | Other                    |                   |       |       |        |
| 30 | Other                    |                   |       |       |        |
| 31 | Other                    |                   |       |       |        |

**COST ESTIMATE TOTAL:**

**\$452,365.00**

**150% of TOTAL:**

**\$678,847.50**

### FOR OFFICE USE ONLY

EROSION CONTROL/SITE STABILIZATION BOND (IF APPLICABLE):

PERFORMANCE GUARANTEE REQUIRED:

Name:

Signature:

Date:

From: egj@maine.rr.com @  
 Subject: Petit Estimate  
 Date: February 29, 2020 at 2:23 PM  
 To: gillist@rocketmail.com



Peter Petit Excavating, Inc.  
 20 Forest Street  
 Biddeford, ME 04005 - 3833  
 Tel: 207 282-9305

## ESTIMATE

| Name / Address                                           |
|----------------------------------------------------------|
| Dempsey LLC<br>PO Box 468<br>Old Orchard Beach, ME 04064 |

| Date      | Estimate # |
|-----------|------------|
| 2/27/2020 | 1522       |

| Item      | Description                    | Total      |
|-----------|--------------------------------|------------|
|           | Marcel Ave                     |            |
| Entrance  | Construction Entrance          | 1,500.00   |
| Erosion   | Erosion Control                | 800.00     |
| Cut       | Cut trees, stump disposal      | 4,000.00   |
| Pipe      | 3 sewer manhole, pipe          | 16,000.00  |
| Water     | Water main                     | 19,500.00  |
| Basin     | Catch basin, storm             | 12,000.00  |
| Gravel    | Base Gravel                    | 43,500.00  |
| Gravel    | Finish Gravel                  | 30,000.00  |
| Fill      | Fill                           | 130,000.00 |
| Stone     | Stone, rip rap                 | 3,500.00   |
| Power     | Underground power              | 5,000.00   |
| Materials | Wooden guard rail              | 4,500.00   |
| Materials | Grassed underdrain soil filter | 28,500.00  |
| Materials | Level spreaders                | 3,000.00   |
| Colverts  | Colvert, rip rap               | 6,000.00   |
| Pipe      | 12" pipe                       | 2,220.00   |
| Pipe      | 8" pipe                        | 2,000.00   |
| Pipe      | 6" pipe                        | 2,400.00   |
| Excavate  | Excavation, Labor              | 85,000.00  |
|           | Note:<br>no paving, curbing    |            |

**Total** \$399,420.00

## ESTIMATE

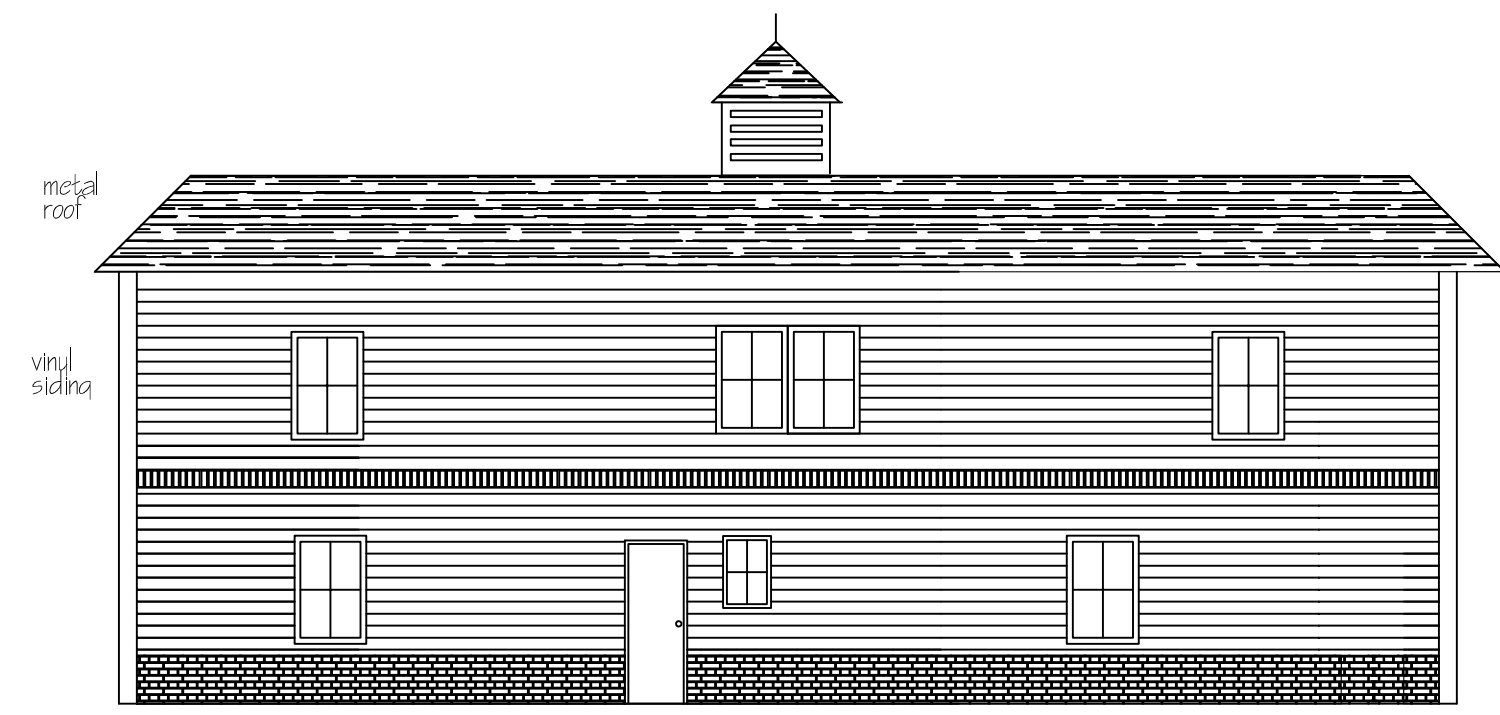
| Date      | Estimate # |
|-----------|------------|
| 2/27/2020 | 1521       |

230

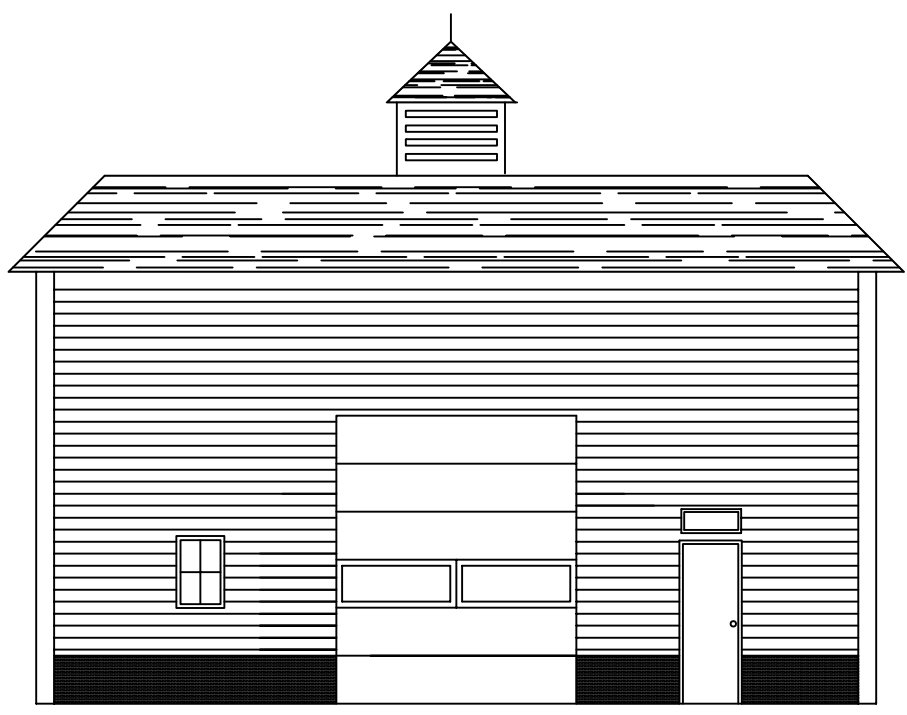




Building D Rear



Building D Front



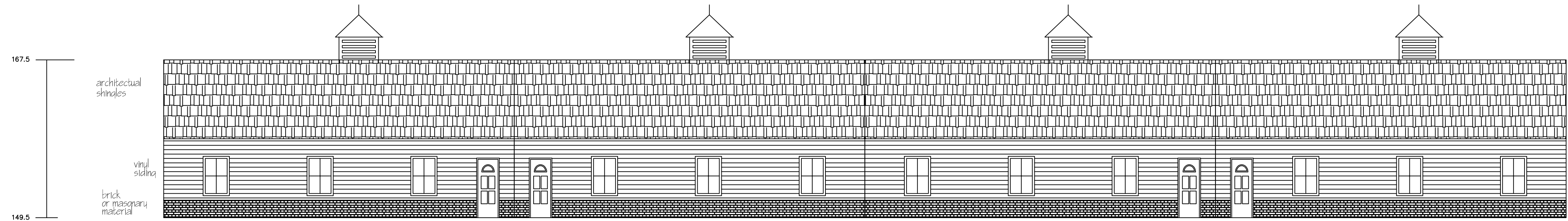
Building D side



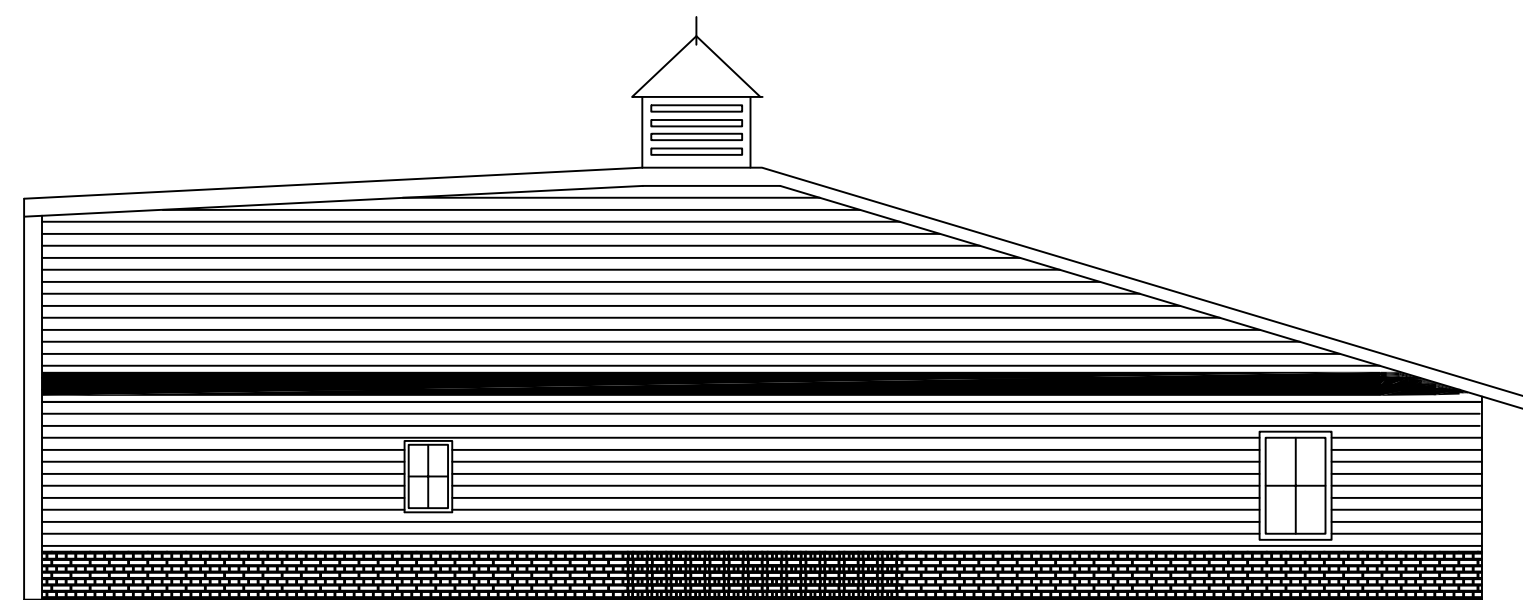
Building A Rear



Building A Front



Building's B & C (front)



Building's B & C (side)



Building's B & C (two units rear)

Dempsey Drive  
at  
Marcel Avenue  
Biddeford Maine  
Building elevations  
DempseyLLC.  
Scale: As Noted  
Sheet 1 of 1  
October, 2019



# CITY OF BIDDEFORD

## PLANNING DEPARTMENT

Greg D. Tansley, A.I.C.P.  
205 Main Street  
PO Box 586  
Biddeford, ME 04005  
(207) 284-9115

[Greg.Tansley@Biddefordmaine.org](mailto:Greg.Tansley@Biddefordmaine.org)

### NOTICE OF DECISION

**November 12, 2019**

William Thompson  
BH2M Engineers  
28 State Street  
Gorham, ME 04038

**RE: 2019.01 Final Site Plan Review/Conditional Use Permit for Landmatters, LLC to construct 14 storage units located at 23 Marcel Avenue (Tax Map 74, Lot 11) in the I-2 zone.**

Dear Bill,

At their meeting of November 6, 2019 the Biddeford Planning Board reviewed the Final Site Plan and Conditional Use Permit for the proposed multi-building, 14 storage unit, development off Landry Street (at 23 Marcel Avenue) in the I-2 zone. The Heirs of Clarence Belanger owns the property and you presented the application proposal to the Planning Board.

Based on the presentation and the materials submitted, the Planning Board granted the following waiver requests:

1. LDR, Article VI, Section 26.F – cut/fill slopes within 10' of a property line and steeper than 3:1;
2. LDR, Article VI, Section 49, 5 & 10 – screen parking from adjacent residential properties and public roads;
3. LDR, Article XI, II.5.B.4.f.1 – no parking or paving within rear or side setbacks;
4. LDR, Article XI, 5.B.4.i.3 – 30% maximum lot coverage for paving.

Following the granting of the waivers, the Biddeford Planning Board approved the Site Plan and Conditional Use Permit and approved the findings of fact conditioned on the following:

1. **Prior to any ground disturbance or issuance of any permits:**
  - a. A pre-construction meeting with the contractor needs to be held with the Engineering Department to discuss inspection requirements.
  - b. A stormwater mitigation fee of \$21,750.00 shall be paid to the Planning Department.



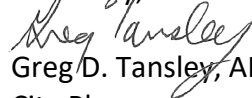
- c. An Erosion and Sedimentation Control Performance Guarantee (acceptable to the Planning Department) in the amount of \$XXX,XXX (amount to be determined by the Planning Department) shall be submitted to the Planning Department.
- d. Salt Management Plan to be provided for review and approval by the Planning Department.
- e. A Financial Capacity letter shall be provided from a recognized financial institution indicating the financial ability of the developer to complete the project.
- 2. Prior to issuance of any occupancy permits:
  - a. A compliance inspection needs to occur by the Engineering Department to determine that all site improvements as shown on the submitted plan were constructed in accordance with the approved plans.
  - b. A performance guarantee (acceptable to the Engineering Department) in the amount of 150% of any remaining site improvements shall be submitted to the Planning Department. Amount to be determined based on City inspections and the recommendation of the City Engineer.
- 3. Conditional Use Permit approval for this project is limited to the following:
  - a. Air transportation dependent use
  - b. Contractor's storage yard
- 4. Outside storage and/or display is prohibited.
- 5. Snow storage (temporary or otherwise) is prohibited from stormwater management facilities.
- 6. Best management practices shall be adhered to during all ground disturbance operations.
- 7. All erosion and sediment control measures need to be installed. Applicant shall notify the Engineering Department once installed so that Staff may inspect said installation, as necessary.
- 8. Copies of the maintenance logs for the stormwater facilities shall be submitted to the City for each calendar year no later than January 15<sup>th</sup> of the following year. If the Engineering Department does not receive these copies within 30 days after the deadline, the applicant may be required to return to the Planning Board for further review.
- 9. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc., prior to commencing business, unless authority issuing said permit allows for such actions.
- 10. Once completed, as-built drawings of the site shall be provided to the Planning Department.
- 11. Upon completion of the work the project engineer shall certify that the project has been completed as per the approved plans or shall note any deviations from the approved plans.
- 12. Standard Conditions of Approval apply.

Following the date of final approval, such approval shall be valid for one year from date of said approval. If a building permit/occupancy permit has not been issued, then said approval shall become automatically null and void. Appeals of the Planning Board's decision may be made as per the Biddeford Revised Code of Ordinances.

If you have any questions please call the Planning Department at 284-9115.

FOR THE BIDDEFORD PLANNING BOARD

Sincerely,

  
Greg D. Tansley, AICP  
City Planner

Cc: R. Fecteau, Code Enforcement Officer (via e-mail)  
T. Milligan, P.E., City Engineer (via e-mail)  
T. Saucier, P.E., Site Design Associates (via e-mail)  
File



# CITY OF BIDDEFORD

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## PLANNING DEPARTMENT

Greg D. Tansley, A.I.C.P.  
205 Main Street  
PO Box 586  
Biddeford, ME 04005  
(207) 284-9115

[Greg.Tansley@Biddefordmaine.org](mailto:Greg.Tansley@Biddefordmaine.org)

### Standard Conditions of Approval

**Owner/Applicant:** Tom Gillis  
Landmatters, LLC  
PO Box 468  
Old Orchard Beach, ME 04064

**Project Description:** Multi-Unit Storage Facility

**Project Location:** Off Landry Street

**Tax Map / Lot Number:** Tax Map 74, Lot 11 and Tax Map 74, Lot 10-2

**Project ID:** 2019.01

1. The material provided for the proposed project has been reviewed only for general conformance to the City technical requirements. The applicant(s) and/or their technical consultant shall be responsible for the actual design details and completeness of their work. It is incumbent upon the applicant(s) to ensure that the project is in conformance and complies with all City Codes, ordinances and regulations as well as with all state regulations, including, but not limited to, space and bulk standards, performance standards, use standards and other zoning type requirements.
2. All work shall be in conformance with the approved plans and submission documents. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner and City Engineer for minor changes. The City Planner shall make the determination of major or minor.
3. If Site Development is required as part of the project, a Letter of Credit or other surety acceptable to the City of Biddeford shall be submitted prior to the issuance of permits or site work being initiated. The financial guarantee shall be established for 150% of the cost of the remaining project improvements. (Items include but are not limited to the following):
  - a. Landscaping
  - b. Paving
  - c. Work within ROW (existing or proposed)

- d. Drainage
  - e. Loam & seed
  - f. Sediment & erosion control
  - g. As-builts
  - h. Monuments
4. Prior to any ground disturbance, the applicant shall establish a construction inspection account equal to: \$3,000 PAID.
  5. Prior to any ground disturbance, a pre-construction meeting with the owner/applicant, contractor, and City is required. Contact the Engineering Department to schedule this meeting.
  6. Contact the Department of Public Works for driveway location permits, curb cut permits and/or street opening permits prior to the start of construction.
  7. If Site Development is required as part of the project, an as-built plan must be provided to the City of Biddeford Engineering Office at the end of the project on mylar and on a disk, in a format, which can be read by the City of Biddeford's Geographic Information System software. If a disk copy cannot be provided, a charge for staff time to enter the plan into the City system will be assessed to the applicant.
  8. The applicant shall incorporate appropriate erosion control measures into this project to reduce erosion affects from the work. All disturbed areas must be re-vegetated and/or otherwise stabilized at the appropriate stage of the work per Maine DEP standards in the Best Management Practice (BMP) manual.
  9. That the Article VI Performance Standards requirements regarding Dust, Fumes, Vapors & Gases (sect 25), Explosive Materials (sect 28), Glare (sect 37), Noise (sect 48) be followed.
  10. The applicant is required to comply with all applicable requirements of Chapter 70 (Utilities) and Chapter 71 (Utilities/Industrial Pretreatment Program).
  11. The applicant shall obtain all other pertinent local, state and federal permits, licenses, and insurance such as blasting, building, electrical, plumbing, etc prior to commencing business.
  12. If Site Development is required as part of the project, at the completion of the project the owner/applicant shall request a final inspection. This request shall be directed to the Planning Office. Performance Guarantees and remaining escrow accounts shall not be released until the Planning Office certifies that the project has been completed and is in compliance with the approval and all applicable City Ordinances.



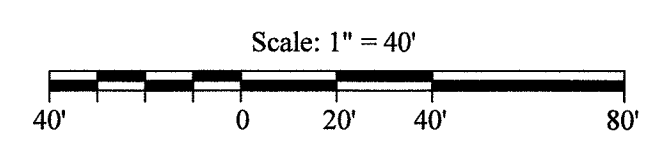
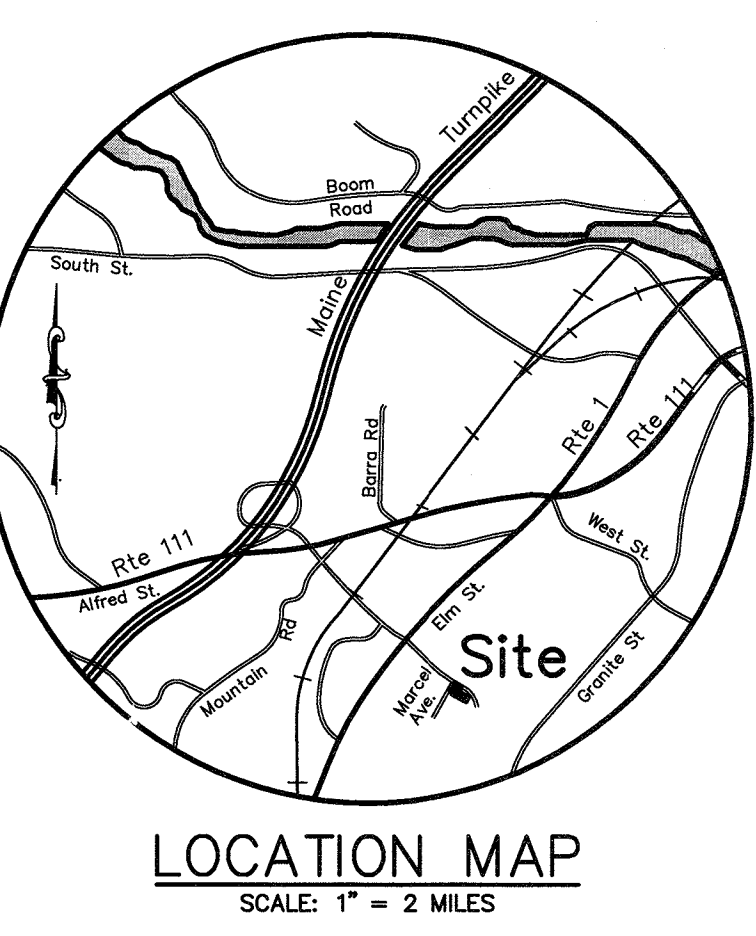
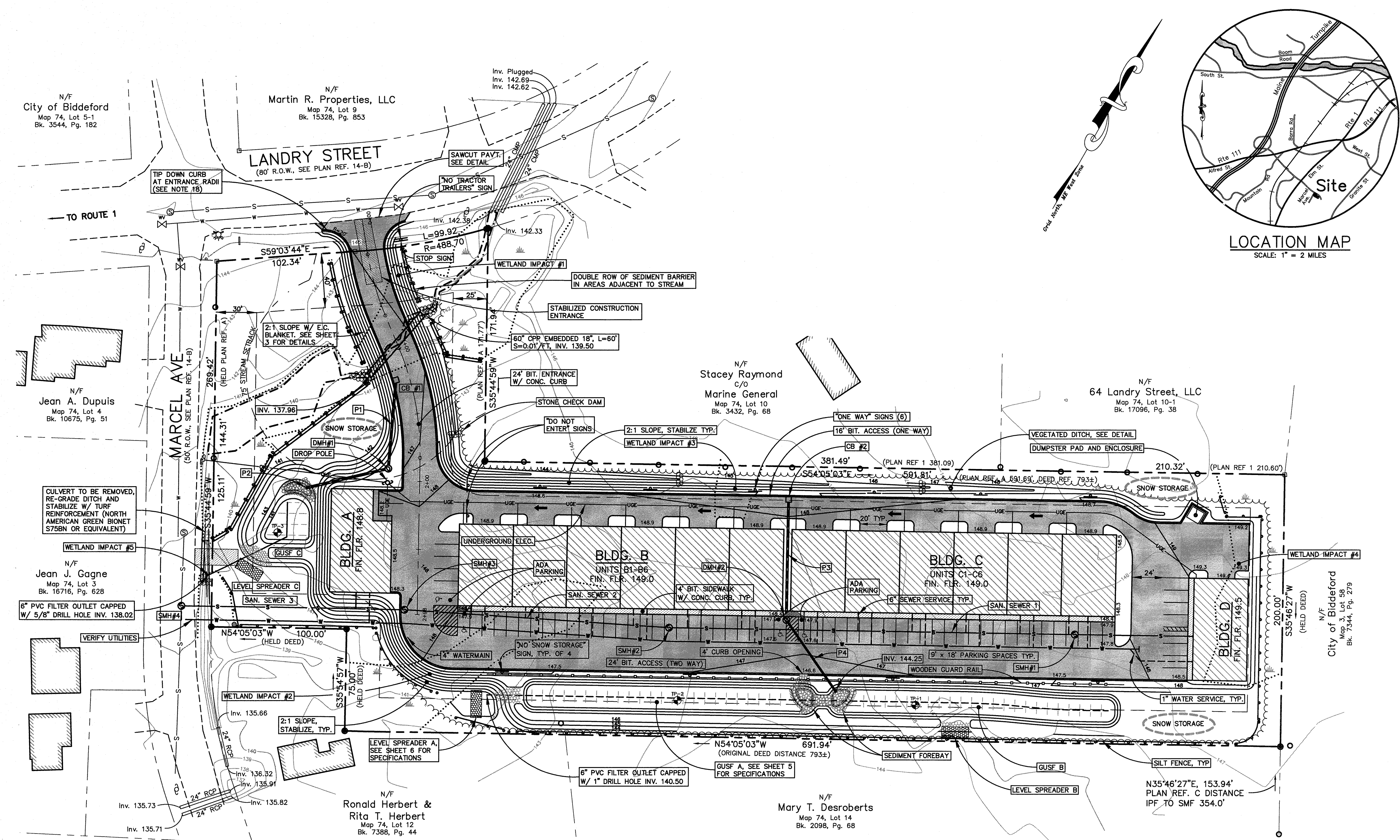
| SYMBOL    | DESCRIPTION                      |
|-----------|----------------------------------|
| □ SMF     | STONE MONUMENT FOUND             |
| □ GMP     | GRANITE MONUMENT FOUND           |
| ○ IPF/IRF | IRON PIPE/ROD FOUND              |
| ○ IPF-1   | CAPPED IRON ROD FOUND (PLS#2190) |
| ○ IRS     | 5/8" IRON ROD W/ CAP TO BE SET   |
| ○ P       | UTILITY POLE                     |
| ○ S       | SIGN                             |
| ○ H       | HYDRANT                          |
| ○ W       | WATER SHUTOFF                    |
| ○ M       | SEWER MANHOLE                    |
| ○ S       | STREAM                           |
| ○ T       | TREE LINE                        |
| ○ W       | WETLANDS                         |
| ○ P       | PROPERTY LINE                    |
| ○ E       | ABUTTER PROPERTY LINE            |
| ○ A       | EDGE OF PAVEMENT                 |
| ○ N       | EXISTING CONTOUR                 |
| ○ A       | ABOVE GROUND                     |
| ○ N       | NOW OR FORMERLY                  |
| ○ F       | SILT FENCE                       |

| Q CURVE DATA |
|--------------|
| CURVE #1     |
| R=200.00'    |
| L=47.16'     |
| T=23.65'     |
| C=47.05'     |
| PC=0+28.31   |
| PT=0+73.47   |
| CURVE #2     |
| R=200.00'    |
| L=83.01'     |
| T=42.11'     |
| C=82.41'     |
| PC=0+99.56   |
| PT=1+82.56   |

| STORMDRAIN/SEWER PIPES                              |
|-----------------------------------------------------|
| P1 - 12" S.D., L=61', S=0.005'/FT., INV. OUT 142.30 |
| P2 - 12" S.D., L=60', S=0.005'/FT., INV. OUT 142.30 |
| P3 - 12" S.D., L=85', S=0.004'/FT., INV. OUT 142.30 |
| P4 - 12" S.D., L=62', S=0.004'/FT., INV. OUT 142.30 |
| SS1 - 8" PVC, L=296', S=0.005'/FT., INV. OUT 142.30 |
| SS2 - 8" PVC, L=196', S=0.005'/FT., INV. OUT 142.30 |
| SS3 - 8" PVC, L=196', S=0.005'/FT., INV. OUT 142.30 |
| GUSF A & B - 6" PVC, L=464', INV. OUT 142.30        |
| GUSF C - 6" PVC, L=91', INV. OUT 142.30             |

| STORMDRAIN/SEWER STRUCTURES                              |
|----------------------------------------------------------|
| CB#1 - RIM 146.40, 12" INV. 143.00                       |
| CB#2 - RIM 147.50, 15" INV. 144.94                       |
| DMH#1 - RIM 146.90, 12" INV. 142.70, 12" INV. OUT 142.60 |
| DMH#2 - RIM 147.90, 15" INV. 144.60, 15" INV. OUT 144.50 |
| SMH#1 - RIM 147.40, 8" INV. 142.00                       |
| SMH#2 - RIM 147.60, 8" INV. 140.52, 8" INV. OUT 140.42   |
| SMH#3 - RIM 147.50, 8" INV. 139.44, 8" INV. OUT 139.34   |
| SMH#4 - RIM 140.30, 8" INV. 139.44, 8" INV. OUT 139.34   |

| NOTES:                                                                                                       |
|--------------------------------------------------------------------------------------------------------------|
| 1. OWNER: HEIRS OF CLARENCE BELANGER<br>C/O THOMAS BELANGER<br>81 SOUTH WATERBORO ROAD<br>LYMAN, MAINE 04002 |
| 2. APPLICANT: TOM GILLIS, LANDMATTERS, LLC<br>P.O. BOX 468<br>OLD ORCHARD BEACH, MAINE 04064                 |
| 3. SURVEYOR: ROBERT C. LIBBY JR., PLS #2190<br>BH2M<br>28 STATE STREET<br>GORHAM, MAINE                      |
| 4. WETLAND DELINEATION: ALEXANDER FINAMORE, CWS, LSE<br>440 SWAMP ROAD<br>DURHAM, MAINE 04222                |
| 5. ENGINEER: STEVEN BLAKE, BH2M<br>PE #11695                                                                 |



YORK ss REGISTRY OF DEEDS  
RECEIVED Mar 16 2020  
AT 11:15 M. P. M., AND  
RECORDED IN BOOK 401 PAGE 18  
ATTEST:  
Marcy E. Hammond  
REGISTER

|                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. OWNER:                                                                                                                       | HEIRS OF CLARENCE BELANGER<br>C/O THOMAS BELANGER<br>81 SOUTH WATERBORO ROAD<br>LYMAN, MAINE 04002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2. APPLICANT:                                                                                                                   | TOM GILLIS, LANDMATTERS, LLC<br>P.O. BOX 468<br>OLD ORCHARD BEACH, MAINE 04064                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. SURVEYOR:                                                                                                                    | ROBERT C. LIBBY JR., PLS #2190<br>BH2M<br>28 STATE STREET<br>GORHAM, MAINE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. WETLAND DELINEATION:                                                                                                         | ALEXANDER FINAMORE, CWS, LSE<br>440 SWAMP ROAD<br>DURHAM, MAINE 04222                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5. ENGINEER:                                                                                                                    | STEVEN BLAKE, BH2M<br>PE #11695                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6. DEED REFERENCE:                                                                                                              | BK. 3010, PG. 210 &<br>BK. 4303, PG. 149                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7. TAX MAP REFERENCE:                                                                                                           | MAP 74, LOT 11 & MAP 74, LOT 10-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 8. ZONING:                                                                                                                      | I2, INDUSTRIAL 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 9. MINIMUM STANDARDS:                                                                                                           | FRONTAGE - 50'<br>SETBACKS - 30' FRONT, MARCEL AVENUE<br>40' FRONT, LANDRY STREET<br>25' SIDE AND REAR<br>(50' AT RESIDENTIAL DISTRICT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10. LOT AREA:                                                                                                                   | 181,794 S.F. (4.173 ACRES)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11. SEWER SERVICE:                                                                                                              | PUBLIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 12. WATER SERVICE:                                                                                                              | PUBLIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 13. ELECTRIC/TELEPHONE:                                                                                                         | UNDERGROUND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 14. BENCHMARK:                                                                                                                  | BM A - 4" NAIL IN UTILITY POLE #J1<br>0.2' A.G. ON THE NORTH-EASTERLY<br>SIDE OF MARCEL AVE., ELEVATION<br>141.39 NAVD 88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 15. WETLAND IMPACTS:                                                                                                            | WETLAND IMPACT #1.....138 SF<br>WETLAND IMPACT #2.....4,416 SF<br>WETLAND IMPACT #3.....727 SF<br>WETLAND IMPACT #4.....2,999 SF<br>WETLAND IMPACT #5.....36 SF<br>TOTAL WETLAND IMPACTS.....8,316 SF                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 16. PLAN REFERENCES:                                                                                                            | A. "PLAN OF RESUBDIVISION OF LOT-1<br>AIRPORT IND. PARK II LAND OF THE CITY<br>OF BIDDEFORD, ME ON LANDRY ST. IN,<br>BIDDEFORD, ME" DATED AUG. 7, 1984, BY<br>THE CITY OF BIDDEFORD, ME. ENGINEERING<br>DEPT. RECORDED AT THE YORK REGISTRY<br>OF DEEDS BOOK 132 PAGE 23.<br>B. "PLAN SHOWING A PORTION OF MARCEL<br>AVENUE IN, BIDDEFORD, ME" DATED SEPT.<br>19, 1988, BY THE CITY OF BIDDEFORD, ME.<br>ENGINEERING DEPT. RECORDED AT THE<br>YORK REGISTRY OF DEEDS BOOK 160 PAGE<br>29.<br>C. "PLAN SHOWING LAND SURVEYED FOR THE<br>CITY OF BIDDEFORD KNOWN AS THE<br>BIDDEFORD MUNICIPAL AIRPORT" DATED<br>JUNE 8, 1983 BY THE CITY OF BIDDEFORD,<br>ME. FILE NO TR-BB11-686" |
| 17. PARKING REQUIREMENTS:                                                                                                       | BUILDING MATERIAL STORAGE:<br>1 SPACE/500 S.F. OF FLOOR AREA<br>34,500 S.F. BUILDING = 69 SPACES<br>500 S.F.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 18. ALL CURBING PLACED IN THE CITY RIGHT OF WAY SHALL BE GRANITE.                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 19. ALL AREAS THAT ARE DISTURBED AS A RESULT OF CONSTRUCTION SHALL BE REVEGETATED PRIOR TO COMPLETION OF THE PROJECT.           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 20. ALL CATCH BASINS IN THE ENTRANCE ROAD AND PARKING AREAS SHALL BE INSTALLED WITH OIL/ DEBRIS HOODS. SEE SHEET 4 FOR DETAILS. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. NO SURVEYORS REPORT                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

I CERTIFY THAT THIS SURVEY CONFORMS TO THE MAINE BOARD OF LAND SURVEYORS TECHNICAL STANDARDS OF PRACTICE FOR A STANDARD BOUNDARY SURVEY WITH THE FOLLOWING EXCEPTIONS:

1. NO SURVEYORS REPORT

THIS PLAN REVIEWED AND APPROVED BY THE CITY OF BIDDEFORD PLANNING BOARD.

CHAIR: Bruce E. Berry DATE: 11-6-19

Robert C. Libby Jr.  
REGISTERED PROFESSIONAL LAND SURVEYOR  
PLS #2190

| NO. | DATE     | REVISION                                | DESCRIPTION |
|-----|----------|-----------------------------------------|-------------|
| 1   | 4/10/19  | Submitted Plan For City Review          |             |
| 2   | 5/15/19  | Submitted Plan For City Review          |             |
| 3   | 7/15/19  | Revised Per City Comments               |             |
| 4   | 8/14/19  | Revised Per City Review                 |             |
| 5   | 9/17/19  | Revised Per City Review, & DEP Comments |             |
| 6   | 9/20/19  | Revised Per DEP Comments                |             |
| 7   | 10/31/19 | Revised Per Final City Comments         |             |

**BH2M**  
Berry, Huff, McDonald, Milligan Inc.  
Engineers, Surveyors  
28 State Street  
Cortland, Maine 04308  
Tel: (207) 859-2771  
Fax: (207) 859-6260

**SITE PLAN**

**DEMPSEY DRIVE**

**MARCEL AVE**  
BIDDEFORD, MAINE

|                      |                   |
|----------------------|-------------------|
| DESIGNED<br>A. Fagan | DATE<br>Mar. 2019 |
| DRAWN<br>Dept.       | SCALE<br>1" = 40' |
| CHECKED<br>S. Blake  | JOB. NO.<br>19003 |

SHEET

**1**

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